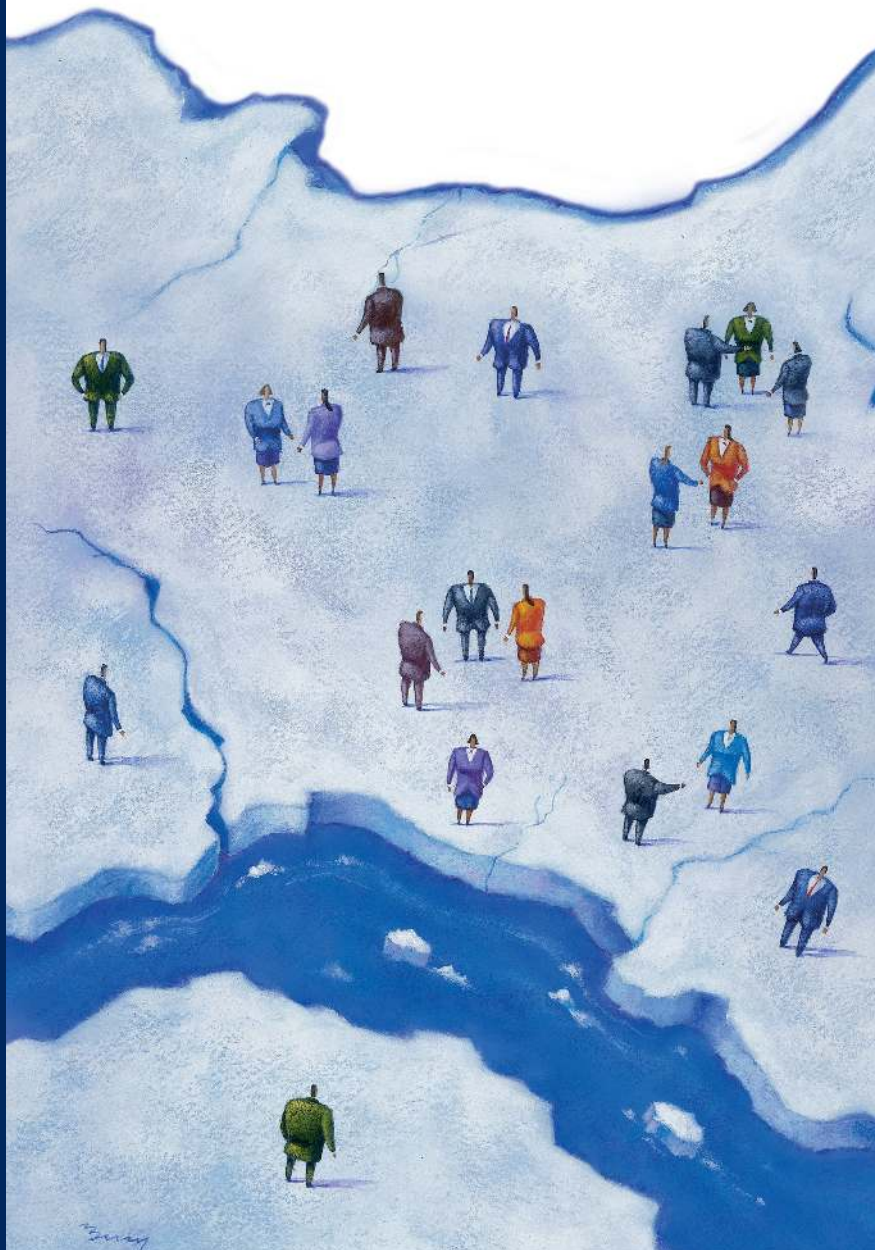
SANDER WENNEKERS

Entrepreneurship at Country Level

Economic and Non-Economic Determinants



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ECONOMIC AND NON-ECONOMIC DETERMINANTS

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ECONOMIC AND NON-ECONOMIC DETERMINANTS

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To Jacqueline

PREFACE

Subject matter of this study

This book is a study into the rate of entrepreneurship at country level, either measured by the number of business owners as a percentage of the labor force, or by some metric of the dynamics of entrepreneurship such as 'nascent entrepreneurship' and new business start-ups. The rate of entrepreneurship, however measured, differs across countries and over time. The causes of this variety are intriguing and it is important to know more about them.

Entrepreneurship is an ill-defined, at best multidimensional, concept. An important distinction is that between an occupational and a behavioral notion of entrepreneurship. The former refers to individuals owning and managing a business for their own account and risk, while the latter focuses on entrepreneurial behavior in the sense of seizing an economic opportunity. The present book chooses the occupational view as its main perspective. Within this view, a dynamic perspective focuses on the creation of new businesses, while a static perspective relates to the number of business owners. While measurement problems in this field are not negligible, professionally collected data for well-defined metrics of the level of occupational entrepreneurship are available for a large number of countries. Basically, the subject of the rate of occupational entrepreneurship thus seems suitable for scientific research.

Personal and professional motivations

Why would someone in his fifties, to a considerable extent in addition to a full-time job, spend so much time and energy on a venture as uncertain as writing a dissertation? Although after my graduation from university with an MA in general economics there were practical reasons for not writing a dissertation, there has always, deep down, been a feeling of regret about this missed opportunity. After a long gestation lag, only little inducement was required to depart upon a dissertation in 1998. Coincidence also played a role. After 18 years in economic forecasting and policy research at subsequently CPB and EIM, I was offered the opportunity, in 1995, to take charge of EIM's strategic research program. My first research project on the subject of entrepreneurship ('Linking entrepreneurship and economic growth'), initiated by Roy Thurik, introduced me to many unknown strands of literature and confronted me with many different and sometimes rather unclear concepts. In short, my investigation started with a great deal of confusion, which persisted for several years and proved a great incentive to keep digging. Stimulating discussions with Roy Thurik and David Audretsch, and the reading of seminal literature on entrepreneurship increased my interest even further. In 1997, the publication of our findings in an EIM research report entitled "Entrepreneurship, economic growth and what links them together", enhanced my motivation to carry on with the subject. This was also

stimulated by the Dutch Department of Economic Affairs' increasing policy interest in entrepreneurship and the related decision by EIM to focus a greater part of its SME research program on the subject of entrepreneurship. The publication in Small Business Economics, in 1999, of a revised version of the abovementioned report was a great encouragement.

In retrospect, many other instances in my personal and professional history have contributed to my motivation to write the present book. First, my gymnasium education, followed by a year as a foreign exchange student in California, a BSc in econometrics interspersed with several classes in psychology, a few years as a research assistant at the Econometric Institute in Rotterdam and one year as an editor for Het Financieele Dagblad, all helped me to develop a broad and eclectic outlook. Next, in the early 1980s, David Birch's publication about the dominant role of small firms in job creation and the disbelief this finding caused among many colleagues at CPB, planted the seed of interest in small business and entrepreneurship. At the same time, discussions about history with my CPB colleague André de Jong, who introduced me to the works of Landes and Cipolla, planted another seed. Meanwhile, seven years at CPB (1977-1984) carrying out long term economic analysis initiated my digressions from macro into meso and microeconomics (without losing touch with macro). Subsequently, four years at CPB devoted to research of the services sector, also leading to contacts with EIM and finally to a transfer to EIM in 1988, proved indispensable for choosing my subject matter.

Acknowledgements

Writing this book would not have been possible without the support of many others. First of all I thank my PhD supervisor and EIM colleague Roy Thurik for his active cooperation during the past 8 years. Together, we have spent many hours discussing the concept of entrepreneurship, designing causal schemes and presenting our results at scientific conferences. This has always been a lot of fun. Roy contributed to most of the papers underlying this dissertation. His inspiring suggestions and critical remarks have been invaluable. In addition, I thank my employer, EIM, for their interest and support.

Many others have contributed to this dissertation. First, I thank the co-authors of the papers underlying the theoretical framework presented in chapter 3. Ingrid Verheul made indispensable contributions to the 'eclectic theory of entrepreneurship' and commented upon an earlier version of chapter 3. David Audretsch gave stimulating suggestions for the 'Linking' paper mentioned before and was resourceful in getting the eclectic theory published. Lorraine Uhlaner was a great sparring partner for the paper on 'entrepreneurship and its conditions'. Secondly, several colleagues contributed to the empirical chapters of this dissertation. Mickey Folkeringa actively participated in chapter 4. Niels Noorderhaven enlightened me about the concept of culture and made contributions to chapters 6 and 7. André van Stel contributed to chapters 5, 6 and 7. I always enjoy our discussions interpreting coefficients and

designing new specifications for our regression models. Paul Reynolds, the founding father of the Global Entrepreneurship Monitor, contributed to chapter 5. Thirdly, my thanks go to Shirley Cooper for improving the English in several chapters of this book. Finally, Erica Wink did a great job in managing the growing document of this dissertation.

This book is based on nine research papers. Seven of these papers have been or will be published in *Entrepreneurship: Theory and Practice*, the *International Journal of Entrepreneurship Education*, the *Journal of Evolutionary Economics*, the *Journal of Small Business and Enterprise Development*, and *Small Business Economics*. Two papers were incorporated in books published by Kluwer Academic Publishers and Physica-Verlag.

I also thank my daughters for their continuous interest and support. In particular, Annemarie helped improving the layout of the final manuscript, Marjolein has tidied up the References System and Charlotte contributed to the propositions attached to this dissertation. Most of all I am grateful to my wife Jacqueline. As always, she has been a true partner. Her love, care and support over the years were the key factors making this project possible.

Sander Wennekers
Leidschendam, July 2006

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PART I

Prelude, Motivation, Overview and Conclusions

CHAPTER 1

EXPLORING THE FIELD: HISTORICAL CASE STUDIES

Abstract
Chapter 1 is a prelude. It explores entrepreneurship, its manifestations and its conditions by using a number of historical case studies. After describing the highly entrepreneurial Dutch Golden Age, the chapter gives brief accounts of Britain's entrepreneurial rise and decline during the First Industrial Revolution and its aftermath. These cases illustrate the role of 'entrepreneurial framework conditions', such as property rights, social mobility and a cultural receptiveness to new ideas, and of feedback from entrepreneurial performance to key conditions, such as learning and role models. This approach provides an introduction to the multidisciplinary framework developed in chapter 3 to explain the variations in the rate of entrepreneurship at the country level. A subsequent case study is devoted to the Second Industrial Revolution and the Managerial Revolution illustrating how, over time, entrepreneurship may display diverse manifestations across a continuum between 'creative destruction' and 'management/coordination'. Next, a fifth 'case' reviews the revival of entrepreneurship in several OECD countries during the last quarter of the 20th century, while at the same time bearing out the large variety in the rate of entrepreneurship across nations.
Subsequently, the chapter traces the roots and early interpretations of the word 'entrepreneur' and discusses historical thought about what constitutes entrepreneurship. Firstly, an *occupational* notion of entrepreneurship, dating back to the mid 18th century, refers to 'someone who works for her/his own account and risk'. Secondly, a more recently developed *behavioral* notion of entrepreneurship, loosely related to the original 15th century meaning of the French word *entrepreneur*, refers to the perception or creation of new economic opportunities and their exploitation. These two notions may also be viewed as separate dimensions, i.e. self-employed versus employee and entrepreneurial versus managerial. Additionally, the chapter discusses a class of *functional* notions, related to the major functions of entrepreneurship in the economic process. Finally, the 'occupational' notion of entrepreneurship is chosen as the main perspective of the present book.

The historical cases in chapter 1 are partly based on revised sections of:

Wennekers, Sander and Roy Thurik (1999), Linking entrepreneurship and economic growth, *Small Business Economics* 13, 27-55, with kind permission of Springer Science and Business Media.

Wennekers, A.R.M., L.M. Uhlaner and A.R. Thurik (2002), Entrepreneurship and its conditions: a macro perspective, *International Journal of Entrepreneurship Education* 1 (1), 25-64, with kind permission of Senate Hall Academic Publishing.

Thurik, Roy, Sander Wennekers and Lorraine M. Uhlaner (2002), Entrepreneurship and economic performance: a macro perspective, *International Journal of Entrepreneurship Education* 1 (2), 157-179, with kind permission of Senate Hall Academic Publishing.

EXPLORING THE FIELD: HISTORICAL CASE STUDIES

1.1 Introduction

Entrepreneurship as a real life economic phenomenon dates back at least to the classical era[1]. In those times, as in the Middle Ages, entrepreneurs were not primarily recognized as such, but were usually denoted by their 'trade' as craftsmen (artisans) or as merchants. Conceptualizing and theorizing about entrepreneurship as a separate economic function, seems to be a more recent activity that began in the early 18th century. For the present study into the causes of variation in the rate of entrepreneurship across countries and over time, there is much to be gained from an encounter with some of the evidence about determinants, manifestations and consequences of entrepreneurship in historical times and with historical thought about such phenomena. It is the purpose of the present chapter to provide such an encounter, if only a brief one.

First, this chapter explores entrepreneurship and its conditions by means of a number of historical case studies. Although clear examples of entrepreneurship already appear in the cities of Northern Italy and Flanders from the Middle Ages onward (Cipolla, 1981; McNeill and McNeill, 2003), we pick up the story of 'modern' entrepreneurship in the late 16th and early 17th century Dutch Republic. After describing the Dutch Golden Age, the chapter gives brief accounts of Britain's entrepreneurial developments (rise and decline) during the First Industrial Revolution and during its aftermath. These three cases are structured in such a way, that they offer an implicit introduction to the multidisciplinary framework that will be developed in chapter 3 for explaining the variations in the rate of entrepreneurship at country level. This is done by identifying key conditions for entrepreneurship and by briefly outlining intermediate linkages between entrepreneurship and economic development, while implicitly revealing feedback mechanisms through role models and learning processes.

Secondly, a case study is devoted to two partly overlapping revolutions, i.e., the Second Industrial Revolution and the Managerial Revolution. This is done to illustrate how entrepreneurship may display wide-ranging manifestations over time. Then, a fifth 'case' reviews the (partial) revival of entrepreneurship in several OECD countries during the last quarter of the 20th century (the 'Entrepreneurial Divide'). Relevant data from recently assembled international datasets will be presented to illustrate this renaissance. The data will also bear out the large variety in entrepreneurship (both in a static and a dynamic sense) across nations. How this variety may relate to different underlying 'entrepreneurial framework conditions' will also be discussed.

[1] However, while "the Graeco-Roman world was essentially and precisely one of private ownership" (Finley, 1973: 29), in the classical economy the self-employed craftsmen, merchants and other businessmen were often slaves with a *peculium*, freedmen or foreigners (Finley, 1973: 59, 64) and "acquiesced in an inferior social position" (Cipolla, 1981: 147).

Subsequently, the chapter follows the early traces of the French word 'entrepreneur' and of its counterparts in some other languages. As a side benefit, these traces display major relevant notions and dimensions of entrepreneurship. A brief summary of historical thought about what constitutes entrepreneurship further helps to distil relevant notions and dimensions. The chapter rounds off with preliminary conclusions.

1.2 The Golden Age of the 17th Century Dutch Republic

There is abundant evidence to support the proposition that the Golden Age of the Dutch Republic was a highly entrepreneurial economy[2] (Cipolla, 1981: 120; Klein, 1965: 479; Klein and Veluwenkamp, 1993: 31-43). During this period, the Dutch Republic also demonstrated relatively rapid economic growth (Davids, 2000: 433-442; Klein, 1965: 475; de Vries, 2000: 452-457).

Aggregate conditions
Aggregate conditions provided a rich environment for entrepreneurial activities during the 17th century. Technology and science blossomed, offering many opportunities for new economic applications. The experimentalists, such as Huyghens and Leeuwenhoek, and inventors, such as Stevin and Leeghwater, are just a few of the well-known scientists of this period (Cipolla, 1981: 120). The Dutch Republic was viewed as the technological frontier of Europe during this period (de Vries and van der Woude, 1995: 798).

The level of economic development offered ample opportunities for entrepreneurship. The Republic's per capita income was much higher than that of other European countries and notably England (de Vries and van der Woude, 1995: 722, 814). Population density was another economic factor stimulating entrepreneurial activity. In 1525 about 45% of Holland's population lived in cities, increasing to more than 60% in 1675 (de Vries and van der Woude, 1995: 84), an urbanization rate far ahead of the rest of Europe at that time. Urbanization provided accessible markets for final goods and access to production resources. The immigration to Holland of many experienced and wealthy businessmen from the Southern Low Countries, Portugal and other countries in the decades following the fall of Antwerp in 1585, stimulated entrepreneurial activity (Klein and Veluwenkamp, 1993: 33-34). In addition, Holland's high standard of living and the relative freedom of religion attracted large numbers of skilled and unskilled laborers throughout the 17th century, further facilitating economic expansion (de Vries and van der Woude, 1995: 95-103).

The legal or institutional framework was conducive to both the demand side and the supply side of entrepreneurship. The Northern Low Countries lacked a feudal history; agriculture was based on a tradition of relatively free enterprise (de Vries and van der Woude, 1995: 201) and in many lines of business wage-labor was an established

[2] The Dutch Republic is also referred to as the Northern Low Countries, the United Provinces or simply as Holland (see Davids and Noordegraaf, 1993: 1-2).

practice long before the 17th century (van Zanden, 1988)[3]. In addition, the legal framework including property rights, the monetary system and tax systems were well developed. Also, in comparison with the rest of Europe, the educational system in the Republic was already remarkably mature and literacy was relatively high (de Vries and Van der Woude, 1995: 210-212). In particular, legal restrictions on experimentation were relatively absent, and intellectual property rights were secure. A system of granting patents was in place and stimulated the actual application of inventions. Additionally, political decentralization and the ensuing competition between cities created a sellers' market for inventors. The number of patents for inventions, granted by the States General, peaked between 1600 and 1650 (Davids, 1993: 91-97).

Because of the competition between cities, municipal government played an active role in stimulating new business start-ups. These stimulants took a wide variety of forms including "bounties, patents, monopolies, cheap loans, tax exemptions, exemptions from civic duties, freedom from rent, free use of city-owned equipment or special arrangements for the provision of labor" (Davids, 1995: 168). The highest level of government assistance occurred during the period 1575-1620 and again between 1655 and 1700, after which such assistance programs declined sharply.

As a consequence of these economic conditions, social mobility and job mobility were relatively high, and there was ample opportunity for individual inventiveness and entrepreneurial spirit (de Vries and van der Woude, 1995: 199). It has also been hypothesized that the 'protestant ethic' of Calvinism stimulated the entrepreneurial economy (Weber, 1958), although much of the capitalist spirit was already to be found in the culture of the Low Countries in the medieval period (de Vries and Van der Woude (1995: 205-213) and Holland of around 1500 was already characterized by a 'proto-capitalist' structure (van Zanden, 1988: 361).

Rate of entrepreneurship

The rate of entrepreneurship in the 17th century Dutch Republic cannot be measured statistically. However, there is ample anecdotal evidence both of widespread self-employment and of a dynamic society with an entrepreneurial orientation, of opportunities exploited for the production and marketing of new products and processes, domestically and globally.

Take for instance the Dutch brewing industry. Yntema (1995) analysed the role of entrepreneurship in the transformation of the Dutch brewing industry between 1500 and 1580, the period just preceding what is usually considered the Golden Age. Yntema describes this period as follows: "Enterprising brewers penetrated new markets, marketing new types of beer and altering traditional market arrangements. Technological change was a hallmark of the brewing industry: the use of new brewing processes spread throughout Holland, the per unit cost of brewing beer declined, and

[3] Wage-labor was often combined with part-time self-employment (van Zanden, 1988: 377).

the types of beer that were brewed increased. ... Increased fixed capital investment embodied technological change, allowing brewers to profit from economies of scale" (Yntema, 1995: 201).

The wide-ranging business activities of the Trip family provide another example of the dynamic qualities of the period (Klein, 1965). Across several generations and for more than a century, the Trips started and expanded firms in various areas of the economy, including international commerce (arms, tar, iron, copper), production industries (woolens, salt refinery, gun foundry), ship ownership, land ownership, stock jobbing, and finance and insurance. They also participated in the Dutch East India Company. Their entrepreneurial success pushed "the family fortunes to spectacular heights" (Klein, 1965: 474). The successes of another businessman, Louis de Geer, provide one more case example of the vigor of Dutch entrepreneurship in the 17th century. Founder and administrator of an economic empire headquartered in Amsterdam, De Geer is also considered the founding father of the industrial sector in Sweden (Cipolla, 1981; Lindblad, 1995).

To sum up, during this period the Dutch covered the world as explorers, colonists, merchants, consultants and industrialists (Cipolla, 1981).

Economic performance during the Dutch Golden Age

The scope of the industrial diversification during the Dutch Golden Age was far reaching. This period in history witnessed advances in a wide variety of sectors, including agriculture, fishery, construction, manufacturing, shipping and trade as well as a remarkable development of modern services such as finance, insurance, broking and factoring.[4] The macroeconomic accomplishments of this capitalist episode are also conspicuous. First of all the period between 1550 and 1675 witnessed a total average population growth of more than 0.3% per annum and an average urban population growth of 0.8% (de Vries, 2000: 454). Van Zanden (1993: 11) estimates real per capita output growth between 1580 and 1650 to be more than 0.3% per year in the Province of Holland "and perhaps even twice that figure".[5] On the other hand, real wages in Holland remained roughly constant, while real per capita wealth tripled between 1500 and 1650. Apparently, economic growth in this period was accompanied by a change in the distribution of income between business owners and employed labor.

Population growth can be both a cause and a consequence of economic development, but an economic analysis by de Vries of the period 1580-1620 bears out the job creating effect of the economic development in these years. Considering the concurrent strong rise in the wage for unskilled labor, urban population growth was "more than matched by the expansive growth of employment opportunities as capital

[4] For an extensive account, see De Vries and van der Woude (1995: 235-582).

[5] These growth rates may seem modest by modern standards, but a lasting combination of population growth with per capita income growth was exceptional in the pre-industrial era.

was invested across a broad range of commercial and industrial activities" (de Vries, 2000: 456).

One explanation for the economic success of the period may be the continuous drive towards higher productivity. During this period, the Dutch were particularly adept at boosting productivity via cost-reducing innovations, while maintaining high wages (Cipolla, 1981; Davids, 1993; Klein, 1965; de Vries and van der Woude, 1995). The innovations are wide ranging, and apply to many industries. For example, in fishing, the Dutch refined techniques for curing herring aboard ship and improved harpoons used for whaling. Agricultural productivity was boosted by fertilization, crop rotation, and the application of advanced drainage techniques. In shipping, productivity was improved by the invention of a revolutionary new ship (the *fluyt* ship) and via advances in navigation techniques and cartography. In shipbuilding, standardized ship design and investments in cranes raised productivity. Innovations in manufacturing were also quite numerous ranging from the use of peat as a source of energy, the widespread use of industrial windmills and the introduction of mechanical devices. Of course, in addition to process innovations there were also many new products and services introduced in this period, including clocks and other precision instruments, and tradable equity shares.

Conclusion

Historical analysis suggests that entrepreneurship may serve as an important intervening explanatory variable connecting the aggregate conditions and economic development in the Golden Age. We have no clear evidence to what extent economic progress was due to the entry of new businesses and to new investments undertaken by incumbents. There are alternative explanations for the economic prosperity of the period and/or explanations working in tandem with entrepreneurship. For instance, monopolies were permitted and were often critical prerequisites for high investment. However, these monopolistic practices were generally short-term in character (Klein, 1965; Klein and Veluwenkamp, 1993). Also, although the precise importance of scale economies in this period is relatively unknown, many large-scale businesses, i.e., with more than 50 employees, thrived, for instance in textile manufacturing, industrial paper windmills, brewing, peat cutting and shipbuilding. Moreover, certain political forces boosted the Dutch economy in this period. Some historians argue that the energy and cohesiveness required by the Dutch to resist the power of and to achieve political autonomy from the Spanish Habsburg Empire during the eighty years war (1568-1648) stimulated their fierce mercantilist competitive spirit.[6] In any event, Dutch merchants and statesmen of this period drew together capital and expertise to prey upon the overseas property of Spain and Portugal in Africa, the Americas and Asia (O'Brien, 2000: 481). The subsequent permanent presence in Asia in the form of the large Dutch East India Company and the continued role of the Dutch as middlemen in intra-European trade also played an important role in creating the Golden Age.

[6] For a description of this war, see (Israel, 1995).

The neo-classical production function model is an alternative explanation of the key forces affecting economic performance during the Dutch Golden Age—in particular, improved productivity through substituting large scale capital investment and more efficient energy sources (wind, peat, coal and water) for manual labor. Trade in imports and re-exports augmented the capital available for financing investments and related innovations (Cipolla, 1981: 239), while the high real wage rate played a role in triggering these innovations (for an example in the wood sawing industry, see de Vries and van der Woude, 1995: 725). Nevertheless, one might argue that these factors are at best the "proximate" causes of economic growth, with entrepreneurship still serving as the crucial intermediate variable linking the underlying conditions to these proximate causes of economic growth (Lewis, 1955; North and Thomas, 1973; Wennekers and Thurik, 1999).

To summarize, applying our framework to the Dutch Golden age, we can identify technological, economic, demographic, cultural and institutional factors that played a role shaping both the demand and the supply side determinants of entrepreneurship. Likewise, it appears that entrepreneurial activity stimulated innovation, variety and competition, which in turn, was associated with the economic growth during the period. The late 16th and early 17th century Dutch Republic provides an illuminating historical example of the many forces shaping a strong entrepreneurial economy.

1.3 Britain's First Industrial Revolution (1760-1830)

We now take a more abbreviated look at another historical period and location, the first Industrial Revolution in Great Britain between 1760 and 1830 (Mokyr, 2000).[7]

Aggregate conditions
At the end of the 15th century England was still an 'underdeveloped country' in comparison to countries such as Italy, the Low Countries, France and Southern Germany (Cipolla, 1981). Considerable changes took place between 1500 and 1700. At first English exports were dominated by wool and woolen cloth. After 1550, the many immigrants from France and the southern Low Countries gradually introduced many new products. During this period English[8] society became more receptive to new ideas and cultural influences. Young men were sent abroad to study at foreign universities. By 1700 the legal and institutional conditions had changed considerably, setting the stage for Britain's industrial expansion. Innovations in economic activity were spurred by the elimination of feudalism, the declining power of the guilds, the growth in popularity of the joint stock company and the development of a banking system (North and Thomas, 1973). By this time, Britain had also developed an efficient set of property rights embedded in common law and had begun to protect property of knowledge with its patent laws.

[7] For a more detailed description of this period, see Wennekers and Thurik (1999).
[8] Colloquially the terms 'English' and 'British' are often used interchangeably - similar to the use of 'Holland' and 'the Netherlands', though strictly speaking this is not correct.

As in the Dutch Golden Age, the technological leadership that Britain showed between 1750 and 1850, is probably a determining factor to explain its success during the First Industrial Revolution. (Mokyr, 1990). In particular, Britain excelled in technically skilled labor and on its supply of entrepreneurs. Its leadership was viewed more in the arena of the application and implementation of new innovations rather than in new discoveries and inventions themselves (Mokyr, 1990).

Finally, during this period, occupational mobility in Britain was relatively high. A free flow of entrepreneurship between lines of business was manifest, and the allocation of resources was more responsive to new opportunities than in other European economies characterized by occupational exclusiveness (Landes, 1969: 71). 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 also unfavorable for effective entrepreneurship and competition (Landes, 1969: 131-132).

As in the case of the Dutch Golden Age, we conclude that in 18th century Britain, demographic, cultural, institutional, technological and economic conditions were conducive to entrepreneurship.

Entrepreneurship and economic performance
Statistics about the rate of entrepreneurship in late 18th and early 19th century Britain are scant, but indications of entrepreneurial behavior are widespread. British society showed an ability to provide positive and innovative responses to challenges such as increasing competition and scarcity of raw materials. Entrepreneurs adopted new methods of production, diversified into other manufactures and penetrated new markets. Gradually, the British developed a worldwide commercial network. The notable development of international trade from the late 16th century onwards, had according to Cipolla (1981: 295) "proved to be a great school of entrepreneurship".

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: 41). The figures presented by De Vries (2000: 452) show how British economic growth took off in the early 1700s and accelerated after 1800. The gap with Dutch real wage levels was gradually closed during the 18th century, and for several decades from 1850 onwards GDP per capita (in 1985 US dollars) was higher in Britain than in Belgium, France and the Low Countries, though it was overtaken by the United States from 1880 onwards.

1.4 Britain's Entrepreneurial and Economic Decline

During the second half of the 19th century a relative decline of Britain's economic performance set in and lasted until roughly the 1970s.

Aggregate conditions
It is beyond the scope of this chapter to consider all the possible causes of this decline. We will only view this retardation from 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 USA where Henry Ford was a folk hero, in Britain a successful entrepreneur like William Morris "received largely uninformed and unenthusiastic acceptance" (Wiener, 1981: 131). Wiener also gives two examples illustrating how this cultural reorientation permeated deeply into the 1960s and the 1970s. Firstly, 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: 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: 502) sums it all up for the post-war 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 the motivation of managers and workers to work hard and to earn a great deal of money was also traditionally low in Britain, and absenteeism was high. High personal tax rates contributed to dulled incentives.

Entrepreneurship and Economic Performance
Again, statistics about the rate of entrepreneurship in this period are scarce. Storey (1994, figure 2.2), shows how the number of self-employed as a percentage of the UK labor force gradually decreased from 1910 until the mid 1960s[9]. Historical data on entrepreneurial dynamics are even more scant. Consistent time series on new business

[9] However, this decline is not specific for the UK only. A similar development over those years has been shown for the US and the Netherlands (see chapter 4 of the present book).

start-ups (VAT registrations) are available only from 1980 onwards. Data on incorporations of limited companies in Great Britain are available for a considerably longer period (Storey, 1994: 59-60). While fluctuating heavily until 1974, annual company incorporations do not show a substantial net growth between the late 1940s and the late 1960s, but more than a fivefold increase between 1968 and 1989. According to Porter (1990) domestic rivalry has also long been lacking in Britain. 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.

Some figures from Maddison (1995: 23-24) may serve to illustrate the relative decline in Britain's economic performance. 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 USA (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 of the world, had fallen substantially behind that in countries such as Switzerland, Denmark, Germany and the USA.

Conclusion
Summarizing one may conclude that entrepreneurship played a vital role during Britain's 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[10].

1.5 The Second Industrial and the Managerial Revolution: two different regimes

The Second Industrial Revolution (Landes, 1969: 4; Atkeson and Kehoe, 2001: 1), driven by inventions such as electricity and the internal combustion engine, was a highly entrepreneurial period in economic history. This revolution was most conspicuous in the United States, although several European countries, notably Germany, also produced many innovations in this period (Landes, 1969: 352). The Second Industrial Revolution, while basically concentrated between 1860 and the early 1900s, gave rise to innovations in all walks of life, both in the US and in Europe, over an even longer period of time (Atkeson and Kehoe, 2001: 1). This case study will briefly contrast the Second Industrial Revolution with the, to some extent, overlapping Managerial Revolution, which began a few decades later and carried into a period ending roughly in 1970 (Chandler, 1977).

[10] For a somewhat 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: 89).

The Second Industrial Revolution

The speed of scientific discoveries, technical inventions and ensuing innovations during the second half of the 19th century was remarkable, rivaling or possibly even surpassing that of the so-called 'new' economy of the late twentieth century. A sample of the innovations put on the market between 1851 and 1910, and predominantly still in use in the early 21st century, include automobiles, aeroplanes, telephones, photographic equipment, the cinema, the typewriter, electric light, the refrigerator and many other electrical household appliances, aspirin, vaccines, plastics, the safety pin, the zipper, jeans, and toilet paper.[11] One source of dissemination somewhat unique to that period was the popularity of world exhibitions in both America and Europe. In a period where international communication was still quite primitive by today's standards, these international fairs played an extremely important role in the diffusion and adoption of new innovations. Later, photography and other newer technologies reduced the need for the physical display of wares. Also, these fairs came into being at a time of relative calm and political stability among different nation-states.

The late 19th and early 20th century was also a period of high entry rates of new businesses. Many of the companies to dominate commerce for the majority of the twentieth century, such as General Electric, American Telephone and Telegraph (AT&T), General Motors and Boeing, were new entrants to business during this period, becoming listed on the stock market rather quickly upon their initial founding and creating lasting value (Jovanovic and Rousseau, 2001). It may be conjectured that these were among the firms, also including 'new' German brands[12] such as Siemens (1847), Bayer (1863), Agfa (1873) and Opel (1898), that may have inspired Schumpeter to develop his *Theory of Economic Development* (Schumpeter, 1911/1934), emphasizing the role of the entrepreneur as prime cause of economic development, challenging incumbent firms by introducing new inventions that make current technologies and products obsolete. This process of 'creative destruction' is the main characteristic of the so-called Schumpeter Mark I regime[13].

For the champions of the Second Industrial Revolution, notably the US and Germany, this period was also an era of relatively high economic growth rates. According to Maddison (2001: 185-186), GDP per capita growth between 1870 and 1913 averaged 1.8% per annum in the US. The average economic growth rate in Germany was 1.6%, while the leader of the First Industrial Revolution, the UK, achieved no better than 1.0% per annum. In The Netherlands, the technological frontier of Europe in the 17th century and the richest country of the western world until the early 1800s, economic growth between 1870-1913 did not exceed 0.9%.

[11] For a more complete overview of the many innovations of this period, the reader is referred to the catalogue of the exposition "La belle Europe; le temps des expositions universelles 1851-1913", Musées Royaux d'Art et d'Histoire, Brussels 26 October 2001 - 17 March 2002.

[12] Again the reader is referred to the catalogue of "La belle Europe; le temps des expositions universelles 1851-1913", mentioned before.

[13] For a more extensive exposition on the Schumpeter Mark I and Mark II technological regimes see Carree et al. (2002), Malerba and Orsenigo (1995) or Nooteboom (2003).

The Managerial Revolution

At the same time, the evolving separation of business ownership and management roles in the late 19th and early 20th century is a hallmark of the onset of the Managerial Revolution (Chandler, 1977). The introduction of the limited and/or listed company facilitated the development of this separation of roles between ownership and management, first by the railroad and telegraphs industries and later mimicked by a broad range of other sectors including the automobile industry, retailing, and insurance. These changes were also coincident with a giant leap in business scale, the onset of multi-unit firms and the creation of managerial hierarchies. Though reaching a mature stage maybe as early as 1910, the Managerial Revolution continued until roughly around 1970 (Chandler, 1977).

The growth in scale economies and the managerial revolution that took place in these decades were forces that pushed the rate of business ownership downward, suppressing the entry of new businesses and other entrepreneurial ventures. The continued decline of the business ownership rate during this period may thus partly be attributed to the Managerial Revolution (Phillips, 1962). In spite of these upscaling trends, the economic success of this interim period can however still be traced back to individual entrepreneurs. In support of this assertion, Purrington and Bettcher (2001) tracked the entrepreneurial roots of America's largest corporations at the close of the twentieth century. In particular, they found that out of the *Fortune 200* companies listed in 1997, 197 were either directly (101) or indirectly (96) tracked back to one or more entrepreneurial founders.

The scale achieved by many of the early entrants also helped these companies to ride out the Great Depression of the 1930s. For decades after the Great Depression, few firms entered the stock market, exceptions being mature firms, such as Proctor and Gamble and Pfizer that had been founded in the previous century. "Accordingly, the largest firms, which in the vast majority of cases were able to ride out the Depression, remained large" (Jovanovic and Rousseau, 2001: 15).

To sum up, while the years before 1910 are characterized as a 'textbook' entrepreneurial period with many new radical inventions and high business entry rates, the decades after 1910 were increasingly committed to technology diffusion, a period of about 70 years of ongoing, rapid technical change and accelerated growth in productivity (Atkeson and Kehoe, 2001: 1). The high economic growth rates of the 1950s and 1960s seem to be more the result of the spread of the managerial revolution, investments in new capital intensive industrial plants and large firm R&D (the so-called Schumpeter Mark II regime as foreseen in Schumpeter, 1942), rather than of new entrepreneurial formation.

Conclusion

In the decades before 1900 new business start-up activity and creative destruction dominated the explanation of growing economic performance. Restructuring and a variety of new enterprises and products were seen to be particularly relevant for these

decades showing the onset of many new industries, resulting in a large wave of new and small firms consistent with the early stage of their product life cycle. These processes seem less prominent during 1930-1970, years dominated by scale economies and stable technological trajectories giving rise to a relatively large firm-based industrial structure. This latter period is also quite distinct from the late 1970s and the 1980s, during which a more entrepreneurial economy would re-emerge (see below).

1.6 The Entrepreneurial Divide

Since the early 1970s several (although not all) developed economies, beginning with the US and the UK, have witnessed a revival of business ownership, while the attention given to entrepreneurship by both policymakers and social scientists across the world has also surged. A final historical case example reviews this revival of entrepreneurship that, because of its apparently structural character, might also be labeled as the 'Entrepreneurial Divide'. This case is of a more quantitative nature in comparison with the previous, highly qualitative case studies, because only in recent years have internationally comparable datasets about the rate of entrepreneurship (both in a static and a dynamic sense) become available. Relevant data from these datasets will be presented, both to illustrate this renaissance of entrepreneurship[14] and to point out differences in entrepreneurial activity across nations. How these differences may relate to different underlying key conditions for entrepreneurship will also be discussed.

The level of business ownership across countries, 1972-2004

Table 1.1 presents an overview of business ownership rates excluding the primary sectors in 1972, 1988 and 2004 across 23 OECD-countries. Between 1972 and 1988, the average rate of business ownership across these countries increased from 9.8% to 11.0% of the total labor force, subsequently remaining stable at this level during the ten years period from 1988 to 1998, and leveling off at 10.4% in 2002. In the following two years the business ownership rate increased again to 10.7% in 2004. The resulting seemingly small change in the average business ownership rate between 1972 and 2004 represents an annual growth rate of the number of business owners (1.5%) that is even higher than the expansive annual growth rate of the overall labor force (1.2%). It also represents an absolute growth, over a period of thirty-two years, from 29 million to 46 million business owners. The timing, magnitude, and pattern of growth vary for each individual country during this period. For the United States and Australia growth occurred primarily in the 1970s and 1980s[15]. Seven OECD countries, i.e. Greece, Ireland, Italy, the United Kingdom, Switzerland, Canada and New Zealand, showed a more or less continuous rise in their business ownership rate during

[14] OECD (2000) calls it a 'partial renaissance', probably because it is not universal and because in some countries it is dominated by an upsurge of self-employed people without employees.

[15] In spite of a subsequent period of stabilization followed by a decline in 2000 and 2002, the United States still account for the highest number of business owners: more than 30% of all business owners within these 23 countries as of 2004.

most of the period 1972 to 2004, while in ten other countries, viz. Austria, Belgium, Denmark, Finland, Germany, the Netherlands, Portugal, Spain, Sweden and Iceland the revival of entrepreneurship did not start until the 1980s or later. However, in many countries business ownership rates declined somewhat after 1998. Time will tell whether this decline is cyclical or structural. In several countries the business ownership rate has increased again between 2002 and 2004.

Table 1.1 Business ownership in 1972, 1988 and 2004

Country	*Number of business owners (x 1,000)*			*Business ownership rate in labor force (%)*		
	1972	*1988*	*2004*	*1972*	*1988*	*2004*
Austria	281	236	349	9.3	6.9	8.9
Belgium	398	450	508	10.5	10.9	11.1
Denmark	200	161	181	8.2	5.6	6.3
Finland	145	195	215	6.6	7.6	8.2
France	2468	2436	2230	11.3	9.9	8.2
Germany*	2070	2073	3763	7.6	7.0	9.3
Greece	524	737	944	16.1	18.6	19.6
Ireland	86	133	225	7.7	10.1	11.7
Italy	2811	3906	4740	14.3	16.9	19.3
Luxembourg	16	13	16	10.7	7.5	5.3
Netherlands	586	543	963	10.0	8.2	11.4
Portugal	405	537	709	11.3	11.6	13.3
Spain	1551	1889	2548	11.8	12.3	12.6
Sweden	292	285	356	7.4	6.4	8.1
United Kingdom	1968	2857	3456	7.8	10.1	11.4
EU-15	**13801**	**16452**	**21206**	**10.1**	**10.6**	**11.6**
Iceland	11	14	21	11.1	10.1	12.8
Norway	165	182	172	9.7	8.4	7.2
EEA	**13977**	**16649**	**21399**	**10.1**	**10.6**	**11.6**
Switzerland	236	275	312	6.6	7.1	7.5
United States	7103	13164	14750	8.0	10.7	9.9
Japan	6479	7606	6015	12.5	12.3	9.1
Canada	734	1475	2127	7.9	10.6	12.1
Australia	734	1308	1718	12.6	16.4	16.9
New Zealand	138	189	303	10.6	11.4	14.4
Total	**29401**	**40666**	**46623**	**9.8**	**11.0**	**10.7**

* West-Germany for 1972 and 1988.

Note: Business ownership is defined as including both the owners of incorporated and unincorporated businesses, but excluding unpaid family workers and wage-and-salary workers operating a side-business as a secondary work activity. Business owners in the primary sectors of economy are also excluded. See van Stel (2003) or van Stel (2005b).

Source: COMPENDIA 2004.2 (see www.eim.net).

In contrast, not all the listed OECD countries experienced structural growth in entrepreneurship. Three countries, i.e., France, Luxembourg and Norway, actually

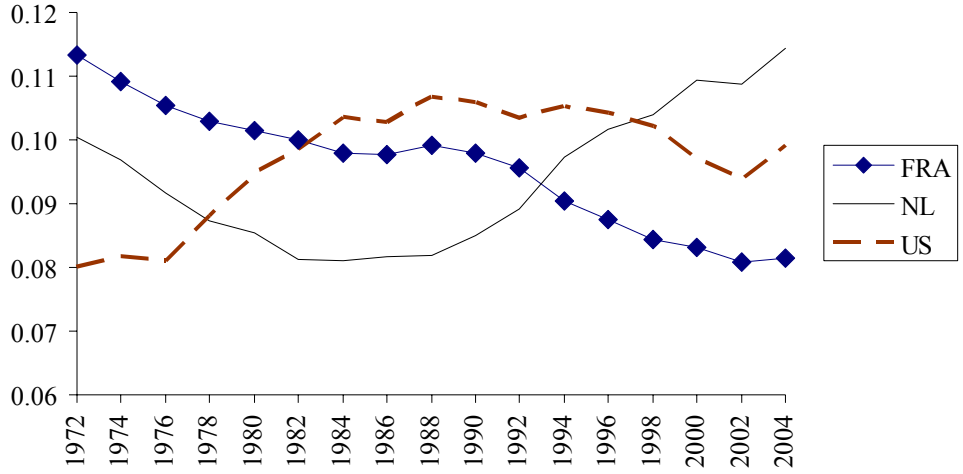
suffered a continuous decline in business ownership rate, while Japan began to experience a sharp decline in business ownership in the mid 1980s.

To sum up, after the steady decline between 1900 and 1970 of the business ownership rate in many economically developed countries, as discussed in the previous section, a reversal of this pattern emerged in most OECD countries between 1970 and the end of the 20th century, depending on the country. This reversal is probably related to other fundamental changes in the economy[16]. As early as in 1984, Piore and Sabel talked of the 'Second Industrial Divide.' Looking back, Audretsch and Thurik (2000, 2001) refer more explicitly to a U-shaped curve in the rate of entrepreneurship, representing the steady decline and subsequent renewal in entrepreneurship, as the 'shift from the managed to the entrepreneurial economy.'

In spite of these global changes in the rate of entrepreneurship over the past century, the resulting levels of business ownership still differ considerably across countries. These differences may be due to economic, demographic, institutional and cultural factors. For instance, four of the seven countries with the lowest rate of business ownership (below 8.5% in 2004) are Scandinavian, including Denmark, Norway, Sweden and Finland. They also share several characteristics associated with lower business ownership rates, including a high per capita income, high female labor participation rates, low income inequality, a large public sector and a relatively low degree of dissatisfaction with life (Henrekson, 2000; Wennekers, Noorderhaven, Hofstede and Thurik, 2001). In contrast, four of the seven countries with the highest business ownership rate (in excess of 12.5% in 2004) are Mediterranean countries, including Greece, Italy, Portugal and Spain. For these countries, but especially Greece and Portugal, a relatively low per capita income rate and relatively high dissatisfaction rates have been associated with higher self-employment. Spain, with 13% self-employment, also fits this pattern. Italy is more of a mixed story, characterized by a low per capita income in the *Mezzogiorno* (Southern Italy) and a fairly unique industrial structure in Northern Italy based on industrial districts and an emphasis on small family businesses. Australia, with one of the highest self-employment rates, may have an even more unique set of circumstances influencing its rate of entrepreneurship. It has an extremely high immigration rate: almost a quarter of its population is foreign-born, compared to only approximately 10% in the US where immigration has also often been referred to as an advantageous economic factor (Drucker, 2001). Altogether, even though some obvious patterns emerge, these explanations leave many questions unanswered even among the OECD nations. For instance, business ownership rates are about equally high in New Zealand, Canada and Iceland, raising the question whether there are common causes. Furthermore, earlier studies suggest that the determinants of self-employment in advanced economies may be quite different from those in economically developing nations (Acs, Audretsch and Evans, 1994).

[16] These changes will be discussed in chapter 2.

Figure 1.1 Business ownership in France, the Netherlands and the United States, 1972-2004



Note: Number of business owners as a fraction of total labor force. Business owners include unincorporated and incorporated self-employed, but exclude unpaid family workers. Business owners in agriculture, hunting, forestry and fishing are also excluded.
Source: COMPENDIA 2004.2 (see www.eim.net).

In figure 1.1 the development of business ownership rates 1972-2004 in three selected countries is depicted in more detail, bearing out idiosyncratic developments. The figure shows the strong difference in development between France, the Netherlands and the USA.

Dynamic indicators of entrepreneurship across countries

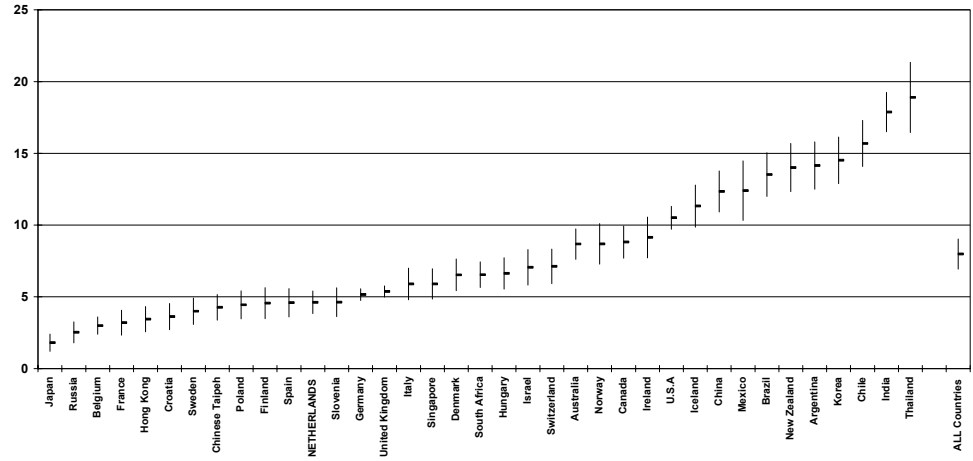
In table 1.1 it may also be noted that across this period of 30 years, the self-employment rate of the United States is structurally below the average for the 23 countries, despite America's reputation for leading the world in entrepreneurship. This figure may thus reflect some of the limitations of using a static index. Recently however, with the onset of the Global Entrepreneurship Monitor (GEM), a set of dynamic indicators of early-stage entrepreneurial activity across a large number of countries has become available (Reynolds et al, 2005).[17] GEM's overall index, the

[17] GEM was designed to measure the variety in (early-stage) entrepreneurial activity across nations on an annual basis, to find explanations for this variety and to explore the impact of entrepreneurship on economic growth. In its first year (1999), ten countries including the so-called G7, (the United States, Japan, Great Britain, France, Germany, Italy, and Canada) participated in GEM (Reynolds et al., 1999), while in 2000 GEM had expanded to 21 countries. The 2001 wave of data includes 29 and the 2002 wave 37 nations. Meanwhile GEM has continued, on an annual basis, to assemble data for all participating countries from four basic sources: 1) surveys of at least 2,000 adults in each country; 2) in-depth interviews with national experts on entrepreneurship in each country; 3) standardized questionnaires completed by the national experts; and 4) a wide selection of standardized national (statistical) data. For more information on both the GEM-project and its major results, see Reynolds et al. (2005) and Acs et al. (2004).

Total early-stage Entrepreneurial Activity (TEA), sums the proportion of nascent entrepreneurs as a proportion of the adult population, i.e. 18-64 years of age, with the presence of new firms, i.e. the proportion of adults operating a business that is less than 42 months old. Figure 1.2 presents the TEA-rates for all 37 countries participating in GEM 2002. TEA rates in 2002 ranged from 1.8% in Japan to 18.9% in Thailand.

In 2002, the United States had a TEA-index of 10.5%, above the country average of 8%. Stated differently, in the US roughly one in every ten adults was trying to start a new business or was the owner/manager of an active business less than 42 months old, compared with one in about fifty in Japan, one in thirty in France, one in seven in New Zealand and almost one in five in Thailand. In short, there is considerable variation across different countries[18].

Figure 1.2 TEA-rates for 37 countries participating in Global Entrepreneurship Monitor 2002



Source: Global Entrepreneurship Monitor (GEM).

Taking a longitudinal perspective, it appears that recent decades have witnessed an upsurge of new business start-ups. Unfortunately, long, comparable time series of start-up rates covering many countries are lacking. Table 1.2 shows the development of the business start-up rate for the Netherlands, expressed as a share of the total number of enterprises, during 1987-2003. In fact, during most of this period of entrepreneurial revival in the Netherlands, start-up rates remained at the same level of around 7%. Given the rapidly growing total number of enterprises, this stable gross

[18] The statistical precision of the TEA-rates is indicated by confidence intervals (see figure 1.2). As the annual figures move up and down together reflecting the world business cycle (Reynolds et al., 2003), the country rankings are relatively stable.

expansion rate implies a strong increase in the absolute number of business start-ups from 28,000 in 1987 to 54,000 in 2000. Only after 2000, during the prolonged economic downturn, did start-up rates decline to 5% but this nonetheless resulted in an absolute number of 41,000 start-ups in 2003. In 2004 the number of new business start-ups picked up again, totaling 49.000[19].

Table 1.2 New business start-up rates for the Netherlands, 1987-2004

Year	*Start-up rate*	*Number of start-ups*	*Year*	*Start-up rate*	*Number of start-ups*
1987	0.066	27,680	1996	0.065	39,560
1988	0.065	28,490	1997	0.063	40,140
1989	0.066	29,750	1998	0.063	42,005
1990	0.065	30,475	1999	0.068	47,220
1991	0.068	33,400	2000	0.075	53,800
1992	0.070	36,090	2001	0.063	47,280
1993	0.072	38,350	2002	0.055	42,600
1994	0.070	39,060	2003	0.051	41,080
1995	0.071	41,530	2004		48,900

Note: The start-up rate is defined as the number of business start-ups as a share of the number of enterprises. The figure for 2004 is provisional.
Source: EIM, data base 'Bedrijvendynamiek en werkgelegenheid'.

Subsequently, this section explores how the variety over time and across countries, in the level of business ownership and in new business start-up activity, may be related to factors inside and outside the economic system.

Influence of the level of economic development
It is well established that the secular decline of business ownership rates from at least the late nineteenth century until the 1970s is partly related to an upward trend in the level of economic development, just as the variation in business ownership across countries stems partly from differences in economic development. Up to a certain stage of economic development more prosperous countries have relatively fewer business owners and a relatively greater large firms sector. However, beyond this stage of development a reversal of the declining business ownership rate was seen to occur in several, but not all, of the economically most advanced nations[20].

Role of global trends in the business environment
In addition to the advancing level of economic development, global trends in the business environment may have further boosted the recent upsurge in entrepreneurship. In the modern economy, knowledge has replaced raw materials and physical labor as the key resource (Drucker, 2001), thus earning the present era the label of the *knowledge economy* (Audretsch and Thurik, 2000). New information

[19] Provisional figure (EIM, Kleinschalig Ondernemen 2005: 29).
[20] See chapters 2 and 5 of the present book for a brief review of the relevant literature, including a summary of the underlying reasons for the U-shaped relationship between the rate of business ownership and the level of economic development.

technologies, especially the Internet, allow knowledge to spread quickly, available to anyone with computer access and telephone connections. These new technologies have led to an information technology (IT) revolution characterized by Jovanovic and Rousseau as the "second democratization of knowledge", the first one being the invention of the printing press in the 15th century (Jovanovic and Rousseau, 2001: 22).

One can draw parallels between the Second Industrial Revolution and the present IT revolution. Obvious parallels are the young age of IT entrants on the stock market (Jovanovic and Rousseau, 2001: 17) and the waves of new products and new enterprises. Secondly, governments at both country and supranational level are increasingly being tuned towards fostering entrepreneurship (Audretsch et al., 2002; European Commission, 1999, 2003; OECD, 1998; Stevenson and Lundström, 2001). Various nations have instituted labor and capital market reforms, reduction of regulatory and administrative barriers for business start-ups, new competition policies, specific programs and services in support of new and small firms, promotion of entrepreneurship and an increasing attention for entrepreneurship at all levels of the educational system.

Contemporary institutional differences across nations
Finally, and in spite of these global trends, many historically rooted cultural and institutional differences across nations remain and may contribute to the variation in entrepreneurship.

A brief comparison of the cultural and institutional conditions for entrepreneurship in France with those in the US, may serve to illustrate the point[21]. Both France and the US rank among the most advanced nations of the world, economically and technically speaking. However, they differ conspicuously with respect to their business ownership rates (see figure 1.1). Over the last three decades of the twentieth century, business ownership (excluding the primary sectors) in France declined from above 11% to an all-time low level of about 8% in 2002. In contrast, the US rebounded in its rate of business ownership from 8% to around 10% of its labor force over the same period, even when its rate has slightly declined in recent years. This modest relative gain in business ownership masks a far more vibrant entrepreneurial economy: the US economy is more turbulent[22], as reflected in relatively high entry and exit rates and a high prevalence of rapid growth firms, and it is known for its leading role in innovative entrepreneurship based on advanced technologies.

Cultural and institutional differences between these two countries may help to explain theses sharp differences in entrepreneurship rates. For instance, Hofstede's research characterizes French culture as having a high degree of uncertainty avoidance and power distance (Hofstede, 2001). Its institutions also reflect strict government

[21] This section is partly based on Audretsch, Thurik, Verheul and Wennekers (2002), chapters 3 and 6.
[22] EIM, Internationale Benchmark Ondernemerschap 2003, unpublished manuscript.

regulations, centralized planning and control[23]. Management positions are often assigned to former students of the elite schools, the so-called *Grandes Écoles*. The French educational system restricts its attention for entrepreneurship to universities and colleges, predominantly in business schools. Labor market flexibility is traditionally limited, causing high opportunity costs of entrepreneurship and restricting the room for business owners to adjust their workforce to market demand. Relative to the United States, France can also be seen as a more centrally managed economy. It has a centuries-long history of strong government intervention in industrial development. Innovation is strongly dependent upon the government, which is inclined to assign technological projects to large firms. Within technological clusters large firms are often aloof from their immediate environment, thereby inhibiting 'technological cross-fertilization'.

In contrast, the US culture has often been described as supportive of entrepreneurship. Using Hofstede's dimensions, it is characterized by a relatively low rate of uncertainty avoidance and power distance, and the world's highest rate of individualism. Its culture traditionally attaches a high value to self-reliance. Starting a business is easy and considered 'normal'. The social stigma of failure is relatively low. Its institutions also support entrepreneurship. The venture capital market is well developed, the labor market is flexible and intellectual property rights are relatively well protected. Finally, knowledge spills over rather smoothly from universities and large corporations to small and new firms through spin-offs, incubator centers, and rules that often encourage or at least allow for the sharing of information.

1.7 Roots of the words 'entrepreneur' and 'entrepreneurship'

Entrepreneurship is an ill-defined, at best multidimensional concept. While in some dictionaries[24] entrepreneurship (or an equivalent term in other languages) is not explicitly defined but is only mentioned as a derivative of entrepreneur, and in others[25] is defined in a restricted way related to 'being an entrepreneur' or 'the total of all entrepreneurs', in colloquial speech it seems to have at least two meanings. First, entrepreneurship may refer to 'entrepreneurial behavior' in the sense of launching a new venture or business, or more generally seizing an opportunity. Synonyms for an entrepreneur as one who shows such behavior are an innovator or a pioneer. Secondly, entrepreneurship may refer to the activity of the entrepreneur as 'one who organizes, owns, manages and assumes the risks of a business'[26]. Synonyms are self-employed or business owner. Likewise, the related term 'enterprise' refers to a business, to a bold undertaking or to the readiness to engage in such undertakings, while 'enterprising'

[23] For a more extensive description of economic institutions in France, see Groenewegen (2001).
[24] For example, the Concise Oxford Dictionary, tenth edition (1999).
[25] Die Zeit - das Lexikon (2005), Volume 19, Hamburg, or Van Dale's Groot Woordenboek der Nederlandse Taal, 13th edition, 1999.
[26] Webster's Third New International Dictionary of the English Language, unabridged (1976), Encyclopaedia Brittanica.

means 'showing initiative and resourcefulness' or 'forward to undertake new projects'[27]. The concepts underlying entrepreneur and entrepreneurship are much older than the words themselves. Historically, self-employment might well be the natural economic status of *homo sapiens*[28]. And enterprising behavior is a hallmark of the history of our species.

French roots

The terms entrepreneur, entrepreneurship and enterprise are derived from the French verb 'entreprendre', which was already in use as early as the twelfth century with the connotation 'to do something' (Hoselitz, 1951/1960: 235)[29]. The noun entrepreneur in the sense of 'a person who is active, who gets things done' was formed in the fifteenth century, while the older form 'entreprendeur' was already in use in the fourteenth century[30].

In subsequent centuries the word entrepreneur attained additional, more specific economic meaning. In sixteenth-century France, references to the word entrepreneur appeared defining the captain of fortune who hired mercenary soldiers to serve princes or towns for pay (Martinelli, 1994: 476). Hoselitz cites contemporary French authors describing these entrepreneurs as 'hardy, usurping and intent to risk their lives and fortunes'. By the beginning of the seventeenth century a new meaning appeared in which the word entrepreneur referred to a contractor for large public works, at a fixed price and bearing the risks of the bargain (Hoselitz 1951/1960). According to Martinelli (1994: 476), in the eighteenth century the concept also applied to those who introduced new agricultural techniques on their land, or risked their own capital in industry. These meanings of the word entrepreneur have survived until present times.

In recent years, the English noun entrepreneurship is being translated in French as 'entrepreneuriat', although as yet not all dictionaries[31] recognize this word. The various meanings of entrepreneuriat seem similar to those of entrepreneurship, encompassing new business creation and the identification and exploitation of opportunities[32].

[27] These meanings were assembled from various sources including Webster's New Twentieth Century Dictionary, unabridged second edition (1970), The Oxford English Dictionary, second edition (1989), the New Oxford Dictionary of English (1998) and the Concise Oxford Dictionary, tenth edition (1999), where none of these sources singly give all meanings.

[28] Admittedly, it is a debatable but probably irresolvable issue to what extent tribal hunters and gatherers in prehistoric times compare best with self-employed and/or unpaid family workers, or whether many of them should be viewed as unfree laborers bonded to a chief. In any case, according to Finley (1973: 65) it holds that "historically speaking, the institution of wage-labour is a sophisticated latecomer". Also see Cipolla (1981: 65).

[29] According to the Dictionnaire Historique de la Langue Française (1998), Paris: Le Robert, another 12th century meaning was to attack.

[30] The Grande Larousse de la Langue Française (1972) even speaks of the 13th century.

[31] E-mail communication by professor Thierry Volery.

[32] Also see the interview in Dunod Editeur of 11 February 2004, with Alain Fayolle, the author of *Entrepreneuriat; Apprendre à Entreprendre*.

English equivalents
Hoselitz (1951/1960: 240-243) also describes how in the seventeenth and early eighteenth century, the most common English equivalent for the French entrepreneur was the word 'undertaker', and sometimes 'adventurer'. The second term had already been used from the fifteenth century on in the name 'Merchant Adventurers', but tended to become obsolete in this special meaning during the eighteenth century. In general, the early history of the English word 'undertaker' runs parallel to that of the French word 'entrepreneur'. By the middle of the eighteenth century an undertaker was quite simply a businessman. However, according to Hoselitz, by the time of Adam Smith the more general meaning of the word undertaker "tended to become obsolete and only the special meaning of an arranger of funerals survived. The undertaker in English economics was replaced by the capitalist who only toward the end of the nineteenth century again gave way to the entrepreneur". Swedberg (2000: 11), referring to Schumpeter, gives an earlier dating: "The term entrepreneur was given general currency among English economists by John Stuart Mill in the mid-nineteenth century".

A pendant in Italian
The French verb 'entreprendre' is closely related to its Italian equivalent 'intraprendere'[33]. In Italian, the word for entrepreneur is 'imprenditore' and the word for enterprise or business is 'impresa'. A related word is 'impresario'[34], i.e. an entrepreneur who organizes an opera, a concert or stage performance for his own account and risk. The impresario is a very early example of Italian entrepreneurship, dating back at least as far as the 17th century, when in Venice and other Italian cities, opera was a leading source of entertainment for the elite with money and leisure (Scherer, 2001: 309). Impresarios were frequently persons other than the individuals who composed the opera, but "in an appreciable number of instances composers rose to the challenge" (Scherer, 2001: 317). Additionally, many composers were pursuing free-lance composition.

The noun 'imprenditoria' refers to entrepreneurship in the sense of a group of entrepreneurs or entrepreneurial firms. The word 'imprenditorialita' means entrepreneurship in the sense of a person or firm or groups exhibiting entrepreneurial behavior. Finally, the noun 'intraprendenza' and the adjective 'intraprendente' refer to

[33] Both verbs seem to have their roots in Latin. According to the Oxford Latin Dictionary (1968), Oxford at the Clarendon Press, 'pre(hen)dere' means to take hold of, grasp, seize or occupy. The Dizionario Etimologico Italiano (1952), Firenze: Barbera, indicates the medieval latin word 'interprendere' as 'fatto sul modello del lat. intercipere'. In the Oxford Latin Dictionary the latter (intercipere) is translated as to seize, intercept or occupy, while 'incipere' means to take in hand, start, embark on (an enterprise) or begin an action. Remarkably, the old French verb 'emprendre' (11th century) indicated as 'issu de bas latin', also means to commence (Dictionnaire Historique de la Langue Française, 1998). This dictionary refers to a historical 'confusion' between 'entreprendre' and 'emprendre'. It would take a linguistic investigation outside the scope of this book to further ascertain these roots.

[34] In fact, 'impresario' is derived from 'impresa' (Nuovo Vocabolario Illustrato della Lingua Italiana, Selezione del Reader's Digest: Milano, 1987).

being resourceful and getting things done one way or another; these latter words are sometimes used with an implicit negative connotation[35].

Entrepreneurship in Dutch and German

The two meanings of entrepreneurship also manifest themselves in the Dutch language. The first meaning of the Dutch noun 'ondernemer' refers to someone who takes a venture or difficult task upon one self, the second meaning is economic and refers to someone who works independently, i.e. for one's own account and risk[36]. The Dutch verb 'ondernemen' primarily means 'to take upon oneself' and 'to commence to do'. Some major synonyms are 'to dare' and 'to attempt'. Its English equivalent is 'to undertake', the first meaning[37] of which is 'to commit oneself to and begin (an enterprise or responsibility)' or 'to take on'. In colloquial Dutch 'ondernemerschap' is roughly equivalent to entrepreneurship.

One would expect that similar conclusions hold for the German word 'Unternehmer'. However, in this case the consulted source[38] refers only to the person who runs a business for his/her own account and risk, while the verb 'unternehmen' is indicated to mean 'to do, to realize or to take measures'. In colloquial German the noun 'Unternehmertum' is often used in a wider sense than the restricted meaning given in the dictionary[39].

Table 1.3 summarizes the relevant contemporary terms in the five Indo-European languages referred to in the text.

35 E-mail communication by professor Maria Minniti.

36 Van Dale's Groot Woordenboek der Nederlandse Taal, 13th edition, 1999. However, the dictionary adds to the second meaning: '…, op grond van het bezit van productiemiddelen en met vreemde arbeidskracht', suggesting that owning the business and employing personnel are also intrinsic elements of entrepreneurship.

37 A second meaning is 'to formally guarantee, to pledge, or promise' (Concise Oxford Dictionary, tenth edition, 1999).

38 Brockhaus Wahrig Deutsches Wörterbuch, in sechs banden (1984).

39 E-mail communication by professor Rolf Sternberg.

Table 1.3 Present-day terms related to entrepreneurship in five Indo-European languages

French	*Italian*	*English*	*German*	*Dutch*
entreprendre	intraprendere	to undertake	unternehmen	ondernemen
entrepreneur	imprenditore	entrepreneur	Unternehmer	ondernemer
entreprise	impresa	enterprise, undertaking	Unternehmen, Unternehmung	onderneming
entreprenant	intraprendente	enterprising	unternehmend	ondernemend
entrepreneuriat	imprenditoria, imprenditorialita	entrepreneurship	Unternehmertum	ondernemerschap

Note: Words on the same line refer to corresponding concepts, but they are not always identical with respect to their various meanings and connotations. There is ample scope for a linguistic and/or a language-sociological study into the historical development of present-day terms related to entrepreneurship in these five Indo-European languages, while possibly adding Spanish.

1.8 Historical economic thinking about what constitutes entrepreneurship

Several surveys are available with respect to the history of economic thought about entrepreneurship. While Hoselitz (1951/1960) focuses on the earliest history of the concept of entrepreneurship up to and including the classical economists, the most extensive survey (Hébert and Link, 1982 and 1989) picks up the history of entrepreneurial theory with Cantillon (early 18th century) and carries the historical overview into the second half of the 20th century. Some other surveys are by Baumol (1968), Blaug (1986/2000) and Van Praag (1999).

For the first theoretical account of what constitutes entrepreneurship, Hoselitz (1951/1960: 239-240) refers to Bernard de Belidor who in 1729 published a book entitled 'La science des ingénieurs', viewing the entrepreneur as the contractor who sells for a fixed price, while bearing the risk of uncertainty about the costs. Its counterpart is the more well-known theory of entrepreneurship by Cantillon[40], viewing an entrepreneur as "someone who buys at a certain cost price and sells at an uncertain price" (Hoselitz, 240). The net effect in both theories is basically the same.

In the view of Hébert and Link (1982, 1989), Cantillon's theoretical account of the entrepreneurial function can be linked to three subsequent intellectual traditions. According to Hébert and Link, the first is the German tradition of Von Thünen and Schumpeter (Schumpeter, 1911/1934), the second is the Chicago tradition of Knight and Schultz (Knight, 1921; Schultz, 1975) and the third is the (neo-)Austrian tradition of Von Mises and Kirzner (Kirzner, 1979, 1997). These traditions point to different aspects of the function of the entrepreneur. In the German or Schumpeterian tradition economists concentrate on the entrepreneur as a creator of instability and creative destruction, where the entrepreneur (or enterprise) changes the 'rules of competition' for the industry (Schumpeter, 1911/1934; Stopford and Baden-Fuller, 1994). The

[40] Cantillon (1755), Essai sur la Nature du Commerce en Général, first published 21 years after the author's death.

Austrian school focuses on the abilities of the entrepreneur to perceive profit opportunities, usually after some exogenous shock. According to this view, the entrepreneur combines resources to fulfill unsatisfied needs or to improve market inefficiencies or deficiencies. Combining the two views, Nooteboom (1993) notes that "the creation of potential may be seen as Schumpeterian and its realization as Austrian" (Nooteboom 1993: 1). Finally, in the Chicago perspective, entrepreneurs lead markets to equilibrium. In a recent publication, Nooteboom (2003) emphasizes that there is not one true or correct notion of entrepreneurship, but rather that "different notions fit different stages in an overall process of discovery", in which equilibrium and disequilibrium succeed each other as subsequent stages[41].

Entrepreneurship versus management

Baumol (1968: 64-65), in the spirit of Schumpeter, distinguishes between the manager as "the individual who oversees the ongoing efficiency of continuing processes" and the entrepreneur as the one whose job it is "to locate new ideas and to put them into effect". In a similar vein Martinelli (1994: 476) discusses the concepts of entrepreneurship and management within the context of economic sociology. He concludes, that while both terms are not precise in meaning and overlap each other and other terms, such as employer, producer, business man and chief executive, they both "typically connote leadership in business organizations", with entrepreneurship suggesting innovation and risk-taking, and management suggesting the coordination and control of ongoing business activities. Finally, the discipline of strategic management (Stevenson and Jarillo, 1990; Stevenson and Gumpert, 1991) typically views entrepreneurship as a range of behavior. Stevenson and Jarillo (1990: 23) define entrepreneurship as follows: "entrepreneurship is a process by which individuals - either on their own or within organizations - pursue opportunities without regard to the resources they currently control". Applying the concept of entrepreneurial behavior to business managers, Stevenson and Gumpert juxtapose the 'promoter' or entrepreneurial manager and the 'trustee' or administrative manager.

A behavioral and an occupational notion

Hébert and Link (1989) list twelve different concepts of entrepreneurship that have one time or another been proposed by economists. Although some of these concepts overlap, an impressive variety of notions remain. The science of strategic management adds a behavioral notion of entrepreneurship, as discussed before. In recent decades a new, multi-disciplinary discipline of 'entrepreneurial academics' (Vesper, 1988) has appeared, that considers 'new venture creation' as the hallmark of entrepreneurship (Cooper, 2003: 28-29; Vesper, 1985, as quoted by Stevenson and Jarillo, 1990: 22). This new field has a strong counterpart in non-academic publications viewing entrepreneurship as the creation and growth of *new* businesses (a major example is the Global Entrepreneurship Monitor, see Reynolds et al., 2005, and www.gemconsortium.org).

[41] Likewise, Schumpeter's 'Mark I' and 'Mark II' regimes, as discussed earlier in this chapter, also follow each other in an ongoing cycle of discovery (Nooteboom, 2003: 3-4).

An attempt at classification may help to shed more light. In this respect, one might distinguish between two types or categories of notions. One type of notions has to do with the question 'what do entrepreneurs do?'. This includes a behavioral and an occupational notion that will be discussed below[42]. Another type of notions pertains to the functions of entrepreneurship such as equilibrating or dis-equilibrating markets, bearing the risk associated with true uncertainty and introducing innovations in the economy. The occupational notion applies to individuals only, but the behavioral and the functional notions of entrepreneurship may be applied to either individuals or to corporations (Stevenson and Jarillo, 1990; Stopford and Baden-Fuller, 1994).

We will now focus on the behavioral and occupational notions, applied at the personal level of individuals. From the *behavioral* angle and integrating various views, entrepreneurship may be defined as a mix of 'the perception and creation of new economic opportunities' and 'decision-making on the location, form and use of resources' (Wennekers and Thurik, 1999). While decision-making with respect to resources is an indispensable element of entrepreneurship, the emphasis is on opportunities. When making decisions on the use of resources becomes the dominant factor, we refer to management rather than to entrepreneurship. Additionally, there is the *occupational* notion that defines an entrepreneur as someone who works for his/her own account and risk. Synonyms for an entrepreneur in the occupational sense are business owner, proprietor and self-employed. The occupational notion of entrepreneurship has a long history, dating back as far as the middle of the eighteenth century and enjoying common usage by classical economists such as Say and Mill (Hébert and Link, 1982; Hoselitz, 1951/1960).

For a combination of these two notions or dimensions, see scheme 1.1. First, the scheme reiterates the behavioral distinction between the concepts *entrepreneurial*, as a type of behavior concentrating on the perception, exploitation and creation of new economic opportunities, and *managerial* in the sense of organizing and coordinating resources. Secondly, the scheme includes the occupational distinction between people owning and managing a business on their own account and risk (business-owners or self-employed)[43] and employees. Based on this double dichotomy of self-employed versus employee and entrepreneurial versus managerial, three types of entrepreneurs may be distinguished[44]. These three types are the independent entrepreneurs, the (managerial) business owners who are entrepreneurs in a formal (occupational) sense only, and the corporate entrepreneurs or intrapreneurs. This is indicated in scheme 1.1.

[42] The explicit distinction between an occupational and a behavioral notion as such was introduced in Sternberg and Wennekers (2005). It resembles a dichotomy used by Baumol (1993b: 198) who contrasts the 'firm-organizing entrepreneur' of Cantillon and Say with the 'innovating entrepreneur' of Schumpeter, as well as a distinction made by Davidsson (2004: 4-5) who differentiates between the (partly overlapping) 'social realities' of the 'independent business' and the 'micro-level novel initiative'.

[43] We will use the terms self-employed and business owners interchangeably, always including owner-managers of incorporated firms. For definitions see: The state of small business: a report of the president 1986, Washington: US Government Printing Office, chapter 4.

[44] These types are 'polar categories', while many real-life entrepreneurs may fall in-between.

Scheme 1.1 Three types of entrepreneurs versus executive managers

	Self-employed	*Employee*
Entrepreneurial	**independent entrepreneurs**	**corporate entrepreneurs**
Managerial	**(managerial) business owners**	**executive managers**

Source: based upon Wennekers and Thurik, 1999.

The present book concentrates on explaining the rate of 'occupational entrepreneurship', in the sense of the left-hand column of the above dichotomy[45], i.e., self-employment or business ownership. The reasons for this specific focus will be elucidated in chapter 2.
In the remainder of this study we will thus focus on the entrepreneurs who work for their own account and risk. Empirically it is, however, virtually impossible to distinguish the independent entrepreneurs, the managerial business owners and the conceivable categories in-between. Therefore, a more straightforward but partly related distinction between a *dynamic* and a *static* perspective of (occupational) entrepreneurship will be made, as will be further explained in chapter 3.

1.9 Preliminary conclusions

Entrepreneurship is an ill-defined, at best multidimensional subject. In contemporary English, the word 'entrepreneur' is alternately used to indicate a businessman, a founder of a *new* business, a business owner of an *innovative* enterprise, an enterprising individual, or the CEO of a large corporation. Sometimes, the concept 'entrepreneurship' is not applied merely to individuals but also to enterprises, such as in 'the entrepreneurial firm or corporation'. However, the confusion of terms must not be exaggerated. An average dictionary discloses two basic meanings of the underlying French words 'entreprendre' and 'entrepreneur', or of their counterparts in for example Italian, German and Dutch. The first basic meaning refers to 'taking initiative, daring or attempting'. A second meaning refers to 'owning and managing a business for one's own account and risk'. The linguistic history of the word 'entrepreneur' suggests that the first meaning is also the older of the two, dating back to at least early medieval times. Historical economic thought about what constitutes entrepreneurship basically corroborates this dichotomy. An *occupational* notion of entrepreneurship, dating back to the mid 18th century and referring to 'someone who works for her/his own account and risk', is obviously related to the second meaning. A more recently developed *behavioral* notion of entrepreneurship, referring to the perception or creation of new economic opportunities and to their exploitation, may be linked to the first (and oldest) meaning. These two notions may also be viewed as separate dimensions, i.e. self-employed versus employee and entrepreneurial versus managerial. A double dichotomy of these dimensions differentiates between three types of entrepreneurs

[45] This excludes corporate entrepreneurial activity, even though corporate entrepreneurs or intrapreneurs working in larger corporation also engage in new opportunities and drive the development of new resource combinations, in the Schumpeterian sense (Burgelman, 1984; Pinchot, 1985; Stopford and Baden-Fuller, 1994).

versus executive managers. In addition to an occupational and a behavioral notion, a class of *functional* notions may be distinguished, related to the major functions of entrepreneurship in the economic process such as equilibrating or dis-equilibrating markets, bearing the risk associated with true uncertainty and introducing innovations in the economy. Historical case studies demonstrate the various notions and functions of entrepreneurship. Economic high tides, such as the Dutch Golden Age and the British Industrial Revolution, often seem to ride on waves of behavioral and occupational entrepreneurship. The case studies also suggest that different stages of successive technological cycles emphasize different functions of entrepreneurship.

Another finding based upon comparing qualitative historical evidence as well as upon statistical data pertaining to the 20th century is that the rate of entrepreneurship varies significantly across nations and over time. This variety is partly due to differences in the level of economic development. It is a 'stylized fact' that the rate of occupational entrepreneurship is negatively related to the level of economic development. Only in recent decades does this negatively sloped relationship appear to break down in at least a number of modern economies. In these cases, a U-shaped development of business ownership, or at least an L-shaped one, seems to materialize.

However, economic development alone cannot account for the large variety of entrepreneurship found in reality. The historical case studies bear out the additional role of wide-ranging 'entrepreneurial framework conditions', such as urbanization and other demographic phenomena, labor mobility and property rights. This suggests a need for multidisciplinary investigations of the rate of entrepreneurship at the country level.
At present, a multidisciplinary framework for explaining the variations in the rate of (occupational) entrepreneurship at country level does not seem to be available in the literature. This assertion will be elaborated in chapter 2. Subsequently, the subject of chapter 3 is to develop such a multidisciplinary framework, identifying key conditions as well as elaborating causal chains of intermediate linkages. Finally, some empirical investigations that were carried out against the background of this framework will be reported in the remaining chapters of the present book.

CHAPTER 2

MOTIVATION, OVERVIEW, CONCLUSIONS AND DISCUSSION

Abstract
Chapter 2 is both the introduction to, and summary of, the present book. First, it discusses the main motivation for carrying out this study. A survey of some earlier *economic* research into the determinants of occupational entrepreneurship at country level leads to the conclusion, that an explanation of the variety of entrepreneurship across nations is by no means straightforward and that the explanatory power of purely economic models of (occupational) entrepreneurship is modest. After all, business ownership rates at country level are aggregated individual occupational choices that are based upon both psychological and economic considerations, and embedded in a societal context. This implies that, in addition to economic variables, technological, demographical, cultural and institutional factors may also make a contribution to the explanation of entrepreneurship rates. This conclusion calls for a *multi-disciplinary* approach. Subsequently, the ensuing goals of the present book are stated. The first goal is to develop a multidisciplinary framework for explaining the variations in the rate of (occupational) entrepreneurship at country level, identifying key conditions as well as elaborating causal chains of intermediate linkages including feedback mechanisms. A second objective is to demonstrate empirically some relevant relationships within the context of this framework.
The chapter then goes on to present an overview of the individual chapters of this study. A brief summary of the historical case studies in chapter 1 merges into a sketch of the multidisciplinary framework developed in chapter 3. Additionally, the empirical chapters 4 through 7 are placed within the perspective of the framework and the main findings of these investigations are highlighted. Finally, the present chapter winds up with the overall conclusions, reflects on the limitations of the study, and derives some major implications for future research and for policy.

MOTIVATION, OVERVIEW, CONCLUSIONS AND DISCUSSION

2.1 Motivation

Briefly, the subject matter of this study is the causes of the variation in (occupational) entrepreneurship across countries and over time. As was explained in chapter 1, the occupational notion of entrepreneurship refers to individuals working for their own account and risk. A *static* and a *dynamic* perspective are used to operationalize the occupational concept of entrepreneurship. The static concept refers to the total number of owner-managers of incorporated and unincorporated businesses as a dimension of the industrial structure of the economy. In this respect the terms entrepreneurs, business owners and self-employed will be used interchangeably. The dynamic concept of occupational entrepreneurship refers to net and gross changes in the number of entrepreneurs. Several operational variables are available, such as nascent entrepreneurship, new business start-ups and net entry. These will be elaborated in chapter 3. Available data as presented in chapter 1, show a large range in the various indicators of occupational entrepreneurship across countries and over time. So far, only partial explanations for this variety seem to be available in literature. Given the social and economic importance of entrepreneurship, and with an eye on the increasing policy interest in promoting entrepreneurship, more knowledge about the causes of the variation in (occupational) entrepreneurship is needed.

Why focus on the occupational notion of entrepreneurship?
There are several reasons to focus on the *occupational* notion of entrepreneurship. The first reason is that the occupational notion is a constant element in historical thought on entrepreneurship (Cantillon, von Thünen, Say, Mill, Marshall, Pigou), even though entrepreneurial roles of businessmen (entrepreneurs) show different profiles across individuals and across historical episodes. The second reasons is that, in addition to a static perspective (the number of business owners), the occupational entrepreneurship also encompasses a dynamic perspective that is linked to the behavioral (and some of the functional) concepts of entrepreneurship (see chapter 1). A third, more practical reason is that occupational entrepreneurship is the most readily measured notion of entrepreneurship. As such, it has shown a remarkable, worldwide revival in the past thirty years. Finally, occupational entrepreneurship has become a highly policy-relevant subject (witness policy documents at national and EU level), thus also warranting more attention from social and economic research.

Brief survey of some relevant economic literature about entrepreneurship
In chapter 1, brief attention was paid to some early (Cantillon), classical (Say) and early neo-classical (Marshall) thought about entrepreneurship. In the 20th century, three intellectual traditions that may ultimately be linked to Cantillon, were further developed (Hébert and Link, 1982 and 1989). These are the German tradition of Von Thünen and Schumpeter, the Chicago tradition of Knight and Schultz and the (neo-)Austrian tradition of Von Mises and Kirzner (see chapter 1). It is, however, fair

to say that outside these three traditions[46], mainstream 20th century neo-classical economics, and particularly general equilibrium theory, has had increasingly little room for entrepreneurship. In a well-known article on this theme, Baumol (1968) observed that the entrepreneur had virtually disappeared from the formal models in mainstream economics. He summarized, as paraphrased by Swedberg (2000: 18), "that the whole thing was a little like a performance of *Hamlet* with the Danish prince missing". Almost twenty years later, Blaug (1986/2000: 80-81) made a similar diagnosis. Blaug argued: "So long as economic analysis is preoccupied with the nature of static equilibrium under conditions of perfect competition, there is simply no room … for a theory of entrepreneurship …". He continues: "By assuming that all economic agents have free access to all the information they require for taking decisions, decision-making in modern economics is largely trivialized into … mathematical rules for optimization". In other words, in this setting there is no need for an entrepreneur who assumes the risks associated with the economic application of new knowledge or with other sources of true uncertainty. For the role of entrepreneurship in mainstream economics, also see Barreto (1989) and Baumol (1993b).

Microeconomic studies

However, since the late 1970s and following a seminal article by Lucas (1978), a niche has been created within neo-classical economics that is dedicated to finding economic explanations for the occupational choice for entrepreneurship. Lucas shows how across economic development rising real wages may increase the opportunity cost of self-employment relative to the expected return on investment. Given an underlying distribution of "managerial" talent (Lucas refers to managers instead of entrepreneurs) this process induces marginal entrepreneurs to become employees. Overall, this pushes up the average size of firms and decreases the number of independent entrepreneurs. Murphy, Shleifer and Vishny (1991) derived a related model that includes 'rent-seeking' as yet another occupational alternative for entrepreneurship. Another major publication in this area is by Kihlstrom and Laffont (1979). Where Lucas assumes an uneven distribution of entrepreneurial abilities, the latter authors postulate that individuals differ in their risk aversion while self-employed individuals all face the same uncertainty. They conclude: "In the equilibrium, more risk averse individuals become workers while the less risk averse become entrepreneurs" (Kihlstrom and Laffont, 1979: 1). For an extensive discussion of several microeconomic models of self-employment, see de Wit (1993a) who also developed a 'unifying model' in which several determinants of self-employment are brought together. Another publication in this area is by van Praag (1996).

Macroeconomic investigations

In addition to the above publications that are mainly in the microeconomic domain, since the 1980s a number of economists have carried out empirical macroeconomic

[46] Additionally, contributions by Leibenstein (1968, 1979) and Williamson (1975) create new possibilities to incorporate entrepreneurship in economic theory. See Wennekers and Thurik (1999: 32,33).

studies trying to explain the recent revival of entrepreneurship in the US and other OECD countries, or more generally trying to explain the variety of entrepreneurship across nations.
A well-known early study in this vein is the one by Blau (1987) who attempts to explain the reversal of the previously downward trend in the share of self-employment in the US non-agricultural labor force which has gone on since the early 1970s. The main hypotheses for which Blau has found empirical support include recent changes in sector structure favoring industries in which scale economies are relatively unimportant, changes in technology, such as personal computers, making small firms more competitive and rising marginal tax rates making self-employment more attractive because of the relative ease of under-reporting income from self-employment.

Acs, Audretsch and Evans (1994) investigated the determinants of variations in self-employment rates across an unbalanced panel of 21 OECD countries within the period 1966-1990. Their set of potential explanatory variables includes the level of economic development (per capita GNP), changes in industry composition, a proxy for the prevalence of high technology, unemployment, female labor-force participation and Hofstede's cultural indices for uncertainty avoidance and individualism. Following Lucas (1978) they conjecture a negative secular relationship between self-employment and economic development (per capita GNP), for which they find empirical support. Like Blau (1987), they find a positive influence of a sector shift from manufacturing to services. As expected, they also find a significant negative effect of the female labor-force participation rate. No significant results were found with respect to unemployment and high technology. The adjusted R-square in a model without country dummies is modest (0.60), while a model including country dummies has a high R-square (0.89) but reports very sizable country-specific fixed effects. These results may be viewed as a measure of our remaining ignorance. Additionally, a regression of the country-specific fixed effects on Hofstede's cultural indices suggests a positive correlation with uncertainty avoidance and a negative one with individualism. Although these intriguing latter results are barely significant, they have inspired independent further investigations in a later chapter of the present book. Finally, Acs, Audretsch and Evans report a U-shaped time pattern for the total self-employment rate for 12 OECD countries for which data were available for all years between 1966 and 1990.

In recent years, an international group of researchers based at or connected with the Dutch research institute EIM has carried out several studies in this area. Audretsch, Carree and Thurik (2001) developed and estimated a two-way causation model of entrepreneurship and unemployment. Based upon an analysis of panel data for 23 OECD countries over the period 1974-1998, they reported evidence for both a (negative) 'Schumpeter' effect of entrepreneurship reducing unemployment, and a (positive) 'shopkeeper' effect of unemployment stimulating self-employment. Carree, van Stel, Thurik and Wennekers (2002) developed and estimated a two-way causation model of entrepreneurship and economic development. In this model, an equilibrium

rate of entrepreneurship is hypothesized and found to have either a U-shaped or L-shaped relationship with the level of economic development. In their model, the underlying reasons for this reversal of the downward trend remain largely implicit. Finally, Bosma, de Wit and Carree (2003) developed a model of the self-employment rate in the Netherlands in which they combined an equilibrium approach of the total number of self-employed with an entry/exit approach. This model simultaneously explains the development of the equilibrium and the actual number of self-employed persons as well as their entry and exit rates. The unification of these approaches has two advantages. First, it is possible to analyze how any determinant influences both the net development of the self-employment rate and the underlying entry and exit rates. Second, the constraints implied by the model impose a degree of consistency between the net development of self-employment and the underlying entry and exit. This allows more realistic simulations of future developments of entrepreneurship.

Further reflection on the results of these studies leads to the conclusion that an explanation of the variety of entrepreneurship at country level is by no means straightforward and that the explanatory power of the economic models discussed above is modest. The large country-specific fixed effects in some of these models suggest that cultural and institutional factors may be quite important. However, 'non-economic' variables are often missing or are only weakly represented in these models, although there are theoretical reasons to assume their importance. After all, business ownership rates at country level are aggregated individual occupational choices that are based upon both psychological and economic considerations, and are embedded in a societal context. This implies that, together with economic and technological variables, demographical as well as (path-dependent) cultural and institutional factors may also make a contribution to the explanation of entrepreneurship rates. In chapter 1 of the present book some case studies already alluded to the substantial role of these variables in determining entrepreneurial development. Futhermore, relevant contributions to the study of entrepreneurship are also being made by disciplines other than economics, such as sociology, political science, history, psychology and anthropology (Baumol, 1968: 69; Kilby, 1971: 6-19; Martinelli, 1994: 476; Acemoglu, 1995: 30; Swedberg, 2000: 28). Consequently, a multidisciplinary model might offer a promising opportunity for enhancing our insight into the variety of entrepreneurship at country level. To my knowledge, a well-developed multidisciplinary approach to this subject is as yet not available.

Objectives

The first objective of this study is, therefore, to develop a multidisciplinary framework for explaining the variations in the rate of entrepreneurship at country level, identifying key conditions as well as elaborating causal chains of intermediate linkages. Given the likelihood of feedback through learning and role models, it is also necessary to include the interactions between entrepreneurship and economic performance in the framework. A second goal is to demonstrate empirically some relevant relationships within the context of this framework.

2.2 Overview of the individual chapters

Chapter 1 - Exploring the field; historical case studies
This chapter is a prelude to the present book. It explores entrepreneurship, its manifestations and its conditions using a number of historical case studies. After describing the Dutch Golden Age, chapter 1 gives brief accounts of Britain's entrepreneurial developments (rise and decline) during the First Industrial Revolution and its aftermath. These cases offer an implicit introduction to the multidisciplinary framework developed in chapter 3 for explaining the variations in the rate of entrepreneurship at country level. This is done by illustrating the role of diverse 'entrepreneurial framework conditions', such as well developed property rights, social mobility and a cultural receptiveness to new ideas, and by indicating feedback from entrepreneurial performance to key conditions, such as learning and role models. A subsequent case study is devoted to the Second Industrial Revolution and the Managerial Revolution, illustrating how over time entrepreneurship displays diverse manifestations across the continuum between 'creative destruction' and 'management/coordination'. Next, a fifth 'case' reviews the (partial) revival of entrepreneurship in several OECD countries during the last quarter of the 20th century (the so-called 'Entrepreneurial Divide'). Relevant data from recently assembled international datasets illustrate this renaissance and at the same time bear out the large variety in the rate of entrepreneurship across nations. Subsequently, the chapter follows the early traces of the word 'entrepreneur' and discusses historical thought about what constitutes entrepreneurship. Some major relevant notions and dimensions of entrepreneurship are derived from these investigations. First, an *occupational* notion of entrepreneurship, dating back to the mid 18th century, refers to 'someone who works on her/his own account and risk'. Secondly, a more recently developed *behavioral* notion of entrepreneurship, loosely related to the original, 15th century meaning of the French word 'entrepreneur' in the sense of 'a person who is active, who gets things done', refers to the perception or creation of new economic opportunities and to their exploitation. These two notions may also be viewed as separate dimensions, i.e., self-employed versus employee and entrepreneurial versus managerial. A double dichotomy of these dimensions differentiates between three types of entrepreneurs versus executive managers. In addition to an occupational and a behavioral notion, chapter 1 discusses a class of *functional* notions, related to the major functions of entrepreneurship in the economic process. Finally, chapter 1 chooses the occupational notion of entrepreneurship as the main perspective of this book, while distinguishing between a static and a dynamic perspective, as was explained more extensively in the motivation section of the present chapter.

Chapter 3 - A framework for explaining the rate of entrepreneurship
This chapter is devoted to the aspired multidisciplinary framework for explaining variations in the rate of (occupational) entrepreneurship. It starts out with a 'blueprint' outlining the main relationships (see figure 3.1 in chapter 3). The blueprint links conditions, entrepreneurship and economic performance, including feedback. Based upon this design, a theoretical framework for explaining the variations in the rate of

entrepreneurship at country level has been elaborated. Five domains of aggregate conditions are distinguished: the technological, economic, demographic, cultural and institutional domain. Factors within these domains determine the stock of entrepreneurial opportunities on the demand side of entrepreneurship, and the capabilities and preferences available to a population on the supply side. Against this background, individual occupational choice for (nascent) entrepreneurship is based upon perceived opportunities, upon personal capabilities and preferences and upon a related assessment of the financial and immaterial risks and rewards of relevant occupational alternatives. Next, the framework links (aggregate) nascent entrepreneurship to the actual rate of entrepreneurship (business ownership). Finally, the framework outlines intermediate linkages between entrepreneurship and various performance indicators, and feedback mechanisms such as the creation of role models and learning processes. The framework distinguishes between three levels of analysis: the individual level of 'nascent' entrepreneurs and incumbent business owners, the firm level of new business start-ups and incumbent enterprises, and finally the aggregate level of the nascent entrepreneurship rate and the business ownership rate. These levels are clearly linked. For example, the rate of business ownership at the aggregate level is based upon a great many individual occupational choices, while the analysis of occupational choices at the individual level embodies elements defined at the aggregate level, such as institutions and feedback from deviations between the total number of business owners and a (perceived) 'carrying capacity of the market'.

The framework has two modules, but module I is divided into two parts. The first part of Module I shows how societal 'entrepreneurial framework conditions' influence individual occupational choices for entrepreneurship and the ensuing aggregate rate of *nascent entrepreneurship*. It is assumed that individuals, at certain moments in their working life, consciously or implicitly valuate and compare the perceived financial and immaterial risks and rewards of relevant occupational alternatives and may accordingly opt for (nascent) entrepreneurship. Individual assessments of risks and rewards are clearly linked to both societal conditions and individual characteristics, through perceived opportunities on the demand side and personal capabilities and preferences on the supply side of entrepreneurship. At the aggregate level, the pool of actual and potential opportunities available for starting a new business as well as the distribution of preferences, skills and resources relevant for starting a business across the individuals of a population, determine the aggregate rate of nascent entrepreneurship. Finally, entrepreneurial opportunities, capabilities and preferences within a population are influenced by variables in the technological, economic, demographic, cultural and institutional domain, the so-called 'entrepreneurial framework conditions' that were mentioned above.

The second part of Module I outlines the linkages between aggregate nascent entrepreneurship and the *actual rate of business ownership* at country level, while considering (negative) feedback from perceived deviations between the actual and an assumed 'natural' rate of business ownership. Module I winds up with the role of the government. It is argued that the government is able to influence the rate of

entrepreneurship through five types of policy measures, one aiming at the demand side of entrepreneurship, three at the supply side and one directly at the occupational decision-making process.

Module II explores how intermediate variables including innovation, variety and competition link the dynamic and static 'dimensions' of entrepreneurship, i.e. nascent entrepreneurship, start-ups, and incumbent business ownership, to entrepreneurial performance and other effects at the individual, firm and macro levels. Additionally, this module spells out the feedback from these effects with respect to the entrepreneurial process. The process of establishing and running a business of one's own enables individual entrepreneurs and their business partners to learn from their own and other enterprises' experiences, successes and failures. Learning has to do with skill development, the recognition of opportunities and behavioral change. Learning from other people's successes also includes the creation of 'role models', implanting preferences and expectations in future (nascent) entrepreneurs.

In concluding, as the framework developed in chapter 3 draws heavily on several disciplines, in particular neo-classical economics, institutional economics, sociology and psychology, it is by definition multidisciplinary. Because at this stage a unifying theory is far beyond our grasp, the framework is also decidedly eclectic.

Chapter 4
Subsequently, chapters 4 through 7 present the empirical investigations that were carried out. In chapter 4, a unique time series of the self-employment rate in the period 1899-1997 distinguishing three major sectors of industry is presented for the Netherlands. It shows a more or less continuous decline until the early 1980s and a revival thereafter. The role of changes in the sector composition versus within-sector trends in explaining this development of self-employment is investigated through a shift-share analysis of these data. Overall, the evidence rejects a prime role for sector shifts. On the contrary, a deeply rooted process of upscaling followed by historically anomalous downscaling in almost all sectors of industry seems to be the major proximate cause. This conclusion calls for a continued search for ultimate causes within the domains of technology, economics, demography, institutions and culture. Next, in chapters 5 through 7, three empirical investigations are undertaken to investigate the role of some of these 'underlying variables', such as a nation's level of economic development, the population growth rate and the extent of social security, as well as the level of the population's dissatisfaction and its degree of uncertainty avoidance, in explaining differences in the rate of business ownership.

Chapter 5
This chapter aims to explain the variation in nascent entrepreneurship across a large number of countries, including both developing and economically more highly developed nations. Based upon two strands of literature, the chapter hypothesizes a U-shaped relationship between a country's rate of entrepreneurial dynamics and its level of economic development. The empirical analysis makes use of the Global

Entrepreneurship Monitor database, including nascent entrepreneurship rates for 36 countries in 2002 as well as variables from standardized national statistics. Regressing GEM's data for nascent entrepreneurship on the level of economic development as measured either by per capita income or by an index for innovative capacity, shows support for the hypothesized U-shaped relationship. Additionally, separate regressions for opportunity-based nascent entrepreneurship (U-shaped relationship) and necessity-based nascent entrepreneurship (decreasing relationship) underline that the U-shaped relationship between total nascent entrepreneurship and economic development is related particularly to the creation of new business opportunities at more advanced levels of economic development.

The explanatory power of these single-variable models is, however, quite modest. Testing our results against several control variables acknowledging that nascent entrepreneurship also depends upon various non-economic conditions, evidence is again found for the U-shaped relationship with economic development. Additionally, significant effects are found for the total business ownership rate (+), an index of social security expenditures (-), aggregate taxes (+) and population growth (+). The positive influence of the business ownership rate possibly represents a role model effect, while the negative impact of social security expenditure seems related to the opportunity costs of entrepreneurship and the positive effect of aggregate taxes suggests that opportunities to avoid tax liabilities also play a part in motivating nascent entrepreneurship. The positive influence of population growth stands for both demand side and supply side effects. Finally, a significant, negative influence of a '(former) centralized command economies' dummy indirectly suggests the importance of other path-dependent cultural and institutional factors. Overall, the results suggest that a 'natural rate' of nascent entrepreneurship is to some extent governed by underlying 'laws' related to the level of economic development. This finding seems to imply a different scope for entrepreneurship policy across subsequent stages of development. For the most advanced nations, improving incentive structures for business start-ups and promoting the commercial exploitation of scientific findings offer the most promising approach for public policy. Developing nations, however, may be better off pursuing the exploitation of scale economies, fostering foreign direct investment and promoting management education.

Chapter 6

This chapter deals with the role of dissatisfaction in explaining differences in the level of entrepreneurship. First, a theoretical underpinning of job dissatisfaction as a motivational factor influencing the occupational choice for entrepreneurship is presented. It is further proposed that occupational choice is not determined by 'motivational factors' alone, but also depends on so-called 'reality factors' such as the opportunity costs of the choice for entrepreneurship. The chapter briefly summarizes the literature linking rising opportunity costs of entrepreneurship to increasing per capita income. Next, the chapter concentrates on explaining the sizable differences in the aggregate rate of self-employment (business ownership) across 15 European countries in the period 1978-2000. It is assumed that the available *Eurobarometer*

indices of dissatisfaction with life and with the way democracy works are proxies for job dissatisfaction and at the same time represent other negative 'displacements' known to promote self-employment. These factors are considered in addition to the influence of the level of per capita income, while the role of several control variables and a time trend is also accounted for.
The major finding is that, across nations, dissatisfaction with society and with life in general seems to be a distinguishing factor. Countries with relatively more people who are dissatisfied with the society they live in and/or who have a lower overall life satisfaction, have a higher proportion of self-employed. This conclusion is robust when controlling for other explanatory variables. In addition to the positive influence of dissatisfaction, and in spite of some degree of multicollinearity, the negative influence of the level of economic development as predicted by theory, is confirmed. The increasing coefficients of the three consecutive year dummies suggest that during the 1990s general trends such as globalization, the ICT revolution and deregulation may have had a positive effect on the rate of self-employment, while an additional business cycle effect in the year 2000 cannot be ruled out. Unemployment is found to have a negative rather than a positive influence, indicating that an influence of high opportunity costs of entrepreneurship applies at least to the 15 European countries considered in this study. The fact that nations with a higher average level of dissatisfaction have a higher proportion of self-employed should not be taken as a sign that the average self-employed is more dissatisfied than the average wage earner. In fact, the opposite seems to be true.

Chapter 7
This chapter reflects on the direct and indirect influence of cultural attitudes towards uncertainty on the level of business ownership across countries. This is illustrated with an empirical investigation across 21 OECD countries. First, the concepts of uncertainty and risk are elaborated, as is their relevance for entrepreneurship. An occupational choice model is introduced to underpin our reasoning at the macro-level. Second, regression analysis using pooled macro data for 1976, 1990 and 2004 and controlling for several economic variables, yields evidence that uncertainty avoidance is *positively* correlated with the prevalence of business ownership. According to the model, a restrictive climate of incumbent organizations in high uncertainty avoidance countries pushes individuals striving for autonomy towards self-employment. Regressions for these three years separately show that in 2004 this positive correlation is no longer found, indicating that a compensating pull of entrepreneurship in countries with low uncertainty avoidance may have gained momentum in recent years. Third, an interaction term between uncertainty avoidance and GDP per capita in the pooled panel regressions shows that the historical negative relationship between GDP per capita and the level of business ownership is substantially weaker for countries with lower uncertainty avoidance. This suggests that rising opportunity costs of self-employment play a less important role in this cultural environment, or are being compensated by increasing entrepreneurial opportunities.

Overview of the empirical investigations in relation to the theoretical framework
Table 2.1 indicates how the historical cases from chapter 1 and the empirical investigations reported in chapters 4-7 fit into the multidisciplinary theoretical framework for explaining the rate of entrepreneurship. The historical cases deal explicitly with both the occupational and the behavioral notion of entrepreneurship. The empirical investigations focus on the occupational notion of entrepreneurship and use either a static or a dynamic perspective. Additionally, chapter 5 relates to the behavioral notion through a regression analysis of so-called opportunity-based nascent entrepreneurship.

As for the aggregate framework conditions for entrepreneurship, table 2.1 briefly indicates the main factors that are discussed in the historical case studies or are used as an explanatory variable in the regression analyses. In a few instances proxy variables are indicated. These include the total business ownership rate representing the presence of entrepreneurial role models, year dummies standing for recent trends such as globalization and the ICT revolution and a '(former) centralized command economies' dummy representing various cultural and institutional factors discouraging entrepreneurship. A cell contains the word 'implicit' when a framework condition is not explicitly mentioned but is implied in the text. An example is the discussed popularity of world exhibitions during the Second Industrial Revolution as an indirect indicator for cultural receptiveness and the presence of role models. Finally, a blank cell means that a specific domain was not included in that particular case study or regression analysis. However, it certainly does not imply that a domain is irrelevant for entrepreneurship.

Table 2.1 Overview of how historical case studies and empirical chapters fit into the multidisciplinary framework

Case study or chapter	*Entrepreneurial notion*		*Conditions for entrepreneurship*					*Feedback*	
	Occupational	*Behavioral*	*Technological*	*Economic*	*Demographic*	*Cultural*	*Institutional*	*Role models*	*Learning*
Dutch Golden Age	static and dynamic	explicit	technological frontier of Europe	strong domestic market	urbanization; immigration	social mobility; capitalist spirit	developed legal framework; active city governments	Trip family; Louis de Geer	implicit
Britain's Industrial Revolution	static and dynamic	explicit	technological leadership	implicit	immigration	cultural receptiveness; labor mobility	efficient set of property rights	implicit	'great school of entrepreneurship'
Britain's decline	static and dynamic	explicit				gentrification; ignorance and distaste	labor union power; high taxes	lack of entre-preneurial role models	implicit
Second Industrial Revolution	dynamic	explicit	innovations in all walks of life			implicit		implicit	
Managerial Revolution (cpt 1 and cpt 3)	static and dynamic	implicit	scale economies; technological diffusion			implicit	labor market regulation; educational system	implicit	
Decomposition analysis cpt 4	static			implicit					
Nascent entrepreneurship cpt 5	dynamic	implicit	innovation capacity	per capita income	population growth	country dummy variable	social security; taxes	business ownership rate (proxy)	

Table 2.1, continued

Case study or chapter	*Entrepreneurial notion*		*Conditions for entrepreneurship*					*Feedback*	
	Occupational	*Behavioral*	*Technological*	*Economic*	*Demographic*	*Cultural*	*Institutional*	*Role models*	*Learning*
Dissatisfaction cpt 6	static		year dummy variables	per capita income; unemploy-ment	population density; female labor share	dissatisfaction			
Uncertainty avoidance cpt 7	static		year dummy variables	per capita income; share of services	age composition; female labor share	uncertainty avoidance	replacement rate unem-ployment		

2.3 Conclusions

What have we learned about the determinants of the rate of occupational entrepreneurship at country level? The following overall conclusions may be drawn from the various investigations reported in the present study.

Validity of a multidisciplinary approach
While a negative or a U-shaped relationship between the entrepreneurship rate and the level of per capita income is significant across several available datasets, the explanatory power of this single variable economic model is modest. After taking account of the influence of per capita income, a large degree of unexplained variety remains. Adding other economic variables raises the R2 to a varying extent. Overall, the limited explanatory power of economic variables and the stability over time of relative differences in the rate of entrepreneurship across nations, suggest the additional influence of technological, demographic, psychological, cultural and institutional variables. The various investigations carried out for this book clearly show that such factors can make a significant additional contribution to the explanation of differences in the entrepreneurship rate across countries and over time. The explanatory power of these multi-variable models is usually considerably higher than of a purely economic model. These findings bear out the validity of a multidisciplinary approach for (future) research into the entrepreneurship rate at country level.

Role of incentives
The investigations also suggest that the occupational choice model that forms the core of the multidisciplinary framework as developed in chapter 3, is a powerful instrument for analysis. In particular, the assumed assessment of the financial and non-pecuniary risks and rewards of relevant occupational alternatives serves to put the role of various positive and negative incentives for the occupational choice for entrepreneurship into perspective. First, our investigations make clear the role of 'push factors', such as dissatisfaction with a current employment situation, as a strong incentive for job mobility respectively for taking an 'entrepreneurial decision'. Secondly, both the academic literature reported in this study and the empirical investigations carried out, underline the importance of 'pull factors' such as business opportunities related to new technologies and new consumer preferences, and the promise of more autonomy when working for one's own account. On the other hand, pull factors also include the possibilities for tax evasion through the status of business owner. Thirdly, opportunity costs of entrepreneurship, such as high social security entitlements related to wage employment, were shown to have a negative bearing on the occupational choice for entrepreneurship. This probably also partly explains why in the EU countries, as a consequence of their relatively generous social security, the unemployment rate was not found to have the expected positive influence on the level of entrepreneurship. In addition, institutional arrangements with respect to labor market flexibility and

employment security[47] also seem to be core variables for explaining the rate of entrepreneurship.

The role of culture
We have conceived culture to be a collective pattern of values that distinguishes the members of one group or nation from another. Some values that may be relevant for explaining the rate of entrepreneurship are uncertainty avoidance, individualism and post-materialism. The influence of national culture on the rate of entrepreneurship is, however, complex and not well understood. One view, the 'aggregate psychological trait explanation' for entrepreneurship, is based on the idea that if a society contains more people with 'entrepreneurial values', more people will be entrepreneurs (Davidsson, 1995: 42; also see Shane, 1993: 67). Another view, the 'push explanation' for entrepreneurship, argues that a clash of values between the population as whole and potential entrepreneurs may drive the latter away from the average (non-entrepreneurial) organization and into self-employment (Baum et al., 1993: 505, and Noorderhaven et al., 2004). A third view refers to the degree of 'legitimation' or 'moral approval' of entrepreneurship within a culture at large (Etzioni, 1987: 182, 183). This view claims that a higher level of legitimation of entrepreneurship implies wide ranging manifestations including more attention for entrepreneurship within the educational system, a higher social status of entrepreneurs and more tax incentives to encourage business start-ups.

In this study, we have focused on the possible role of uncertainty avoidance as a determinant of the rate of entrepreneurship. The empirical investigations reported in chapter 7 suggest that cultural traits may have a direct as well as an indirect effect. As far as a direct effect is concerned, until the 1990s the 'push explanation' seems to have been dominant in the sense that a culture of high uncertainty avoidance significantly stimulated the rate of self-employment. However, this effect has no longer been found in more recent years. Possibly, in the 1990s the strong worldwide rise of new entrepreneurial opportunities has mobilized a relatively abundant supply of potential 'entrepreneurial capital' in countries with low uncertainty avoidance. This indicates that there may have been a structural shift in the effect of uncertainty avoidance. The findings with respect to an indirect effect of uncertainty avoidance seem to support this conjecture. The weaker negative relationship between GDP per capita and the level of business ownership in low uncertainty avoidance countries compared with high uncertainty avoidance countries, suggests that in the former cultural environment perceived entrepreneurial opportunities may be a stronger countervailing force to a perception of opportunity costs of entrepreneurship.
While these results offer some support for several views, our preliminary conclusion would be that in modern service economies high uncertainty avoidance may hamper the exploitation of new economic opportunities and thus may have a negative indirect impact on business ownership.

[47] For empirical evidence of the negative influence of employment protection on early-stage entrepreneurial activity, see Bosma et al. (2005).

Role of feedback
Reviewing the possible feedback with respect to the conditions for entrepreneurship and the entrepreneurial process itself as discussed in chapter 3, the potential effects of role models and of experiential learning on new entrepreneurial initiatives stand out quite clearly. First, as far as the importance of entrepreneurial role models is concerned, empirical support was found in academic literature, in the historical case studies reported in chapter 1 and in the empirical investigations carried out in chapter 5. In the private domain, it is an established fact that children of self-employed fathers (parents) are more likely to become self-employed themselves (de Wit, 1993a: 149). In the public domain, well-known entrepreneurial heroes may act as inspiring examples for new generations, witness economic history dating from the Dutch Golden Age to late 20th century's Silicon Valley. On the other hand, however, the successful CEOs of the giant corporations that dominated the economies of the Western world after the Second World War may have inspired many talented young men and women of the post war generation to pursue a corporate rather than an entrepreneurial career. Secondly, entrepreneurship offers many opportunities for experiential learning through managing an enterprise, maintaining external relationships, surmounting obstacles and sometimes failure. Apart from contributing to skill development and subsequent effects for firm performance, experiential learning and not in the last place learning from failure may also stimulate successful new trials to start a business.

These examples of (positive) feedback signal the likelihood of self-reinforcing loops that may strengthen today's budding entrepreneurial economy, as they strengthened the managerial economy during the greater part of the last century. The road from a managerial towards an entrepreneurial economy may prove to be a long one, due to the belated perception of disequilibrium and to long gestation lags of debate, lobby and policy implementation. However, once a society has seriously embarked on a more entrepreneurial course, feedback from the reviving entrepreneurial process may be expected to further strengthen it over time.

A structural shift
As a side benefit, the present book brings together the overwhelming evidence that during the last decades of the 20th century, a structural shift has occurred in major parts of the world economy. Additionally, this book presents some new evidence. As was explained in chapter 1, this shift may be labeled the 'Entrepreneurial Divide', and is sometimes referred to as 'the re-emergence of small-scale production' (Loveman and Sengenberger, 1991), the shift 'from the managed to the entrepreneurial economy' (Audretsch and Thurik, 2000) or 'the partial renaissance of self-employment' (OECD, 2000). Among the first to analyze this shift were Blau (1987) and Brock and Evans (1989). The shift is strikingly illustrated by the increase of the business ownership rate in most (but not all) OECD countries since the 1970s or 1980s, following a long lasting historical decline as illustrated in chapter 4. Additionally, it is documented by an upsurge of new business start-ups in countries like the Netherlands, for which longitudinal data are available. This statistical U-turn seems to be driven by structural shifts in underlying conditions. *First*, several nations seem to have reached a level of

economic development at which the historically negative relationship between real per capita income and self-employment may start to reverse. Where Carree et al. (2002) presented econometric evidence for an underlying U-shaped relationship between the rate of business ownership and the level of economic development, using data for 23 OECD countries between 1976 and 1996, chapter 5 of the present book adds evidence for a U-shaped relationship with nascent entrepreneurship, using data for 36 highly developed as well as developing countries in 2002. This reversal is related to demand side factors such as the expansion of the services sector and a growing differentiation of consumer preferences, and to supply side factors making entrepreneurship a more attractive occupational choice at higher levels of income when material needs have been satisfied and self-realization (autonomy) gains prominence as a human motivation. *Secondly*, in the 1980s and 1990s the invention and worldwide diffusion of new information and communication technologies started a new (third) Industrial Revolution (Jensen, 1993)[48], ushering in a return to a technological Schumpeter Mark I regime, a phase of 'creative destruction' when it is the role of the entrepreneur to challenge incumbent firms by introducing new inventions that make current technologies and products obsolete (Carree et al., 2002). The implied shift in emphasis away from corporate management towards new entrepreneurial formation received further support from a widespread tendency towards deregulation of markets. In order to survive in this complex and turbulent environment, incumbent firms participate in strategic partnerships with heterogeneous enterprises, giving them flexibility and responsiveness combined with cost efficiency. This emerging 'network economy' has created new opportunities for specialized, small enterprises[49]. So other factors not exclusively related to the level of economic development may also be at play in inducing the present revival of entrepreneurship. In the pooled panel regressions, presented in chapters 6 and 7, these factors were caught by year dummies (representing time trends). *Thirdly*, and interacting with the mechanisms discussed above, it seems that there may also have been a structural shift in the effect of cultural parameters such as uncertainty avoidance, as was shown in chapter 7. While until the 1990s a 'push effect' seems to have been dominant in the sense that a culture of high uncertainty avoidance significantly stimulated the rate of self-employment, in recent years the rise of new entrepreneurial opportunities has generated a 'pull effect' mobilizing the supply of potential 'entrepreneurial capital' in countries with low uncertainty avoidance. This may also explain why the reversal of a declining trend in entrepreneurship is apparently not universal, witness the continued decline of business ownership in some highly developed economies such as France and Japan. In these countries, increasing opportunity costs of self-employment with rising wage levels may still dominate the opposing force of new entrepreneurial opportunities. These anomalies may stem from a different balance of *real life* entrepreneurial opportunities and opportunity costs across countries, due to idiosyncratic national institutions related to the rate of uncertainty avoidance. However, they may also root in diverging

[48] Alternatively, Piore and Sabel (1984) use the term 'Industrial Divide', while Freeman and Perez (1988) refer to the transition from the fourth to the fifth Kondratiev wave.

[49] For a brief survey of literature on networks, see Hulsink (2005: 21-24).

perceptions of opportunities and opportunity costs as a consequence of diverging cultural traits.

Table 2.2 summarizes the empirical evidence with respect to the causes of the structural revival of entrepreneurship taking place in many countries, and the apparent lack of such a revival in others.

Table 2.2 Summary of the major findings concerning the causes of the revival of occupational entrepreneurship at country level (or the lack of it in some countries)

	The level of business ownership	*The rate of nascent entrepreneurship*
U-shaped relationship with the level of economic development	Chapter 4; other studies*	Chapter 5
Technological shifts, globalization, deregulation, network economy (structural trends)	Chapters 6 and 7	
Interaction with a nation's degree of uncertainty avoidance	Chapter 7	
Other country-specific factors, in particular idiosyncratic institutions	Chapters 6 and 7	Chapter 5

* Most notably Carree et al. (2002).

2.4 Discussion

This study has several limitations that should be borne in mind when interpreting the results. One may distinguish between theoretical and empirical limitations. These are discussed below. Subsequently, and partly based on these limitations, this chapter enumerates suggestions for future research. Finally, several implications of our findings for policies by governments and intermediary business organizations are discussed.

Theoretical limitations

While the multidisciplinary framework developed in chapter 3 goes a long way to delineate the many concepts involved in explaining the rate of occupational entrepreneurship, and put them into a proper perspective, a major limitation is its incapacity to derive testable relationships. Therefore, empirical research carried out against the background of the multidisciplinary framework is necessarily of a rather inductive or ad hoc nature. This creates a risk that empirical investigations in this area will 'capitalize on chance', and thus limits the reliability of the regression results in particular with respect to the relative importance of the many determinants of entrepreneurship. It also limits the possibility to falsify hypotheses.

A second major theoretical limitation of the multidisciplinary framework is its inadequacy to deal with the aggregation problem. While the framework does

distinguish between the relevant levels of analysis, indicates the major processes at each level and links them together, their integration and aggregation are presently beyond its grasp. The problem is clearly illustrated by the figures 3.2A and 3.2B in chapter 3. However, it seems fair to add that in economics this limitation is not typical for this particular framework only.

A third theoretical limitation of the framework is that, although it has given ample attention to feedback mechanisms, it has not fully elaborated the implied two-way causalities. A prominent example is the reciprocal relationship between entrepreneurial dynamics and economic development. For economically highly developed countries at least, a higher rate of early-stage entrepreneurial activity has a positive effect on the rate of economic growth (Van Stel et al., 2005). On the other hand, a higher economic growth rate may also have a positive effect on new business start-ups. Economic growth is a well-known indicator of market opportunities (Reynolds et al., 1994), besides influencing the demand for and supply of entrepreneurship through a higher level of economic development (see chapter 5). While this two-way causation implies a possibility for policy makers in advanced economies to keep a 'fortuitous circle' going, it also creates a challenge for researchers to specify multi-equation models incorporating non-linear relationships. Two other examples are a two-way relationship between entrepreneurship and unemployment (Audretsch, Carree and Thurik, 2001) and a two-way relationship between entrepreneurship and income disparity (see chapter 5).

Finally, the occupational choice model that is one of the cornerstones of the multidisciplinary framework developed in chapter 3 is less suitable for analyzing a situation in which people do not have any other work options than self-employment. This is often the case in developing countries. The framework treats this so-called necessity entrepreneurship as a special case, in which minor entrepreneurial opportunities obtain relevance. While other key elements of the multidisciplinary framework, such as the underlying economic, institutional and cultural conditions, do have full relevance for explaining the rate of self-employment in any nation, the framework is most suitable for analyzing the rate of occupational entrepreneurship in the economically more highly developed countries.

Empirical limitations

Measurement problems or a simple lack of data have limited the scope of the empirical investigations reported in this book. First, entrepreneurship as used in this study is an aggregate indicator. As a consequence, small high-tech businesses cannot be distinguished from mom-and-pop retail outlets. Disaggregation by sector and differentiation by firm size or ambitions for growth may lead to different results. A specific limitation with respect to the nascent entrepreneurship indicator is the lack of time series data. The analysis in chapter 5 pertains to the differences in nascent entrepreneurship across countries at one moment in time only. This is probably the main reason why no effect of cyclical variables has been found. A preliminary analysis carried out by Reynolds et al. (2002), comparing so-called Total early-stage

Entrepreneurship Activity (TEA) rates for 29 countries in 2001 and 2002, however does suggest the existence of a strong cyclical component of new business start-up rates in the short run[50].

Secondly, there are also many limitations with respect to the explanatory variables. The modest explanatory power of most of our regressions suggests that there may still be important variables missing from the analysis. A scarcity of internationally comparable institutional variables, including data on administrative and regulatory barriers for small business start-ups, is a problem that immediately comes to mind[51]. Other missing variables are the educational composition of the labor force or indicators of income disparity at country level. Also, the innovative capacity index as used in chapter 5 is too broad a concept for creating an in-depth understanding of how technological factors influence the rate of (occupational) entrepreneurship.

Thirdly, there are also limitations with respect to the set-up of our empirical work. For example, by using the full set of GEM-countries in our regressions, it is implicitly assumed in chapter 5 that the effects of the various independent variables are uniformly valid across a wide variety of countries. However, it is conceivable that the level of economic development may influence the effects of various other determinants. For instance, computer and Internet use may be more important for setting up a business in highly developed countries than in less developed ones. More generally, the model does not explicitly take into account that there may be multiplier effects, originating in a two-way relationship between entrepreneurship and economic development as mentioned before. A specific complication with our set-up for explaining self-employment at country level in chapter 6 is that per capita income and unemployment may influence dissatisfaction. Due to these interrelationships, the 'final' effect of the economic factors may be greater than their partial influence found in our multiple regressions. Additionally, the models used in chapters 6 and 7 study only the effect of psycho-sociological variables on the *level* of (occupational) entrepreneurship. It would be relevant to repeat these studies for the *dynamics* of entrepreneurship, but a lack of time series of harmonized business start-up data across countries may hamper the latter in the near future at least. Finally, the time lags in the models discussed in chapters 6 and 7 are extremely simple.

Implications for theoretical research

Clearly more theoretical work is needed to further develop the framework for explaining the rate of occupational entrepreneurship. Many of the concepts used must be elaborated and valid operational variables must be designed for quantifying these concepts. This pertains both to variables measuring (an aspect of) entrepreneurship

[50] On the other hand, the fact that the *relative rankings* of countries with respect to these TEA-rates are remarkably stable between these two years, is support for the view that structural economic and non-economic variables determine the underlying comparative rate of entrepreneurship in a society.

[51] However, Hessels et al. (2006), Bosma et al. (2005) and Van Stel et al. (2006) add relevant institutional variables to the cross-sectional regression analysis of early-stage entrepreneurial activity rates.

and to variables measuring its determinants. As for the former, much work has yet to be done to develop theoretically sound typologies of entrepreneurship at the micro level. Another challenge in this domain is the development of a theory-based, multi-dimensional concept of entrepreneurship at the macro level encompassing both early-stage and established entrepreneurship. As for the domain of the determinants of entrepreneurship, the continued theoretical development of key concepts such as entrepreneurial opportunities, uncertainty, risk and opportunity costs of entrepreneurship is advised.

Additional theoretical work with respect to the relationships between key variables in the framework is needed for deriving testable hypotheses from first principles. This is a major challenge. An even more daunting task is the development of a coherent and consistent system of relationships, including an adequate solution for the unresolved problem of aggregation.

Implications for applied research
At the applied level the following research agenda is proposed. A first field is that of measuring occupational entrepreneurship. Here, attention should focus on the dynamic indicators of entrepreneurship such as nascent entrepreneurship and new business start-ups. These dynamic indicators appear to be at least as important as the static indicator of entrepreneurship, viz. the number of business owners, but their measurement is less developed. Most needed is the systematic collection of internationally comparable time series data on these variables. The carefully designed, annual comparisons of early-stage entrepreneurial activity across nations, carried out by the Global Entrepreneurship Monitor, is a major step to building such time series. Additionally, official statistical agencies should devote more resources to the international harmonization of data on new business start-ups and business closures, preferably disaggregated by regions and industries. A final priority is the measurement of early-stage entrepreneurial activity by growth orientation and/or innovation propensity[52].

A second field is that of measuring the determinants of occupational entrepreneurship. First, the development of internationally comparable institutional variables, as briefly discussed in a previous section, is a pressing issue. To give just one example, there is still a lack of an adequate indicator of the social security entitlements of employees relative to those of self-employed persons. Secondly, a valid internationally comparable measurement of cultural variables such as entrepreneurial attitudes and/or preferences awaits further research. Thirdly, a further development of technological indicators relevant for explaining entrepreneurship is needed. Possibly the underlying sub-indices of the aggregate innovative capacity index used in chapter 5 (also see the 'data' section of that chapter) offer useful ingredients.

[52] Also see Kevin Hindle (2005), A measurement framework for international entrepreneurship policy research: from impossible index to malleable matrix, unpublished memorandum.

A third field is that of estimating quantitative relationships between key variables. A number of research questions are suggested, for which internationally comparative research seems the most suitable research strategy:

- How do cultural variables influence the rate of early-stage entrepreneurial activity, and how do these cultural variables interact with economic developments?
- In which specific way do fiscal and social security legislation as well as labor market regulation create incentives and disincentives for the occupational choice between entrepreneurship and a paid job, and how does this help to explain the aggregate rate of entrepreneurship?
- What is the influence of immigration on the rate of entrepreneurship?
- How do various technological and institutional indicators influence early-stage entrepreneurial activity by growth orientation and/or innovation propensity?
- What are the two-way relationships between business dynamics (entry and exit) and the actual rate of self-employment (occupational entrepreneurship)?
- What is the role of time lags in the influence of the various determinants of entrepreneurship? This may be investigated by using a distributed lag or by specifying an equation in first differences within the context of an error correction model.

A fourth field is that of qualitative research into the differences in the rate of (occupational) entrepreneurship across nations. Well-designed country case studies will help to select the most relevant independent variables and to narrow the framework into a more precisely formulated theory. In particular, in-depth qualitative investigations of so-called 'negative cases'[53] such as Japan and France where the number of business owners keeps declining, or New Zealand where the rate of nascent entrepreneurship is very high given its level of economic development, are expected to offer new clues about which economic, demographic, cultural and institutional variables matter most for entrepreneurship.

A fifth field is that of the impact of the entrepreneurial process on future entrepreneurship. Knowing that many new start-ups fail and that only few develop into gazelles, what are the major determinants of failure, of mere survival and of real success? And particularly, what is the impact of these successes and failures, through learning and role models, on future attempts at entrepreneurship?

Policy implications

Europe is bogged down in stagnant economic growth and structurally high unemployment. This apparent deadlock has triggered a plea by policy makers for rethinking the policy approach that ushered in European prosperity during the post-war era. Entrepreneurship is a crucial element for achieving the political objectives set at the European Council Meeting in Lisbon in 2000, where the European Union committed itself to becoming, within a decade, the most competitive and dynamic

[53] Also see http://www.compasss.org/mahoney_goertz2003.pdf for the key role of studying 'negative cases' in evaluating proto-theories.

knowledge-based economy in the world. Even though halfway through the decade this goal still seems distant, entrepreneurship is rightly seen as a major driver for innovation, competitiveness, economic growth and job creation[54]. Furthermore, entrepreneurship can be a vehicle for personal development and it may help to resolve social issues such as the integration of ethnic minorities.

This section will show what lessons for policymakers may be derived from our theoretical and empirical investigations into the subject of occupational entrepreneurship. Occasionally, we take a broader view and include elements of behavioral entrepreneurship in our discussion. We feel this is justified for the following reasons. First, as was indicated earlier in this chapter, occupational entrepreneurship includes a dynamic perspective (new business start-ups) that clearly overlaps with behavioral entrepreneurship. Secondly, our reading of the literature as listed in the References gives us reason to believe that cultural and institutional changes will often affect both types of entrepreneurship.

First, the framework certainly does not claim that every 'entrepreneur' is an agent of change, representing the 'persona causa' of the new entrepreneurial economy. Possibly, many of the traditional small firms (mom-and-pop businesses) should be characterized as obstacles to, rather than agents of, change. Most new business start-ups also play only a limited role as agents of change and many of them disappear after a short period. Generic policies providing incentives for new and small firms in general and taking away impediments for business start-ups, may therefore suffer from decreased probabilities of new firm survival without achieving immediate transformation towards an entrepreneurial economy. On the other hand, the many thousands of small start-ups created in this way may function as a seedbed for a smaller number of successful and innovative new firms and may provide positive externalities (role models and lessons) for new generations. In that vein, there is room for at least two types of additional policy intervention. The first type is policy aimed at promoting the creation of new technology-based firms in new industries. The second type is policy aimed at providing newly created firms, irrespective of their industrial classification, with the financial, organizational and technological resources needed to grow. Together, specific and generic policies will promote variation among new businesses, creating the basis for a selection process that may result in new successful products and markets. Incumbent firms striving to maintain their competitive position should not be put in a position where they can hamper this selection process. Low business entry and exit barriers are a necessary condition to create a virtuous circle.

Secondly, the theoretical framework suggests that the comparative rate of (nascent) entrepreneurship is to some extent governed by underlying 'laws' related to the level of economic development. Cultural values, the availability of entrepreneurial role models and the incentive structure of the economic system provide additional structural influences on entrepreneurship. The combined impact of these structural variables

[54] See van Stel (2005a) for an overview of the evidence.

implies that the comparative rate of nascent entrepreneurship may be quite stable and path-dependent. In the short run, the influence of government policy will thus be relatively modest. In the long run, through its impact on attitudes, (dis)incentives and regulatory barriers for business start-ups and firm growth, government policy may well be of crucial importance. Thus, governments striving to promote entrepreneurship are advised to aim at institutional reform and to be patient and persevering. The road to an entrepreneurial society is a long one (Bosma et al., 2002).

Thirdly, for politicians who would like to follow this road to a more entrepreneurial economy, the empirical findings reported with respect to the influence of culture on entrepreneurship seem to offer only limited guidance. The promotion of dissatisfaction or of uncertainty acceptance hardly seems to be a feasible policy option. However, some policy implications may emerge by linking our results to (other) considerations and empirical findings reported in the literature. *First*, when explaining differences in self-employment rates it is customary to distinguish between 'pull' factors and 'push' factors (Stanworth and Curran, 1973). Pull factors make self-employment more attractive. Some examples are the perspective of independence and autonomy and the possibility to make high profits. Push factors make wage earning and/or unemployment less attractive and thus 'push' people towards self-employment. Some examples are low wages, limited autonomy in a paid job, frugal social security benefits or lack of alternative ways to make a living. Viewed from within this context, our findings point out the importance of both push factors and pull factors. This may induce policymakers to scrutinize the balance in the incentive structures of their economies. *Second*, another policy implication arises when combining our findings with those of research on micro data. Research comparing self-employed with wage earners suggests that the former are more focused on individual responsibility and effort, and more strongly espouse an ethic of working hard (Beugelsdijk and Noorderhaven, 2004). These characteristics may make an individual more likely to respond to dissatisfaction by setting up shop. Hence, it may also be wise to consider how the educational system may contribute to the development of the entrepreneurial qualities of a country's population (Van der Kuip and Verheul, 2004). In this way, the chances that dissatisfaction will become an engine of economic progress, rather than a source of inertia, may be increased.

Finally, this book presents empirical evidence that the role of entrepreneurship differs across the stages of economic development, in that there appears to be a U-shaped relationship between (a natural rate of) entrepreneurship and the level of economic development. Additionally, Van Stel, Carree and Thurik (2005) report evidence that early-stage entrepreneurial activity has a positive effect on economic growth in highly developed economies, but a negative effect in developing countries. Moreover, deviations between the actual level of business ownership and its hypothesized natural level (given the stage of economic development) are found to have a negative impact on economic growth[55]. Combined, these findings could have striking policy

[55] See Carree et al. (2002).

implications. On the one hand, developing nations may do well to invest in management education, to foster foreign direct investment and to pursue the exploitation of scale economies in order to further their economic development, rather than to give priority to the promotion of (even more) new business start-ups. On the other hand, for the economically most advanced nations, improving incentive structures for business start-ups and firm growth, as well as promoting the commercial exploitation of scientific findings through entrepreneurship offer the most promising approach for public policy.

To conclude, in an economically highly developed society striving to become a more entrepreneurial economy, government policy should target on increasing the entrepreneurial attitudes and skills of workers, facilitating their labor mobility, removing disincentives for entrepreneurship, lowering administrative and regulatory burdens for small business, enhancing the scope of market opportunities, fostering the social capital of business founders and facilitating knowledge transfer to innovative new enterprises.

PART II

Framework

CHAPTER 3

A FRAMEWORK FOR EXPLAINING THE RATE OF ENTREPRENEURSHIP, LINKING THREE LEVELS OF ANALYSIS

Abstract
As shown in chapter 2, the explanatory power of economic models of the rate of (occupational) entrepreneurship at country level is modest. Technological, demographical, cultural and institutional factors also influence entrepreneurship rates. Chapter 3 presents a theoretical framework developed to guide multidisciplinary research into the rate of entrepreneurship. The framework explores the (intermediate) linkages between various aggregate conditions and the rate of entrepreneurship as well as the subsequent causal links to entrepreneurial performance, while outlining feedback mechanisms. Three levels of analysis are identified: the individual level, the enterprise level and the aggregate level. A great deal of attention is paid to conceptualizing relevant entrepreneurial and intermediate variables. The framework has two modules, but module I is divided into two parts. The first part of Module I shows how societal conditions influence individual occupational choices for entrepreneurship and the ensuing aggregate rate of nascent entrepreneurship, through an intermediate role of preferences and (perceived) opportunities, capabilities, risks and rewards in the occupational choice process. The second part of Module I outlines the linkages between aggregate nascent entrepreneurship and the actual rate of business ownership at country level, while also considering feedback from perceived deviations between the actual and an assumed 'equilibrium' rate of business ownership. Module II explores how intermediate variables including innovation, variety and competition link the static and dynamic dimensions of entrepreneurship to performance and other effects at individual, firm and macro levels. Additionally, this module spells out feedback through learning and role models.

Chapter 3 is partly based on revised sections of:

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Wennekers, Sander and Roy Thurik (1999), Linking entrepreneurship and economic growth, *Small Business Economics* 13, 27-55, with kind permission of Springer Science and Business Media.

Verheul, I., A.R.M. Wennekers, D.B. Audretsch and A.R. Thurik (2002), An eclectic theory of entrepreneurship, in: D.B. Audretsch, A.R. Thurik, I. Verheul and A.R.M. Wennekers (eds.), *Entrepreneurship: Determinants and Policy in a European-US Comparison*, Boston/Dordrecht: Kluwer Academic Publishers.

Wennekers, A.R.M., L.M. Uhlaner and A.R. Thurik (2002), Entrepreneurship and its conditions: a macro perspective, *International Journal of Entrepreurship Education* 1 (1), 25-64, with kind permission of Senate Hall Academic Publishing.

Thurik, Roy, Sander Wennekers and Lorraine M. Uhlaner (2002), Entrepreneurship and economic performance: a macro perspective, *International Journal of Entrepreneurship Education* 1 (2), 157-179, with kind permission of Senate Hall Academic Publishing.

Thurik, A.R. and A.R.M. Wennekers (2004), Entrepreneurship, small business and economic growth, *Journal of Small Business and Enterprise Development* 11 (1), with kind permission of Emerald.

A FRAMEWORK FOR EXPLAINING THE RATE OF ENTREPRENEURSHIP, LINKING THREE LEVELS OF ANALYSIS

3.1 Introduction

As was shown in chapter 1, the rate of (occupational) entrepreneurship, measured either in a static sense as the level of business ownership or in a dynamic sense as nascent entrepreneurship or new business start-ups, differs considerably across countries and over time. The variety in these indicators has been documented across a large number of countries. For some nations the development of the business ownership rate has also been documented over a long period of time. The explanation of this variety is by no means straightforward. Start-up rates and business ownership rates at the country level are based upon individual occupational choices that are embedded in a societal context. This implies that, in addition to psychological and microeconomic considerations, demographic, technological, macroeconomic and (path-dependent) cultural and institutional factors also make a contribution to the explanation of entrepreneurship rates. It also implies that an explanation will have to take account of different levels of analysis, i.e. the individual level, the firm level and the aggregate level.

Due to this inherent complexity, there is a risk that isolated attempts at explanation will be *ad hoc* or not consistent. This chapter aims to develop an encompassing, multidisciplinary framework as a guide for explanations of the variations in the rate of 'occupational entrepreneurship' at country level as introduced in chapter 1. First, it identifies key conditions for occupational entrepreneurship, elaborates causal chains of intermediate linkages and discusses feedback from the aggregate level of business ownership to the individual level of occupational choice. Second, the influence of entrepreneurship on economic performance and the ensuing feedback through learning and role models are included in the framework. At individual level, the framework is influenced by the theoretical (psychological and neo-classical microeconomic) literature with respect to occupational choice. At firm level and aggregate level, it draws mainly on industrial economics, evolutionary economics, sociology, anthropology and (old and new) institutional economics.

The framework is a synthesis of earlier contributions, by the present author in cooperation with others, that have so far been published in Small Business Economics (1999), proceedings published by Physica-Verlag (1999), the International Journal of Entrepreneurship Education (2002), a volume published by Kluwer Academic Publishers (2002) and the Journal of Small Business and Entrepreneurship Development (2004). Compared with these earlier contributions, there will now be more emphasis on the links between three relevant levels of analysis (the individual, firm and aggregate level). In particular, there is explicit attention for the two-way linkages between nascent entrepreneurship at individual level and the macroeconomic business-ownership rate. Additionally, the feedback effects from entrepreneurial

performance to 'new rounds of occupational choice' and to societal conditions for entrepreneurship are developed more extensively.

This chapter starts by raising some theoretical issues. It is argued that the adopted multidisciplinary framework of entrepreneurship is necessarily 'eclectic', and it is shown how the multidisciplinary framework relates to mainstream economics and to what extent the framework might be viewed as a 'theory'. Additionally, the chapter introduces the relevant levels of analysis and discusses the main dimensions of entrepreneurship.
Next, the 'blueprint' of the framework as introduced in chapter 2 is reiterated. Its purpose is to introduce the main variables and to indicate their major linkages. Subsequently, the framework will be elaborated in three steps. In the first step, a qualitative framework of individual occupational choice for nascent entrepreneurship, linking technological, economic, demographic, cultural and institutional conditions to occupational preferences, 'reality factors' (opportunities, resources and skills) and perceptions of these, is the basis for deriving the aggregate rate of nascent entrepreneurship. The second step deals in a conceptualizing non-mathematical manner with the linkages between (aggregate) nascent entrepreneurship, new business start-ups and the aggregate rate of business ownership. A synthesis of these first two steps focuses on the role of government policies. Subsequently, a third step considers the effects of entrepreneurship on entrepreneurial performance and economic growth. This is a necessary step for incorporating feedback from performance to entrepreneurship. Based upon these steps, the chapter then synthesizes all relevant feedback mechanisms directed at the conditions for entrepreneurship and the entrepreneurial process itself.

3.2 Theoretical considerations

Theoretical eclecticism
While in philosophy 'Eclecticism'[56] dates back to the first centuries BCE, in modern science theoretical eclecticism is not a virtue. One risk of eclecticism is that it may lead to selecting and combining those elements of numerous theories that fit a certain viewpoint, while forgetting about the other elements (Foss, 2000: 67). The major arguments for developing an eclectic framework or theory must always derive from the failure of existing theories to explain certain phenomena combined with indications that different disciplines or paradigms may be complementary in this respect. The ultimate test of an eclectic 'theory' is whether it may (help to) explain phenomena that cannot be explained by the theories that it integrates[57].

[56] Eclecticism is a name given to a group of ancient philosophers who, from the existing philosophical beliefs, tried to select the doctrines that seemed to them most reasonable, and out of these constructed a new system' (http://www.iep.utm.edu/e/eclectic/htm, The Internet Encyclopedia of Philosophy).

[57] In fact, this is the well-known 14th century principle of 'Occam's razor' that states that 'One should not increase, beyond what is necessary, the number of entities required to explain anything'.

Why an eclectic 'theory' of entrepreneurship?

With respect to the research question at hand - the explanation of the variety of entrepreneurship rates across countries and over time - the first argument for developing a multidisciplinary, eclectic 'theory' is the apparent failure of existing (neo-classical) economic theories to explain the recent revival of the rate of entrepreneurship in many economically advanced nations. While offering fundamental insights, the Lucas hypothesis (Lucas, 1978) predicts that as the prosperity of a nation continues to grow, a continued decline of its business ownership rate will be inevitable. Recent data, as presented in chapter 1, have shown this prediction to be counterfactual for many developed nations. A second argument is the similar failure of existing economic models to explain the considerable differences in business ownership rates across nations with the same level of economic development[58]. Nor do these models explain why over the past decades the rate of entrepreneurship has increased in many developed countries, while it continues to decline in some others, most notably in Japan and France. A third argument is that various disciplines outside mainstream economics provide additional insights that are relevant to understanding these phenomena. To begin with, the occupational choice for entrepreneurship is often to some extent motivated by immaterial or psychological considerations (such as autonomy, status and self-realization). This calls for a contribution from psychology in addition to one from labor economics and/or microeconomics. Another issue is the apparently significant influence of technological trends on the 'demand for entrepreneurship', an area where evolutionary economics[59] and (new) institutionalism make their contributions. Furthermore, the impact of demographic and socio-economic developments on the supply of potential entrepreneurs suggests that geography[60] and sociology[61] may be a useful aspect. Finally, a strong cultural and institutional context of the occupational choice for entrepreneurship calls for a contribution from respectively anthropology[62], (old) institutional economics[63] and economic history.

Relationship with mainstream economics

It is not suggested that mainstream economics should not endeavor to explain the rate of entrepreneurship. Some useful first attempts made in recent years have already been discussed in chapter 2. In that chapter, extensive motivation was also given as to why additional insights from outside mainstream economics could be indispensable for a more satisfactory explanation of variations in the rate of entrepreneurship. The implied multidisciplinary approach also seems to fit well with ongoing and more general discussions about the scope of mainstream economics. Gordon (1976), in an article

58 This is illustrated by Carree et al. (2002).

59 Groenewegen and Vromen (1999), however, point at an extending scope of evolutionary economics.

60 Acs and Audretsch (2003: 3) indicate geography as one of several disciplines harbouring a 'subfield' on entrepreneurship.

61 See Martinelli (1994).

62 For the division of labor among anthropology, sociology, psychology and other social sciences, see Hofstede (2001: 19).

63 For a treatise on the essence of (old and new) institutional economics, see Groenewegen et al. (1995) and Hodgson (2000).

entitled "Rigor and relevance in a changing institutional setting", proposed a broader, institutionally oriented analysis in order to be able to explain real world economic phenomena. Blaug (1992: xxi-xxiii) criticized a "tendency in modern economics to pursue theorizing like an intellectual game" and advocated "that economics must first and foremost be an empirical science". Fogel (1999) stated that the economic profession is lagging more behind the real economy than it has to. He continued (p. 1) "There has been a significant broadening of the scope of economics during recent decades, with the emergence of such fields as the new household economics, the new institutional economics, …, but much remains to be done." He closed (p. 15) by quoting Kuznets: "A broader historical background might have prevented some economists from ignoring the dependence of their generalizations upon transient historical conditions". In a recent book about competition, Hunt (2000) offered an interesting survey of a large number of relevant economic disciplines outside neo-classical economics[64] and attempted to combine insights from these schools into a new resource-advantage theory of competition. Finally, Hodgson (2000: 325) showed that while there is a great deal of antagonism between neo-classical and institutional economics, their basic premises do not rule out potential complementarity. Here, we follow this stance. More precisely, it is assumed that the neo-classical hypothesis of a utility-maximizing individual can be combined with the institutional notion of institutions affecting individuals in fundamental ways ('reconstitutive downward causation'.) Possibly, in a future stage mainstream economics will be able to integrate neo-classical and institutional economics within one framework or theory.

Theory, proto-theory or theoretical framework?

A theory should at least meet the following criteria[65]:

- refer to a well-defined domain of reality;
- define the concepts, notions, constructs and other variables that are used;
- formulate a coherent and consistent system of causal relationships between a number of these variables;
- make it possible to derive testable hypotheses from these relationships.

The multidisciplinary framework for explaining the rate of entrepreneurship, as developed in this chapter, meets these criteria only to some extent. It explicitly refers to a well-defined domain of reality, i.e. the rate of entrepreneurship in the sense of the number of business owners relative to the labor force in a nation, including the gross and net growth of this fraction. It pays a great deal of attention to developing and defining many of the concepts used, such as opportunities, capabilities and preferences, rewards and risks of entrepreneurship, or the equilibrium rate of business ownership. It also goes a long way in outlining causal relationships between many of these variables. However, it is certainly not a theory in the strict sense of a deductive system consisting of analytically derived and testable relationships between operationally defined variables. Following de Groot (1968: 42) and Mahoney and

[64] Additionally, through institutional economics a contribution by psychology, anthropology and sociology is also implied. See Hodgson (2000: 318).

[65] This is based upon de Groot (1968: 42).

Goertz (2003: 7-8)[66], it may be called a *proto-theory*. As it contains general, leading thoughts about relevant concepts and logical relationships with respect to a domain of reality, it may also be called a *theoretical framework* (de Groot, 1968: 43).

Three levels of analysis

The multidisciplinary framework of occupational entrepreneurship distinguishes three levels of analysis[67]: the individual level of nascent entrepreneurs and incumbent business owners, the firm level of new business start-ups and incumbent enterprises, and finally the aggregate level of the nascent entrepreneurship rate and the business ownership rate with respect to the adult population or labor force. The relationship between (behavior at) these different levels is complex. Hogarth and Reder (1986, S187) stated that the "rational choice paradigm refers to individuals, even though the price-quantity relations it is used to explain refer typically to the behavior of aggregates". However, the aggregation from the individual level to the aggregate level is by no means trivial. In this respect, Hogarth and Reder (1986, S198) also mentioned the role of non-price-quantity variables that are either not observable or "idiosyncratic to particular sectors or even to particular decision-making units, so that aggregation presents difficult problems". Blaug (1992: 229-232) agreed that, while the rationality postulate refers to individual behavior, economics is interested in the behavior of aggregates. He added that for aggregation many 'auxiliary assumptions' are needed. To sum up, the problem of aggregation is not only far from trivial, but as yet it also seems unresolved. The eclectic framework does not offer any formal contribution to solving the problem of aggregation in this area. It does however attempt to distinguish clearly between the relevant levels of analysis. First, the rate of business ownership at the aggregate level is based upon a great many individual occupational choices. Second, beyond straightforward aggregation, the analysis at different levels often has to be carried out simultaneously. In particular, the analysis of occupational choices at individual level embodies elements defined at aggregate level, such as institutions and (feedback from) deviations between the total number of business owners and the (perceived) 'carrying capacity of the market'.

Static and dynamic dimension of the occupational notion of entrepreneurship

To operationalize the occupational concept of entrepreneurship, it is helpful to distinguish between a *dynamic* and a *static* perspective of entrepreneurship (Wennekers, 1999), as was indicated briefly in chapter 1. The dynamic perspective views entrepreneurs as agents of change, by starting new businesses[68]. The static

[66] See http://www.compasss.org/mahoney_goertz2003.pdf. These authors contend that a proto-theory presents 'good reasons for considering many independent variables', but has little theoretical structure.

[67] In a framework for behavioral entrepreneurship one might add a fourth level of 'emerging new ventures' (see Davidsson, 2004: 72-80)

[68] In a sense, the dynamic perspective of occupational entrepreneurship overlaps the behavioral view on entrepreneurship, as discussed in chapter 1. The dynamic perspective also concurs with Schumpeter (1911, in Swedberg, 2000: 52): "On the contrary, new combinations are, as a rule, embodied, as it were, in new firms … in general it is not the owner of stage-coaches who builds railways".

perspective views the number of business owners as a dimension of the industrial structure of the economy at a particular point in time.
For empirical research with respect to the *dynamic perspective*, several indicators can be used including nascent entrepreneurial activity (the prevalence of people actively engaged in activities to start a new business) and gross entry of new business start-ups[69]. The dynamic perspective also harbors a wide variety in types of start-ups, including new independent business start-ups, management buy-outs, spin-offs from existing organizations and business transfers[70].
For empirical work on the *static dimension*, the self-employment or business ownership rate is the most important statistical indicator of entrepreneurship (EIM/ENSR, 1995). Self-employment refers to people who provide employment for themselves as business owners. Two categories of self-employment (business ownership) can be identified. The first category concerns those who lead an unincorporated business and who draw no salary but use the profits of the enterprise to cover personal expenses. The second category concerns owner-managers who gain a share of the profits as well as a salary from an incorporated business. These entrepreneurs run a risk equal to their share of the invested capital in the business. In comparing country data, it is important to know which definition is being used, and to correct for inconsistencies. In the present study, we consider the appropriate static measure to be the broader definition, covering both categories: owners of incorporated and unincorporated businesses, but excluding the unpaid family workers and wage-and-salary workers operating a side-business as a secondary work activity (Carree, van Stel, Thurik and Wennekers, 2002). As is the case with the dynamic perspective, the static dimension of entrepreneurship encompasses a wide variety in terms of line of business, firm size, legal structure and business objectives.
Box 3.1 summarizes four entrepreneurial key concepts that play a role in the framework for explaining the rate of entrepreneurship. In addition to two dynamic variables and one static measure, this also includes the concept of 'latent entrepreneurship'. Although all four indicators should be clearly distinguished from one another, they are linked as subsequent phases of the entrepreneurial process.

3.3 Blueprint of the framework for explaining the rate of entrepreneurship

Figure 3.1 presents a 'blueprint' of the framework. This design is broad in scope and can be divided into two modules, each covering a major process. Module I explores the intermediate linkages between aggregate conditions and the rate of entrepreneurship, module II describes the intermediate linkages between entrepreneurship and performance. Apart from elaborating causal links flowing from

[69] Additionally, the owner-managers of young firms (up to 42 months) taken together with the nascent entrepreneurs (per 100 adults) form another dynamic indicator of entrepreneurship, the so-called Total (early-stage) Entrepreneurial Activity (TEA) rate (see the various issues of the Global Entrepreneurship Monitor).
[70] Some would even include the establishment of new subsidiaries by incumbent firms.

(aggregate) conditions to entrepreneurship and subsequently to performance, the framework also considers relevant feedback mechanisms.

Box 3.1 Four entrepreneurial key concepts in the framework for explaining the rate of (occupational) entrepreneurship

Latent or potential entrepreneurship is not very well defined. It refers to a wide range of 'mental engagements levels' of a population, ranging across *awareness* of entrepreneurship as a viable occupational option, *preference* for entrepreneurship when free to choose and *intentions* to start a business sometime in the future. See Blanchflower et al. (2001), Grilo and Irigoyen (2005) and Van Gelderen (2004) for various operational elaborations of several of these phenomena. The prevalence of potential entrepreneurship within a nation's population is usually measured through survey studies among students or other groups in the population.

Nascent entrepreneurship refers to all individuals (including wage earners, unemployed, students, homemakers and owners of another business) who are *actively trying to start a new business*[71]. In the Global Entrepreneurship Monitor (GEM) study, a person is considered to be involved in a nascent firm "if he or she had engaged in any activity to start the firm in the past 12 months, expected to own all or part of the new firm once it became operational, and the initiative had not paid salaries or wages to anyone for more than three months" (Reynolds et al., 2000: 52). Nascent entrepreneurship is measured through periodical population surveys such as carried out by GEM. Nascent entrepreneurship is thus typically a stock variable. Although a significant fraction of nascent entrepreneurs step into the next phase within the year following their first identification (Wagner, 2004), individuals may also remain a nascent entrepreneur for several years.

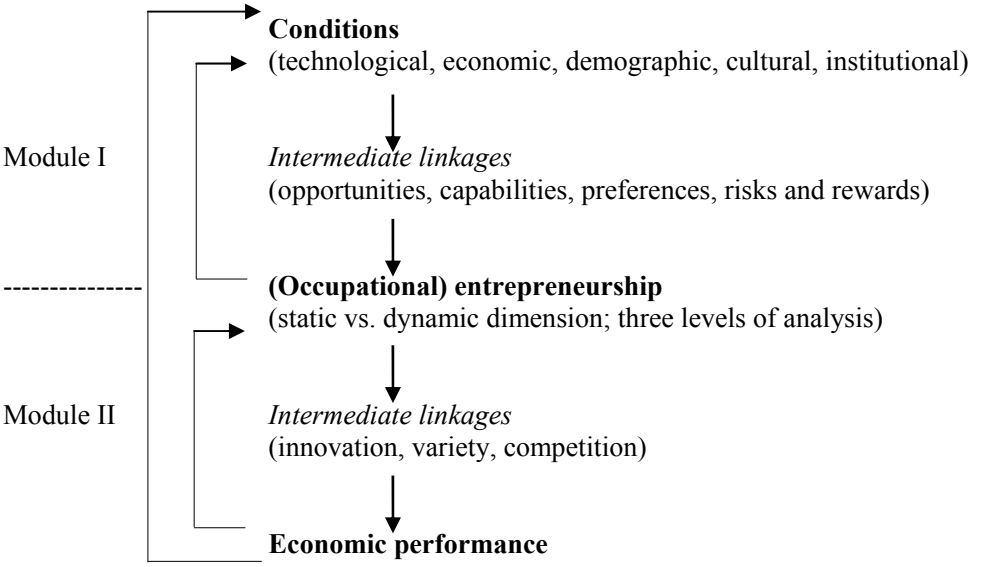
Business start-ups refer to the birth or formation of new enterprises. Operational measurement of business start-ups is often based upon counts of new entries into business registries, such as those administered by Chambers of Commerce, or in administrative files developed for other purposes such as unemployment insurance, social security payments or VAT. Cross-national comparison presents a major problem, because of a lack of harmonization across countries related to the use of different criteria as to when a firm is eligible for registration. Start-ups refer to the new registrations within a fixed time frame, usually a year, and thus constitute a flow variable.

The rate of business ownership is again a stock variable. It refers to the number of incumbent owner-managers per 100 in the adult population or in the labor force. This variable may be operationalized in various ways. Its measurement may be based upon counts in one of the registries discussed before. It may also be based upon a labor force survey. Cross-national comparison is again a problem (van Stel, 2005b). Also, the number of businesses will usually differ from the number of business owners. The Global Entrepreneurship Monitor defines incumbent entrepreneurship as the owner-managers of both 'new businesses' (that have paid salaries and wages for more than three months but for less than 42 months) and 'established businesses' (that have paid salaries and wages for more than 42 months), both taken from the GEM Adult Population Survey (Reynolds et al., 2002: 38).

[71] This may include succeeding one's parents as a business owner or participating in a management buy-out or buy-in with respect to an existing business.

Two other, to some extent related characteristics of the framework are the following. First, the framework distinguishes the three levels of analysis mentioned before: the individual level of nascent entrepreneurs and incumbent business owners, the firm level of new business start-ups and incumbent enterprises, and the aggregate level of the nascent entrepreneurship rate and the business ownership rate with respect to the adult population or labor force. For practical reasons, the three levels of analysis are not specified separately in figure 3.1, but they are continuously disentangled in the subsequent discussion. Second, the framework acknowledges the multi-dimensional character of entrepreneurship, as discussed before. In particular, the framework distinguishes nascent entrepreneurs and new business start-ups (dynamic view) on the one hand and incumbent business owners (static view) on the other.

Figure 3.1 Blueprint of the framework for explaining the rate of (occupational) entrepreneurship



Source: Based on Wennekers and Thurik (1999) and on Wennekers, Uhlaner and Thurik (2002).

Module I is divided into two parts. The first part of module I shows how various aggregate conditions within the fields of technology, economic development, demography, culture and institutions, influence *individual* occupational choices for entrepreneurship and the ensuing *aggregate* rate of nascent entrepreneurship, through an intermediate role of opportunities, preferences, capabilities, risks and rewards in the occupational choice process. The second part of module I provides insight into the linkages between (aggregate) nascent entrepreneurship and the actual rate of business ownership at country level, considering various conditional and intermediate variables as well as the role of feedback from perceived deviations from an assumed equilibrium rate of business ownership.

Module II of the framework explores how intermediate variables such as innovation, variety and competition link the static and dynamic *dimensions of entrepreneurship*, i.e. nascent entrepreneurship, start-ups, and incumbent business ownership, to the resulting *performance and other effects* at the individual, firm and macro levels. Additionally, the module spells out the role of major feedback effects such as learning and role models.

3.4 Module I, Part 1 - A framework of occupational choice for nascent entrepreneurship

Introduction

Central to the framework of occupational choice for nascent entrepreneurship is the assumption that at certain moments in their working life, individuals choose between wage earning and self-employment by assessing, valuating and weighing the perceived (potential) financial and non-pecuniary rewards and risks of these alternatives. Perceived rewards and risks are influenced by (an individual's perception of) relevant *entrepreneurial opportunities* and *personal capabilities*, while their weights depend upon personal attitudes and *preferences.* Various specific models fit within the framework. Explicit rational choice as assumed in neo-classical economics is one of these models. Unconscious thought in preference development and decision making (Dijksterhuis, 2004), which has been shown by modern psychology to be relatively effective for complex decision problems, is also compatible with the framework. Decisions may then be viewed as the outcome of an implicit, unconscious process of perceiving, assessing, weighing and integrating all relevant attributes of the career alternatives. Additionally, occupational choice will to a large extent be based on subjective perceptions and self-perceptions (Arenius and Minniti, 2005). Finally, decision making may even be irrational[72]. Whatever specific model of occupational choice is employed, for some individuals the weights of specific risks or rewards may be quite large and may dominate the outcome. The model may thus be highly non-linear. Finally, the framework acknowledges the possibility that for some individuals entrepreneurship is not an occupational option that they are truly aware of, and embodies the concept of latent or potential entrepreneurship as defined in Box 3.1.

The framework links aggregate conditions, such as technology, economic development, demography, institutions and culture with individual assessments through either the *demand-side or the supply side of entrepreneurship*. While the demand for entrepreneurship is a somewhat metaphorical term[73], the distinction between a demand-side and a supply-side of entrepreneurship is an established analytical tool for explaining

[72] Kahneman and Lovallo (1993) present empirical results showing that (new) entrepreneurs are not immune to unrealistic optimism, and discuss why this may be the case.

[73] The term demand for entrepreneurship is explicitly used by Casson (1995: 94). A contemporary reference to 'supply and demand in the market for entrepreneurs' is Van Praag (1996: 11), who also cites earlier references to a supply and demand side of entrepreneurship by Cantillon, Say, Marshall and Knight. Kilby (1971: 23-26) formalizes this approach in a conventional supply and demand diagram. For an elaboration, see the Appendix to this chapter.

changes in the actual rate of entrepreneurship. In particular, the demand-side of entrepreneurship refers to the opportunities available for starting a business. The supply-side of entrepreneurship refers to the pool of preferences and capabilities (skills and resources) relevant for starting a business, which is embedded in the individuals of a population[74]. In addition, it is useful to distinguish between opportunities and capabilities as 'reality factors' and individuals' perceptions thereof.

At individual level, the framework aims to explain the probability of specific persons being involved in the attempt to start a business. On the one hand, this probability will depend on their personal characteristics such as age, gender, relevant psychological traits, entrepreneurial skills, financial resources and social capital, all of which are known to have a bearing on the entrepreneurial decision. On the other hand, an individual's chance of nascent entrepreneurship will also depend on aggregate conditions in the individual's environment at local, regional or national level. These conditions first of all include technological, economic, demographic, cultural and institutional factors influencing the actual opportunities on the demand side of entrepreneurship. They also refer to specific institutional and cultural factors influencing an individual's awareness and perceptions, as well as the risks and opportunity costs of entrepreneurship. Finally they include the availability of role models in the environment. A recent binominal logistic regression analysis by Arenius and Minniti (2005), employing a dataset of more than 50,000 respondents across 28 countries to explain whether each of these individuals is a nascent entrepreneur, basically applies this framework by including both individual characteristics and aggregate conditions. Another example of an empirical study conducted within the framework, is a multinomial logit model analysis by Grilo and Thurik (2005a), explaining various 'entrepreneurial engagements levels' across Europe and using survey data from 18 European countries and the US.

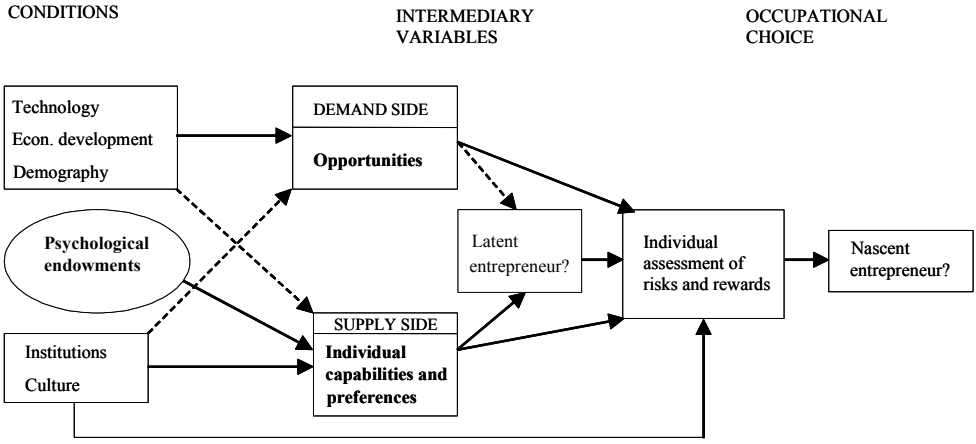
Subsequently, the framework acknowledges that it is the aggregation of occupational choices that determines the rate of nascent entrepreneurship at country level. While aggregation awaits the solution of many methodological problems, it seems likely that the following two aspects will play a role. First, the distribution of relevant demographic, psychological and other individual characteristics across a country's population by definition links the rate of nascent entrepreneurship to various aggregate conditions. Second, these and other conditions will also influence the aggregate outcome through the decision making process itself, analogous to the individual analysis discussed above. Based upon these considerations, the framework posits that the greater the demand for entrepreneurship, i.e., the availability of (perceived) market opportunities, and/or the supply of entrepreneurial preferences and (perceived)

[74] For a contrasting distinction, see Van Praag en van Ophem (1995) who distinguish between willingness and opportunity, where the latter embodies both individual capabilities and characteristics of the business environment. While their definition of opportunity as 'the possibility to become self-employed if one desires to' is appealing at face value, it sacrifices the analytically indispensable separation of the individual attributes of (potential) entrepreneurs and the external conditions they encounter.

capabilities, the larger the proportion of the population that will develop entrepreneurial intentions and will sometime in their career actually attempt to set up a business (nascent entrepreneurship). A recent study by Wennekers et al. (2005), also reprinted in the present volume (chapter 5), linking the rate of nascent entrepreneurship across 36 countries in 2002 to economic, technological, demographic, cultural and institutional variables, clearly applies the framework at the aggregate level.

Figures 3.2A and 3.2B stylize the main causal relationships in the framework of occupational choice for nascent entrepreneurship, at respectively the individual and the aggregate level. Although these figures are highly simplified and sidestep the problems and details of aggregation, they do spell out the major mechanisms. The discussion below follows figure 3.2A in a backward direction from the right-hand to the left-hand side. After discussing the assumed mechanism of individual occupational choice for nascent entrepreneurship, we conceptualize the intermediary variables on the demand and supply side, i.e. opportunities, capabilities and preferences, and finally we elaborate the underlying conditions of individual (nascent) entrepreneurship. Occasionally we will refer to figure 3.2B in order to discuss specific aspects that are relevant at the aggregate level.

Figure 3.2A The determinants of nascent entrepreneurship at the individual level



Source: Based on Wennekers, Uhlaner and Thurik (2002).

Occupational choice for nascent entrepreneurship

In modeling occupational choice between business ownership and wage earning[75] it is often assumed that individuals, at certain moments in their working life, valuate and

[75] Generalizing, one may also include unemployment benefits and unpaid work, such as housework or volunteer activities, as occupational options. Analogous models may be applied to the decision of a self-employed person to close or sell his or her business.

compare the expected financial and non-pecuniary rewards of these alternatives (Blau et al., 1956; Bird, 1989; Murphy et al., 1991; de Wit, 1993a; Acemoglu, 1995)[76]. Rewards include profits, wages, capital gains, status, autonomy and other dimensions of job satisfaction. The framework for explaining the rate of entrepreneurship considers *net rewards*, taking inputs (such as working hours) and other costs (premiums, necessary investments) into account. Additionally, the framework assumes that these individuals compare not only the expected rewards but also the *risks* of their career options. In that respect, compared with wage earners entrepreneurs face a relatively high uncertainty (variance) of income due to demand uncertainty and cost uncertainty (de Wit, 1993a). Additionally, specific risks[77] are related to undesirable possible events such as sickness and disability, unemployment due to business failure and bankruptcy. The extent of these specific risks is partly related to the social security entitlements of self-employed workers compared to those of wage and salary earners, but risks may obviously stretch far beyond loss of income. In general, entrepreneurs face the following types of risks: loss of income, capital, employment and social status, and psychological harm (van den Broeck and Willem, 2003: 12).

Weighing the alternatives according to personal preferences results in an individual's 'risk-reward profile' of self-employment versus wage earning. Conceptually, one way to express a risk-reward profile is through the expected utility of the various risks and rewards[78]. An alternative way is to consider the rewards of wage-employment (including job security and social security entitlements) as the opportunity costs of self-employment (Lucas, 1978). Each individual has his or her own risk-reward profile, guiding a personal occupational choice. In addition to perceiving a potential business opportunity, a choice for nascent entrepreneurship presupposes that the individual is truly aware of and has a real interest in entrepreneurship as a career option. This is the domain of latent entrepreneurship as defined in Box 3.1.

Intermediary variables on the demand and supply side

Moving along from the right-hand to the left-hand side of figure 3.2A, factors on the demand and supply sides of entrepreneurship provide the key intermediary linkages between aggregate conditions and occupational choice. However, the supply and demand sides of entrepreneurship do not always coincide with those of the product market. In fact, the 'demand for entrepreneurship' can also be influenced by typical product supply side factors such as technological development.

The demand side of entrepreneurship represents the *opportunities* for setting up a viable business. An entrepreneurial opportunity may be conceived as a set of circumstances that is favorable for starting a business, with the intent of either serving

[76] Lucas (1978) models the choice between entrepreneurship and wage earning in financial terms only. For a survey of economic models focussing on the *financial* rewards of self-employment versus a paid job or an unspecified outside option, see de Wit (1993a).

[77] In one of the following chapters, attention is paid to the conceptual difference between risk and uncertainty.

[78] See chapter 7 for an occupational choice model specifying these utilities.

an existing market, developing a latent market or creating a new one[79]. When the opportunity has to do with the exploitation of an existing market, by competing for a share of the market or by responding to an increase in demand, the dominant entrepreneurial process is 'opportunity recognition'. If there is a latent market, for instance related to deregulation, or because only demand exists (such as a new consumer preference or a needed cure for a disease) or only supply (such as a product or commercial formula from abroad), the inherent business opportunity has to be 'discovered'. If there is, as yet, no obvious supply and demand, the opportunity involves the creation of a new market (such as for applications of new radical technologies or for a new recreational concept).

Underlying sources of entrepreneurial opportunities are manifold. Opportunities may be found in emerging technologies, in a changing industrial structure and in an increasing degree of differentiation of consumer demand. Demographic developments, such as immigration, a baby boom or ageing of the population can also foster new business opportunities. Additionally, cultural developments, such as modernization, secularization and individualization[80], and institutional changes, such as (de)regulation and privatization, are sources of new entrepreneurial opportunities. The influence of these conditions will be elaborated in the next section.

Within our framework of occupational choice, entrepreneurial opportunities are being compared with alternative opportunities to make a living. When job opportunities are absent and social security is poor, as is often the case in developing countries, even very small entrepreneurial opportunities will be relatively important. This is the domain of necessity entrepreneurship[81] to which we will briefly return in chapter 5.

Key elements of the supply side of entrepreneurship are *capabilities* (resources and skills) and *preferences*. Whether a particular individual acts upon an entrepreneurial opportunity also depends upon the external resources available to that individual, his or her skills and personality traits, and his or her preferences for self-employment.

Capabilities encompass the resources and skills required for successful entrepreneurship. Resources refer to the required financial and social capital to get a business up and running. *Financial capital* may be needed to purchase or rent the premises, to invest in equipment and/or vehicles, to purchase raw materials, to finance market research and advertising and to advance wages. The need for financial capital differs strongly with the line of business. Financial resources for business start-ups are often derived from self-financing (including savings, gifts, inheritances and lottery

[79] This paragraph is inspired by Sarasvathy et al., 2003.
[80] See Van Gelderen (2004), chapters 2 and 3, for an elaboration.
[81] While necessity entrepreneurship may in this way fit into the the multidisciplinary framework, the occupational choice model is obviously more suitable for analyzing a situation in which people have a real choice as is more commonly (but not always) the case in more highly developed countries.

wins). Additionally, informal investors (mostly family[82] and friends, and more rarely business angels), mortgage loans, commercial credit and bank loans and (very rarely) venture capital can also be a source of start-up capital (Bygrave and Hunt, 2005). Liquidity constraints often related to lack of assets and/or collateral can be serious impediments to business start-ups (Blanchflower and Oswald, 1998; Blanchflower et al., 2001; Evans and Leighton, 1989a; Van Praag, 1996), as they have also proved to be for small and young firms (Chittenden et al., 1996; LeCornu and McMahon, 1996). *Social capital* includes so-called 'bonding' social capital based on strong ties, and 'bridging' social capital based on weak ties (Davidsson and Honig, 2003). Social capital facilitates the identification, collection and efficient use of resources, including finance and information, as well as the recognition of entrepreneurial opportunities. Examples of bonding social capital are having parents, relatives or close friends who own a business, emotional support from a spouse and active encouragement from family and friends. Examples of bridging social capital include membership of business networks, access to mentoring and advice and to knowledge transfer, and contacts with customers and suppliers. Summarizing the literature, Arenius and De Clercq (2005) posit that contacts between people with different networks are particularly functional for access to new information. Previous work experience is also a major source of social capital (Bosma, van Praag, Thurik and de Wit, 2004).

Additionally, skills refer to the *human capital* that is embedded in the individual making an occupational choice. With respect to entrepreneurship, relevant human capital includes underlying entrepreneurial qualities needed to launch an enterprise successfully as well as management skills necessary to run the business (Kuip, van der and Verheul, 2004). Entrepreneurial qualities are partly inborn but may be developed through training and experience (Kuip, van der and Verheul, 2004). Management skills are mostly acquired through education, training and experience, but inborn aptitude is a relevant asset.

Preferences relevant for nascent entrepreneurship include preferences related to entrepreneurship per se as well as other preferences. Entrepreneurial preference[83] presupposes an awareness of entrepreneurship as a viable occupational option. Because in many countries entrepreneurship is never mentioned at school, and because in many families it is never a subject for dinner table conversation, entrepreneurial awareness cannot be taken for granted. A next step towards entrepreneurial preference is entrepreneurial interest. This represents a positive appreciation of entrepreneurship as a possible occupation, or even a preference for self-employment when free to choose, i.e. given an opportunity and disregarding financial requirements and practical constraints. Other relevant preferences have to do with one's attitude towards risk and with one's appreciation of immaterial versus material rewards.

[82] The particular importance of informal investment by relatives is confirmed by the founding histories of thirteen of the 20th century's largest Dutch companies as documented by Wennekes (1993/2005).

[83] This section was inspired by Blanchflower et al. (2001), Grilo and Irigoyen (2005) and Van Gelderen (2004).

The impact of demographic developments, culture and institutions on the supply side of entrepreneurship, as indicated in figure 3.2A, is intuitively obvious but not always straightforward. These influences are elaborated below. Additionally, the level of economic development also affects the supply side of entrepreneurship, for instance through its influence on immaterial motivations such as autonomy and self-realization or through its impact on the availability of financial resources for business start-ups.

Conditions

We now reach the left-hand side of figure 3.2A, i.e. the underlying conditions of entrepreneurship. Below, we subsequently discuss the role of technology, economic development, demographic factors, institutions and culture. But first we briefly discuss the role of psychological endowments.

Psychological endowments

While one school of thought emphasizes the importance of personality traits for understanding entrepreneurship (Brockhaus, 1982; Baron, 2000) and another school focuses on the behavioral aspects of entrepreneurship (Gartner, 1989), it also seems generally accepted that certain personality traits facilitate entrepreneurial behavior (Cromie, 2000: 12; Kuip, van der and Verheul, 2003: 8). While entrepreneurial qualities as discussed in scholarly literature[84] (including creativity, perseverance, internal locus of control, initiative, autonomy, achievement motivation, acceptance of risk, openness to experience, perception of opportunities and learning abilities) may to some extent be developed through child rearing, education, training and experience, at the same time inborn aptitudes or 'psychological endowments' underlie these qualities. However, it must be emphasized that listings of entrepreneurial qualities indicate only general tendencies that are valid at the 'group level' of entrepreneurship. On the one hand individual entrepreneurs differ widely among themselves, on the other hand many people in other occupations may also possess some or several of these entrepreneurial traits.

The role of technology

Technological change is perhaps the most significant determinant of expanded entrepreneurial opportunities in the late 20th and early 21st century. In any era new technological knowledge embodies a potential of new goods and services, and this is certainly the case at present times. However, the incumbent organizations such as universities and large enterprises, whose R&D activities nowadays produce most of the new knowledge, do not automatically exploit the implied economic opportunities. This 'gap' may be caused by the inherent uncertainty with respect to the expected value of the new knowledge, by information asymmetries and other divergences between the researcher possessing the knowledge and the decision-making hierarchy of the

[84] Additionally, a biographical study of fifteen 'patriarchs' of thirteen very large Dutch companies that were established in the late 19th and early 20th century, particularly highlights stamina and fitness for hard work, 'commercial instincts' as well as imagination and foresight as indispensable traits for successful entrepreneurship (Wennekes, 1993/2005).

incumbent organization, or by an inconsistency between the new idea and the core competence of the incumbent organization (Acs, Audretsch, Braunerhjelm and Carlsson, 2004; Acs and Varga, 2005; Audretsch and Keilbach, 2006). It is essentially for these reasons that new knowledge often creates entrepreneurial opportunities for new business start-ups.

In the present era, information and communication technologies (ICT), biotechnology and nanotechnology are prominent examples of new knowledge domains embodying great entrepreneurial potential. Of these, ICT plays a key role as a fundamental or generic technology permeating virtually all sectors of economic activity. Some have suggested that the many technological, economic and social changes related to ICT are revolutionary in implication. In this respect Jensen (1993) uses the term 'Third Industrial Revolution', while Freeman and Perez (1988) talk about the 'transition from the fourth to the fifth Kondratiev wave'. Information and communication technologies have, for example, resulted in diminished transaction costs and lower minimum efficient scales in many industries. The reduction of transaction costs and related scale trends have opened the doors for many smaller businesses previously unable to compete, either in existing or new industries. However, it should be noted that not all economists view the resulting downscaling trends as permanent. Often, when new technologies mature, economies of scale return with a resulting shakeout of suppliers. Over the course of the 20th century this pattern typically led to a greater representation of larger firms exploiting economies of scale through mass-production (Carree and Thurik, 2000b; Klepper and Graddy, 1990; Klepper and Simons, 1993; Klepper and Miller, 1995; Klepper, 1996).

The role of economic development

Through its influence on entrepreneurial opportunities, the level of economic development is highly active on the demand side of entrepreneurship. In less-developed economies very small enterprises in agriculture, retailing and craft will dominate. Once industrialization sets in, enhanced scale economies arise while diminishing the scope for self-employment. We have come across this structural process in chapter 1. However, in many of the most highly developed economies, a shift from manufacturing to services (Inman, 1985) has created opportunities for new, small firms. A prime reason is that in many service industries economies of scale and other barriers to entry are lower than in manufacturing. High disposable income is another aspect of advanced economic development that has given rise to greater entrepreneurial opportunity. There is evidence that a high and rising average level of income and wealth enhances the variety of consumer demand (Jackson, 1984). A high differentiation in demand favors the suppliers of new and specialized products and diminishes the scale advantages of large incumbent firms. There is also evidence that in some sectors small businesses are more capable than large ones of occupying upcoming market niches (Jovanovic, 1993). In a subsequent chapter, a hypothesized U-shaped relationship between a country's level of economic development and an underlying 'natural' rate of entrepreneurship is discussed more extensively.

On the supply side, as hypothesized in social psychology, there is a hierarchy of human motivations, ranging from physical needs to self-realization (Maslow, 1970). Once the main material needs have been satisfied, a still higher level of prosperity will give prominence to immaterial motivations such as autonomy and self-realization, possibly making self-employment a more attractive option. The level of economic development also influences the supply side of entrepreneurship through the availability of financial resources for business start-ups. Of course, the effective availability will also depend upon institutional factors. A possible determinant of entrepreneurship related to the cyclical processes of economic development, but not to its level, is unemployment (Evans and Leighton 1989a; Meager 1992; Audretsch, Thurik, Verheul and Wennekers, 2002). The influence of unemployment can, however, be quite complex and ambiguous (see for instance Audretsch, Carree and Thurik, 2001).

Other economic factors, not strictly related to the *level* of economic development, also play a role in setting the conditions for entrepreneurship. These factors are briefly mentioned below, and some are elaborated in chapters 5, 6 and/or 7. The current rate of economic growth may be seen as an indicator of market opportunities, while the unemployment rate may act as an inverse indicator of opportunity. The latter may also be seen as a push factor for self-employment. Additionally, income disparity may also stimulate self-employment (Ilmakunnas et al., 1999). Finally, the functioning of the capital market plays an important role by influencing financial variables such as interest rates and liquidity constraints as were already discussed in the previous section on resources.

The role of demographic factors

Demography fulfils a double role in the framework. When explaining nascent entrepreneurship at individual level (figure 3.2A), demographic factors primarily influence the entrepreneurial opportunities available to individuals in a given society. At aggregate level, the age distribution, ethnic composition, female labor participation rate and other structural demographic characteristics determine a country's distribution of capabilities and preferences, and thus influence the overall rate of nascent entrepreneurship (figure 3.2B).

Research at micro-level traditionally identifies several links between demographic factors and self-employment[85]. Some prominent demographic characteristics are age, ethnic origin and gender. Related micro-variables include the level of educational attainment and previous experience in self-employment.

With respect to age, Blanchflower et al. (2001: 686) reported that while "older people are more likely to be self-employed, it is younger people who say they would prefer to be self-employed". Earlier research also shows that people in the middle age cohorts

[85] Cooper and Dunkelberg, 1987; Delmar and Davidsson, 2000; Erutku and Vallée, 1997; Evans and Leighton, 1989b; Reynolds, 1997; Storey, 1994.

have the highest prevalence of incumbent business owners (Storey, 1994). In many countries, prevalence rates of *nascent* entrepreneurship are highest in the age group between 25 and 34, while according to some research, a tendency towards start-ups at a younger age is also apparent.[86] *Ceteris paribus*, the ageing of the population in most developed countries implies a threat to the future development of business ownership.

The influence of immigration and ethnicity on the prevalence of self-employment is complex. It has been extensively documented how some ethnic groups are more strongly associated with entrepreneurship than others (Delmar and Davidsson, 2000; Shapero and Sokol, 1982). This holds for ethnic groups within their country of origin, and also upon emigration to another country. After migrating for economic reasons or fleeing from oppression, immigrants may use entrepreneurship as a way to establish themselves economically in the host country. Immigrant groups usually take their cultural traits, religious convictions, role models and various resources with them. The extent to which these resources include access to financial and human capital may be a major factor in explaining their entrepreneurial success (Delmar and Davidsson, 2000). Finally, the prevalence of immigrant entrepreneurship may also depend upon the culture and institutions of the new country of residence. Recent empirical research in the Netherlands again serves to illustrate the large entrepreneurial differences between various ethnic groups (EIM, 2004; Jansen et al., 2003).

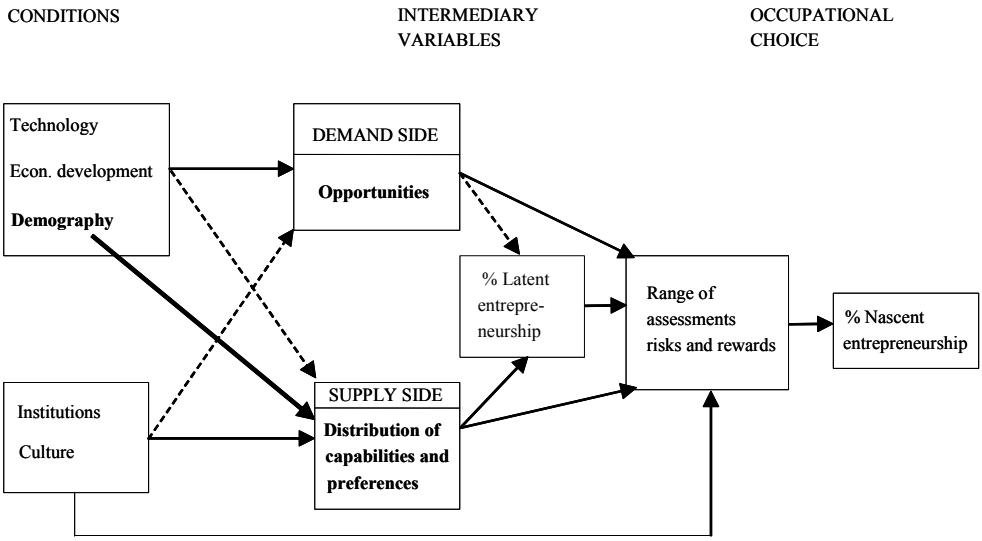
With respect to gender, in most surveys women are found to be (much) less likely to be involved in either self-employment or early-stage entrepreneurial activity than are men, although the difference varies across nations (Acs et al., 2004; Blanchflower et al., 2001; Minniti et al., 2005; Reynolds et al., 2003). Econometric analysis of a large Swedish dataset of individual business start-ups has shown a remaining 'pure' gender effect after correcting for other differences such as education and previous management experience (Delmar and Davidsson, 2000). Delmar and Davidsson also conclude that, as compared with men, less is known about the processes that lead women to opt for self-employment. Using a macro dataset with Total (early-stage) Entrepreneurial Activity rates across 37 countries in 2002, Verheul et al. (2004) found that, by and large, female and male entrepreneurship rates are influenced by the same factors in the same direction. The most striking difference is a positive influence of life satisfaction on the level of female entrepreneurial activity, while no effect is found for males. Using micro data, Verheul (2005) reports several other direct and indirect differences between female and male entrepreneurship, including time allocation and the amount and composition of start-up capital.

Because the age structure and ethnic composition of the population may differ between regions and countries, these factors potentially help to explain differences in the aggregate rate of entrepreneurship. Other relevant demographic influences at regional and national levels are the rate of female labor force participation, population

[86] Delmar and Davidsson (2000), EIM/EZ (2000), van Gelderen (1999: 21) and various annual Executive Reports published by the Global Entrepreneurship Monitor.

density or urbanization, and population growth. This is where figure 3.2B comes in handy.

Figure 3.2B The determinants of nascent entrepreneurship at the aggregate level



Source: Based on Wennekers, Uhlaner and Thurik (2002).

In several macro-studies, including those of Uhlaner and Thurik (2004) and Noorderhaven et al. (2004), female labor force participation bears negatively on the total rate of self-employment in the labor force. This holds almost per definition, given the finding that gender is a negative predictor of entrepreneurship. At the same time, female labor force participation may be positively associated with the female rate of entrepreneurship scaled upon the female population, as labor participation in itself enhances the supply of women entrepreneurs (Verheul et al., 2004).

Population growth is expected to have a positive effect on entrepreneurship (Armington and Acs, 2002: 43). A growing population creates new and bigger consumer markets and thus is a pull factor on the demand side of entrepreneurship. Population growth may also be a push factor on the supply side of entrepreneurship. Wennekers at al. (2005) find a positive effect of population growth on the rate of nascent entrepreneurship across 36 countries (see chapter 5 of this volume).

Population density may influence the national self-employment rate in various ways. Thinly populated areas with widely dispersed small villages will have relatively many small retail outlets and workshops, while urban areas will give rise to economies of scale. On the other hand, networks and other supply side factors in urban areas are conducive to new entrepreneurship in many service industries. The effect of population density at national level is thus not a priori clear, particularly because it

may represent a varying mix of metropolitan agglomerations, medium-sized towns and sparsely populated rural areas. Macroeconomic studies including the influence of population density on the national rate of entrepreneurship are scarce and inconclusive (see chapters 6 and 7).

More abundant empirical research using demographic variables was carried out comparing regions within countries. Summing up seven such studies, Reynolds, Storey and Westhead (1994) concluded that population growth, a dense, urbanized environment, and a population of business organizations dominated by small firms have a positive influence on firm birth rates.

Although *education* is a factor that belongs to several domains, including the economic and the demographic one, it is discussed here. Education is somewhat of an anomaly. On the one hand, research conducted on a Swedish sample at individual level and showing that nascent entrepreneurs attained on average a higher educational level[87] than those in a control sample (Delmar and Davidsson, 2000), has been reconfirmed in recent investigations across several high-income countries (Acs et al., 2004; Hessels et al., 2005). On the other hand, research with respect to a static index of entrepreneurship leads to the opposite conclusion. For instance, in a recent comparative study across fourteen OECD countries, countries with a higher level of education tend to have a smaller proportion of self-employment (Uhlaner and Thurik, 2004).

Blau and Duncan (1967) concluded that educational attainment is a more important predictor of someone's occupation than background characteristics such as the father's occupation or education. They also concluded that intergenerational mobility within business families increases and, as a result, children of business owners increasingly choose to pursue a different career than their parents. At the macroeconomic level, the relationship between education and static indices of entrepreneurship can also be at variance.

Further research is needed to separate the different effects of various demographic variables on entrepreneurship at the macro-level of analysis. Findings to date are sometimes inconclusive or outright contradictory. For instance, although education provides a larger pool of nascent entrepreneurs, apparently this does not always translate into a higher rate of business ownership.

The role of institutions

Institutions and institutional change play a major role in the framework for explaining the rate of entrepreneurship. In this respect, the framework owes a great debt to the work of North (1990, 1994). North (1994: 360) defined institutions as "... the humanly devised constraints that structure human interaction. They are made up of formal constraints (e.g., rules, laws, constitutions), informal constraints (e.g., norms of

[87] In addition, nascent entrepreneurs were found to have more management experience.

behavior, conventions, self-imposed codes of conduct), and their enforcement characteristics. Together they define the incentive structure of societies and specifically economies". The framework underwrites the distinction between informal and formal constraints. Informal constraints are mainly 'between the ears' and can also be regarded as part of the cultural domain, as discussed in the next subsection. Formal constraints and their enforcement characteristics are 'observable in the outside world' and will be referred to as institutions in a strict sense. North (1990: 4) also distinguished between institutions and organizations. The latter entail political, social, educational and economic bodies[88]. Together, culture, institutions and organizations make up an interconnected web that shapes choice sets in various contexts (North, 1990: 67).

Organizations relevant for entrepreneurship include schools, universities, research foundations, chambers of commerce, financial and professional organizations, agencies for the support of new enterprises, business incubator facilities, venture capital funds and business networks. In addition, institutions relevant for entrepreneurship encompass fiscal and social security legislation, competition policy, specific government support schemes focusing on new firms and many other regulations. In the synthesis section of Module I, we will discuss the role of legislation and specific government policies with respect to entrepreneurship in greater detail. Analytically, institutions including relevant organizations and specific government policies act as framework conditions influencing the stock of *opportunities* to start a business and the pool of *entrepreneurial capabilities* and *preferences,* but some institutions also have a direct effect on the net rewards and risks of the various occupational alternatives (see figure 3.2).

Generally speaking, "the major role of institutions in a society is to reduce uncertainty by establishing a stable (but not necessarily efficient) structure for human interaction" (North, 1990: 6). By determining incentives and disincentives and by creating or stifling opportunities, institutions also influence economic production and exchange. Institutions are often related to transaction costs (information costs and costs of protecting property rights and monitoring and enforcing agreements), but do not necessarily reduce these costs. In reality, institutions often "are a mixed bag composed of those that raise costs and those that lower them" (North, 1990: 63). There is no reason to assume that this does not apply to institutions involved with entrepreneurship.

Although institutions are stable, they also evolve over time. Institutional change is however typically incremental rather than discontinuous. "Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions and codes of conduct are much more impervious to deliberate policies" (North, 1990: 6). Thus the tenacity of deeply rooted cultural constraints slows down the speed of effective institutional change. Path dependence is

[88] For the role of organizations in social and industrial change, also see Hannan and Freeman (1989).

a related phenomenon (North, 1990: 92-104). Institutional change is not only slow, but its direction is always linked to the past and tends to be self-reinforcing due to 'historically derived subjective modelling' by the main agents of change and to 'an increasing return characteristic of institutions' related to the activities of key organizations and to network externalities. This also implies that inefficient and unproductive paths may persist, if only through the role of interest groups with a stake in existing constraints. Path dependence is also highly relevant for understanding the historical, national path of entrepreneurship[89] and its conditions.

The role of culture

Kroeber and Parson (1959: 583) defined culture as "patterns of values, ideas and other symbolic-meaningful systems as factors in the shaping of human behavior." Barnouw (1979: 5) defined culture as configurations of "stereotyped patterns of learned behavior which are handed down from one generation to the next." Hofstede (2001: 9) refers to culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another." Since values are typically determined early in life (Hofstede, 1980; Barnouw, 1979) they tend to be "programmed" in individuals resulting in behavior patterns consistent with the cultural context and enduring over time (Hofstede, 1980; Mueller and Thomas, 2000).

Since extensive research at the psychological level shows a link between values, beliefs and behavior, it is plausible that differences in culture, in which these values and beliefs are imbedded, may influence a wide range of behaviors including the decision to become self-employed rather than to work for others (Mueller and Thomas, 2000). Using this logic, several studies explore the relationship between various aspects of culture and entrepreneurial behavior across cultures (Busenitz, Gómez and Spencer, 2000; Davidsson, 1995; Huisman, 1985; Lee and Petersen, 2000; McGrath and MacMillan, 1992; Mueller and Thomas, 2000; Tiessen, 1997; Uhlaner and Thurik, 2004; Wennekers, Noorderhaven, Hofstede and Thurik, 2001). Some values that may be relevant for explaining the rate of entrepreneurship are uncertainty avoidance, individualism and post-materialism.

The influence of national culture on the rate of entrepreneurship is however complex and not well understood. One view, the 'aggregate psychological trait explanation' for entrepreneurship, is based on the idea that if a society contains more people with 'entrepreneurial values', more people will be entrepreneurs (Davidsson, 1995: 42; also see Shane, 1993: 67). Davidsson noted that this is essentially the perspective taken by McClelland (1961) and other proponents of the individualistic view of culture. Suddle, Beugelsdijk and Wennekers (2006) follow this approach in an empirical investigation relating the rate of nascent entrepreneurship at country level to a composite index of

[89] In addition to institutional change, there is another major influence on entrepreneurship, i.e. technological change, which also exhibits characteristics of path dependence, although here it rests more on increasing returns than on the subjective perceptions of policy makers and on their activities (North, 1990: 103).

entrepreneurial culture based on World Value Survey measures for 'initiative', 'achievement motivation' and 'internal locus of control'.

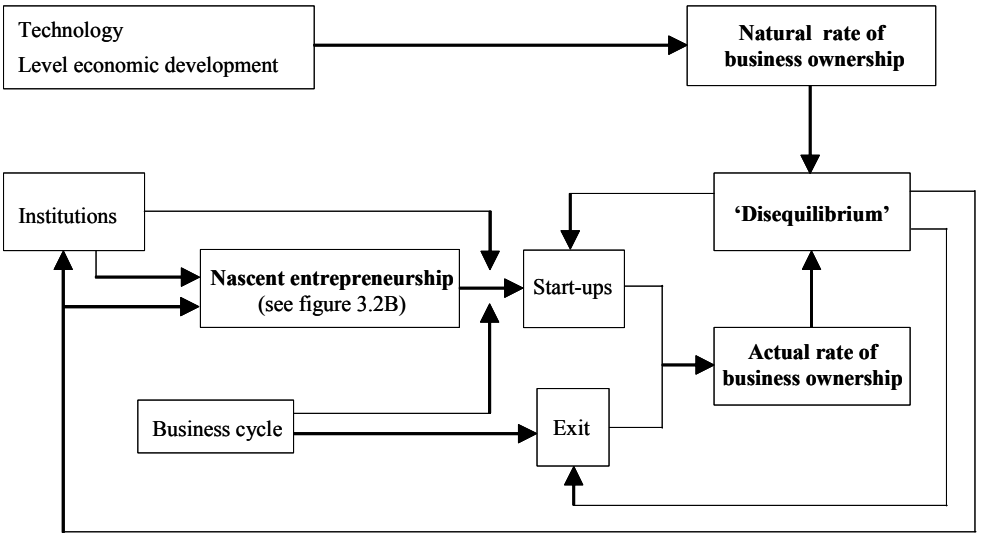
Another view, the 'push explanation' for entrepreneurship, assumes that variation in entrepreneurship is based upon differences in values and beliefs between the population as whole and potential entrepreneurs. It argues that, in a predominantly non-entrepreneurial culture, a clash of values between these groups may drive the latter away from the average (non-entrepreneurial) organization and into self-employment (Baum et al., 1993: 505; Noorderhaven et al., 2004). We will return to this view in a later chapter of this book.

A third view, inversely related to the second one, refers to the degree of 'legitimation' or 'moral approval' of entrepreneurship within a culture at large (Etzioni, 1987: 182, 183). This view claims that a higher overall level of legitimation of entrepreneurship implies wide ranging manifestations including more attention for entrepreneurship within the educational system, a higher social status of entrepreneurs and more tax incentives to encourage business start-ups. This results in a higher demand for and supply of entrepreneurship (Etzioni, 1987: 175). A generalization of this latter view would give reason to expect a permeating influence of all relevant cultural values on the institutional framework for entrepreneurship. Baptista (2004) offered some empirical support for that assertion. Analyzing data on the number of procedures that a start-up has to comply with to obtain legal status in 53 countries, he found a positive correlation with the degree of uncertainty avoidance.

3.5 Module I, Part 2 - Linkages between nascent entrepreneurship and the rate of business ownership at the aggregate level

Figure 3.3 addresses the complex linkages between nascent entrepreneurship and the rate of (incumbent) business ownership at macro level. A significant portion of those attempting to establish a business fails to do so (van Gelderen, 2004: 98). Therefore, as a starting point, we take the actual birth or start-up of the firm as its first success. In a Dutch sample of nascent entrepreneurs, personal characteristics as well as features of the intended organization and characteristics of the entrepreneur's environment are seen to play a role in explaining a successful start-up (van Gelderen, 2004; EIM/EZ, 2000). Relevant industry experience, the availability of resources derived from self-financing and starting full-time show a positive effect on success, while a large amount of required capital and high (perceived) risk of the market have a negative bearing. Institutional factors such as required licenses, administrative obligations and other regulations are seen to impede the start-up process. In a Swedish sample, a prominent factor explaining the successful emergence of a new enterprise is 'bridging social capital based on weak ties' such as being a member of a business network (Davidsson and Honig, 2003: 302).

Figure 3.3 Linkages between nascent entrepreneurship and the rate of business ownership at the aggregate level



Source: based on Wennekers, Uhlaner and Thurik (2002).

Actual versus a 'natural' rate of business ownership

At country level, given the occupational choices made in the past with respect to nascent entrepreneurship, the success rate of business start-ups and the exit of incumbent entrepreneurs retiring, failing or deciding on other occupational choices, an aggregate level of business ownership results. Expressed as a percentage of the labor force, this is called the *actual rate of business ownership*. Summarizing, this actual rate is determined by a combination of many factors, including cultural and institutional ones, operating on the demand and supply side.

In addition to this actual rate or level of business ownership (occupational entrepreneurship) one may hypothesize an underlying *'natural' rate of business ownership*, related to a country's level of economic development. This conjecture originates from empirical and theoretical work in this area by Carree, van Stel, Thurik, and Wennekers (2002) who view the natural rate as a long-term 'equilibrium', as indicated in figure 3.3. The natural rate is hypothesized initially to be a decreasing function of economic development. As a rule, the business ownership rate is high in less-developed economies while economically more developed, industrialized countries utilizing scale economies have lower business ownership rates. As is elaborated elsewhere in this volume, emerging literature indicates a still later phase of economic development where the business ownership rate increases again. This phase is characterized by a reversal of the trend towards increasing economies of scale and scope. This reversal of the downward trend in business ownership rates, that has been manifest since the early 1970s, leaves room for two alternative hypotheses. First, one may assume a U-shaped relationship between the natural or 'equilibrium' rate of

(occupational) entrepreneurship and the level of economic development, due to the advent of the service economy and the differentiation of consumer demand, and reinforced over time by the opportunities offered by new technologies, particularly those connected to information and communication. Second, one may assume that these new trends lead only to a bottoming out of the longstanding downward trend in the natural or 'equilibrium' rate, while viewing the U-shaped movement of actual business ownership rates in individual countries as a reaction to 'overshooting' in previous decades[90].

Obviously, the actual level of business ownership does not necessarily equal the natural or 'equilibrium' rate. In fact, many forces may cause the factual and the theoretical number of business owners to differ from each other (Carree, van Stel, Thurik and Wennekers, 2002). This 'disequilibrium' (also included in figure 3.3) may particularly stem from cultural factors and institutional arrangements, such as the regulation of entry, incentive structures and the functioning of the capital market (Verheul, Wennekers, Audretsch and Thurik, 2002). As figure 3.3 indicates by the arrows originating in 'disequilibrium', feedback mechanisms play a role in restoring equilibrium by triggering 'error correction' of future occupational choices resulting in changes in entry and exit. These feedback processes include policy measures as well as market forces.

Depending on the nature of the (assumed) 'disequilibrium', the government can try to restore equilibrium through policies fostering or restricting entrepreneurship. A classification of such policies is discussed in the next section. To intervene efficiently in the national economy, it is important that the government is able to perceive any deviation from the equilibrium rate of entrepreneurship correctly. If the government is mistaken or has its own specific political ideas about the 'optimal' level of entrepreneurship, government intervention is likely to have a 'disturbing' rather than a 'restoring' effect. In this sense the government can also be a source of disequilibrium. Market forces can also play a role in restoring equilibrium. This restoration capacity of the market works mainly through the influence of entrepreneurial opportunities and opportunity costs. In the late 1970s and the early 1980s the structurally low number of enterprises is likely to have contributed to a high level of unemployment in many countries (Carree, van Stel, Thurik and Wennekers, 2002). A high level of unemployment slows down real wage increases, helping to restore business profitability and creating new entrepreneurial opportunities. Unemployment may also push people into self-employment when the opportunity costs of entrepreneurship are sufficiently low (Audretsch, Carree and Thurik, 2001; Evans and Leighton, 1989a; Storey, 1991). On the flip side of the coin, when the number of business owners exceeds the equilibrium level this is assumed to diminish profitability, because there is increased competition, resulting in high exit or failure rates and lower entry. A related

[90] As will be explained in the next paragraphs, overshooting may lead to 'disequilibrium' and subsequently to 'error correction'.

question pertains to the speed of convergence. There are indications that this speed may be quite slow.[91]

Historical development of the natural rate of (occupational) entrepreneurship
When considering the long term historical development of the natural rate of entrepreneurship, one should first note the structural decline of business ownership in many countries from the beginning of the 20th century until approximately the 1970s, a decline probably dating much further back in history[92]. Prime determinants of this development were rising per capita incomes (real wages), industrialization (at least until the mid 20th century) and the exploitation of economies of scale and scope made possible by the maturing of many technologies introduced during the second industrial revolution. These developments highlight a corresponding decline of the natural rate of business ownership. As stated previously, one must however consider the possibility of some overshooting involved in the decline of actual entrepreneurship rates. This may be the case because the upsizing of the business sector and the development of relevant institutions (business licensing, labor market regulation, social security, tax system, educational system) systematically reinforced each other during the greater part of the last century. During the 1950s and 1960s the actual business ownership rate in many countries could well have dropped until below equilibrium.

An optimum rate of business ownership?
Finally, there are indications that the natural or 'equilibrium' rate may at the same time mark an 'optimum' level. This is also implied by the research findings published by Carree, van Stel, Thurik and Wennekers (2002). Using a data panel of 23 OECD countries for the period 1976-1996, they show the actual rate of business ownership to influence economic growth through deviations from a hypothesized 'equilibrium rate'. This result supports the view that differences in the business ownership rate across countries matter when explaining economic performance. As a consequence, economies can have either too few or too many business owners and both situations can lead to lower economic growth rates. In this respect the natural or equilibrium rate may also be viewed as an optimum rate. The subject of optimal industrial structure will be elaborated in the section on Module II.

3.6 Synthesis of Module I: the role of legislation and government policies

Legislation and (other) government policies constitute major institutional framework conditions for entrepreneurship. Some regulations and policies focus directly on the occupational decision-making by individuals, others aim to influence the opportunities for entrepreneurship or the supply of potential entrepreneurs. Regulations and policies may be a response to the pleas of business organizations, but as we have seen they

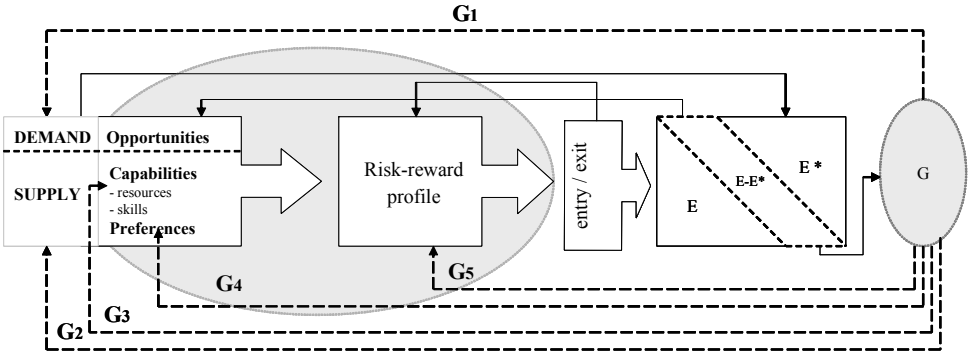
[91] See Audretsch, Carree, van Stel and Thurik (2002) for a full account of the correction of disequilibrium.
[92] Also see the historical case studies presented in chapter 1.

may also be induced by a perceived disequilibrium of the national business ownership rate or by a government's expectations with respect to the macroeconomic effects of enhanced entrepreneurial dynamism. Nowadays, because of its believed potency in job creation and economic growth, entrepreneurship is at the top of government policy agendas all over the world. During the past decades, policies aimed to encourage entrepreneurial activity have proliferated. Two examples are European Commission (2003) and Ministerie van Economische Zaken (2003).

Because of the many interfaces between government policies and entrepreneurship, the present section synthesizes the linkages between aggregate conditions and the rate of entrepreneurship discussed before while focusing on the role of the government. To that purpose, figure 3.4 integrates figures 3.2 and 3.3. It is argued that the government is able to influence the rate of entrepreneurship through five different groups of determinants of entrepreneurship as represented in figure 3.4. For this purpose a distinction is made between five types of policy measures, one aiming at the demand side of entrepreneurship, three at the supply side and one directly at the occupational decision-making process:

- Government intervention aimed at influencing the stock and accessibility of entrepreneurial opportunities (G1).
- Government intervention aimed at influencing the demographic pool of potential entrepreneurs (G2).
- Government policies aimed at influencing the availability of resources and skills within the population. These policies generally deal with the input factors of entrepreneurship, i.e., finance, education and information transfer (G3).
- Government policies aimed at influencing relevant values of individuals and at their occupational preferences (G4).
- Government policies (directly) aimed at the decision-making process of individuals. This type of government intervention influences the 'risk-reward profile' of entrepreneurship (G5).

Figure 3.4 Role of legislation and government policies



Note: In figure 3.4, G stands for legislation and (other) government policies, E for the actual and E* for the natural rate of entrepreneurship, while E-E* represents the 'disequilibrium' as perceived by the government.
Source: Based on Verheul, Wennekers, Audretsch and Thurik (2002).

'Type 1' government intervention, as represented by arrow 'G1' in figure 3.4, involves government intervention on the demand side of entrepreneurship, i.e. government intervention that (in)directly impacts the stock and accessibility of entrepreneurial opportunities. Some of these policies help to create opportunities for entrepreneurship whereas others enable entrepreneurial firms to make use of these opportunities. Policies stimulating technological developments and privatization policy belong to the former category, whereas competition policy and establishment legislation belong to the latter. Technological change creates opportunities for entrepreneurial ventures based on new products or production processes. Governments can stimulate technological progress in many ways, for example through subsidizing R&D activities. Privatization policy can create opportunities for entrepreneurship in formerly (semi-)public sectors such as health care and education.
Competition policy improves the accessibility of markets by reducing the market power of large firms and lowering entry barriers for new and small businesses. Establishment legislation tends to have a negative influence on entry, because of the implementation of business licensing requirements.

'Type 2' government intervention, as represented by arrow 'G2' in figure 3.4, involves government intervention to affect the demographic pool or supply of potential entrepreneurs at aggregate level. These policies often take the form of influencing the composition of the national or regional population. Policies that pertain to 'type 2' intervention include immigration policy and regional development policy (dealing with (sub)-urbanization processes), influencing the ethnic composition and the dispersion of the population, respectively. Moreover, the fiscal treatment of families with children, including family allowances or child benefits, may influence the age composition of the population.

'Type 3' government intervention, as represented by arrow 'G3' in figure 3.4, impacts the availability of resources and skills for potential entrepreneurs, as well as the knowledge to which they have access. Skills and knowledge can, in part, be developed or acquired through training, education or knowledge transfer. However, inborn characteristics such as intelligence and personality traits may be developed to a limited extent only. Government policy may focus particularly on overcoming financial and knowledge gaps. For example, policies aimed at the (development of the) capital market can help to improve the access of (small) business owners to the financial capital needed to start or expand a business. Direct financial support, i.e. subsidies, fiscal allowances and loan guarantees, can also increase the availability of financial resources for (potential) entrepreneurs. The knowledge base of (nascent) entrepreneurs can be influenced through the support of professional advice and counseling, through the promotion of business networks and through facilities for knowledge transfer by universities.

'Type 4' government intervention, as represented by arrow 'G4' in figure 3.4, pertains to the preferences of individuals to become an entrepreneur. These preferences are based upon underlying values and attitudes, developed during upbringing. Although preferences are to some extent culturally determined, the government can play an additional role in shaping entrepreneurial values and attitudes by introducing entrepreneurial elements in the educational system and by promoting entrepreneurial role models in the media.

'Type 5' government intervention, as represented by arrow 'G5' in figure 3.4, is directed at the (occupational) decision-making process of potential entrepreneurs. Given opportunities, resources, skills, personality traits and preferences, the risk-reward profile of entrepreneurship can be influenced by this type of government intervention. Policies that are relevant in this respect are taxation on business earnings, social security arrangements influencing the opportunity costs of entrepreneurship and the incentives for people to exchange wage earning or (un)employment for entrepreneurship, and labor market legislation (flexibility of 'hire and fire') affecting the attractiveness to start or extend a business. Bankruptcy policy can also influence the risk-reward profile. For example, when the legal consequences of bankruptcy are severe, this may lead potential entrepreneurs to shy away from self-employment.

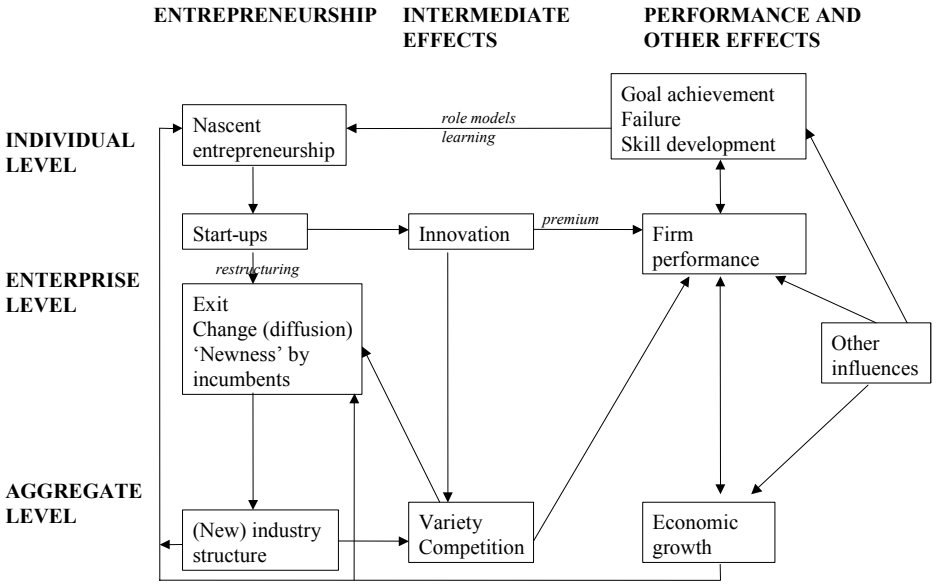
3.7 Module II - Effects of entrepreneurship and feedback mechanisms

Introduction

The main reason why a theoretical framework for explaining the rate of entrepreneurship should include a module on the effects of entrepreneurship, is the occurrence of feedback mechanisms affecting the aggregate conditions for entrepreneurship and the entrepreneurial process itself. Again, three levels of aggregation, i.e. the individual level, the enterprise level and the aggregate level, are needed for the analysis. Figure 3.5 is a highly stylized attempt to describe the links between entrepreneurship and performance, while at the same time linking the relevant

aggregation levels. The relationships involved are complex, and there is no pretence that the theoretical model or framework in figure 3.5 is complete. In particular, its emphasis on the role of the triangle of restructuring, (new) structure and variety and competition leaves room for alternative points of view. For instance, (new) entrepreneurs may also contribute to economic development by working longer and harder than similarly educated wage earners.

Figure 3.5 Effects of entrepreneurship and feedback mechanisms



Source: Based on Wennekers and Thurik (1999) and on Thurik, Wennekers and Uhlaner (2002).

Nascent entrepreneurship, start-ups, restructuring and intermediate effects

Once again, our discussion starts from the phenomenon of nascent entrepreneurship, as indicated in the upper left corner of figure 3.5. Nascent entrepreneurship stands for untapped 'entrepreneurial energy outside the market', represented by individuals (such as wage earners, unemployed, students and homemakers)[93] who actively try to start a new business. As indicated before, only a certain proportion of nascent entrepreneurs succeed in getting a new business up and running. This proportion is represented in our framework by the variable 'start-ups', which is treated as an enterprise level variable.

[93] Nascent entrepreneurship also includes incumbent business owners actively trying to start another business.

Start-ups represent the enterprises that enter the market. First, start-ups affect the rate of innovation found at the enterprise level of analysis. A small but significant proportion of new enterprises[94] foster innovation by introducing new products or by finding new ways of producing and/or delivering an existing good or service. This influence is most directly operational at the enterprise level (as noted by the arrows between start-ups, innovation and firm performance in figure 3.5). Second, start-ups trigger a restructuring of the economy through a wide array of adaptive reactions including business exits, mergers, diffusion of new ideas, business process re-engineering, and new innovations by incumbents[95]. The decisions leading to these reactions are made at the enterprise level, but their accumulated effects influence the aggregate level as well. In particular, the accumulated effects of start-ups, exits and mergers change industry structure in terms of the number of businesses (or the rate of business ownership), the size distribution of firms and their age distribution.[96] This restructuring takes place at the aggregate levels of sectors, regions and national economies.

The (new) industry structure resulting from start-up behavior and decisions taken by the incumbent firms and the innovations brought forward by new enterprises are also crucial inputs for the degree of variety and the processes of competition at the aggregate level. For one thing, variety or diversity represents a 'stock of alternative forms' that has particular value for an economy whenever the future is uncertain (Hannan and Freeman: 1989: 8). New industrial constellations lead to new forms of static as well as dynamic competition, in particular when new products or processes become manifest (innovation). Therefore in figure 3.5 arrows are drawn from both (new) structure and innovation to the process of variety and competition. The static competition depends upon the number and size class distribution of firms whereas dynamic competition arises from the variety of products and processes. This variety and competition, in turn, have an effect on the process of restructuring through selection of the most viable enterprises and the best ideas. In other words, firms are inclined or forced to react to their competitive environment with decisions about exiting, changing or introducing newness. Therefore in figure 3.5 an arrow links the process of variety and competition and that of restructuring, creating a circular chain of reactions.

[94] The Global Entrepreneurship Monitor 2002 reports that just under 10% of 9,615 start-ups and new firms identified in 37 countries, met all five criteria used to distinguish "high potential, innovative new ventures" (Reynolds et al., 2002: 19).

[95] To catch the latter effect in figure 3.5, an arrow might be drawn pointing from 'Newness by incumbents' to 'Innovation'.

[96] Age is an interesting aspect of industry structure influenced by new firm start-ups. Based upon an extensive investigation into company histories of many of the world's major firms of the past century, Jovanovic and Rousseau (2001: 14) conclude: "New technologies and products are usually brought in by young companies and this means that - with some delay - when a new technology comes to market, [the average age of] an economy's leading firms tend[s] to get younger".

Effects on firm performance and economic growth
Figure 3.5 also considers the direct and indirect effects of (new) entrepreneurial decision making on firm performance. Firm performance is influenced in three *direct* ways. First, the variety and competition process resulting from increased start-ups and restructuring of the economy put pressure on incumbent firms to improve their performance in terms of costs and productivity. Second, in the short run, innovation often brings a premium to the innovator, in terms of higher growth of sales or higher business profitability (and thus also influencing firm performance). Third, economic growth at aggregate level also influences firm performance by creating or destroying opportunities for improved performance at firm level. A strong economy not only provides a richer resource base for starting and expanding firms but also, *ceteris paribus*, for high performance. Conversely, an economy (or sector) in recession, will have an overall dampening effect on new business start-ups[97] and on individual firm performance. And, of course, the accumulated results of firm performance affect economic performance at aggregate level. Therefore, the diagram shown in figure 3.5 reveals a two-way arrow between firm performance and economic performance.

Effects at individual level and feedback mechanisms
The figure also shows a relationship between firm performance and the outcome for entrepreneurs as a result of managing and owning their own businesses. A possible outcome is goal achievement including making a living from running a business, increase of personal wealth as well as the achievement of immaterial goals. Of course, another possibility is failure or even bankruptcy. A third possible outcome is skill development and behavioral change through experiential learning[98]. Entrepreneurial activity offers many opportunities for learning. These opportunities originate from the surmounting of obstacles, from task-related aspects such as change management, high levels of responsibility and autonomy, and from maintaining external relationships with customers, business partners and advisors. In a recent empirical study (van Gelderen, 2004: 117-131), task-related characteristics in particular were found to contribute to skill development, underlining the importance of experiential learning. Van den Broeck and Willem (2003: 16-21) add that entrepreneurs learn in an experimental way, in particular by drawing lessons from mistakes and unpleasant incidents. They also emphasize the importance of 'learning by networking' for the process of opportunity recognition.

Potentially, skill development and behavioral change have a positive influence on future entrepreneurial performance and thus create feedback from the individual level to the firm level. Other feedback from the outcome at individual level is directed towards new rounds of nascent entrepreneurship. This includes learning from failure

[97] This recession effect was clearly born out by the significant decline of entrepreneurial activity rates between 2001 and 2002 across most countries participating in the Global Entrepreneurship Monitor in these years.

[98] See Kolb (1984: 132-160) for 'the experiential learning theory of development', Sullivan (2000: 161) for 'the intention to behave in a modified way' as a crucial aspect of learning and Van den Broeck and Willem (2003) for an overview of the literature on 'entrepreneurial learning'.

and the influence of role models. On the one hand, a recent empirical study by Folkeringa and Vroonhof (2004) bears out that failed start-up entrepreneurs who start up again are on average remarkably successful. On the other hand, although the failures of other entrepreneurs may discourage new generations they may also increase awareness of pitfalls and contribute to a realistic view of entrepreneurship and to better preparation by new business founders. Finally, successful entrepreneurs generate role models that inspire younger generations to attempt nascent entrepreneurship[99].

Other influences

Finally figure 3.5 indicates that other influences may also affect the outcome at individual level. These other influences may include taxation and inheritance laws affecting the amount of profits entrepreneurs and their families are entitled to keep. Of course, exogenous factors may also influence economic growth and firm performance in addition to the endogenous factors indicated in figure 3.5. Three important examples are the characteristics of consumer preferences, the growth of scientific knowledge and the invention of new radical technologies. Specific government policies also affect firm performance and economic growth. Some examples are innovation policy, including the stimulation of knowledge transfer from universities, and policies to promote the maturation and growth of new and incumbent firms. And to conclude, one other influence consists of deviations between the 'optimal' industrial structure and the current one. So far, little is known about the consequences of deviating from the 'optimal' industry structure. However, the evidence provided in Audretsch, Carree, van Stel and Thurik (2002) and Carree, van Stel, Thurik and Wennekers (2002) suggests that, in fact, there is a price to pay for not adjusting industry structure towards the 'optimal'. They define structure in terms of the small business share or the relative number of entrepreneurs and measure 'costs' in terms of forgone economic growth. Since deviations are inevitable, due to regulations, scarce input factors or failing markets, the existence of growth penalties is a relevant phenomenon.

3.8 Synthesis of feedback mechanisms

Feedback plays an essential role in the framework for explaining the rate of entrepreneurship. Some feedback mechanisms have already been touched upon in Modules I and II. A more systematic discussion can build upon those elements. Feedback mechanisms may be categorized by distinguishing those concerning the aggregate conditions for entrepreneurship and those concerning the entrepreneurial process itself. The 'blueprint' in figure 3.1 indicates these categories by the arrows that point backwards.

[99] See Delmar and Davidsson (2000) and EIM/EZ (2000). A well-known specific case is the influence of parental role models on entrepreneurial intentions (de Wit, 1993a: 149; Wennekes, 1993/2005).

Feedback towards the conditions for entrepreneurship
Feedback directed towards the entrepreneurial conditions originates either in the entrepreneurial process or in the resulting performance. Such feedback is often related to a perceived disequilibrium in the rate of entrepreneurship, as discussed in Module I, or in perceived deviations from the "optimal" industrial structure, as discussed in Module II. These perceptions may induce political debate leading to the introduction of new policies and the revision of existing institutions. The main actors in this respect are politicians, government agencies and employer organizations.

On the one hand, a perceived glut of small scale enterprises, a perceived high rate of small business failure and a related belief in the economic superiority of large corporations seem to have prevailed during the 1930s and the first decades after the Second World War. 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-enterprise sector for social and political reasons on the other (see Thurik and Wennekers, 2004). Small business, it was argued, was essential to maintaining American democracy in the Jeffersonian tradition. Certainly, the passage of the Robinson-Patman Act (Foer, 2001), which was accused of protecting competitors and not competition (Bork, 1978, as cited by Audretsch, Thurik, Verheul and Wennekers, 2002: 2), and the 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 of a Schumpeter Mark II regime. Policy in The Netherlands in this period systematically[100] emphasized entry barriers through business licensing, a tolerance of cartels and other collusive behavior and increased attention for business courses and counseling for nascent and incumbent entrepreneurs.

On the other hand, a perceived shortage of entrepreneurship may lead to a wide array of policies directed at lowering entry barriers, facilitating university spin-offs, stimulating labor market flexibility and competition and improving entrepreneurial incentives provided by fiscal and social security legislation, and to increased attention for entrepreneurial skills and values upstream in the educational system. In this respect, the general assumption is that the United States has been much quicker to absorb the virtues of entrepreneurship than Europe. To a lesser extent this also holds for the UK. The countries on the European Continent have been relatively slow to follow suit. However, the European response varied across countries[101]. Nevertheless, by and large some distinct stages can be discerned in the evolution of the European stance towards the entrepreneurial economy (Audretsch, Thurik, Verheul and Wennekers, 2002: 4-6). The first stage was denial. During the 1980s and early 1990s,

[100] See Audretsch, Thurik, Verheul and Wennekers (2002: 138) for a discussion of the Dutch government White Papers on Small Business in the period 1954-1982.

[101] In the Netherlands, from as early as the late 1980s onwards the government White Papers refer to entrepreneurship instead of to small business, as in previous policy documents (Audretsch et al., 2002: 138). In Germany, the insight that the status quo institutions are a barrier to growth only emerged towards the end of the 1990s (Audretsch et al., 2002: 197).

European policy makers viewed Silicon Valley with scepticism and doubt. Europe was used to facing a competitive threat from large multinational corporations across the Atlantic, such as General Motors, U.S. Steel and IBM, and not from nameless and unrecognizable start-up firms in exotic industries such as software and biotechnology. The second stage, during the mid-1990s, was recognition. Europe recognized that the high performance of the entrepreneurial economy in Silicon Valley did deliver a sustainable long-run performance. The third stage, during the second half of the 1990s, was envy. As unemployment in most European countries soared into double digits and growth stagnated, the capacity of the American entrepreneurial economy to generate both jobs and higher wages became the object of envy. The fourth stage, reached at the turn of the last century, was consensus. European policy makers reached a consensus that a commitment had to be made to creating a competitive, innovative and entrepreneurial European economy[102]. The fifth stage, that of attainment, is gradually coming forth witness the cautious signs of progress[103] towards a more entrepreneurial economy emerging on the old continent. See for example the EU Green Paper on 'Entrepreneurship in Europe' (European Commission, 2003) and the subsequent European Entrepreneurship Action Plan (European Commission, 2004).

Feedback towards the entrepreneurial process

Feedback directed towards the entrepreneurial process originates either from within the process itself or from the resulting performance. At individual level, feedback often has to do with learning and with the creation of role models. At aggregate level, feedback in this category has to do with restructuring and dynamic competition leading to new rounds of entrepreneurial activity.

The process of establishing and running a business of one's own enables *individual entrepreneurs* and their business partners to learn from their own and other enterprises' experiences, successes and failures[104]. In a previous section, we discussed the various relevant aspects of entrepreneurial learning, viz. experiential learning, experimental learning and learning by networking, as well as the effects of learning, viz. skill development, the recognition of opportunities and behavioral change. Learning from the success of others also contributes to the creation of 'role models', implanting preferences and expectations in future nascent entrepreneurs.

[102] Although the 'Lisbon Agreement' reached at the European Council of 23 and 24 March 2000, setting 'a new strategic goal for the next decade: to become the most competitive and dynamic knowledge-based economy in the world…', may now be an awkward example due to its apparent lack of realism, it does show consensus about the desirability of improving 'the environment for private research investment, R&D partnerships and high technology start-ups …' and of '… a regulatory climate conducive to investment, innovation, and entrepreneurship.' See http://www.europarl.eu.int/summits/lis1_en.htm#a

[103] However, it is 'a long road to an entrepreneurial society' (Bosma et al., 2002), and the EU is still facing many critical issues in this area (Bosma et al., 2005).

[104] Also see Dosi (1988: 235).

Originating at the *aggregate level*, both restructuring and the ensuing competition and variety directly or indirectly provide new impulses to nascent entrepreneurship, via second attempts made by failed entrepreneurs, via spin-offs from incumbent firms and via new (inexperienced) start-ups following successful examples of entrepreneurship. The indirect impulses of variety and competition for nascent entrepreneurship are complex, traveling via the path to firm performance, individual outcomes and the expectations these examples instil in future nascent entrepreneurs.

Effectiveness of feedback

Feedback takes place within an institutional framework. Hodgson (2000: 318, 326) emphasized the two-way interaction between individuals and institutions. On the one hand, individuals create and change institutions (so-called 'upward causation'). On the other hand, institutions affect individuals in fundamental ways through so-called 'reconstitutive downward causation'[105]. Hodgson (2000: 327) also stated that "Learning typically takes place through and within social structures" and that "Learning involves adaptation to changing circumstances". In this respect, North (1990: 80-82) emphasized the importance of the 'adaptive efficiency' of a society (as distinct from its 'allocative efficiency'), indicating its willingness to learn, to innovate and to undertake risk and creative activity. He summarized that "The society that permits the maximum generation of trials will be most likely to solve problems through time", explicitly including the importance of 'learning from failures'.

With respect to the first category of feedback mechanisms, those directed towards aggregate conditions for entrepreneurship, the correctness and timeliness of the dominant perceptions is a key issue. On the one hand, if perceptions of disequilibrium are correct and timely, an equilibrium seeking process may ensue. However, convergence is usually slow due to belated perception and to long gestation lags of debate, lobby and implementation. Culture and path dependent institutions play a vital role in determining the accuracy and speed of perception and action. On the other hand, if perceptions are misguided, ensuing policies may result in the enhancement of disequilibrium[106].

With respect to the second category of feedback mechanisms, those directed towards the entrepreneurial process itself, restructuring, learning and role models may introduce self-reinforcing loops through which an entrepreneurial society may continually renew itself. However, again it depends upon the quality of culture and institutions to what extent the so-called "spillovers" of nascent entrepreneurship will effectively be *new* entrepreneurial activities, creating a recurrent chain of linkages.

[105] This latter view epitomizes the so-called 'old institutionalism' by not taking individuals as given, but as being molded ('reconstituted') and constrained by institutions (Hodgson, 2000: 318).

[106] Advice to indiscriminately stimulate entrepreneurship (self-employment) may not always be the most prudent. The indications for a U-shaped relationship between the level of economic development and the natural rate of business ownership, suggest that developing countries should pay due attention to the exploitation of scale economies. This view will be elaborated in chapter 5.

APPENDIX

Illustrations of the entrepreneurial economy using demand and supply schedules

After discussing four psychological and three sociological models of the supply of entrepreneurship, Kilby (1971: 23-26) illustrates the supply of and demand for entrepreneurship through diagrams with a negatively sloping demand curve and a positively sloping (or horizontal) supply curve. Below, this highly stylized model is expanded with conceptual elements of the multidisciplinary framework developed in this chapter, and applied to the revival of entrepreneurship in recent decades.

Firstly, one may define demand for entrepreneurship (in a country or region) as the viable number of entrepreneurs based upon the 'carrying capacity' (Carree and Thurik, 1999; Hannan and Freeman, 1989) of existing and new markets. It is assumed that demand is negatively related to the expected financial reward of entrepreneurship. The location and slope of the demand curve are dependent upon factors such as emerging technologies, the industrial structure of the economy and the degree of differentiation of consumer demand. Key conditions for these exogenous factors are the level of economic development, the state of scientific progress and the government regulation of markets (degree of privatization). Secondly, the supply of entrepreneurship is a positive function of the expected financial rewards. Slope and location of the supply schedule depend on psychological and sociological characteristics of the population such as risk attitudes, preferences for autonomy and other immaterial motivations, entrepreneurial skills and role models, as well as on (primarily) economic characteristics such as the availability of financial resources and the opportunity costs of entrepreneurship. Key conditions for these exogenous factors are demographic developments, the educational system, the underlying national culture, government regulation of market entry and (again) the level of economic development.

Supply and demand schedules can be used to illustrate different underlying processes of the strong revival of entrepreneurship in recent decades (Audretsch and Thurik, 2000 and 2001).

Case 1: primarily a demand shift
A technological breakthrough shifts out the demand curve, causing both the number of entrepreneurs and the financial reward to increase. Silicon Valley in the 1980s may be a case in point. Only in a later stage will the supply curve also shift out, due to role model effects.

Case 2: primarily a supply shift
Due to demographic developments and deregulation of entry, the supply curve shifts out in an even stronger way than the demand curve, resulting in a larger number of entrepreneurs and a lower average financial reward. The Netherlands in the 1990s may

be an example of this (see Folkeringa and Vroonhof, 2004, for empirical evidence of decreasing entrepreneurial incomes in the Netherlands in these years).

Case 3: highly elastic supply
Kilby (1971: 24) calls this case the 'economist's model'. An assumed exogenous psychological drive for pecuniary gain and a narrow definition of the entrepreneurial function, result in a highly elastic (nearly horizontal) supply schedule of entrepreneurial services. The number of entrepreneurs is primarily driven by demand shifts, while the average financial return will in the long run remain stable.

However, the above concerns a highly stylized approach that is mainly suitable for illustrative purposes. With respect to its application in an empirical analysis the approach has several limitations. In particular, supply and demand schedules may be empirically intractable. First, there are severe limitations with respect to measuring average financial reward per relevant entrepreneurial unit. Secondly, there may not be a sufficient number of data points (observations) to identify shifts in demand versus supply schedules.

PART III

Empirical Contributions

CHAPTER 4

A SHIFT-SHARE ANALYSIS OF THE SELF-EMPLOYMENT RATE IN THE NETHERLANDS 1899-1997

Abstract
Available data for the overall self-employment rate of the Netherlands in the period 1899-1997 show a secular decline, while there is also evidence of a modest revival from the early 1980s onwards. The role of changes in sector composition versus within-sector trends in explaining the long-term development of self-employment was investigated through a shift-share analysis of the available data for agriculture, industry and services. Apart from a substantial influence of the shrinking employment share of agriculture in the period 1899-1960, the evidence rejects a prime role of sector shifts. On the other hand, scale trends in industry and services seem to be the major proximate causes of the development of the overall self-employment rate. This conclusion calls for a continued search for ultimate causes underlying these scale trends within the domains of technology, economics, institutions and culture.

This chapter is based on:

Wennekers, A.R.M. and M. Folkeringa (2002), The development of the self-employment rate in the Netherlands 1899-1997; a decomposition into sector shift and within sector trends, Scales Paper N200221, Zoetermeer: EIM.

An earlier version has been presented at the BKERC 2002 Conference, Boulder, Colorado.

A SHIFT-SHARE ANALYSIS OF THE SELF-EMPLOYMENT RATE IN THE NETHERLANDS 1899-1997

4.1 Introduction

A remarkable turnaround

In many of the most highly developed economies the last quarter of the 20th century has shown a discontinuation if not a turnaround of the long-standing trend towards increasing scale in the production and distribution of many goods and services. And related to this reversal many of these economies have also experienced a remarkable revival of the share of self-employment in the labor force. The turn towards smaller scale in production has been well documented by Loveman and Sengenberger (1991) and by Acs and Audretsch (1993a). The revival of self-employment has first been analyzed by Blau (1987) and more recently by OECD (2000), while the latter has also pointed out that this renaissance has been most marked for the self-employed without employees. This reversal, though quantitatively modest and possibly of a temporary nature, has now been manifest for more than 30 years in countries like the UK and the USA, and for about two decades in several other advanced economies. It is the more remarkable as it marks the end or at least a discontinuation of a secular development spanning a century[107] and possibly a much longer period. Be it fleeting or sustainable, this turnaround deserves close scholarly attention. Several explanations have already been forwarded, including variables in the economic, technological and cultural arena (Carree et al., 2002, and Wennekers et al., 2002.), but to date the empirical evidence is limited.

A well-known assumption is the role of a changing sector composition. In many OECD-countries the 19th and the early 20th century showed a continuous decline of the employment share of agriculture, with both manufacturing and services gradually gaining ground. The second half of the 20th century brought a further shrinking of agricultural employment and some decline of manufacturing's share, while services became the dominant sector in terms of employment. An article in The Economist (December 31st, 1999: 22) briefly documents these long-term developments in employment. Some scholars (Storey in EIM, 2000: 4-5) assert that the rapid growth of the services sector in recent decades has to a considerable extent been responsible for the renaissance of self-employment. To our knowledge little empirical evidence has so far been brought forward regarding the degree to which this hypothesis might hold. With respect to the related increase in the employment share of small business, some influence of the changing sector composition has been substantiated by earlier studies (Loveman and Sengenberger, 1991, and Acs and Audretsch, 1993a), but the evidence is mixed. The case is still pending. For the Netherlands, various historical data sources

[107] However, the data in this chapter show a stabilization of the self-employment rate in industry and services between 1930 and 1947. Furthermore, a recent, not yet published, historical investigation of Dutch self-employment in the 20th century (the so-called BINT-project) presents evidence of a modest revival of the self-employment rate in the 1920s.

regarding both average firm size and self-employment share by sector, spanning most of the 20th century, are available in the publications of Statistics Netherlands (CBS), be it that these data are not without the usual definitional discrepancies across years and other caveats. After an effort of data collection from these sources and some further processing, these data permit at least a preliminary empirical analysis of the developments outlined above.

Set-up of the chapter and research questions
The goal of our research is to achieve more insight into the relative importance of changes in sector composition of the Dutch economy versus within-sector trends, for explaining the secular downward development of self-employment since 1899 and the recent reversal of this trend. A review of the literature first presents what is already known in this area. Subsequently, our empirical research covers two questions. Our first research question is the core of our research and deals with the role of the changing sector composition of the Dutch economy and of within-sector trends in explaining the development of the self-employment share in the Netherlands between 1899 and 1997. Our second, corroborative, question considers the analysis of an interesting corollary, i.e. the development of average firm size in the Netherlands between 1930 and 1993.

4.2 Definitions

As stated in the previous subsection, the core variable of our investigation is the self-employment rate, i.e. the proportion of the self-employed in total employment or, alternatively, in the labor force. We will define the number of self-employed or entrepreneurs (e) as the sum of both the owners of incorporated and unincorporated businesses, but excluding unpaid family workers and wage-and-salary workers operating a side-business as a secondary work activity (also see Carree et al., 2002). The labor force ($l^* = e + w + u$) is the sum of self-employed (e), wage-employed (w) and unemployed (u). Total employment ($l = e + w$) is the sum of self-employment and wage-employment.

Equation (1) defines the self-employment rate (ser):

$$(1) \quad ser = e / l \text{ (or alternatively } ser^* = e / l^*)$$

In empirical work one sometimes has to deviate from this definition, for example in so far as unpaid family workers are included in self-employment statistics or when data for the owners of incorporated businesses are lacking.

We will also consider two related concepts. The first of these is the concept of average firm size (afs), as defined in equation (2), where b stands for the number of businesses[108]:

[108] In empirical work one may have to use an alternative definition by using the number of establishments instead of the number of businesses.

(2) $afs = (e + w) / b = l / b$

When assuming, as a working hypothesis, the number of businesses (b) to be equal to the number of business owners or self-employed (e), average firm size would be equal to the reciprocal of the self-employment rate in total employment. In reality, however, there may be large and varying differences between b and e. This has to do with the existence of business partnerships, the occurrence of subsidiary firms and other aspects of internal or external organization. Additionally, employment data and firm data are usually drawn from different statistical sources. Nonetheless, the self-employment rate is to some extent inversely related to the average firm size.

A more distantly related variable is the share of small businesses in total employment. In this respect small businesses are often defined as all businesses with fewer than 100 employed; sometimes, in the EU, those with fewer than 200 or 250 employed, and in the USA, those with fewer than 500 employed. Equation (3) defines the small business share (sbs):

(3) $sbs = (e + ws) / (e + w)$,

where ws stands for the number of wage-employed in small businesses. As can easily be seen, the small business share equals the sum of the self-employment rate and the proportion of small business wage earners in total employment. In quantitative terms the small business share is usually substantially larger than the self-employment rate (in developed economies of the late 20th century the total small business rate is in the order of magnitude of (very roughly) around 0.5, whereas the self-employment rate is usually between 0.05 and 0.15).

All three concepts as defined in equations (1), (2) and (3) can be further elaborated by differentiating between self-employed with and without personnel.

4.3 Review of the literature

As discussed in chapter 1, self-employment might historically well be the natural economic status of homo sapiens. However, already in early times and driven by a division of labor, paid jobs arrived on the scene. Although no reliable statistics are available concerning the *prevalence of self-employment* in the distant past, there are indirect indications (Braudel, 1982: 52-54) that by the end of the 18th century in several of the most developed countries the prevalence of self-employed (business owners) had already declined to below 50% of the labor force. To our knowledge the oldest systematic statistical material on self-employment pertains to the end of the 19th century. Historical data for the U.S. assembled by Phillips (1962: 7-26) from several sources, indicate that between 1880 and 1930 the proportion of the self-employed among all 'gainful workers' declined substantially (from 37% to 20%.) This decrease of the self-employment share was due to both a decline in the proportion of the self-employed within agricultural and non-agricultural employment, *and* to a decline in the employment share of agriculture. For the period 1930-1960 a continued decline of the

self-employment share in the American labor force to a level of around 13% in 1960 can be observed. Blau (1987) observes that the proportion of male and female self-employed in the (non-agricultural) U.S. labor force further declined until the early 1970s and then started to rise until at least 1982. EIM's dataset COMPENDIA (van Stel, 2005b) shows how the self-employment rate in the U.S. further increased until the mid 1980s and how it has stabilized in recent years. The possibilities for analysis are limited in the sense that neither the data presented by Blau, nor EIM's Compendia data are disaggregated by sector. Also with respect to the U.S., OECD (1986: 47) demonstrates how the revival of non-agricultural self-employment between 1969 and 1983 concurred with a further decline of agricultural self-employment, but these structural shifts have not been analyzed. With respect to the United Kingdom, Storey (1994: 26) presents a comparable long-term decline of the self-employment rate from around 13% of the total labor force in 1910 to around 8% in 1965, and a subsequent revival thereafter. These interesting data for the U.K. were however not disaggregated by sector. Storey (1994: 41) also cites grouped national cross-section data spanning the global labor force, corroborating that in correspondence with a rising level of economic development, diminishing agricultural employment (sector shift) and declining self-employment within non-agricultural employment (within-sector trend) contribute to a declining overall self-employment rate.

As far as the development of *average firm size* in the early 19th century is concerned, some telling statistical information is available regarding the USA. The oldest sources are the 1820 and 1850 Censuses of Manufactures, as quoted by Sokoloff (1984: 353-355). Between those two years and regarding the Northeast, a rise in the average number of workers employed can be observed in 9 out of 10 manufacturing industries for which a sufficient number of observations are available. In most of these industries the increase in the average firm size was quite substantial, "with the average industry registering growth in firm size of 66% over the 30 years." Sokoloff attributes this increase to larger-scale manufacturing plants superseding artisan shops during this period. This upscaling trend obviously signals within-sector developments and had little or nothing to do with sector shifts. Chandler (1977) presents many more examples of a further increase in average firm size in both manufacturing (across many lines of business such as food, steel, oil, automobiles, aircraft, chemicals and pharmaceuticals) and service industries (such as retailing, transport, telecommunication and financial services) during the period 1860-1960.

The *SME (employment) share* in many countries typically declined during the greater part of the 20th century, while following a U-shaped development in recent decades. Sector data concerning the development of the SME-share were analyzed by Loveman and Sengenberger (1991) as well as by several contributions to a volume edited by Acs and Audretsch (1993a). The well-known article by Loveman and Sengenberger (1991) documents the major developments in the firm size distribution of the six largest OECD countries, across various time spans until the mid 1980s. We will cite two of their main conclusions (op. cit., p. 35.) "First, after many decades of decline, the employment share of SMEs began to increase in the 1970s, though at different rates in

different countries and sectors." They continue "From the empirical evidence … it appears that the employment gains in the SME sector are neither merely the results of sectoral change toward the service sector, nor the effects of the business cycle." Instead, Loveman and Sengenberger attribute the re-emergence of small-scale production to a significant extent to the decentralization and vertical disintegration of large companies and to various kinds of new small business dynamism. The volume edited by Acs and Audretsch (1993a: 227) concludes that across several Western countries, in the 1970s and 1980s "a distinct and consistent shift away from large firms and towards small enterprises has occurred within the manufacturing sector." Here we will discuss two of the country cases presented in their book. Fritsch (1993: 41-48) shows how the employment share of small firms in Germany continuously declined between 1907 and 1970, and how it increased thereafter. He subsequently shows how between 1970 and 1987 the small firm share increased in manufacturing and decreased in services. A shift approach shows that, overall, the increasing small firm share in the Federal Republic of Germany in those years can be explained by a change in sectoral composition (shrinking manufacturing and expanding services sector). Using the U.S. Small Business Data Base, Acs and Audretsch (1993b) show how between 1976 and 1986 small-firm employment shares increased in manufacturing and decreased in services. In fact, in the manufacturing sector a pronounced shift towards small enterprises has taken place in this period, both in terms of employment or sales shares and in terms of average firm size. For instance, between 1979 and 1984, "with a single exception, in the tobacco industry, the mean plant employment size declined in every 2 digit major manufacturing industry" (Acs and Audretsch, 1993b: 70.) They attribute this shift to smaller firms in manufacturing for a considerable extent to "the establishment of new firms which are apparently replacing old ones" (Acs and Audretsch, 1993b: 76.)

To conclude, the literature on the long-term historical decline of the self-employment rate points at an influence of both the diminishing employment share of agriculture and a trend towards lower self-employment rates within non-agricultural employment. To our knowledge a shift-share analysis of the long-term decline of self-employment, distinguishing different non-agricultural sectors of industry, has never been carried out, nor has the recent revival of self-employment been analyzed in those terms. The literature about the long-term development of average firm size does however provide some clues, in so far as it clearly underscores the importance of within-sector trends. The literature with respect to the enhanced small business presence in recent decades offers evidence of both within-sector trends, particularly in manufacturing, and the role of an expanding service sector.

4.4 Data for the Netherlands

Relevant statistical data for the Netherlands across long time intervals and potentially suitable for analyzing our first research question, are to be found in various official data sources published by the Dutch statistical office (CBS). Regarding the number of self-employed, excluding unpaid family workers, we have assembled data for eight

data points[109]. Regarding the years 1899, 1909, 1930, 1947 and 1960 these data were directly or indirectly taken from various Population and Occupation Censuses carried out in those years. With respect to 1981, 1987 and 1997 data were taken from the Labor Accounts[110]. Data for total employment in those years were either from the CBS Statistical Time Series 1899-1994 or from recent Labor Accounts. For all these years we have collected data for three major sectors that together span the entire Dutch economy. These sectors are Agriculture, Industry (total of manufacturing, construction, mining and utilities) and Services (including trade, transport, financial, personal and collective services). The Appendix presents a more elaborate account of the data and of some definitional discrepancies across years. Self-employment rates for all three sectors, in each of the years mentioned above, were calculated by dividing the number of self-employed by total employment in these sectors. Figure 4.1 presents the total self-employment rate with respect to employment in all three sectors together, as well as the self-employment rate in industry and services with respect to non-agricultural employment. While both graphs show a clear secular decline across the 20th century, there is also evidence of stabilization in the 1930s[111] and of a modest revival of self-employment from the early 1980s onwards. Figure 4.2 presents the long-term development of non-agricultural self-employment as a share of the total labor force (see Appendix).

Figure 4.1 Self-employment as a share of employment, The Netherlands 1899-1997

Note: Due to definitional discrepancies the data may not always be fully comparable across years.
Source: EIM, based on CBS.

[109] The Appendix to this chapter pays attention to some small definitional discrepancies across years.
[110] In addition, data for 1971 including unpaid family workers are also available.
[111] As was pointed out in an earlier footnote, additional data that were recently brought to our attention suggest that this period of stabilization and/or temporary recovery of self-employment set in as early as in the 1920s.

Another relevant time series for the Netherlands concerns the average employment size of business establishments in the years 1930, 1950, 1963 and 1978. These data, which were taken from Ritzen and van der Ven (1990), are available for industry and for several service sectors. We have completed this dataset with more recent data on average firm size in 1983 and 1993, taken from the CBS Statistical Time Series 1899-1994.

4.5 A shift-share analysis of the self-employment rate

Tables 4.1 and 4.2 summarize the main developments of respectively total employment shares and self-employment rates of each of the three major sectors. From these tables a number of observations can be made. First, in 1899 total employment in the Netherlands was evenly distributed over agriculture, industry (including manufacturing and construction) and services (including trade and transportation). In 1960 the share of agriculture had shriveled to 10%, while industry and services each took 45%. During the following decades services continued their growth, while the share of industry declined to 20% in 1997. Second, self-employment rates in agriculture, while historically high, have further increased in recent decades. In industry the self-employment rate declined from 25% in 1900 to below 5% in the mid-eighties, and rebounded thereafter. In the services self-employment decreased from 20 to 10%, while leveling off in recent years.

Table 4.1 Shares of agriculture, industry and services in total employment, The Netherlands 1899-1997

	1899	*1909*	*1930*	*1947*	*1960*	*1981*	*1997*
Agriculture	31.4%	28.3%	20.8%	19.6%	11.0%	5.3%	4.1%
Industry	32.2%	32.7%	36.8%	37.4%	43.4%	30.7%	21.8%
Services	36.4%	39.0%	42.3%	43.0%	45.6%	63.9%	74.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: EIM, based on CBS.

Table 4.2 Self-employment rates with respect to employment in agriculture, industry and services, The Netherlands 1899-1997

	1899	*1909*	*1930*	*1947*	*1960*	*1981*	*1997*
Agriculture	0.315	0.374	0.406	0.337	0.501	0.542	0.486
Industry	0.268	0.222	0.143	0.135	0.076	0.043	0.066
Services	0.216	0.186	0.169	0.177	0.154	0.095	0.101
Total	0.264	0.251	0.208	0.193	0.158	0.102	0.109

Source: EIM, based on CBS.

The availability of these data for agriculture, industry and services also allows for a decomposition (shift-share) analysis. This will allow us to investigate our first research question, concerning the role of the changing sectoral composition of the Dutch economy versus within-sector trends in explaining the long-term development of the

self-employment rate in the Netherlands. Given the following definition (with the capital subscripts A, I and S referring to agriculture, industry and services respectively):

$$\frac{e}{l} = \frac{l_A}{l} \cdot \frac{e_A}{l_A} + \frac{l_I}{l} \cdot \frac{e_I}{l_I} + \frac{l_S}{l} \cdot \frac{e_S}{l_S} \tag{4}$$

it also holds:

$$\begin{aligned} \Delta\left(\frac{e}{l}\right) = {} & \Delta\left(\frac{l_A}{l}\right) \cdot \frac{e_A}{l_A} + \frac{l_A}{l} \cdot \Delta\left(\frac{e_A}{l_A}\right) + \Delta\left(\frac{l_A}{l}\right) \cdot \Delta\left(\frac{e_A}{l_A}\right) + \\ & \Delta\left(\frac{l_I}{l}\right) \cdot \frac{e_I}{l_I} + \frac{l_I}{l} \cdot \Delta\left(\frac{e_I}{l_I}\right) + \Delta\left(\frac{l_I}{l}\right) \cdot \Delta\left(\frac{e_I}{l_I}\right) + \\ & \Delta\left(\frac{l_S}{l}\right) \cdot \frac{e_S}{l_S} + \frac{l_S}{l} \cdot \Delta\left(\frac{e_S}{l_S}\right) + \Delta\left(\frac{l_S}{l}\right) \cdot \Delta\left(\frac{e_S}{l_S}\right) \end{aligned} \tag{5}$$

Our shift-share analysis entails applying equation (5) to the available data for all subperiods. The first terms of each line in the equation add up to the influence of the changing sector composition. Taken together, the second terms represent the impact of within-sector shifts in the rate of self-employment. Each line closes with a so-called cross-term. The main results are presented in table 4.3. The analysis gives rise to the following conclusions. During the period 1900-1960 the overall self-employment rate with respect to total employment decreased from 25% to 15%. This decline was equally due to the strong decline of the share of the agricultural sector and to the decreasing self-employment rates within all major sectors, particularly within industry. The 1960s and 1970s show a further decline in self-employment that was mainly due to continued upscaling of most sectors and only partly to sectoral shifts. The re-emergence of self-employment in the late 1980s and the 1990s is fully due to a new trend of downscaling in industry and (to a lesser extent) services, while there is no net effect of sectoral shifts.

Table 4.3 Results from the shift-share analysis on the self-employment rate in agriculture, industry and services, The Netherlands 1899-1997

	1899-1909	*1909-1930*	*1930-1947*	*1947-1960*	*1960-1981*	*1981-1997*
Changes *between* sectors	-0.003	-0.013	-0.003	-0.016	-0.010	-0.001
Changes *within* sectors	-0.007	-0.024	-0.013	0.000	-0.037	0.009
Cross-product changes	-0.003	-0.006	0.001	-0.018	-0.009	-0.001
Total change	-0.013	-0.043	-0.015	-0.035	-0.056	0.007

4.6 Some tests of robustness

As explained in the Data section and the Appendix, the data used in this chapter are not without caveats. In that sense the analysis in this chapter is tentative. For that reason we have carried out some tests of robustness of our findings.

First, we have repeated the shift-share analysis using self-employment data including unpaid family workers. This was done with respect to the periods 1947-1960, 1960-1981 and 1981-1997, for which these data are available. While the results for the latter period now imply equal effects for within-sector scale trends and sectoral shifts, the analysis for 1947-1960 and 1960-1981 shows a clear dominance of scale trends. Secondly, the shift-share analysis was repeated for industry and services only. Because this analysis excludes the effect of the shrinking employment share of agriculture, it comes as no surprise that for the period 1899-1981 the scale trends within industry and services now dominate the outcome more strongly than in our baseline analysis for three sectors as presented in the previous section. For the recent decades the results of this exercise show a minor effect of the increasing share of services, while downscaling trends remain dominant. Thirdly, we would like to know to which extent the increasing share of collective services over time may have influenced our results. We have therefore carried out a shift-share analysis for industry and services, while excluding government personnel from our employment data for the services sector. Although the results are not in every way identical to those of the previous analysis, our conclusions are not influenced by these differences. Fourthly, we have used an alternative dataset to ascertain the robustness of our results. Using EIM's database 'BLISS OESO Sectoraal'[112] and some additional national data for the period 1971-1997, a shift-share analysis on self-employment including unpaid family workers in industry and services in the Netherlands was carried out. Again, the effect of within-sector scale trends dominates the effect of sector shifts.

Finally, when we restrict the analysis to a smaller number of subperiods for which there are no definitional discrepancies with respect to self-employment, i.e. 1899-1909, 1909-1930, 1947-1960, 1971-1981 (including unpaid family workers) and 1987-1997, the conclusions also remain similar to the ones based on the analysis spanning the full period 1899-1997, as presented in the previous section.

4.7 A corollary: average firm size in the Netherlands

We have also carried out a shift-share analysis of average business size, using data on average establishment size during the period 1930-1978 and on average firm size during 1983-1993, while distinguishing between industry and services. Table 4.4 and table 4.5 summarize the data. As can be seen from table 4.5, average establishment size increased between 1930 and 1963, while stabilizing in the period until 1978. The

[112] This database is based on OECD National Accounts and additional (national) sources.

figures for the period 1983-1993 demonstrate a subsequent slight decline in average firm size.

Table 4.4 Shares of industry and services in the number of establishments, 1930-1978, respectively in the number of firms, 1983-1993, The Netherlands

	1930	*1950*	*1963*	*1978*	*1983*	*1993*
Industry	36.0%	37.6%	34.4%	27.1%	19.1%	16.1%
Services	64.0%	62.4%	65.6%	72.9%	80.9%	83.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: EIM, based on CBS.

Table 4.5 Average size of establishments, 1930-1978, and average firm size, 1983-1993, in industry and services, The Netherlands

	1930	*1950*	*1963*	*1978*	*1983*	*1993*
Industry	6.9	10.5	15.5	17.7	16.5	15.3
Services	3.1	3.6	4.7	5.0	8.6	8.3
Total	4.4	6.1	8.4	8.4	10.1	9.4

Source: EIM, based on CBS.

A shift-share analysis can be carried out through the following equation[113]:

$$\Delta\left(\frac{l}{b}\right) = \Delta\left(\frac{b_I}{b}\right)\cdot\frac{l_I}{b_I} + \frac{b_I}{b}\cdot\Delta\left(\frac{l_I}{b_I}\right) + \Delta\left(\frac{b_I}{b}\right)\cdot\Delta\left(\frac{l_I}{b_I}\right) + \Delta\left(\frac{b_S}{b}\right)\cdot\frac{l_S}{b_S} + \frac{b_S}{b}\cdot\Delta\left(\frac{l_S}{b_S}\right) + \Delta\left(\frac{b_S}{b}\right)\cdot\Delta\left(\frac{l_S}{b_S}\right) \quad (6)$$

The results of our shift-share analysis are presented in table 4.6. Our main findings are that during the period 1930-1963 the upscaling of both industry and services were the overriding determinants, while between 1963 and 1978 a slower rate of upscaling within both sectors and a more rapidly declining establishment share of the (relatively large-scale) industrial sector balanced one-another. In the period 1983-1993, a new trend towards downscaling of industrial firms and to a lesser extent service firms and an increase in (relatively small-scale) business start-ups in both sectors are the major causes of the decline in overall average firm size. At the same time, a higher growth of the number of service firms than that of industrial firms added to this effect, due to the smaller average firm size in the services sector.

[113] It is pointed out that the relevant shares in a shift-share analysis of average firm size are the sector shares with respect to the number of firms or establishments, while in a shift-share analysis of the self-employment rate the shares with respect to employment are the relevant ones.

Table 4.6 Results from the shift-share analysis on average establishment size, 1930-1978, and average firm size, 1983-1993, in industry and services, The Netherlands

	1930-1950	*1950-1963*	*1963-1978*	*1983-1993*
Changes *between* sectors	0.1	-0.2	-0.8	-0.2
Changes *within* sectors	1.6	2.6	0.9	-0.4
Cross-product changes	0.0	-0.1	-0.1	0.0
Total change	1.7	2.3	0.0	-0.6

4.8 Conclusions

The main lesson from our reading of the literature is that a so-called shift-share analysis of disaggregated time series data pertaining to non-agricultural self-employment has never been published for either the U.S. or any other OECD country. Such an analysis of sectoral self-employment data for the Netherlands has been the core purpose of our research. A shift-share analysis of a dataset, spanning the period 1899-1997 and specifically developed for this purpose, supports the view that both the longstanding decline in self-employment and its recent revival are, for the greater part, not a statistical artefact due to a changing sectoral composition of the economy. On the contrary, as was also revealed by the empirical research on our second, corroborative, research question, a long-term trend toward upscaling followed by historically anomalous downscaling in industry and, to a lesser extent, in services is the major proximate cause. Available time series data on average firm size in other countries, in particular the U.S., support this view, both for the long historical period between roughly 1820 and 1960 and for recent decades. This conclusion calls for a continued search for ultimate causes within the domains of technology, economics, demography, institutions and culture.

APPENDIX

Sources and definitions

The purpose of this appendix is to provide background information (sources, definitions) on the data for the Netherlands that have been used in this chapter. All data were collected from various official Central Bureau of Statistics (CBS) sources and publications. With respect to self-employment, data on the years 1899, 1909 and 1930 have been collected directly from the Population and Occupation Censuses. For these years, self-employment was defined as 'business owners/managers working for their own account' (in Dutch: 'bedrijfshoofden A'). Data on 1947 and 1960 have been taken from Statistical Note-books, which were based on the Population and Occupation Censuses. For these years we have used the 'bedrijfshoofden' as listed in these statistical publications. For the years 1971 and 1981, self-employment data were taken from the Labor Censuses. Unfortunately, for 1971 only data with respect to self-employed persons including unpaid family workers were available. Data on the most recent years, 1987 and 1997, have been collected from the Labor Accounts. For all self-employment data mentioned above, a disaggregation into a number of sectors was available.
With respect to the labor force, the Statistical Time Series 1899-1994 provided data on a sectoral level for all years except 1987 and 1997. Distinguishing between employed and unemployed persons (in fact 'sector unknown' inclusive of the unemployed), this source allowed for the distinction between labor force and total employment. For the latter years 1987 and 1997, data on total employment are available from the Labor Accounts.

Overall, some (small) definitional discrepancies between the self-employment data taken from different sources cannot be ruled out. Secondly, for some years the data on self-employment and total employment may not be fully consistent in terms of sources or sector composition.

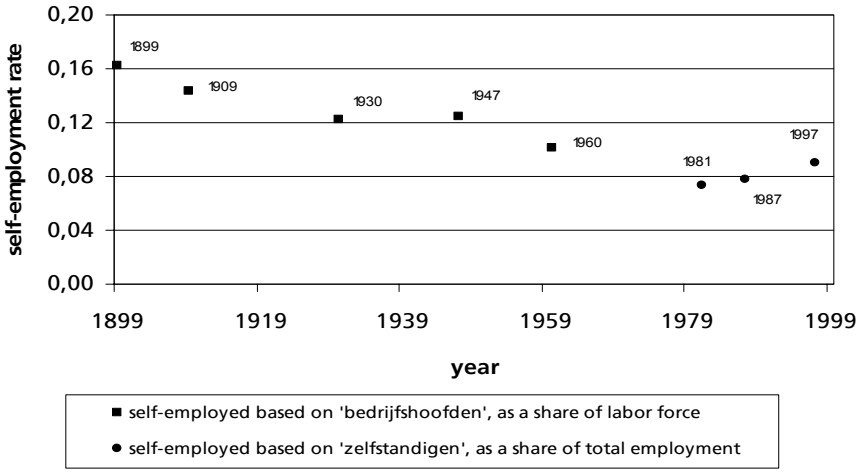
With respect to average business (establishment) size, data on employment and the number of business establishments for the years 1930, 1950, 1963 and 1978 were taken from Ritzen and van der Ven (1990). These data are available for industry and four major service sectors. Data on the number of firms and employment in 1983 and 1993 were added from the Statistical Time Series 1899-1994. Note the difference between average firm size in 1983 and 1993, and average establishment size in the other years. In general, average establishment size will be smaller as a firm may operate from several establishments. The following scheme summarizes the data sources used.

Sources of the data

Data	*Source*	*Year*
Business owners/managers	Population and Occupation Census ("Volks- en beroepstellingen")	1899,1909,1930
,,	Statistical Note-book ("Statistisch zakboek")	1947,1960
Self-employed	Labor Census ("Arbeidskrachtentelling")	1971*,1981
,,	Labor Account ("Arbeidsrekeningen")	1987,1997
Labor force	Statistical Time Series ("Statistiek in tijdreeksen")	1899,1909,1930,1947,1960, 1971,1981
Employment	Labor Account	1987,1997
Establishments	Ritzen and van der Ven (1990)	1930,1950,1963,1978
Firms	Statistical Time Series	1983,1993
Employment	Ritzen and van der Ven (1990)	1930,1950,1963,1978
,,	Statistical Time Series	1983,1993

* Number of self-employed only available including unpaid family workers.

Figure 4.2 Self-employment excluding agriculture, as a share of the labor force, The Netherlands 1899-1997



Note: Due to definitional discrepancies the data may not always be fully comparable across years.
Source: EIM, based on CBS.

CHAPTER 5

NASCENT ENTREPRENEURSHIP AND THE LEVEL OF ECONOMIC DEVELOPMENT

Abstract
Based upon two strands of literature, this chapter hypothesizes a U-shaped relationship between a country's rate of entrepreneurial dynamics and its level of economic development. This would imply a different scope for entrepreneurship policy across subsequent stages of development. Regressing GEM's 2002 data for nascent entrepreneurship in 36 countries on the level of economic development as measured either by per capita income or by an index for innovative capacity, we find support for a U-shaped relationship. Testing our results against several control variables, evidence is again found for this relationship with economic development, in addition to significant effects of the business ownership rate (+), social security expenditure (-), aggregate taxes (+) and population growth (+). The results suggest that a 'natural rate' of nascent entrepreneurship is to some extent governed by 'laws' related to the level of economic development. For the most advanced nations, improving incentive structures for business start-ups and promoting the commercial exploitation of scientific findings offer the most promising approach for public policy. Developing nations, however, may be better off pursuing the exploitation of scale economies, fostering foreign direct investment and promoting management education.

This chapter is based on:

Wennekers, Sander, André van Stel, Roy Thurik and Paul Reynolds (2005), Nascent entrepreneurship and the level of economic development, *Small Business Economics* 24 (3), 293-309, with kind permission of Springer Science and Business Media.

NASCENT ENTREPRENEURSHIP AND THE LEVEL OF ECONOMIC DEVELOPMENT

5.1 Introduction

It has long been known that the *level* of entrepreneurship, expressed as the percentage of owner/managers of incorporated and unincorporated businesses relative to the labor force, differs strongly across countries. This variance is related to differences in levels of economic development, but also has to do with diverging demographic, cultural and institutional characteristics (Blanchflower, 2000). In particular, evidence has been assembled for an underlying U-shaped relationship between the level of business ownership (self-employment) and per capita income (Blau, 1987; Acs et al., 1994; Carree et al., 2002). Recent research in the framework of the Global Entrepreneurship Monitor (GEM) has brought to light that the *dynamics* of entrepreneurship, expressed as the rate of nascent entrepreneurship or the prevalence of young enterprises, also show a wide-ranging diversity across nations. An explanation of this variance is much needed as many governments attach high hopes to a positive effect of entrepreneurship on economic well-being and accordingly try to promote new business start-ups. It is particularly important to know the extent to which a country's level of economic development may determine a 'natural rate' of entrepreneurial dynamics and may thus constrain the scope for entrepreneurship policy. In this chapter it is conjectured that, analogous to the level of entrepreneurship, a U-shaped relationship with economic development is also likely for the rate of entrepreneurial dynamics. This means that, as a nation develops economically, its prevalence of nascent entrepreneurship and of new business start-ups is likely to decline until a revival occurs at the high end of economic development. We will investigate the arguments supporting this conjecture and test it empirically. To our knowledge, no analysis of the relationship between the level of economic development and the gross inflow into entrepreneurship (self-employment) has ever been carried out. The existence of a 'natural rate' of entrepreneurial dynamics depending upon the level of economic development would imply that this level has to be taken into account to decide whether entrepreneurial dynamics are low or high.

Two strands of literature will be used to propose a model for explaining the diversity in nascent entrepreneurship across nations with wide-ranging levels of economic development. The first literature deals with economic development and its main accompanying processes, while the second relates a country's level of economic development to its rate of entrepreneurship. We estimate the model using data from the Global Entrepreneurship Monitor 2002 for 36 countries. The rate of nascent entrepreneurship is defined as the number of people actively involved in attempting to start a new business, expressed as a percentage of the adult population. Economic development is defined either as per capita income or as innovative capacity.

The present chapter is organized as follows. In the first section we discuss the relevant literature and state our hypothesis. In the subsequent section we elaborate the research

method and the main data used to test our hypothesis. Next, we introduce the control variables. Subsequently, we present the results of our regressions. A final section presents our conclusions.

5.2 Literature review

Economic development

There are many concepts of economic development. A well-known operational notion of economic development focuses on the accompanying, interrelated processes of structural change, and is referred to as structural transformation (Syrquin, 1988: 206). Accumulation of physical and human capital, and shifts in the sector composition of economic activity (production, employment, consumption) are regarded as the core components of this transformation. Related socio-economic changes are urbanization, demographic transitions, a growing level of education and changes in the distribution of income. In economic history, one tradition distinguishes between 'stages of economic development', thus emphasizing discontinuities in development. A well-known example is Rostow's theory (1960), that hypothesizes five stages of economic growth. Major criticisms of this theory have to do with the notion of a unique path of development. More recently, Chenery and Syrquin (as cited by Syrquin, 1988: 244, 245) identified three stages of transformation: primary production, industrialization and the developed economy. A further distinction also takes account of the population size of countries and of patterns of international specialization.

In a modern view of economic development, as propagated by Porter, Sachs and McArthur (2002), economic development means increasingly sophisticated ways of producing and competing, and implies the evolution from a resource-based to a knowledge-based economy.

These authors distinguish between three stages and two transitions. At the lowest levels of economic development, production is based upon the mobilization of primary factors of production: land, primary commodities and unskilled labor. At this *factor-driven stage*, international competitiveness is primarily based upon low factor costs and/or the presence of minerals and other commodities. As countries move to the second stage, i.e. that of industrialization, economic growth becomes more capital intensive and thus *investment-driven*. For a successful transition to this stage and its related middle-income status, countries must subsequently get their labor and capital markets working more properly, attract foreign direct investment and educate their workforce to be able to adopt technologies developed elsewhere. Competitiveness is primarily based upon high rates of production efficiency in manufacturing. The key processes in moving from the first to the second stage are capital accumulation and technological diffusion. These may enable countries to achieve a certain degree of 'catch-up growth'. A third stage is that of a technology generating economy (*innovation-driven stage*). According to Porter et al. (2002: 17), countries that have reached this stage innovate at the global technological frontier in at least some sectors. This stage also implies a high-income status. The transition to this stage requires a country to develop its ability to generate as well as commercialize new knowledge.

This entails intensive cooperation between universities, private businesses and government. Once a critical mass of knowledge, technologies, skills and purchasing power has been built up, innovation may achieve increasing returns to scale. These will fuel a self-perpetuating process of continuing innovation and long-term economic growth (Sachs, 2000). At this point one may speak of a knowledge economy. Audretsch and Thurik (2000, 2001 and 2004) describe this transition as one from the 'managed' to the 'entrepreneurial' economy.

Economic development and (occupational) entrepreneurship

Definitions of entrepreneurship abound. Hébert and Link (1989) list twelve different concepts of entrepreneurship that have one time or another been proposed by economists. Most of these concepts pertain to the social and economic functions of entrepreneurship. Other notions have to do with either an occupational or a behavioral view of entrepreneurship, as discussed in chapter 1 of this book. Synonyms for entrepreneurs in the occupational view, as adopted in the present book, are business owners, proprietors and self-employed. Subsequently, a distinction may be made between a *static* and a *dynamic* perspective of entrepreneurship. The static perspective views the number of business owners (or the business ownership rate) as a dimension of the industrial structure of the economy. The dynamic perspective refers to gross and net changes in the rate of business ownership.

Several authors, including Kuznets (1971), Schultz (1990), Yamada (1996) and Iyigun and Owen (1998) have reported a negative empirical relationship between the level of economic development and the rate of business ownership (self-employment) in the labor force. Their studies use large cross-sections of countries spanning a wide range of economic development. Likewise, time series data for several of the most highly developed economies show a declining trend in self-employment for at least the first three quarters of the 20th century (Wennekers and Folkeringa, 2002). There are various reasons for the historical decline of self-employment with increasing per capita income. Across different levels of economic development, a shift from agriculture to manufacturing implies economies of scale in production, while larger enterprises in many sectors may also offer better opportunities to minimize transaction costs. Additionally, Lucas (1978) assumes an unequal distribution of 'managerial' talent among the working population. He shows how rising real wages increase the opportunity cost of self-employment relative to the return, inducing marginal entrepreneurs to become employees. Iyigun and Owen (1998) assume a distribution of risk aversion. They argue that with rising economic development fewer individuals are willing to run the risk associated with becoming an entrepreneur as the relatively 'safe' professional earnings rise.

In recent decades, statistical evidence indicates a *reversal* of the negative relationship between real income and self-employment occurring at an advanced level of economic development. Blau (1987) was among the first to analyze this reversal for the US, using time series data for the period 1948-1982. Acs, Audretsch and Evans (1994) point out a clearly U-shaped trend in the total self-employment rate for 12 OECD countries between 1966 and 1990. They also establish a U-shaped pattern for several

individual countries. There are several reasons for this recent revival of self-employment. From a certain level of economic development onwards, the employment share of manufacturing starts declining while that of the services sector keeps increasing with rising per capita income, providing more opportunities for business ownership.[114] Also, at high levels of economic development, increasing income and wealth enhance consumer demand for variety (Jackson 1984) creating new market niches attainable for small businesses. On the supply side of entrepreneurship, as hypothesized in social psychology, there is a hierarchy of human motivations, ranging from physical needs at the bottom to self-realization at the top (Maslow 1970). Once the main material needs have been satisfied, a still higher level of prosperity will give prominence to immaterial needs such as a growing need for self-realization. Because it provides more autonomy (in the multi-dimensional sense of 'independent self determination')[115], entrepreneurship may then become more highly valued as an occupational choice than at lower income levels. Carree et al. (2002) summarize these arguments and hypothesize a U-shaped relationship between the level of per capita income and the rate of self-employment (business ownership) in the labor force. In a multiple-equation regression analysis, using data for 23 OECD countries in the period 1976-1996, they find empirical support for this hypothesis.

Do the above arguments with respect to the self-employment level also apply with respect to the gross inflow into self-employment? To some extent this will hold almost by definition as the start-up rate is positively related to the level of business ownership through several mechanisms on the demand side and the supply side of entrepreneurship. First, given a life cycle for enterprises, a high business ownership rate will *ceteris paribus* imply a high level of business closures and subsequent replacement start-ups, while a low business ownership rate implies a narrow scope for replacement. Secondly, the business ownership rate also affects the opportunities for the displacement of incumbent enterprises. Thirdly, on the supply side of entrepreneurship, the incumbent business ownership rate governs the availability of entrepreneurial role models stimulating other members of a population to become an entrepreneur. Accordingly, one may expect a U-shaped relationship between economic development on the one hand and nascent entrepreneurship and new business start-ups on the other, similar to the curvilinear correspondence between economic development and the level of business ownership. In addition, there are also specific reasons why a revival of the gross inflow into entrepreneurship at the high end of economic development would take place at the present time. Several studies argue that in the last 25 years, innovative advantage has moved from large, established corporations to small and new enterprises, because new information and communication technologies (ICT) have reduced the importance of scale economies in many sectors. Also, the present ICT revolution (sometimes called the 'Third Industrial Revolution') and the related process of globalization have led to an increasing degree of uncertainty in the

[114] This effect may be temporary in the case of future upscaling of average firm size in new services.

[115] See Van Gelderen et al. (2003) for an exposition of the 'multiple sources of autonomy as a startup motive'.

world economy from the 1970s onwards (Audretsch and Thurik, 2001; Thurow, 2003). This economic uncertainty, in turn, has also created more room and more need for new business start-ups as agents of change, trying to exploit new ideas[116]. Two regimes may be distinguished (Carree et al., 2002). In the Schumpeter Mark I regime ('creative destruction') new entrepreneurs challenge incumbent firms by introducing new inventions. In the Schumpeter Mark II regime ('creative accumulation') R&D activities of established corporations determine the rate of innovation. Industries in the latter regime develop a concentrated market structure, while industries in the former regime offer more opportunities to small businesses and to new entrepreneurial ventures. The greater role in technological development, in recent decades, for new business start-ups at the cost of large incumbent firms may be interpreted as a 'Schumpeterian regime switch' from the Schumpeter Mark II regime of the 1930-1970 era, back to a Schumpeter Mark I regime as prominent during the Second Industrial Revolution (1860 through the early 1900s)[117]. It is also indicated as a switch from a 'managed' towards an 'entrepreneurial' economy (Audretsch and Thurik, 2001). Clearly, for countries at the innovation-driven (high end) stage of economic development, the start-up of new enterprises is a crucial process (Porter et al., 2002: 18-19; Thurow, 2003: 95).

Summing up, we hypothesize a U-shaped relationship between a country's gross inflow into entrepreneurship and its level of economic development.

5.3 Data and method

Data on entrepreneurship and economic development
We make use of the Global Entrepreneurship Monitor (GEM) and some other sources. In 2002 there were 37 countries participating in GEM (see the Appendix). Of these, one country (Croatia) has not been included in the regression analysis due to missing data for the independent variables. The GEM database includes various metrics of entrepreneurship[118], as well as a wide selection of explanatory variables from standardized national statistics[119].

Our dependent variable is gross inflow into entrepreneurship. There are several reasons why we have chosen nascent entrepreneurship as its metric. Counts of new entries into business registries also reflect the creation of a new business unit, but these entries occur at the end of a successful start-up process and the proportion of still-born entrepreneurial efforts, in relation to those that reach the stage of

[116] "To get a few big success stories, millions of start-ups are necessary" (Thurow, 2003: 95).
[117] These regimes are strikingly symbolized by the fact that, in the US, more than 2,000 car manufacturing firms were set up prior to 1929, while by the late 1950s only three of these firms were left (Thurow, 2003: 56).
[118] These are nascent entrepreneurs, entrepreneurs in young businesses and entrepreneurs in established firms, as well as combinations thereof. See Reynolds, Bosma, Autio et al. (2005).
[119] For some variables, missing data were collected from additional sources. For details, see Van Stel et al. (2004).

registration, is unknown. Also, a major problem with a cross-national comparison of new registrations is its lack of harmonization, as these registrations are generally administrative files developed for other purposes often related to tax payments, while each country has developed different criteria for when a new business must pay a tax (related to unemployment insurance, social security payments, VAT etc.). Consequently, no database with harmonized business start-up data for a sufficient number of countries is available. Alternatively, we might have used GEM's so-called TEA-measures that include both nascent entrepreneurs and new businesses from 3-42 months old. TEA-rates have relatively smaller confidence intervals than nascent entrepreneurship rates. A conceptual disadvantage, however, is that TEA also reflects the survival rate of new enterprises. Thus we have chosen nascent entrepreneurship as our primary measure of entrepreneurship, but we have tested the stability of our findings through alternative regressions using TEA. Data on nascent entrepreneurship in 2002 are taken from the GEM 2002 Adult Population Survey. This database contains various entrepreneurial measures constructed on the basis of surveys of at least 2,000 respondents per country (37 countries in total). The nascent entrepreneurship rate is defined as the number of people actively involved in starting a new venture, as a percentage of the adult population (18-64 years of age). For a further exposition, see the article on GEM's methodology by Reynolds, Bosma, Autio et al. (2005). The nascent entrepreneurship rate (per 100 adults) in 2002 ranges from 11.6 in Thailand and 10.9 in India, to values below two in Russia, Sweden, Japan and Taiwan.

The most important manifestation of economic development is increasing per capita income. Gross national income per capita 2001 is expressed in purchasing power parities per US$, and these data are taken from the 2002 World Development Indicators database of the World Bank. As argued before, an alternative indicator of economic development is innovative capacity. We use the GCR Innovation Capacity Index taken from chapter 2.2 of the Global Competitiveness Report 2001-2002 of the World Economic Forum (Porter and Stern, 2002) [120]. It describes national innovative capacity as a country's potential to produce a stream of commercially relevant innovations. This capacity is not simply the realized level of innovation but also reflects the fundamental conditions, investments, and policy choices that create the environment for innovation in a particular location or nation. The index combines four sub-indexes, all of which capture a different aspect of innovative capacity. Each sub-index measures *the relative contribution* to the number of US patents in the period 1999-2000 (an indicator for a country's actual level of innovation), based on regressions using data from the GCR Survey. The four sub-indexes are the proportion of scientists and engineers in the workforce, which is an indicator for a country's innovation infrastructure; the innovation policy sub-index, captured by, among other things, intellectual property protection and R&D tax credits for the private sector; the cluster innovation environment sub-index, captured by, among other things, the

[120] The value for Hong Kong is missing from the GCR. However, three of the four sub-index values for Hong Kong *are* given, and based on that we approximate the Innovative Capacity Index for Hong Kong to be 22.8.

pressure from domestic buyers to innovate and the presence of suppliers of specialized research and training; and the linkages (between innovation infrastructure and a nation's industrial clusters) sub-index, captured by the quality of scientific research institutions and the availability of venture capital.

Method of analysis
We carry out three series of regressions for testing the hypothesized relationship between a country's gross inflow into entrepreneurship and its level of economic development. First, we regress nascent entrepreneurship on economic development as measured by per capita income, testing various functional relationships. Second, we carry out similar regressions using the innovative capacity index as our metric of economic development. Third, we repeat our regressions while adding several control variables. In the first approach, we look at different functional forms of the relationship between nascent entrepreneurship and per capita income. We consider three specifications: a linear relation, a quadratic specification (U-shape), and an inverse specification, i.e. decreasing towards an asymptote (L-shape). We look at the statistical fit of these three specifications (adjusted R^2 values). We also investigate whether there is a statistically superior specification, by applying likelihood ratio tests. In the second approach we again test these functional forms of nascent entrepreneurship but this time using the innovative capacity index as our metric of the level of economic development. In the third approach, we test our hypothesis against a selected set of control variables. First, we select an 'optimal' set of control variables from a larger portfolio, basically using a general-to-specific modeling procedure and successively eliminating the independent variable with the smallest t-statistic and re-estimating until each variable is significant at 10% level[121]. Next, we estimate a full model including a U-shaped relationship with either metric of economic development and the chosen set of control variables.

5.4 Control variables

In addition to the level of economic development, many other economic, technological, demographic, cultural and institutional variables determine the rate of (nascent) entrepreneurship. There is an extensive literature on these influences, across wide-ranging scientific domains including neo-classical economics, institutional economics, sociology and anthropology. Recently, these influences have been integrated into an eclectic framework (see chapter 3 of the present book). This framework is necessarily multidisciplinary in nature and distinguishes between various economic and non-economic domains. From this framework, we have selected a portfolio of independent variables as controls for testing our hypothesis.

Other economic factors
In addition to the level of per capita income, other economic factors also may impact nascent entrepreneurship. First, *economic growth in 2001 and in 2002* are defined as

[121] This method follows Bleany and Nishiyama (2002).

the annual % GDP growth in constant prices (i.e. real growth) for these respective years, and are taken from the World Economic Outlook 2002 of the International Monetary Fund (IMF). Increased demand for goods and services is a major factor stimulating new business start-ups, as may be inferred from various country studies of regional variations in new firm formation (Reynolds, Storey and Westhead, 1994: 449). In the short run business cycle fluctuations influence the market opportunities for new entrepreneurs, as was born out by recent evidence (Reynolds et al., 2002). We expect a positive influence of the annual economic growth rate on nascent entrepreneurship. Secondly, *unemployment* may act as a push factor for self-employment, but it may also be a negative (inverse) indicator of entrepreneurial opportunity (Evans and Leighton, 1990; Audretsch and Thurik, 2000; Verheul et al., 2002). We use the 2001 unemployment rate, taken from table 1.4.06 of the World Competitiveness Yearbook 2002 of the Institute for Management Development. Third, *income disparity* may stimulate entrepreneurship. On the supply side it may be both a push and a pull factor to enter self-employment, and on the demand side it is likely to create a more differentiated demand for goods and services. Empirical research by Ilmakunnas et al. (1999) suggests that income inequality positively influences the rate of self-employment, although reversed causality cannot be ruled out. Unfortunately, data on income disparity were not available for all 36 countries in our sample, so we discarded this variable.

Other technology indicators
The role of technology in general has been discussed above with respect to the influence of a nation's innovative capacity on entrepreneurial activity. Other specific technology indicators include the availability of computers and the use of Internet. These two variables are defined as the number of computers respectively Internet subscribers per 1000 people (in 2001), and are taken from tables 4.2.09 and 4.2.10 of the World Competitiveness Yearbook 2002.

Demographic variables
Relevant demographic factors include population growth, age distribution and educational attainment. *Population growth* is expected to have a positive effect on entrepreneurship (Armington and Acs, 2002: 43). A growing population provides opportunities for new economic activity as new and bigger consumer markets emerge because of the growing population (demand side of entrepreneurship). Population growth may also be a push factor to engage in new economic activity in order to make a living, particularly when population growth is driven by immigration (supply side of entrepreneurship). The population growth 1996-2002 is taken from the US Census Bureau IDB (International Data Base). As regards *age distribution*, while start-ups occur in all relevant age groups, the prevalence rate of nascent entrepreneurship is often seen to be highest in the age group between 25 and 34 (Delmar and Davidsson, 2000). Regarding the age composition of the population in 2002, we have shares in total population of five age groups: 20-24, 25-34; 35-44; 45-54 and 55-64 years. These data are also taken from the International Data Base of the US Bureau of the Census. *Education* is somewhat of an anomaly (Wennekers et al., 2002). Research conducted

on a Swedish sample at the individual level shows that nascent entrepreneurs have, on average, attained a higher educational level than those in a control sample (Delmar and Davidsson, 2000). Lee, Florida and Acs (2004) present evidence that post-secondary education may have a positive effect on new firm formation in services, but a negative effect in manufacturing. However, educational attainment could not be included in our study as data are not available for all countries in our sample.

Culture

A relevant phenomenon in the cultural domain is the influence of *entrepreneurial role models*, as represented by the prevalence of incumbent business owners, on nascent entrepreneurship (see chapter 3 of the present book)[122]. The incumbent business ownership rate is computed as the sum of entrepreneurs in 'young businesses' and 'established businesses', both measured as a percentage of adult population (18-64 years old), taken from the GEM 2002 Adult Population Survey[123]. An enterprise is defined as a 'young business' if the business has paid salaries and wages for more than three months but for less than 42 months, and as an 'established business' if the business has paid salaries and wages for more than 42 months (Reynolds et al., 2002: 38). Secondly, *a (former) centralized command economies' dummy* is included because over many decades of the 20th century, culture and institutions in the (formerly) communist countries have become unfavorable or even hostile to self-employment. We control for this negative impact on entrepreneurship by introducing a dummy. The variable has value 1 for Russia, Hungary, Poland, China and Slovenia, and value 0 for all other countries in our sample.

Institutions

Relevant institutions include fiscal legislation (tax rates and tax breaks), the social security system influencing the rewards and the risks of entrepreneurship, and the administrative requirements for starting a new business. The impact of *taxes* on the level of entrepreneurial activity is complex and even paradoxical. On the one hand high tax rates reduce the return on entrepreneurship, on the other hand self-employment may offer greater opportunities to evade or avoid tax liabilities. For a selection of 12 OECD countries spanning the period 1972-1996, Parker and Robson (2004) find a significantly positive effect of personal income tax rates on self-employment. Our control variable is tax revenues as % of GDP (1999), taken from table 2.2.09 of the World Competitiveness Yearbook 2001. The effect of *social security* on entrepreneurial activity may also be two-sided. First, there is a negative impact because generous social security for employees increases the opportunity costs of self-employment and adds to the costs of being an employer. In this respect, social security benefits determining the opportunity costs of unemployed persons may also interact with unemployment (Noorderhaven et al. 2004). Second, social security in

[122] A special case, empirically confirmed by de Wit (1993a), is the hypothesis that children of self-employed fathers (parents) are more likely to become self-employed themselves.

[123] This variable is not to be confused with the so-called 'Total Entrepreneurial Activity' (TEA) used elsewhere in this publication, which combines the nascent entrepreneurs and the 'new businesses'.

general may have a positive effect on entrepreneurial activity by creating a safety net in the case of business failure. Employers' social security contributions as a percentage of GDP (2000), taken from table 2.2.01 of the World Competitiveness Yearbook 2001, are used as our control variable. The *administrative requirements for starting a new business* are measured as the number of permits and the number of days required to start a new business taken from tables 8.05 and 8.06, respectively, of the Global Competitiveness Report 2001-2002. These variables are expected to have a negative bearing on business start-ups.

A correlation matrix for the dependent and independent variables is presented in table 5.1. The table is based on 36 observations, i.e., excluding Croatia that has missing values for several variables (also see the Appendix). Because the 'age group variables' are highly inter-correlated, only the population share of age group 45-54 years, which is most strongly (negatively) correlated with nascent entrepreneurship, is included in the table.

5.5 Analysis of the main results

Approach 1 - Per capita income and nascent entrepreneurship
We computed regressions for the linear, quadratic and inverse specifications, as described in the 'Data and method' section, using data for 36 countries participating in GEM 2002 (Croatia excluded). Based on a comparison of adjusted R^2 values and nested likelihood ratio tests we conclude that the linearly decreasing specification is formally rejected, compared to the quadratic (U-shaped) and inverse (L-shaped) specifications (see Annex II in Van Stel et al., 2004, for details). Additional likelihood ratio tests reveal that the statistical fit of the quadratic specification (U-curve) is somewhat better than that of the inverse specification (L-curve), but this difference is not significant. So most probably, from a certain level of economic development onwards, entrepreneurship starts to rise again as per capita income increases still further. Estimation results for the quadratic specification are in the left hand column of table 5.2. As an illustration, in figure 5.1 we depict the estimated U-curve as well as the positions of the 37 GEM countries (including Croatia) in the per capita income/nascent entrepreneurship space (country two letter codes are in the Appendix). The minimum of the curve lies at about 22,000 US $, at the level of 3.3 nascent entrepreneurs per 100 adults. As a test of robustness we also carried out a regression excluding the uppermost observation on the right-hand side (the US). Both the linear and the quadratic per capita income terms remain significant at 5% level. A further test of the robustness of our results is provided by alternative regressions of TEA, the total entrepreneurial activity index that includes nascent entrepreneurs as well as owner-managers of young businesses. Applying likelihood ratio tests similar to those applied for nascent entrepreneurship, the quadratic specification performs best.[124]

[124] Adjusted R^2 is 0.32. T-values for linear and quadratic term are -3.3 and 2.6, respectively.

Table 5.1 Correlation matrix, 36 observations

	1.	*2.*	*3.*	*4.*	*5.*	*6.*	*7.*	*8.*	*9.*	*10.*	*11.*	*12.*	*13.*	*14.*	*15.*	*16.*
1. Nascent rate	1.00															
2. Business ownership	.63**	1.00														
3. GCR Innov. Cap. Index	-.55**	-.29	1.00													
4. Social security contributions	-.45**	-.43**	.05	1.00												
5. Communist country	-.19	-.16	-.41*	.23	1.00											
6. Computers per capita	-.38*	-.16	.89**	-.09	-.43**	1.00										
7. Internet per capita	-.34*	-.08	.81**	-.18	-.42*	.96**	1.00									
8. Tax revenue	-.43**	-.35*	.54**	.38*	-.03	.56**	.45**	1.00								
9. Permits req. to start bus.	.25	.14	-.41*	.27	.06	-.41*	-.36*	-.12	1.00							
10. Days req. to start bus.	.24	-.05	-.45**	.31	.03	-.50**	-.50**	-.08	.78**	1.00						
11. Population growth 96-02	.39*	.18	-.10	-.42*	-.36*	.00	.02	-.59**	-.09	-.09	1.00					
12. Economic growth 2001	.09	.21	-.21	-.04	.45**	-.22	-.22	.04	.28	.03	-.31	1.00				
13. Economic growth 2002	-.03	.04	.06	-.18	.24	.02	.06	-.13	.20	-.02	.03	.67**	1.00			
14. Unempl. rate 2001	.03	-.20	-.31	.11	.08	-.48**	-.50**	-.03	.04	.27	-.11	-.12	-.32	1.00		
15. Population share 45-54 yr.	-.63**	-.39*	.52**	.28	.35*	.54**	.52**	.45**	-.44**	-.41*	-.36*	-.01	.07	-.32	1.00	
16. Per capita income	-.44**	-.29	.87**	.02	-.43**	.93**	.87**	.57**	-.38*	-.39*	-.08	-.24	-.11	-.41*	.56**	1.00

* p< .05.
** p< .01.

Table 5.2 Relating nascent entrepreneurship (2002) to the level of economic development, as measured by per capita income and innovative capacity (approach 1 and 2)

	Approach 1: U-curved relationship with per capita income	*Approach 2: U-curved relationship with innovative capacity*
Constant	11.8 (6.6)	58.8 (3.8)
Per capita income	-.76 (3.4)	
Per capita income, squared	.017 (2.8)	
GCR Innovative Capacity Index		-4.3 (3.1)
GCR Inn. Cap. Index, squared		.085 (2.8)
Adjusted R^2	.31	.40
Observations	36	36

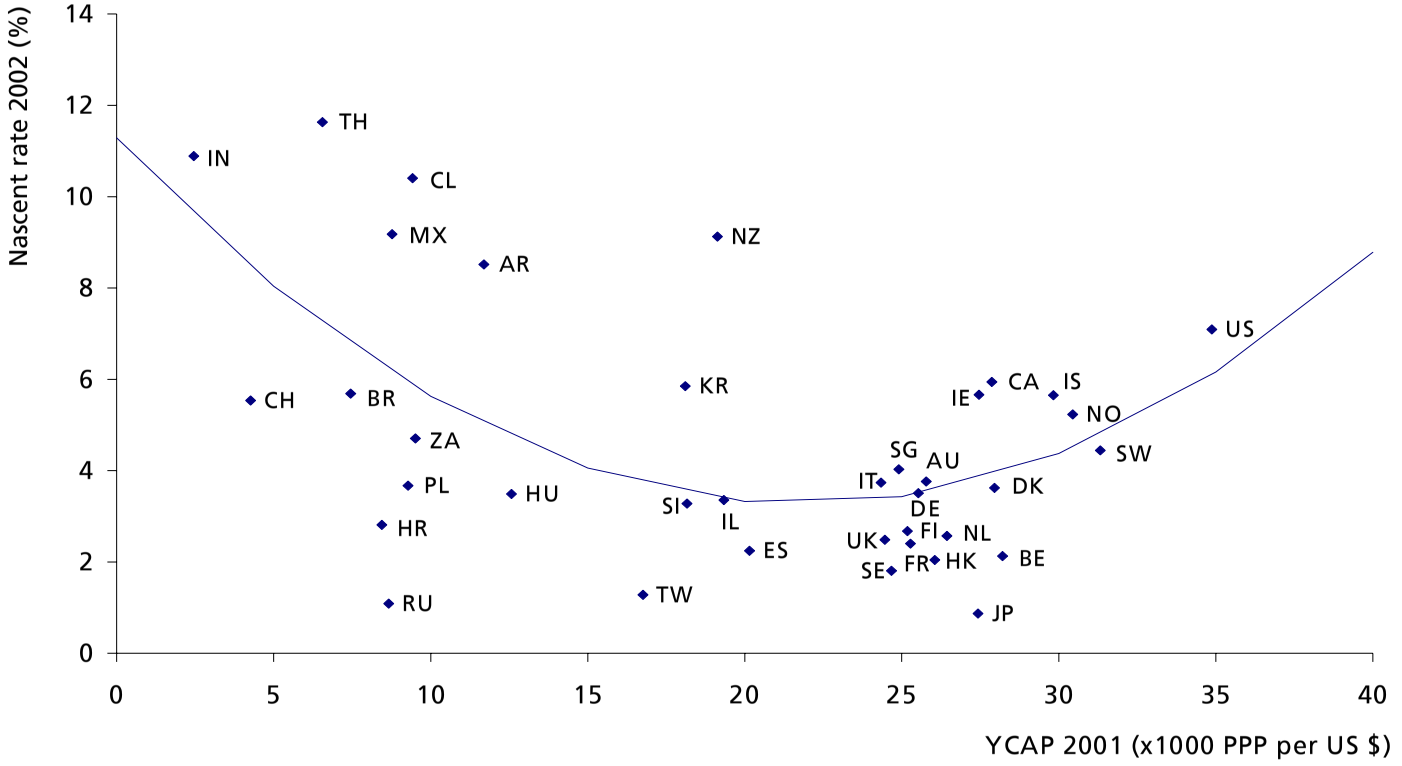
Absolute t-values between parentheses.

Approach 2 - Innovation capacity and nascent entrepreneurship

To test the role of the innovative capacity as a metric of economic development we perform a similar exercise as in approach 1. Again we test linear, quadratic and inverse specifications, based on the innovative capacity index. We find again that the linear specification is rejected. This time however, the inverse specification is also formally rejected, in favor of the quadratic specification. This suggests that initially, a developing innovation system discourages new and small enterprises ('regime of creative accumulation') up to a certain point onwards, after which still further improvement of the innovation system favors entrepreneurship ('regime of creative destruction').[125] Estimation results are in the right hand column of table 5.2, while figure 5.2 presents the estimated U-curve. The minimum of the curve of 3.3 nascent entrepreneurs per 100 adults is reached at a level of the innovative capacity index of 25.5. For comparison, the index values for the 36 countries in our data set range from 16.8 (Mexico) to 30.3 (US), and 14 countries have a value higher than 25.5 (source: Porter and Stern, 2002: 104). Compared to per capita income, the U-shaped relation with innovative capacity is somewhat less robust to removal of the US observation.

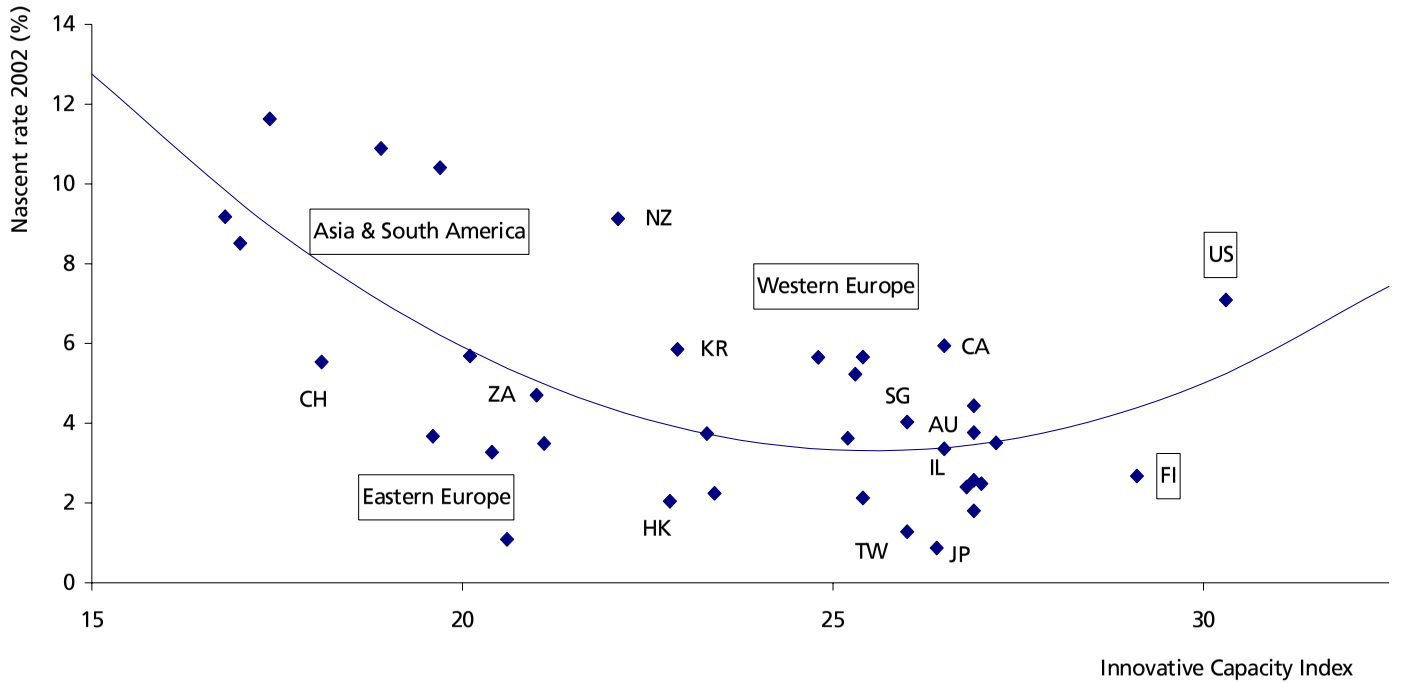
[125] The relation between innovation and entrepreneurship is a complex one. We assume an 'innovation pull' effect: if innovation is in the air because of the specific stage of the technology cycle there will be a supply of entrepreneurial energy trying to exploit the opportunities. The reverse effect is also likely to exist when the supply of entrepreneurship, driven for instance by low opportunity costs, leads to the exploration of new markets because incumbent markets have high entry barriers. In reality, these two effects will probably interact leading to dynamic spurts in innovative and entrepreneurial behavior. Further research using times series data sets is needed to throw more light on the exact relationship between innovative and entrepreneurial behavior.

Figure 5.1 Nascent entrepreneurship versus per capita income, the U-curve



For reasons of completeness Croatia (HR), that was not a part of the regression analysis, is also included in this figure.

Figure 5.2 Nascent entrepreneurship versus innovative capacity, the U-curve



The t-value of the squared term then drops to 1.7. As in the case of approach 1 (per capita income), regression results for TEA are similar to those for nascent entrepreneurship.[126]

Approach 3 - Regression analysis including control variables
In the third approach we test the role of economic development against the influence of our control variables as other possible determinants of nascent entrepreneurship. To reduce multicollinearity, we omit Internet penetration per capita, the number of days required to start a business, and economic growth in 2002 from the control variables[127]. Next, we apply a general-to-specific modeling procedure, resulting in a set of significant variables. However, some candidate control variables may not appear in the final set because of multicollinearity with other regressors, and may be re-assessed.

Estimation results for this approach, employing linear relationships only, are in table 5.3. The first column presents our initial set, i.e. a constant, ten control variables and linear terms of per capita income and innovative capacity. The final set of significant regressors (given our tolerance level of 0.1) is presented in the second column. However, it seems likely that the variables tax revenues and population growth were omitted from the procedure due to multicollinearity and not because they have no (significant) influence on nascent entrepreneurship (see Annex III in Van Stel et al., 2004, for details). Therefore, we also present results including these two variables (third column). In the last two columns of table 5.3 we present our full model, combining the selected variables from the general-to-specific procedure (including tax revenues and population growth) with either the per capita income variables (linear and squared terms) or the innovative capacity index (linear and squared terms). As regards the estimated U-curves for per capita income and innovative capacity, we find these to be robust, because both terms (linear and squared) remain significant in the regressions including control variables[128]. In addition to the effects of per capita income and innovative capacity, we find significant effects of five variables.
First, incumbent business ownership has a positive influence on nascent entrepreneurship. This supports the assumed importance of entrepreneurial role models. It may also reflect the willingness of experienced workers in small firms to go out and create a new business. An additional explanation is that a larger number of incumbent business owners may imply a higher turnover of enterprises, as discussed in the Literature Review section. Second, we find a negative effect of the employers' social security

[126] Quadratic specification has highest adjusted R^2, 0.34. T-values for linear and quadratic term are -2.4 and 2.1, respectively.

[127] These variables are correlated with respectively the number of computers per capita, the number of permits required to start a business, and economic growth in 2001.

[128] However, the U-shaped curves of nascent entrepreneurship as estimated in table 5.3 are somewhat less steeply sloped than those in table 5.2. This may be due to the fact that the 'incumbent business ownership' variable is also U-shaped with respect to economic development, as discussed in the Literature Review section.

contributions on nascent entrepreneurship[129]. In countries with a relatively generous social security system, the unemployed have less financial need to set up shop for themselves and the opportunity costs of becoming self-employed are relatively high. Besides, social security contributions add to the costs of being an employer.
Apparently, these effects dominate a potential positive effect stemming from a relatively high social minimum acting as a safety net in the case of business failure. Third, there is a negative effect for the (former) centralized command economies dummy. This reflects that the 'inherited' culture and institutions in the (former) communist countries are less suitable for self-employment. Fourth, tax revenues as a percentage of GDP are found to have a positive effect on nascent entrepreneurship. This result supports the tax evasion or tax avoidance hypothesis, but it may also reflect that countries with higher tax revenues may be spending more on infrastructure and research and development, providing a better context for new start-ups. Fifth, we find the hypothesized positive effect of population growth. This confirms earlier results presented by Hunt and Levie (2003) who use individual GEM-data within the context of a different model specification.[130]

Differentiating between opportunity-based and necessity-based nascent entrepreneurship

In this section we distinguish between opportunity-based and necessity-based entrepreneurial activity. We estimate equations for these types of nascent entrepreneurship, comparing different functional forms of our metrics of economic development. The Global Entrepreneurship Monitor distinguishes two basic (classes of) dominant reasons or motives why individuals participate in entrepreneurial activities: (a) primarily, they perceive a business opportunity (i.e. they choose to start a business as one of several possible career options), or (b) they see entrepreneurship as their last resort (i.e. they feel compelled to start their own business because all other work options are either non-existent or unsatisfactory). Using this categorization it is possible to label more than 97 percent of those who are active as either 'opportunity' or 'necessity' entrepreneurs (Reynolds et al., 2002: 15). In our sample, the mean share of opportunity nascent entrepreneurship with respect to total nascent entrepreneurship is 79%. In Norway this share is as high as 99%. Relatively low shares (below 60%) are found in South Africa, Argentina, Brazil and Chile. In other words, in these (lesser developed) countries relatively many nascent entrepreneurs engage in entrepreneurial activity out of necessity.

[129] In a follow-up project using a similar regression model, a negative effect on nascent entrepreneurship was also found for the unemployment replacement rate (Hessels et al., 2006).

[130] Using the method of Hierarchical Linear Modelling, Hunt and Levie (2003) link various entrepreneurship measures at the individual level (94,260 respondents) to a number of explanatory variables at the macro level, and find that "population growth was the only consistent predictor of entrepreneurial activity, being significant and positive for all measures of entrepreneurial activity except corporate start-ups and informal investment".

Table 5.3 Explaining nascent entrepreneurship in 2002, linear relations and full model (approach 3)

	General-to-specific procedure: initial linear regression	*General-to-specific procedure: selected linear regression*	*Regression including tax revenues and population growth*	*Full model combining U-shaped relationship with economic development and control variables*	
Constant	13.0 (1.9)	14.7 (5.4)	13.3 (4.5)	7.5 (3.4)	51.1 (4.7)
Business ownership	.19 (2.2)	.17 (2.6)	.19 (2.9)	.18 (2.7)	.17 (3.0)
Social security as % GDP	-.046 (1.2)	-.044 (1.8)	-.043 (1.6)	-.029 (1.0)	-.047 (2.1)
Communist country	-1.6 (.8)	-2.6 (2.7)	-2.1 (2.0)	-1.8 (1.7)	-2.0 (2.2)
Computers per capita	-.002 (.4)				
Tax revenue as % GDP	.068 (1.2)		.060 (1.5)	.083 (1.9)	.081 (2.4)
Number of Permits required to start bus.	.038 (.2)				
Population growth 1996-2002	.15 (1.4)		.13 (1.6)	.19 (2.1)	.15 (2.0)
Economic growth 2001	.039 (.2)				
Population share 45-54 years old	-.14 (.4)				
Unemployment rate	-.029 (.3)				
Per capita income	.043 (.4)			-.71 (3.7)	

Table 5.3, continued

	General-to-specific procedure: initial linear regression	*General-to-specific procedure: selected linear regression*	*Regression including tax revenues and population growth*	*Full model combining U-shaped relationship with economic development and control variables*	
Per capita income, squared				.014 (2.9)	
GCR Innovative Capacity Index	-.43 (1.9)	-.45 (4.7)	-.51 (4.6)		-3.9 (4.1)
GCR Inn. Cap. Index, squared					.072 (3.6)
Adjusted R^2	.57	.63	.64	.62	.75
Observations	36	36	36	36	36

Absolute t-values between parentheses.

We compare linear, U-shaped and L-shaped relations for opportunity and necessity nascent entrepreneurship separately, by again applying likelihood ratio tests. Some results are presented in table 5.4. With respect to per capita income, we find a quadratic (U-shaped) relationship to have the best statistical fit for opportunity entrepreneurship. This finding is intuitively plausible in so far as many new opportunities for entrepreneurship arise at the high end of economic development. For necessity entrepreneurship we find a negative relationship with per capita income, which is also plausible. As regards innovative capacity, we again find a quadratic function for opportunity entrepreneurship and a decreasing function for necessity entrepreneurship. However, this function is L-shaped instead of decreasing linearly.

Table 5.4 Relating opportunity and necessity nascent entrepreneurship (2002) to the level of economic development, as measured by per capita income and innovative capacity

	Per capita income		*Innovative capacity*	
	Opportunity	*Necessity*	*Opportunity*	*Necessity*
	*Quadratic**	*Linear**	*Quadratic**	*Inverse**
Constant	8.0	2.6	43.3	107.9
	(5.6)	(7.7)	(3.3)	(5.8)
Linear term:	-.57	-.079	-3.3	
x	(3.2)	(5.2)	(2.9)	
Quadratic term:	.014		.068	
x^2	(2.9)		(2.7)	
Inverse term:				-111.5
x/(x+1)				(5.7)
Adjusted R2	.20	.42	.24	.48
Observations	36	36	36	36

Absolute t-values between parentheses.
The symbol x stands for either per capita income or innovative capacity.
* Statistically superior specification.

5.6 Conclusions

In this chapter, a U-shaped relationship between the rate of nascent entrepreneurship and the level of economic development is hypothesized based on both the literature on entrepreneurship and that on economic development. This hypothesis is tested using three approaches of the explanation of nascent entrepreneurship across countries and using data for 36 countries participating in the Global Entrepreneurship Monitor 2002. The first approach finds support for a U-shaped relationship between nascent entrepreneurship and per capita income as our metric of economic development. The second approach finds support for a U-shaped relationship between nascent entrepreneurship and an innovative capacity index. The third approach tests these U-shaped relationships against several control variables, including the incumbent

business ownership rate (+), social security expenditure (-), tax revenues (+), population growth (+), and a (former) communist country dummy (-). A specification combining either of the two approaches for economic development with the control variables corroborates our hypothesized U-shaped relationship between nascent entrepreneurship and economic development. The model using the innovative capacity index as our metric of economic development has the highest explanatory power (adjusted $R^2 = 0.75$). Additionally, separate regressions for opportunity-based nascent entrepreneurship (U-shaped relationship) and necessity-based nascent entrepreneurship (decreasing relationship) underline that the U-shaped relationship between total nascent entrepreneurship and economic development is particularly related to the creation of many new business opportunities at more advanced levels of economic development. We assume that the U-shaped patterns for total nascent entrepreneurship, as shown in figures 5.1 and 5.2, are the net effect of two processes affecting opportunity and necessity entrepreneurship[131].

The results suggest that a 'natural rate' of entrepreneurship is to some extent governed by 'laws' related to the level of economic development. Consequently, the level of economic development has to be taken into account to evaluate whether entrepreneurial dynamics are high or low. Furthermore, another recent study (Van Stel, Carree and Thurik, 2005) finds that the impact of entrepreneurial dynamics on economic growth is considerably smaller (or even negative) for developing countries than for more highly developed economies. Taken together, these results suggest that entrepreneurial dynamics play a different economic role in countries at different stages of economic development[132]. What does this conclusion imply for economic policy across subsequent stages of economic development? On the one hand, the results suggest that low-income nations, given their stage of development, should not consider the promotion of new business start-ups as a top priority on their policy agenda. Instead, they may be better off investing in the management qualities of their population and fostering the exploitation of scale economies through foreign direct investment and the growth of young businesses. To that purpose, governments of these countries must establish confidence in property rights, promote education, guarantee access to capital markets, safeguard stable macroeconomic conditions and make sure that the necessary physical infrastructure is in place. Moreover, they may consider providing specific tax incentives for foreign direct investment. On the other hand, for the economically most advanced nations, fostering investment in research and development, improving the incentives for self-employment, stimulating entrepreneurship education and promoting the commercial exploitation of scientific

[131] In particular, adding up the estimated functions for necessity and opportunity entrepreneurship with respect to per capita income, rather closely reproduces the U-shaped curve estimated for total nascent entrepreneurship.

[132] For a similar conclusion with respect to the level of business ownership, see Carree et al. (2002) who estimate the 'equilibrium rate' of business ownership in 23 OECD countries to be a U-shaped function of economic development. Moreover, deviations between the actual and the equilibrium level of business ownership (given the stage of economic development) are found to have a negative impact on economic growth.

findings through transparent intellectual property rights and a well-developed market for venture capital offer the most promising approach for public policy.

Another conclusion has to do with the speed of adjustment towards the 'natural' rate of (nascent) entrepreneurship, or towards any other rate of entrepreneurship that a country might aspire. Next to the level of economic development, demographic, cultural and institutional factors are found to have an influence on the rate of entrepreneurial dynamics. As these determinants are structural in nature, their impact contributes to the stable and path-dependent character of comparative rates of nascent entrepreneurship[133]. Thus, in the short run the influence of government policy on the rate of entrepreneurial dynamics may be relatively modest. In the long run, government policy may have more impact through a gradual evolution of culture and institutions. Governments in high-income countries striving to promote entrepreneurship are advised to be patient and persevering. The road to an entrepreneurial society is a long one (Bosma et al., 2002).

This study has several limitations that should be borne in mind when interpreting the results. First, the analysis pertains to the differences in nascent entrepreneurship across countries at one moment in time only. This is probably the main reason why no effect of cyclical variables was found. A preliminary analysis carried out by Reynolds et al. (2002), comparing so-called total entrepreneurship activity (TEA) rates for 29 countries in 2001 and 2002 however suggests the existence of a strong cyclical component of entrepreneurship (new business start-up rates) in the short run. However, the fact that the relative rankings of countries with respect to these TEA-rates are remarkably stable between these two years, supports the view that structural variables determine the comparative rate of entrepreneurship. Second, nascent entrepreneurship as used in this chapter is an aggregate indicator of entrepreneurship. Disaggregating by sector may lead to different results. Third, the innovative capacity index as used in this chapter is a broad concept. The use of the underlying sub-indices as described in the 'Data' section may throw more light on which aspects of innovative capacity are most important. This is important for concrete policy initiatives stimulating entrepreneurial activity. Fourth, by using the full set of GEM-countries in our regressions, the present chapter implicitly assumes that the effects of the various independent variables are uniform across a wide variety of countries. However, there may be interaction effects in the sense that the level of economic development influences the effects of various other determinants. For instance, computers and Internet use may be more important for setting up a business in highly developed countries than in less developed ones. More generally, the model does not explicitly take into account that there may be multiplier effects, originating in a two-way relationship between entrepreneurship and economic development (Carree et al., 2002).

[133] With respect to the level of business ownership, Carree et al. (2002) also found a slow speed of adjustment.

APPENDIX Participating countries in GEM 2002

For the empirical part of the current chapter use is made of the GEM database. The countries participating in GEM 2002 are listed below.

GEM participating countries (2002)

1. United States (US)
2. Russia (RU)
3. South Africa (ZA)
4. The Netherlands (NL)
5. Belgium (BE)
6. France (FR)
7. Spain (ES)
8. Hungary (HU)
9. Italy (IT)
10. Switzerland (SW)
11. United Kingdom (UK)
12. Denmark (DK)
13. Sweden (SE)
14. Norway (NO)
15. Poland (PL)
16. Germany (DE)
17. Mexico (MX)
18. Argentina (AR)
19. Brazil (BR)
20. Chile (CL)
21. Australia (AU)
22. New Zealand (NZ)
23. Singapore (SG)
24. Thailand (TH)
25. Japan (JP)
26. Korea (KR)
27. China (CH)
28. India (IN)
29. Canada (CA)
30. Ireland (IE)
31. Iceland (IS)
32. Finland (FI)
33. Croatia (HR)[134]
34. Slovenia (SI)
35. Hong Kong (HK)
36. Taiwan (TW)
37. Israel (IL)

[134] Croatia is not included in the regression analysis due to a lack of data for several independent variables.

CHAPTER 6

THE ROLE OF DISSATISFACTION AND PER CAPITA INCOME IN EXPLAINING SELF-EMPLOYMENT ACROSS 15 EUROPEAN COUNTRIES

Abstract
This chapter deals with explaining the sizable differences in the rate of self-employment (business ownership) across 15 European countries in the period 1978-2000, within a framework of occupational choice, focusing on the influence of dissatisfaction and of per capita income. Using two different measures of dissatisfaction, in addition to the level of economic development and controlling for several other variables, we find that, in addition to a negative and significant impact of per capita income, dissatisfaction at the level of societies has a positive and significant influence on self-employment levels. Both dissatisfaction with life and dissatisfaction with the way democracy works are found to influence self-employment. It is concluded that these are proxies for job dissatisfaction and at the same time represent other negative 'displacements' known to promote self-employment. The findings indirectly point at the potential importance of push factors within the incentive structures of modern economies.

This chapter is based on:

Noorderhaven, Niels, Roy Thurik, Sander Wennekers and André van Stel (2004), The role of dissatisfaction and per capita income in explaining self-employment across 15 European countries, *Entrepreneurship: Theory and Practice,* 447-466, with kind permission of Blackwell Publishing.

THE ROLE OF DISSATISFACTION AND PER CAPITA INCOME IN EXPLAINING SELF-EMPLOYMENT ACROSS 15 EUROPEAN COUNTRIES

6.1 Introduction

Scholars such as Chandler (1977), Galbraith (1967), and Schumpeter (1942) have convinced a generation of economists, social scientists and policy makers that the future was in the hands of large corporations, and that small business would fade away as the victim of its own inefficiencies. The justification for small businesses to survive seemed to be less on the grounds of economic efficiency than for employment and social and political purposes. More recently, however, the role ascribed to small business has changed. It is now also seen as a vehicle for entrepreneurship, contributing in terms of innovative and competitive power, rather than just employment and social and political stability (Morris, 2001). New evidence (Carree and Thurik, 2003; van Stel, 2005a) suggests that entrepreneurship is one of the determinants of economic growth. Therefore, it should be perceived as something desirable for economic reasons, rather than as a social good that should be maintained at an economic cost.

Confronted with rising concerns about economic growth and competitiveness in global markets, governments have responded to this new evidence by making the stimulation of self-employment a policy priority (Audretsch et al., 2001; Carree and Thurik, 2003; Geroski and Jacquemin, 1985; OECD, 1998). The question of how to realize this new policy agenda has led to the renewed recognition of two types of research questions. Firstly, why do some individuals seek self-employment, while others prefer to be an employee rather than a business owner? Secondly, why are more individuals self-employed in some countries than in others? The first question is systematically addressed in the literature on occupational choice (Blanchflower and Oswald, 1998; Brockhaus, 1982; De Wit, 1993a; Kihlstrom and Laffont, 1979; Shapero and Sokol, 1982; Van Praag, 1996), whereas the second has been studied in a more ad hoc manner (see for example Acs, Audretsch and Evans, 1994; Audretsch, Thurik, Verheul and Wennekers, 2002; Blanchflower, 2000). Yet this latter question seems highly relevant, as the proportions of self-employment differ strongly between countries, making it plausible that conditions or the way in which individuals respond to them also vary significantly.

Policies for stimulating entrepreneurship will have to take these factors into account. Additionally, policy makers should be aware of the limits of policy influence. It is important to know the extent to which factors are at play that are hardly susceptible to policy measures, such as cultural characteristics that have been shown to be very stable and changing only slowly over time (Hofstede, 2001).

Previous empirical investigations into the proportion of self-employment across countries have primarily focused on the role of economic factors. Cultural variables have received only limited attention in this domain[135]. For instance, *post-materialism*, first coined by Inglehart (1977), describes the degree to which a society places immaterial life-goals such as personal development and self-esteem above material security. The role of post-materialism in explaining differences in self-employment between countries is dealt with in Uhlaner and Thurik (2004). Their paper confirms a negative relationship between post-materialism and self-employment: countries with less materialistic values have lower self-employment rates in the labor force. Another example is *uncertainty avoidance*, referring to the extent to which members of a culture feel threatened by uncertain or unknown situations (Hofstede, 2001). In strong uncertainty-avoidance countries people are assumed to have stronger emotional needs for rules and procedures, and to stay longer in a job at a particular organization. Uncertainty-avoidance also correlates negatively with need for achievement (Hofstede, 2001: 164). This suggests that in a strong uncertainty avoidance culture the step from wage-employment or unemployment to self-employment will be made less readily than in weak uncertainty-avoidance countries. The role of uncertainty avoidance is the subject of chapter 7 of the present book.

The objective of the present chapter is to explore the role of satisfaction, or rather its inverse, dissatisfaction, as a determinant of aggregate self-employment. At the individual level, dissatisfaction has been shown to be a push factor in the decision to set up shop. But what is its influence at the macro level? The present research is the first to systematically investigate the role of dissatisfaction explaining self-employment across countries. We will use measures of aggregated dissatisfaction in combination with economic, social and demographic variables of 15 Member States of the European Union.
In section 2 of this chapter we first look at motivational factors proposed to influence the willingness to be self-employed at the level of the individual actor, and consider the question of whether these factors can be 'aggregated' to the level of national economies. Next, we look at so-called 'reality' factors primarily influencing the resources and opportunities for entrepreneurship. Two kinds of hypotheses are developed. Firstly, we formulate hypotheses predicting the effect of two aggregated measures of dissatisfaction on the rate of self-employment in a country. Secondly, we discuss the impact of the level of economic development on the rate of self-employment. In section 6.3 we also identify other economic variables as well as indicators of social and demographic structures that have to be controlled for when explaining self-employment at the level of national economies.
A major handicap in the analysis of international differences in self-employment is a lack of data. While research at the level of individuals can make use of large samples, data availability at the level of societies is severely restricted. In section 6.4 we

[135] When 'national culture and entrepreneurship' is the subject of research, it usually does not pertain to entrepreneurship rates at the country level, but to the characteristics of entrepreneurs or to corporate entrepreneurship (see Hayton, George and Zahra, 2002, for a review).

therefore give ample attention to our data. In the present chapter, time-series of aggregate levels of dissatisfaction in 15 European countries (taken from the *Eurobarometer* surveys) are used. Section 6.4 also gives details on the other data sets used to test our hypotheses, dependent and independent variables and controls, and on the statistical methods used. The results of the analysis are presented and discussed in section 6.5. Conclusions follow in section 6.6.

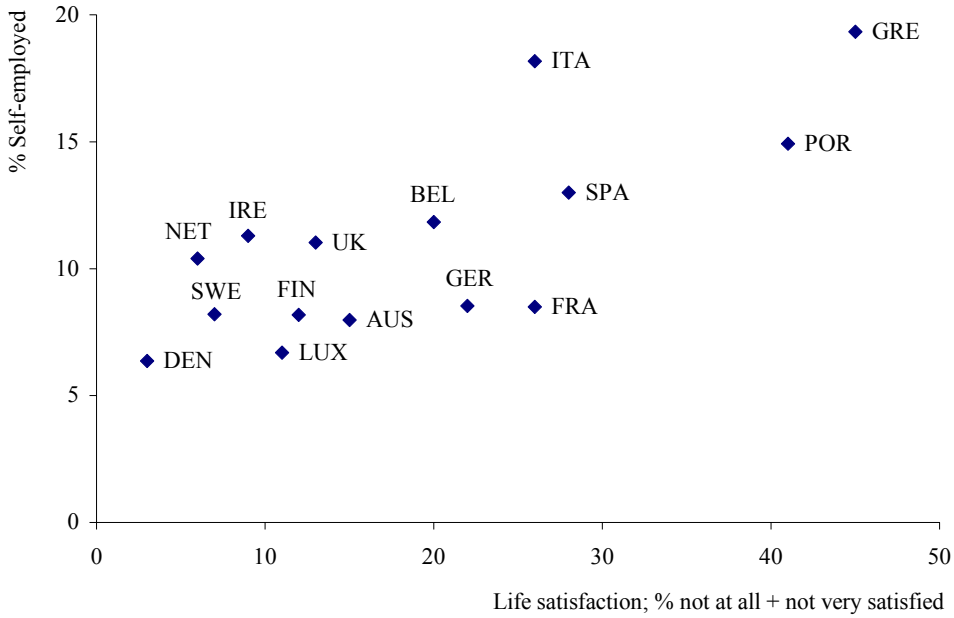
6.2 Motivational factors, level of economic development and self-employment

Recent years have brought an increasing body of literature on the determinants of self-employment and entrepreneurship at the country level. Most work in this area is restricted to economic determinants (Blau, 1987; Carree et al., 2002; Lucas, 1978; OECD, 2000; Parker, 1996). An exception is Wennekers et al. (2001), which addresses the influence of cultural variables by running separate regressions for countries with high and low uncertainty avoidance. Qualitative studies of entrepreneurship at the country level (Reynolds et al., 2000; Verheul et al., 2002; Wennekers, Uhlaner and Thurik, 2002) also draw upon other disciplines, such as psychology and sociology. The eclectic framework of occupational choice as discussed in chapter 3 of the present book assumes that individuals valuate and compare the expected financial and non-pecuniary risks and rewards of self-employment versus wage-employment. This framework of self-employment reflects general[136] psychological theories of occupational choice, such as discussed by Vroom (1982). Here, *anticipated* satisfaction of expected pay, status, autonomy and other 'outcomes', weighted with their subjective probabilities, determine the 'valence' (Vroom, 1982: 15) of alternative occupations. The preferred occupation is defined as the occupation with the highest positive valence (Vroom, 1982: 53). Besides 'occupational preference', Vroom also distinguishes 'occupational choice', referring to the decision to attempt entering an occupation, and 'occupational attainment', referring to the occupation in which a person is presently working. The *actual* satisfaction that an occupation provides, which is called its 'value' (Vroom, 1982: 15), subsequently influences the stability of occupational attainment. In this approach both anticipated and actual satisfaction are among the driving forces in the occupational choice process.

In the present chapter we focus on whether differences in the rate of self-employment at the country level are related to differences in satisfaction of the population at large. This focus is motivated as follows. First, as we will discuss below, at the individual level, the influence of dissatisfaction on the decision to start a business has often been established. Second, at the macro level, there is some intriguing evidence warranting a closer investigation of the role of dissatisfaction in relation to the level of self-employment, as the two variables appear to be positively correlated, as shown in figure 6.1.

[136] For a specific utility (or 'psychic satisfaction') maximization model of career choice with respect to entrepreneurship, see Douglas and Shepherd (1999, 2002).

Figure 6.1 Self-employment and dissatisfaction in 15 European countries, 1998



Source: Eurobarometer surveys and Compendia 2000.2.

In micro studies of entrepreneurship various types of dissatisfaction are used. Brockhaus (1980a, 1982) states that dissatisfaction with previous work experience is closely related to the 'entrepreneurial decision'. He finds that self-employed individuals tend to be relatively strongly dissatisfied with the previous work itself, with supervision and with opportunities for promotion (but more satisfied with actual pay). Shapero and Sokol (1982: 79) assert: "Research data show that individuals are much more likely to take action upon negative information rather than positive, and the data on company formations support that conclusion". In their final model both pull and push factors contribute to the start-up of a business, but negative 'displacements' such as forced emigration, being fired and being bored or angered predominate. Dyer (1994: 10) cites several other studies showing that people are more likely to start their own enterprises when they face a lack of opportunities for viable careers in existing organizations.

This all fits with what psychology tells us about motivation. In particular, individuals with a high sense of self-efficacy are activated by self-dissatisfaction, i.e., when they do not attain their goals. This spurs efforts to bring outcomes in line with their value standards (Bandura and Cervone, 1983). Vroom (1982: 175) infers from his model "... that job satisfaction should be related to the strength of the force on the person to remain in his job" or put otherwise "... that job satisfaction and turnover are negatively related to one another". Consequently, it is no surprise that dissatisfaction is one of the

most important predictors of job mobility (Vroom, 1982; Mobley, 1982; Lee, 1988; Dailey and Kirk, 1992). Dissatisfaction as a motive for self-employment has also been confirmed in survey studies concerning start-ups. Huisman and De Ridder (1984), for instance, report that frustrations with previous wage-employment, unemployment, and personal crises are among the most-cited motives of a large sample of entrepreneurs in eleven different countries. More recently, Van Uxem and Bais (1996) found that about 50% of almost 2000 starting Dutch entrepreneurs mentioned dissatisfaction with their previous job among their motives to start a business, although some pull factors were mentioned even more frequently. Hence, at the level of the individual various kinds of dissatisfaction are conducive to job mobility and the propensity to become self-employed.

It is tempting to generalize these findings to the country level. However, the positive correlation between dissatisfaction and self-employment at the country level, as shown in figure 6.1, might also originate from self-employed people being relatively dissatisfied with their jobs or their lives. This reversed causality, self-employment causing low satisfaction, is however ruled out by ample empirical evidence. In many studies (Blanchflower and Oswald, 1998; Bradley and Roberts, 2004; Frey and Benz, 2002; OECD, 2000; several studies cited by Jamal, 1997) the job satisfaction of self-employed is, on average, found to be higher or at least not lower than that of salaried employees. This seems to be the case in spite of longer work hours, poorer working conditions, heightened job stress and higher risk (OECD, 2000; Bradley and Roberts, 2004). Apparently, these are compensated by other factors such as autonomy and the possibility of becoming wealthy. Given the strong positive correlation between dissatisfaction and self-employment at the country level, it is likely that the push effect of actual dissatisfaction on the number of business start-ups is enhanced by a pull or demonstration effect of the self-employed being relatively satisfied with their jobs, boosting the anticipated satisfaction of entrepreneurship.[137]
Most studies investigating the role of motivational determinants of the choice for self-employment pertain to the *individual level*. Its validity at the country level is under researched in the entrepreneurship literature. Our research question is whether the relationship found at the individual level is valid at the societal level: countries where people are generally less satisfied with wage employment have a higher self-employment rate than other countries. To our knowledge no aggregate country data on job-dissatisfaction are available. Thus other aggregated dissatisfaction data are used to test for the assumed relationship. For reasons of statistical availability we use the following two indicators of dissatisfaction: dissatisfaction with life, and dissatisfaction with the way in which democracy works. *Dissatisfaction with life* (as reported in the *Eurobarometer* surveys) is a general concept and may be influenced by many different factors, like those mentioned by Huisman and De Ridder (1984). This kind of dissatisfaction may depend upon personal factors as well as factors in the environment

[137] Nonetheless, the positive effect of self-employment on satisfaction may cause some countervailing 'statistical' influence on the overall level of dissatisfaction, proportional to the share of self-employment in the labor force.

of the individual. Vroom (1982: 161) cites several empirical studies showing that "The worker dissatisfied with his job, in contrast, is often ... generally unhappy and dissatisfied". Brayfield et al. (1957), as cited by Vroom (1982), add the insight that this holds more strongly for employed men than among employed women. Hence, we expect life-dissatisfaction to be positively related with job-dissatisfaction and thus with self-employment. *Dissatisfaction with the way democracy works* (also taken from the *Eurobarometer*), refers to the self-expressed degree of dissatisfaction of an individual with the way democracy in his or her country works. Dissatisfaction with the way democracy in one's country works is a more outward-directed kind of dissatisfaction than life-dissatisfaction. Although it may be related to the actual quality of the democracy in a particular country, we assume that it also conveys general information about the level of satisfaction of an individual with his or her environment, including the work environment. Given the empirical correlation between life and job satisfaction at the individual level, this seems likely. Hence, a positive relationship between dissatisfaction with democracy and self-employment is also expected.

At the same time we expect that dissatisfaction with life and/or with democracy may also pick up other relevant 'negative displacements' besides job dissatisfaction, such as being a refugee, belonging to an ethnic minority, being insulted, being fired or generally being an 'outsider', that Shapero and Sokol (1982) consider to have a strong positive effect on business start-ups. Our first hypothesis reads:

Hypothesis 1: Higher levels of dissatisfaction with life and/or with democracy in a country are conducive to higher rates of self-employment.

We further assume that occupational choice is not determined, however, by 'motivational factors' alone, but also depends on so-called 'reality factors' (Vroom, 1982: 62). Occupational choices (using this term in a broad way, including occupational attainment) may differ from occupational preferences because expectations may prove false, as a result of insufficient abilities, costs of training, or a lack of job vacancies. With respect to the choice between self-employment and wage employment the 'eclectic framework' as discussed in chapter 3 of the present book analogously distinguishes between preferences, resources, skills and opportunities. In this framework preferences represent the motivational factors, while skills, resources and opportunities are the (perceived) reality factors. Many of these latter factors, particularly resources and opportunities, depend upon economic phenomena such as the level of economic development[138]. Hence, to establish whether dissatisfaction influences the rate of self-employment we must also take economic variables into account.
First, we will discuss the relationship between self-employment rates and the *level of economic development (prosperity)* as measured by per capita income. It has been observed in various studies that the self-employment rate tends to decrease as

[138] In the short run, the stage of the business cycle also plays a role.

economies become more developed (Kuznetz, 1966; Schultz, 1990; Bregger, 1996). This trend can be observed in cross-section data by comparing countries at different levels of economic development and in aggregate time-series data spanning long periods of time for several countries (Blau, 1987: 445). A low level of prosperity coincides with a low wage level, implying little pressure to increase efficiency or the average scale of enterprise. Small enterprises in agriculture, crafts and retail trade are dominant in such an economy. A major route for ambitious wage earners to increase their income is to set up shop and become an entrepreneur. Economic development subsequently leads to a rise in wages, which stimulates enterprises to work more capital-intensively, to save on labor and to reap economies of scale. A decline in self-employment is thus consistent with the exploitation of scale economies as wages grow and markets expand during the course of economic development, with a decline of the share of agriculture and with specialization of labor possible in the emerging large firms (Blau, 1987: 446). At the supply side of the labor market, an additional effect of rising real wage levels is an increased attraction of wage-employment. Put otherwise, the opportunity cost of self-employment increases relative to the return, inducing marginal entrepreneurs to become employees (Lucas, 1978). Iyigun and Owen (1998) argue that fewer individuals are willing to risk becoming an entrepreneur as more secure professional earnings rise with economic development.

This trend towards lower rates of self-employment may weaken, or even be reversed at a still later stage of economic development when differentiation of consumer demand increases and services become more important, creating new opportunities for self-employment. This partly explains the present resurgence of self-employment in some of the most highly developed economies. Furthermore, information technology and the differentiation of markets (niches) lead to new diseconomies of scale. An increased emphasis on subcontracting, partly related to globalization, may reinforce this process (Blau, 1987; Acs et al., 1994; Bais et al., 1995; Carree et al., 2002). However, information technology and globalization are worldwide phenomena (Audretsch and Thurik, 2000 and 2001) and these effects are thus hardly connected to a country's level of prosperity[139]. *Ceteris paribus*, we still expect to find a negative relationship between prosperity and the self-employment rate[140]. This gives rise to our second hypothesis:

Hypothesis 2: Higher levels of economic development (prosperity) in a country will lead to lower rates of self-employment.

[139] The influence of autonomous factors on the resurgence of self-employment, including a possible impact of a general trend towards deregulation in the 1990's and of business cycle effects, will be approximated in this study by the use of year-dummies.

[140] Carree et al. (2002) investigate several functional forms for the relationship between self-employment and per capita income.

6.3 Control variables

Unemployment
When testing the two hypotheses formulated above, we also want to take account of the relationship between unemployment and the propensity of individuals to enter self-employment. This relationship is not straightforward. Unemployment (or the threat of it) basically acts as a push factor for self-employment (Evans and Leighton, 1990; Acs et al., 1994; Foti and Vivarelli, 1994; Audretsch and Thurik, 2000). In comparison with wage-employed persons, the opportunity costs for unemployed persons to become self-employed are relatively low, and this will favor their choice for self-employment. Of course, social security benefits and labor market regulation also determine these opportunity costs. The occupational choices of unemployed persons also relate to their skills and resources, and to the market opportunities available to them. On the whole, only a small proportion of the unemployed will actually become self-employed.[141]

On the other hand, *high* unemployment may be connected with an economic depression, which makes prospects for setting up a new business bleak and may cause disillusionment (Storey, 1991). However, unemployed may still (feel forced to) choose for self-employment, albeit in the form of 'marginal entrepreneurship'. It is difficult to say beyond which critical level of unemployment this discouragement effect is strong enough to reverse the sign of the unemployment variable.

Earning differentials
Another economic factor we will take into account is earning differentials between self-employment and wage-employment. Potential profits are one obvious reason to set up shop or to shift from wage-employment to self-employment. Individuals are assumed to compare expected profits and wages when weighing the attractiveness of self-employment versus wage-employment. This income choice model of self-employment dates back as far as Knight (1921). More recently Murphy et al. (1991) propose a relationship between earning differentials and the allocation of talent across business ownership and wage-employment. In their model, if there are too many workers and too few entrepreneurs, the real wage will be low, "and so the best workers want to switch to entrepreneurship". Furthermore, Acemoglu (1995) provides a theoretical model of the impact of both pecuniary and non-pecuniary reward structures on occupational choices. Evans and Leighton (1990) and Foti and Vivarelli (1994) find empirical support for high profits as a pull factor for entering self-employment. See Santarelli and Sterlachini (1994) for partly conflicting evidence about the impact of profits and wages on business start-up rates in Italian manufacturing. A different argument is that self-employment is inherently risky and "there is a positive probability that entrepreneurial activity will result in failure" (Iyigun and Owen, 1998: 455). An individual must weigh the prospect of potential high profits with the risk and uncertainty associated with self-employment. If countries differ in business risks or in

[141] For a quantitative analysis of self-employment inflows, see Meager (1992).

risk aversion, this may be a cause for international differences in the impact of earning differentials on the rate of self-employment. Visee and Zwinkels (1999) find some empirical evidence of the differential importance that wage earners striving for self-employment attach to income security (and for its influence on their decision tot start part-time or full-time). All in all, at the aggregate level we expect a positive influence of income differentials on the number of self-employed.

Labor participation of women
When testing for the relationships expressed in our hypotheses, we will also control for the labor participation of women. In most Western countries, women in the labor force show substantially lower self-employment rates than men. Under the assumption of constant female/male self-employment differentials over time, a growing participation of women in the labor market implies a decreasing share of self-employment in the labor force (Acs et al., 1994).

Population density
The population density of a country might also influence its self-employment rate. Every region needs a minimum supply of facilities in the trade and handicraft industries for the population to 'survive'. Therefore, thinly populated areas with widely dispersed small villages will have relatively many small retail outlets and workshops. Conversely, urban areas will give rise to economies of scale through which small-sized entrepreneurship in retailing comes under pressure (Bais et al., 1995). On the other hand, networks and other supply side factors in urban areas are conducive to new entrepreneurship in many service industries. The sign of this control variable is not *a priori* clear.

6.4 Data and method

The dependent variable in this study is the rate of self-employment (business ownership) within a country at a certain point in time. This variable is operationalized as the number of self-employed (excluding agriculture, hunting, forestry and fishing), divided by the total labor force of a country and is collected for all the even years in the period 1972-2000. This data base is set up by EIM and is called *Compendia*. Among the 23 countries covered by this data set are the European countries for which *Eurobarometer* dissatisfaction data are available. The economic indicators used in this study are labor income share, unemployment, per capita income, female labor share and population density. The *labor income share* of a country is defined as the share of labor income (including the imputed compensation of self-employed for their labor contribution) in the net national income (i.e., excluding capital consumption). Labor income shares are a pragmatic proxy for earning differentials between wage-employment and self-employment. The higher the labor income share, the smaller the share of the national income made up by profits, and hence the less attractive it is to become self-employed. *Unemployment* is expressed as a percentage of the total labor

force of a country in a given year.[142] *Per capita income* or *GDP per capita* is measured in constant prices of 1990. Furthermore, purchasing power parities in US $ of 1990 are used to make the monetary units comparable between countries. The *female labor share* is the percentage of women in the total labor force. *Population density*, finally, is expressed as the number of people per square kilometer in a country.

The data were collected using several sources. The main sources are: *OECD Main Economic Indicators*, various versions; *OECD Labour Force Statistics*, versions 1970-1990 and 1981-2001; and *OECD National Accounts*, versions 1960-1994, detailed tables, and 1988-1998, detailed tables. However, for a number of variables such as self-employment, unemployment, and labor force, data were incomplete. We have completed these data using ratios derived from various other sources. Furthermore, EIM made a unified data set of self-employment, which was necessary as in OECD Labour Force Statistics, the main source for self-employment in EIM's Compendia data base, the self-employment definitions are not fully compatible across countries. In some countries business owners are defined as individuals owning a business that is not legally incorporated. In other countries, owner/managers of an incorporated business (OMIBs) who enjoy profits as well as a salary are considered owners too. There are also countries that classify a part of the OMIBs as self-employed and another part as employee. This results from a different set-up of labor force surveys in different countries. This topic is dealt with in more detail in Chapter 5 of *OECD Employment Outlook June 2000* (OECD, 2000). Business owners are defined to include OMIBs. For the countries not following this definition, EIM made an estimation of the number of OMIBs using information derived from *The European Observatory for SMEs* (KPMG/ENSR, 2000). Another difference in definition is that for some countries unpaid family workers are included in the self-employment data as well, mostly for early years. For these years, the unpaid family workers were removed from the data by using ratios from more recent years for which separate data on unpaid family workers *are* available. Data on the labor force are also from OECD Labour Force Statistics. Again, some missing data have been filled up from various other sources. This work has resulted in a unified data set of self-employment (COMPENDIA, COMparative ENtrepreneurship Data for International Analysis), which includes the owners of both the incorporated and the unincorporated businesses but excludes the unpaid family workers. More information on this data set can be found in Van Stel (2003).[143]

The data on dissatisfaction are based upon the *Eurobarometer* surveys (Eurobarometer: Public opinion in the European Community, ISSN 1012-2249, Brussels: CEC), and are available for the 15 Member States of the European Union.

[142] We use the concept of 'standardised unemployment rates', as practiced by OECD.

[143] Another important data source for comparing entrepreneurship rates across countries is the *Global Entrepreneurship Monitor* (GEM). In 2002 comparative data for various entrepreneurship measures were available for 37 countries (Reynolds *et al.*, 2002). However, as the first GEM assessment was held in 1999, it will take several years before a time-series analysis over a considerable length of time can be performed using GEM data.

Dissatisfaction with life is measured as the percentage of respondents indicating to be 'not at all satisfied with life' or 'not very satisfied with life'. Dissatisfaction with democracy as the percentage indicating to be 'not at all satisfied with the way democracy works' or 'not very satisfied with the way democracy works'. We have no full data set at our disposal. For nine countries (Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, and the United Kingdom) we have dissatisfaction data available regarding 12 years (1976-1998; even years), for one country (Greece) regarding 10 years (1980-1998), for two countries (Portugal and Spain) regarding 8 years (1984-1998), and for three countries (Austria, Finland, and Sweden) regarding two years (1996-1998).[144] Because of the varying extent of (dissatisfaction) data availability across countries, we carry out our empirical analyses using an *unbalanced* data panel. The correlation matrix of the variables used in our study is in table 6.1. The correlations are computed using data for the years 1976, 1984, 1990 and 1998 (48 observations).[145]

Table 6.1 Correlations between variables (48 observations)

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. Self-employm. rate	1.000							
2. Dissatisfaction Life	.735***	1.000						
3. Dissat. Democracy	.629***	.710***	1.000					
4. Labor income share	.215	.153	.133	1.000				
5. Unemployment rate	.172	.194	.384**	-.106	1.000			
6. GDP per capita	-.466**	-.553***	-.308*	-.367*	-.317*	1.000		
7. Female labor share	-.149	-.090	-.037	-.275	-.087	.385**	1.000	
8. Population density	-.134	-.270	-.076	-.228	-.183	.250	-.013	1.000
Mean	10.5	18.4	40.4	83.6	8.0	14.6	38.7	167
Standard deviation	3.7	11.5	16.3	8.3	3.7	4.2	5.4	101

All variables are expressed in percentages, except for GDP per capita (thousands of US $ of 1990) and population density (persons per squared kilometer).

* p< .05 (two-tailed test).
** p< .01 (two-tailed test).
*** p< .001 (two-tailed test).

We use regression analysis (ordinary least-squares) to test our hypotheses. We regress self-employment on the two metrics of dissatisfaction and on GDP per capita, using labor income share, unemployment, female labor share, population density and some time dummies as controls. In order to assess the effect of dissatisfaction we first regress self-employment on the economic variables only. After that, we include life-dissatisfaction and dissatisfaction with democracy in two separate analyses, the reason for this being the strong positive correlation between the two kinds of dissatisfaction,

[144] We use data for West-Germany until 1988, and data for (re-unified) Germany from 1990 onwards.

[145] These are the years for the independent variables. Because we use a two-year lag in our model, these years correspond to 1978, 1986, 1992 and 2000 for the dependent variable. For the latter three years we will include time dummies in our model. These dummies are also included in table 6.2.

the strongest between any pair of independent variables (see table 6.1). In our regressions, we use only the data from 1978, 1986, 1992 and 2000 (for the dependent variable) and from 1976, 1984, 1990 and 1998 (for the independent variables). By using 8-year intervals we avoid autocorrelation problems.[146] All in all, we have 48 data points, corresponding to the maximum availability of the dissatisfaction data for the four mentioned years in our unbalanced panel. In order to control for systematic differences across years, dummy variables are introduced for 1986, 1992 and 2000 (1978 being the reference year).[147]

6.5 Results

Results are given in table 6.2. We first discuss the results of the regression without the dissatisfaction variable (Model 1).

Table 6.2 Self-employment and dissatisfaction (48 observations)

	Model 1		*Model 2*		*Model 3*	
Constant	18.3	(7.3)*	8.0	(6.0)	17.7	(5.1)**
Labor income share (t-2)	.069	(.057)	.075	(.044)	.025	(.041)
Unemployment rate (t-2)	-.15	(.14)	-.068	(.11)	-.36	(.10)**
GDP per capita (t-2)	-.68	(.13)***	-.28	(.13)*	-.54	(.097)***
Female labor share (t-2)	-.21	(.099)*	-.18	(.076)*	-.24	(.070)**
Population density (t-2)	.0064	(.0046)	.0074	(.0035)*	.0039	(.0033)
Year: 1986	2.9	(1.4)*	1.7	(1.1)	3.4	(1.0)**
Year: 1992	6.0	(1.5)***	4.7	(1.2)***	6.4	(1.0)***
Year: 2000	8.2	(1.8)***	5.4	(1.5)**	7.5	(1.3)***
Dissatisfaction Life (t-2)			.19	(.037)***		
Dissatisf. Democracy (t-2)					.13	(.021)***
R-squared	.528		.725		.769	
Adjusted R-squared	.431		.660		.714	
F-value	5.45***		11.1***		14.1***	
Maximum VIF	4.02 (Year 2000)		4.63 (Year 2000)		4.05 (Year 2000)	

Dependent variable: non-agricultural self-employed as a percentage of the labor force; standard errors between parentheses.
* p< .05 (two-tailed test).
** p< .01 (two-tailed test).
*** p< .001 (two-tailed test).

The results for Model 1 show that GDP per capita has a negative and significant effect on self-employment. This result fully conforms to expectations as formulated in

[146] Note that there is a 6-year interval between 1984 and 1990. We did not use 1982 because this would result in a loss of two observations, as the earliest year for which dissatisfaction data are available for Portugal and Spain is 1984.

[147] The introduction of time dummies while using an unbalanced panel is justified as the extent of 'unbalancedness' over time is limited. The numbers of observations (countries) available for 1986, 1992 and 2000 are 12, 12 and 15, respectively.

hypothesis 2. The economic control variables, labor income share and unemployment rate have insignificant effects, and of the other control variables, only female labor share has significant (negative) sign, while population density is insignificant. The three dummy variables for the years 1986, 1992 and 2000 are significantly positive, with dummy coefficients increasing over time. This pattern shows that in the time period considered there has been an increase in self-employment not fully explained by our independent variables. This autonomous effect on self-employment may be due to general trends such as globalization, the information technology revolution and deregulation.

In Models 2 and 3, dissatisfaction with life respectively dissatisfaction with democracy are entered into the equation. Both dissatisfaction variables have positive and significant coefficients. The significance level (but not the sign) of a number of other variables changes, when either dissatisfaction with life or dissatisfaction with democracy is taken into account. Given the modest sample size, this is not surprising. In the regression with life dissatisfaction (Model 2), the standard errors of all other variables are higher compared to the regression with democracy dissatisfaction (Model 3). This is not surprising given the strong negative correlation between life dissatisfaction and GDP per capita.[148] The results of Model 3 are particularly interesting, as dissatisfaction with democracy is less strongly correlated with GDP per capita. This regression also yields the highest adjusted R-squared (.714).[149]
All in all, the results in Models 2 and 3 offer strong support for hypothesis 1: both types of dissatisfaction, life dissatisfaction as well as dissatisfaction with the way in which democracy works, are positively and significantly related to the rate of self-employment. This is the case controlling for the most important 'economic' factors mentioned in the literature. There is also strong support for hypothesis 2: higher levels of economic development (reflected in a higher GDP per capita) are associated with lower levels of self-employment. Even when taking account of the (varying) correlation between (different types of) dissatisfaction and per capita income, both dissatisfaction and the level of economic development are found to have a separate effect on self-employment.

Our first control variable, unemployment, is negatively, rather than positively, related to self-employment (although this result is significant only in Model 3). The negative influence of unemployment suggests a bigger impact of (high) unemployment as an indicator of decreasing business opportunities than of unemployment as a push factor, where the latter effect is limited by the relatively generous social security system in

[148] Note, however, that results from Model 2 are 'correct' from a multicollinearity point of view as the maximum value of the variance inflation factor is 4.63, corresponding to a tolerance level of .216.

[149] When both dissatisfaction measures are included in a single regression model (not reported in table 6.2), the adjusted R-squared is .721. Estimated parameters and significance levels of the independent variables are similar to those of model 3, except for dissatisfaction with democracy. As mentioned, this is due to the strong correlation between the two dissatisfaction variables. In the combined specification the coefficient is .070 for dissatisfaction with life (t-value 1.4) and .097 for dissatisfaction with democracy (t-value 3.1). The F-value for this specification is 13.1 which is significant at .001 level.

many EU-countries. The negative effect may also be partly due to reversed causality. There is assumed to be a two-way causation between changes in the level of entrepreneurship and the rate of unemployment - a 'Schumpeter' effect of entrepreneurship reducing unemployment and a 'refugee' effect of unemployment stimulating entrepreneurship. Audretsch et al. (2001) estimate a two-equation model where changes in unemployment and in the number of business owners are linked to subsequent changes in those variables for a panel of 23 OECD countries over the period 1974-1998. The existence of two distinct and separate relationships between unemployment and entrepreneurship is identified, including significant 'Schumpeter' and 'refugee' effects. They show that the negative 'Schumpeter' effect is bigger than the positive 'refugee' effect. This might contribute to the negative effect found in the present analysis.

There is no support for an influence of the labor income share. This variable shows an (insignificant) positive sign, contrary to our expectations. Perhaps the labor income share is too crude an (inverse) measure for business profitability. Furthermore, the positive sign might also be partly due to reversed causality. Too large numbers of self-employed may cause average profit levels to be low. A glut of self-employment will cause the average scale of operations to remain below optimum, resulting in large numbers of 'marginal' entrepreneurs, who hardly make any profits (Carree et al., 2002).[150]

Of the other control variables, the effect of population density is consistently positive in the regressions (but only once significantly so). An explanation may be that in the most urbanized member states of the European Union positive network effects on birth rates of new firms prevail, increasing the rate of self-employment. A different explanation may be that population density is too crude a measure for variations in economic activities due to the occurrence of both densely populated areas and sparsely populated areas within one country. The coefficient of female labor share is consistently negative, as expected, and significant in all three models. The results for the year dummies are roughly similar in all three models.

We perform several tests of robustness. First, we investigate to which extent the main estimation results in table 6.2 are affected by three possible 'outlier' countries. From figure 6.1 we see that Greece, Italy and Portugal combine high self-employment rates with high levels of dissatisfaction. It might be that the positive effects found for dissatisfaction in table 6.2 are merely valid for these three countries. However, computing the regressions excluding these three countries, we still find significantly (.001 level) positive effects of both life dissatisfaction and democracy dissatisfaction. The effects are somewhat smaller though: the coefficients are .13 (life dissatisfaction; Model 2) and .09 (democracy dissatisfaction; Model 3).

[150] In this respect, Greece is a striking example. Greece combines a high self-employment rate with a labor income share above one, indicating that the *imputed wage income* for the self-employed persons is higher than the *actual total income* of the self-employed.

Second, we investigate whether results are different if we measure dissatisfaction in terms of only the people responding to be 'not at all' satisfied with life or democracy (instead of 'not at all' or 'not very' satisfied). It might be that people responding to be 'not very' satisfied with life or democracy are less inclined to start their own business than people responding to be 'not at all' satisfied. To test this we computed separate regressions using the separate percentages of people responding to be 'not at all' and 'not very' satisfied. Both for dissatisfaction with life and for dissatisfaction with democracy the estimated parameters remain positive and significant at .001 level, irrespective of whether the 'not at all' or the 'not very' categories are used. We conclude that our regression results are robust in this respect.
Third, we test the robustness for linear versus non-linear specifications. Perhaps the effect of dissatisfaction is smaller when the numbers of dissatisfied citizens are higher. This might be the case if the high dissatisfaction levels signal higher proportions of people who are discouraged to take their life in their own hand and start a business. To test this we computed regressions using the natural logarithm of the dissatisfaction variables. We do not find large differences compared to the results in table 6.2. The effects of the dissatisfaction variables are (remain) positive and highly significant. R-squared values are also similar. Hence, we cannot discriminate statistically between a linear and a non-linear effect.

In all test specifications, the effect of per capita income remains negative and highly significant. We conclude that our results are robust to the exclusion of 'outlier countries', and to different specifications of the dissatisfaction variables.

6.6 Conclusions

The determinants of self-employment constitute a complex phenomenon (Audretsch et al., 2002b). So far, investigations of nation-wide differences have concentrated largely on the role of economic variables, particularly of per capita income. The low explanatory power of these economic variables, as well as the relative stability of differences in the rate of self-employment across nations, suggest the additional influence of cultural and institutional variables. The present chapter takes the socio-psychological variable 'dissatisfaction' into account and concludes that, across nations, dissatisfaction with society and with life in general seems to be a distinguishing factor. Countries with relatively more people who are dissatisfied with the society they live in and/or who have a lower overall life satisfaction, have a higher proportion of self-employed. This conclusion is robust when controlling for other explanatory variables. In addition to the positive influence of dissatisfaction, and in spite of some degree of multicollinearity, the negative influence of the level of economic development as predicted by theory, is confirmed. The increasing coefficients of the three consecutive year dummies suggest that during the 1990's general trends such as globalization, the ICT revolution and deregulation may have had a positive effect on the rate of self-employment, while an additional business cycle effect in the year 2000 is certainly not ruled out. Unemployment is found to have a negative rather than a positive influence, at least in the 15 European countries considered in this study.

The fact that nations with a higher average level of dissatisfaction have a higher proportion of self-employed should not be taken as a sign that the average self-employed is more dissatisfied than the average wage-employed. As discussed in section 2, the opposite seems to be true. The conclusion to be drawn is that if more people in a country feel dissatisfied with their life and with the way democracy works, this increases the chance that they will seek self-employment. Those who do so tend to improve their life and job satisfaction over those who do not (Hofstede, 1998).

This study has several limitations that should be borne in mind when interpreting the results. First, an obvious complication with our set-up for explaining self-employment at the country level is that per capita income, unemployment and earning differentials do not only make up 'economic' factors but may also influence dissatisfaction. Due to these interrelationships, the 'final' effect of the economic factors may be larger than their partial influence found in our multiple regressions. Second, one must be prudent in extrapolating the conclusions found in this study to worldwide relationships. The results pertain to Western European countries. It remains to be investigated whether the relationship still exists when other (e.g., developing) countries are included. Third, we have looked at a particular time period, and not all the relationships we have found may hold in future times. The recent revival of the rate of self-employment that occurred in most countries in our sample (but not in Denmark, France and Luxembourg, that show a continued decline), after a nearly continuous decline since at least the 19th century, mostly happened in the second half of the period covered by our sample (however, in Ireland, the UK and Italy the revival occurred over most of our sample period). This reversal of the trend has coincided with fundamental economic changes including globalization and the ICT revolution. Fourth, although we have included several control variables, we obviously did not control for all factors that may influence the level of self-employment. For instance, we did not take into account the sector composition of the economies of the countries included in the study, the age composition of the labor force, and the level of education (Blanchflower and Meyer 1994; Evans and Leighton 1989b). Fifth, our present model estimates the effect of dissatisfaction on the total self-employment rate, whereas probably dissatisfaction primarily impacts on new business formation and thus influences total self-employment indirectly and with a time lag. The present model pragmatically deals with this problem by specifying a two-year lag for all explanatory variables. Future research may take this into account by using a distributed lag[151] or by specifying an equation in first differences within the context of an error correction model (see Carree et al., 2002).

At first sight, our findings offer only limited guidance to politicians who would like to stimulate self-employment. The promotion of dissatisfaction seems hardly a feasible

[151] A first attempt including a four-year lagged endogenous variable representing a distributed lag on the explanatory variables, confirms the positive effect of dissatisfaction and the negative effect of GDP per capita reported in the present paper.

policy option. However, some policy implications may emerge by linking our results to (other) considerations and empirical findings reported in the literature. First, when explaining differences in self-employment rates it is customary to distinguish between 'pull' factors and 'push' factors (Stanworth and Curran, 1973). Pull factors make self-employment more attractive. Some examples are the perspective of independence and autonomy, the possibility to earn high profits, or the opportunity to evade taxes. Push factors make wage-employment and/or unemployment less attractive and thus 'push' people towards self-employment. Some examples are low wages, limited autonomy in a paid job, frugal social security benefits or lack of alternative ways to make a living. Viewed from within this context, our findings indirectly point at the importance of push factors in addition to pull factors[152]. This may induce policymakers to scrutinize the incentive structures[153] in their economies, next to promoting and facilitating self-employment through counseling and information, through lower administrative and legal hurdles for business start-ups, and through loan guarantee schemes or specific tax breaks for young enterprises.

Second, another policy implication arises by combining our findings with those of research on micro data. Research comparing self-employed with wage earners suggests that the former are more focused on individual responsibility and effort, and more strongly espouse an ethic of working hard (Beugelsdijk and Noorderhaven, 2004). These characteristics may make an individual more likely to respond to dissatisfaction by setting up shop. Hence, it may also be wise to consider how the educational system may contribute to the development of the entrepreneurial qualities of a country's population (Van der Kuip and Verheul, 2004). In this way, the chances that dissatisfaction becomes an engine of economic progress, rather than a source of inertia, may be increased.

[152] The relevance of push factors in addition to pull factors is confirmed by the findings of Parker and Robson (2003). For a panel of 12 OECD countries spanning the period 1972-1996, Parker and Robson investigate the determinants of self-employment utilizing recently developed panel unit root and cointegration techniques. Using original self-employment data from OECD Labour Force Statistics, they find a positive effect of personal income tax rates, and negative effects of employers' social security contributions and the unemployment benefit replacement rate.

[153] In many EU-countries the push effect of unemployment towards self-employment seems to be quite limited by a social security system that is both relatively generous and biased towards insuring the wage-employed, while the push effect embodied in wage-employment is limited by relatively strict labour market regulation.

CHAPTER 7

UNCERTAINTY AVOIDANCE AND THE RATE OF BUSINESS OWNERSHIP ACROSS 21 OECD COUNTRIES, 1976-2004

Abstract
Persistent differences in the level of business ownership across countries have attracted the attention of scientific as well as political debate. Cultural as well as economic influences are assumed to play a role. This chapter deals with the influence of cultural attitudes towards uncertainty on the level of business ownership across 21 OECD countries. First, the concepts of uncertainty and risk are elaborated, as well as their relevance for entrepreneurship. An occupational choice model is introduced to underpin our reasoning at the macro-level. Second, regression analysis using pooled macro data for 1976, 1990 and 2004 and controlling for several economic variables, yields evidence that uncertainty avoidance is *positively* correlated with the prevalence of business ownership. According to our model, a restrictive climate of large organizations in high uncertainty avoidance countries pushes individuals striving for autonomy towards self-employment. Regressions for these three years separately show that in 2004 this positive correlation is no longer found, indicating that a compensating pull of entrepreneurship in countries with low uncertainty avoidance may have gained momentum in recent years. Third, an interaction term between uncertainty avoidance and GDP per capita in the pooled panel regressions shows that the historical negative relationship between GDP per capita and the level of business ownership is substantially weaker for countries with lower uncertainty avoidance. This suggests that rising opportunity costs of self-employment play a less important role in this cultural environment, or are being compensated by increasing entrepreneurial opportunities.

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UNCERTAINTY AVOIDANCE AND THE RATE OF BUSINESS OWNERSHIP ACROSS 21 OECD COUNTRIES, 1976-2004

7.1 Introduction

The prevalence of business ownership expressed as the percentage of owner/managers of incorporated and unincorporated businesses within the labor force, differs strongly between countries. Even within the relatively homogeneous subset of the world's economically most developed nations (the OECD member countries) the diversity is considerable. In Greece approximately one in five out of the labor force is a (non-agricultural) business owner whereas in Finland approximately one in fourteen operates a business of their own (average rates 1972-2004) (see e.g. van Stel, 2005; Thurik and Wennekers, 2004). A well-known approach explains this disparity by differences in prosperity (Kuznets, 1971). The richer the country is, the fewer business owners there are. However, the first cracks in this negative relationship appeared in the late seventies (Blau, 1987 and Acs, Carlson and Karlsson, 1999). In fact, the negative relationship between prosperity and business ownership now seems to be breaking down in several (but not all) of the most prosperous countries, as they have shown a resurgence of business ownership rates in the past decades (see Carree, van Stel, Thurik and Wennekers, 2002, and van Stel and Carree, 2004, for an analysis of the relationship between economic development and business ownership, and Carree and Thurik, 2003, for a literature survey). Moreover, the dominance of economic variables explaining business ownership rates has been questioned, and other explanatory factors, like culture, have been brought forward (Hofstede et al., 2004).

Slowly data material becomes available showing that business ownership rates follow some U-shaped path when related to the level of economic development (Thurik and Wennekers, 2004). The switch between the downward phase of this U-shape and the upward one has to do with the changing role of entrepreneurial activities. The role of entrepreneurship has changed dramatically, fundamentally shifting between what Audretsch and Thurik (2001) introduced as the model of the managed economy and that of the entrepreneurial economy. In particular, Audretsch and Thurik (2001) argue that the model of the managed economy is the political, social and economic response to an economy dictated by the forces of large-scale production, reflecting the predominance of the production factors of capital and (unskilled) labor as the sources of competitive advantage (see also Audretsch and Thurik, 2004). By contrast, the model of the entrepreneurial economy is the political, social and economic response to an economy dictated not just by the dominance of the production factor of knowledge - which can be identified as replacing the more traditional factors as the source of competitive advantage - but also by a very different, but complementary, factor: entrepreneurship capital, or the capacity to engage in and generate entrepreneurial activity. By and large countries first move from a predominantly rural economy with a high level of business ownership to an industrial one where scale economies dominate and then again to a service economy where small scale entrepreneurial activities are

essential in many industries (see Wennekers, van Stel, Thurik and Reynolds, 2005, for an example of the U-shape using data material of the Global Entrepreneurship Monitor).

Differences in the business ownership rate between countries seem to be persistent despite the U-shaped path that appears driven by the level of economic development. There is a general intuition that cultural rather than economic variables play a role explaining these differences since cultural aspects are relatively time invariant (Noorderhaven, Thurik, Wennekers and van Stel, 2004). The present chapter investigates the role of uncertainty avoidance. Elsewhere the role of variables like post-materialism and dissatisfaction is studied (Uhlaner and Thurik, 2004 and Noorderhaven et al., 2004).

At the individual level the decision to become a business owner can be viewed as the outcome of a process of occupational choice. This approach views agents as utility maximizers taking an occupational choice decision - to become employee or business owner - on the grounds of the utility associated with the expected returns from the two activity types.[154] Personal characteristics[155] as well as cultural, institutional and economic conditions will influence these individual choices. An aggregation of these occupational choices at the level of countries shows the cumulative and interactive influence of the different determinants (Verheul, Wennekers, Audretsch and Thurik, 2002). In the present chapter we will focus on a specific cultural determinant of business ownership, viz., uncertainty avoidance, which to date has received only scant attention.

Our first research question considers the concepts of uncertainty and risk and the relevance of cultural attitudes towards uncertainty for the occupational choice with respect to business ownership. What effects of uncertainty avoidance on the choice for business ownership can be assumed to exist at the individual level, and how does this influence work at the country level? Our second question pertains to the direct influence of uncertainty avoidance on the prevalence of business ownership at the country level. Are differences in business ownership rates at the country level related to differences in uncertainty avoidance? Our third question deals with an indirect role of uncertainty avoidance through an influence on the relationship between GDP per capita and business ownership. Do differences in uncertainty avoidance alter the trade-offs between the opportunity costs and benefits of entrepreneurship in relationship to

[154] This approach is rooted in the work of Knight (1921) and starts from the functions of the provision of entrepreneurial ability and the bearing of risks. The second function underlines the importance of risk attitudes in the occupational choice process. See, for instance, Kihlstrom and Laffont (1979) and Parker (1997) where the degree of risk aversion and the differences in risk of becoming a business owner vis-à-vis an employee are given the central role in the determination of the occupational choice. See also Freytag and Thurik (2007).

[155] See Blanchflower and Meyer (1994), Blanchflower and Oswald (1998), Douglas and Shepherd (2002), Evans and Leighton (1989, 1990), Grilo and Irigoyen (2005), Grilo and Thurik (2005a and 2005b) and Lin et al. (2000) for empirical work.

the level of economic development, and hence indirectly affect business ownership rates?

7.2 Uncertainty, risk and entrepreneurship

Some classical and neo-classical views
Since the publication in 1921 of Knight's dissertation *Risk, Uncertainty and Profit* it has become common usage in the social sciences to distinguish between risk and (true) uncertainty (van Praag, 1999: 322). Uncertainty is a basic fact of life. We speak of uncertainty when 'anything might happen'. Relevant examples in the economic domain are new inventions and changing consumer preferences. Basically, these are unique events. Hence there is no statistical basis for calculating a probability. Risk is a special case of uncertainty. It relates to 'disagreeable' events for which past instances may be assembled and analyzed, such as fire-damage or insolvency of debtors. According to the Oxford Concise Dictionary, tenth edition, 1999, risk is "the possibility that something unpleasant will happen". Risk is often expressed in a percentage or probability and, accordingly, is to some extent insurable.

According to Knight, the entrepreneur's main function is bearing the real uncertainty by making judgmental decisions in the face of incalculable and uninsurable business hazards (van Praag, 1999: 322-323).[156] Knight's writings present an elaboration and generalization of Cantillon's views on entrepreneurship that were originally published in 1755 and in which the main entrepreneur's function is arbitrage between supply and demand. "As Cantillon describes it, entrepreneurs buy at a certain price to sell again at an uncertain price, with the difference being their profit or loss" (Hébert and Link, 1989: 42). Most (neo)-classical authors, including Say and Marshall, view entrepreneurs as being responsible for risk bearing (van Praag, 1999: 327). Later authors on entrepreneurship, particularly those in the (neo)-Austrian tradition (such as Kirzner), emphasize the entrepreneurial quality of perception of opportunities in the face of uncertainty.

By contrast, Schumpeter (1934) in his well-known *Theory of Economic Development* (reprinted in Swedberg, 2000: 58) emphasizes the innovative function of the entrepreneur, the person who introduces 'new combinations' of productive means. Schumpeter's view "disposes of the conception of the entrepreneur as risk bearer". In a footnote, Schumpeter continues: "Risk obviously always falls on the owner of the means of production, …., hence never on the entrepreneur *as such*". Finally, T.W. Schultz (1975) defines "entrepreneurship as the ability to deal with disequilibria, rather than the ability to deal with uncertainty" (Hébert and Link, 1989: 46). For

[156] There is no generally accepted definition of entrepreneurship. See chapter 1 for an overview. See also Davidsson (2004). As in the previous empirical chapters we adopt a pragmatic approach by equating entrepreneurship, business ownership and self-employment, and an entrepreneur will simply be understood to be the owner/manager of either an unincorporated or an incorporated business.

Schultz the bearing of risk is involved in entrepreneurship but it is 'not a unique attribute of entrepreneurs'.

In neoclassical economics the role of entrepreneurship is limited to the entry that follows profit opportunities (Carree and Thurik, 1995). Neoclassical economics suggests that there are a set of possible outcomes and a set of probabilities that each of these outcomes will actually occur (Varian, 1992). Then, a distinction is made between risk and uncertainty. The distribution of probabilities says something about the amount of risk. If the probabilities are not known, the term true uncertainty is used. In neoclassical economics, usually, the probabilities are assumed to be known. With regard to entrepreneurship and entry, the profit opportunities are supposed to be known and accessible to everybody. Therefore, pure uncertainty is commonly disregarded (Choi, 1993 and Wubben, 1993).

Economists like Knight and Keynes and economic schools like the Austrians and the Post-Keynesians have given uncertainty more emphasis (Wubben, 1993). They define uncertainty in similar terms, but state that 'especially entrepreneurs do not know the full range of outcomes nor their possibilities of occurring' (Lachmann, in Wubben, 1993).

Contemporary views on risk-attitudes of entrepreneurs
The topic of risk (i.e. chance of failure) has remained current in more recent academic literature on entrepreneurship. Kihlstrom and Laffont (1979) emphasize that individuals differ in 'risk aversion'. In their model, 'more risk averse individuals become workers while the less risk averse become entrepreneurs'. Likewise, Iyigun and Owen (1998) model the occupational choice between 'inherently risky entrepreneurial ventures' and relatively 'safe' alternatives such as professional activities.

McGrath, MacMillan and Scheinberg (1992) compare values, including attitudes towards risk and failure, of entrepreneurs (founder-managers of stand-alone businesses that were at least two years old and employed at least one other person) and non-entrepreneurs in eight nations. Entrepreneurs were found to agree more often to statements like 'start-up means risk but also excitement', whereas non-entrepreneurs agreed more to 'failure means losing face/respect'. Van Praag (1996) investigates which abilities and attitudes predispose individuals to entrepreneurship. In a sample of 1,763 economically active (Dutch) adults in their early fifties in 1993, more risk averse individuals were found to have a significantly smaller probability of being a business owner or having been one in the past.

Uncertainty is particularly relevant for start-up entrepreneurs because they cannot know the full range of possible outcomes (Bhide, 1994). New business founders thus are often unable to calculate their future profits. For example, someone who plans a new outlet of an existing franchise chain might have a fair estimate of its success

given the experiences with previous outlets. For founders of new businesses, or more generally for entrepreneurs who introduce an innovation, this does not hold.

Synthesis of microeconomic views
Uncertainty is a concept that is central to entrepreneurship, as emphasized by eminent economists such as Cantillon, Mangoldt, Knight and Keynes (Hébert and Link, 1989; Ekelund and Hébert, 1990). Without uncertainty, entrepreneurship would be unnecessary. In the East European socialist planning economies entrepreneurship was unneeded and sometimes considered as criminal because a system of complete planning was aimed at that would result in optimal resource allocation. However, since uncertainty is a fact of economic life entrepreneurs are needed to arbitrage, to take risks and to innovate (van Praag, 1996 and Wennekers and Thurik, 1999). Entrepreneurs are considered to be the primary agents dealing with uncertainty in the economy. Entrepreneurs are called for in the fast changing economic reality of today's society (Audretsch and Thurik, 2000 and 2001). Hébert and Link (1989: 47) attempt to synthesize the many diverging views. Their 'synthetic' definition of entrepreneurship incorporates (dealing with) uncertainty, risk, perception of profit opportunities, innovation and change.

Uncertainty is the wider concept, encompassing risks and opportunities as well as distinguishing between degrees of uncertainty. These dimensions are elaborated in table 7.1. Across the rows of the table there is a dichotomy distinguishing between possible unpleasant outcomes ('risks') and possibilities of business success ('opportunities'). Next, the columns represent different degrees of uncertainty. Column (1) describes the relatively low uncertainty when the possible outcomes and their probabilities are known. A case in point is selling fire insurance or starting a new outlet of an existing franchise. Column (2) refers to medium-high uncertainty in the sense that there is only a notion of possible outcomes and probabilities, such as may be the case with many new business start-ups. Business founders may not be able to calculate risks and expected profits, but they will often have a perception of the risks, opportunity costs and profit opportunities of their venture. Column (3) describes the 'true' uncertainty of future loss or profit, inherent to launching a radical innovation or to investing financial capital in fundamental research.

Table 7.1 Uncertainty encompassing risk and opportunity

degree of uncertainty / *risks versus opportunities*	*(1) possible outcomes and their probabilities are known*	*(2) there is a notion of possible outcomes and probabilities*	*(3) anything might happen*
possibility of damage, loss or failure	calculated risks	perceived risks and opportunity costs	true uncertainty of loss or failure
opportunity of profit or other business success	expected profits	perceived profit opportunities	true uncertainty of profit; serendipity

There is agreement that entrepreneurs (in the sense of business owners) make judgmental decisions in the face of uncertainty, reap the rewards of perceiving and utilizing opportunities and in the process also run the risk of losing their money and their reputation. There is also some consensus that entrepreneurs are less averse to risk, while alternative views hold that entrepreneurs are inherently more optimistic rather than less risk averse or dispose of relevant information reducing uncertainty and risk (Gifford, 2003: 37-41).

Cultural traits with respect to uncertainty

Attitudes, such as risk aversion, pertain to individuals and may show a wide variety within groups of individuals. At the 'ecological level' of nations, *cultural traits* related to these individual attitudes may be distinguished. Empirically, these traits may be derived as mean, modal or extreme values of individual observations or through a direct analysis of 'ecological data' (pertaining to national practices and achievements). Cultural traits represent a nation's 'mental programs' that are developed in socialization processes in the family in early childhood and reinforced in schools and organizations (Hofstede, 2001: xix). Accordingly, cultural traits may differ between societies.

A cultural trait that is strongly associated with individual attitudes towards risk and uncertainty is 'uncertainty avoidance'. According to Hofstede (2001: 146), uncertainty avoidance has to do with the extent to which societies tolerate ambiguity. A culture is characterized by high uncertainty avoidance when its members feel threatened by uncertain or unknown situations. People in these cultures "look for structure in their organizations, institutions and relationships, which makes events clearly interpretable and predictable" (Hofstede, 2001: 148.) In countries with lower uncertainty avoidance "not only familiar but also unfamiliar risks are accepted, such as changing jobs and starting activities for which there are no rules". Low uncertainty avoidance thus implies "willingness to enter into unknown ventures" (Hofstede, 2001: 164). Hofstede operationalizes uncertainty avoidance using three survey questions about whether employees feel "company rules should not be broken even when the employee thinks it is in the company's best interests", about their personal expected job stability and about how often they feel nervous or tense at work.

Relevance of uncertainty avoidance for explaining the business ownership rate

Direct effect of uncertainty avoidance

A microeconomic model of occupational choice is introduced to clarify in what ways uncertainty avoidance may have an impact on the prevalence of business ownership at country level. In this model, the individual choice between self-employment and wage-employment depends on a personal assessment and utility valuation of the expected material and immaterial rewards of these occupational alternatives, while taking the perceived risks into account (see Wennekers, 2006). For simplicity we operationalize material rewards as the expected personal income generated by self-employment ($E(I)_{SE}$), compared with the wage one expects to earn in a job ($E(I)_{WE}$). We reduce the immaterial rewards of self-employment to a gain in autonomy

compared with the degree of independence that an individual will experience when working as an employee.

Below, we summarize the model in a schematic manner:

(1) $$OC^*_{SE,i} = \alpha_i U_{MR,i} + (1-\alpha_i) U_{IR,i}; \quad 0 < \alpha_i < 1$$

(2) $$U_{MR,i} = \beta_i ((1-\rho_{SE,i}) E(I)_{SE,i} - E(I)_{WE,i}); \quad \beta_i > 0; \quad 0 < \rho_{SE,i} < 1$$

(3) $$U_{IR,i} = \gamma_i \Delta AUT_i; \quad \gamma_i > 0$$

Where

$OC^*_{SE,i}$ = latent variable measuring total utility of choice for self-employment (individual i)
$U_{MR,i}$ = utility of expected change in material rewards due to self-employment
$U_{IR,i}$ = utility of expected gain in immaterial rewards due to self-employment
$E(I)_{SE,i}$ = expected income self-employment
$E(I)_{WE,i}$ = expected income wage-employment
ΔAUT_i = gain in autonomy (self-employment versus wage-employment)
α_i = parameter reflecting the relative weight in utility of material vs immaterial rewards
β_i = parameter transforming expected change in material rewards into utility
γ_i = parameter transforming expected gain in immaterial rewards into utility
$\rho_{SE,i}$ = discount parameter for perceived risks of self-employment

For empirical application an observable occupational choice variable $OC_{SE,i}$ might be added, where $OC_{SE,i} = 1$ (i is self-employed) when $OC^*_{SE,i} > 0$ and $OC_{SE,i} = 0$ (i is an employee) when $OC^*_{SE,i} < 0$. Parker (2004: 24-26) elaborates how this microeconomic model might be estimated after transformation into a probit or logit model. This is however not necessary for our purpose, i.e. the underpinning of a macroeconomic regression model.

We assume that all parameters and variables in the model are idiosyncratic with respect to individuals, i.e. we assume that for each individual parameters and variable values are randomly drawn from probability distributions. In addition, we assume that attitudes towards uncertainty and risk play a role in the assessments and utility valuations of the expected material and immaterial rewards. In particular, we assume that the distributions of $\rho_{SE,i}$, γ_i, and $E(I)_{SE,i}$ are systematically influenced by the individual level of uncertainty aversion. That is, *ceteris paribus*, the distributions of these three parameters and variables are located more to the right or to the left, depending on the individual level of uncertainty aversion. This will be illustrated below. For simplicity let us assume that there are two groups of individuals, a group with a high uncertainty aversion level H and a group with a low uncertainty aversion

level L. First, it is assumed that an aversion of uncertainty causes people to perceive fewer profit opportunities and see more risks in entrepreneurship. This causes a downward bias in their assessments of the expected income of self-employment, i.e. $\overline{E(I)}_{SE,H} < \overline{E(I)}_{SE,L}$, where the overscore denotes the median value of the distribution. Second, they will also attach a lower utility to a certain expected income when they feel that higher risks are involved, i.e. $\overline{\rho}_{SE,H} > \overline{\rho}_{SE,L}$. Third, it may be assumed that uncertainty averse individuals have a relatively low valuation of autonomy, i.e. $\overline{\gamma}_{H} < \overline{\gamma}_{L}$.

This model of individual occupational choice presents several bridges to the effects of uncertainty avoidance for the macroeconomic business ownership rate. First, a culture of high uncertainty avoidance may imply a higher percentage of uncertainty/risk averse individuals within the population.[157] Applying our microeconomic model at the macro level, this implies lower assessments of the expected entrepreneurial income and a higher discount for perceived risks. On the other hand, countries with low uncertainty avoidance will count more individuals with entrepreneurial values who attach a higher utility to the rewards of self-employment. These countries thus have a relatively large supply of potential entrepreneurs (see Shane, 1993, for indirect support of this assumption). In terms of our model, this means that there will be more people for which the utility of the material rewards of self-employment (U_{MR}) is positive (negative) in countries with low (high) uncertainty avoidance.[158] This gives rise to the hypothesis that the prevalence of self-employment is diminished by high uncertainty avoidance (UAI+), while it is stimulated by low uncertainty avoidance (UAI-). In our section on 'Method' two clusters of countries will be defined.

However, there may also be an opposite effect because a culture of high uncertainty avoidance at country level may be expected to imply a restrictive climate within existing firms and organizations. This would offer a relatively large gain in autonomy (ΔAUT) to individuals choosing for self-employment. Even when there are fewer enterprising individuals in such an economy, UAI+ may push many of them towards self-employment. In terms of our model, this means that, on average, the utility of the immaterial rewards of self-employment (U_{IR}) will be higher in countries with high uncertainty avoidance. This leads to the hypothesis that high uncertainty avoidance (UAI+) may stimulate self-employment (see Baum et al., 1993, for an analogous reasoning with respect to the effect of low individualism at the country level).

[157] In terms of our illustration above, the group of individuals with a high uncertainty aversion level H is larger than in a culture with low uncertainty avoidance.

[158] Note again that $OC^*_{SE,i}$ in Equation (1) has to be positive in order for an individual to choose for self-employment, as the utility variables in the model are defined relative to the situation of wage-employment.

Summarizing, there are two contradicting hypotheses with respect to the *direct influence* of uncertainty avoidance on the supply of business owners. On average, an UAI+ culture will result in more individuals with a relatively low value of U_{MR}, but it will also result in more individuals with a relatively high value of U_{IR}. The overall impact of these opposite forces (i.e. the net-effect on the business ownership rate) is a subject for empirical research.

Indirect effect of uncertainty avoidance

Uncertainty avoidance may also have an *indirect influence* on the rate of business ownership, i.e. the level of uncertainty avoidance in a nation may influence the manner in which other variables determine business ownership. For example, the degree to which increasing per capita income leads to a perception of increasing opportunity costs of entrepreneurship (compared with well-paid, safe jobs) versus a perception of increasing entrepreneurial opportunities (more niches; need for autonomy) may well be dependent on the level of uncertainty avoidance. Likewise, high unemployment levels may be interpreted as a decrease of the opportunity costs associated with business ownership, and hence stimulate entrepreneurship, but also with increased likelihood of failure, and therefore negatively related with business ownership levels, depending on the degree of uncertainty avoidance.

7.3 Modeling the business ownership rate

The dependent variable in this study is the rate of business ownership in a nation at a certain moment in time. Our major interest is the direct and the indirect contribution of uncertainty avoidance to the variance in business ownership across nations and over time. We position our study within a broad multidisciplinary framework that is based on various strands of the entrepreneurship literature (see Verheul et al., 2002, and Wennekers, 2006, for a description of this framework). From this framework we choose control variables for our regression model of the effects of uncertainty avoidance. Table 7.2 lists economic and demographic determinants of business ownership. Here, we do not only focus on the underlying microeconomic studies of occupational choice, but also refer to surveys and empirical macroeconomic investigations. The first column also contains the operationalization of the determinants used in the empirical analysis while the final column indicates the data availability and the sources of the various variables. As we will use data for business ownership (the dependent variable in our study) for the years 1976, 1990 and 2004, and we will use a four years lag for the independent variables, we have aimed at collecting data for the years 1972, 1986 and 2000 for the variables in table 7.2. However, when data are not available for one of these years, we use data for the closest available year. This is also indicated in the final column of table 7.2.

Table 7.2 Major explanatory variables of the business ownership rate

Economic variables (operationalization)	*Relevant literature*	*Data availability (years); Source*
level of economic development (GDP per capita)	Kuznets, 1971; Lucas, 1978; Schultz, 1990; Yamada, 1996	1972, 1986, 2000; OECD National Accounts
share of services (employment in services divided by total labor force)[1]	van Stel and Carree, 2004	1972, 1986, 2000; OECD National Accounts
entrepreneurial income relative to the wage rate (labor income share)[2]	Parker, 2004	1972, 1986, 2000; own calculations, based on OECD National Accounts
unemployment rate	Evans and Leighton, 1989; Meager, 1992	1972, 1986, 2000; OECD Main Economic Indicators
social security entitlements (unemployment replacement rate)	Parker and Robson, 2004	1972, 1986, 2000; OECD Benefits and Wages
income disparity (Gini coefficient)[3]	Ilmakunnas et al., 1999	mid-1980s; 2000; OECD
cost of capital (long term interest rate) [4]	Parker, 2004	1991; 2000; OECD Economic Outlook 78 database
assets; collateral (house prices)	Evans and Jovanovic, 1989; Evans and Leighton, 1989; Parker, 2004.	insufficient data on house prices available
demographic variables		
age composition (number of people aged 25-39 years divided by number of people aged 25-64)	Storey, 1994; Blanchflower et al., 2001	1971, 1984, 1991; US Census Bureau, International Data Base
population density	Audretsch and Keilbach, 2004; Bais et al., 1995	1972, 1986, 2000; OECD Labour Force Statistics (population), Grote Winkler Prins encyclopaedia (area)
educational levels (gross enrollment rates for secondary and tertiary education)	Delmar and Davidsson, 2000; Uhlaner and Thurik, 2004	1970, 1985, 2000; World Bank EdStats data base
female labor participation	Delmar and Davidsson, 2000; Verheul, 2005.	1972, 1986, 2000; OECD Labour Force Statistics

[1] The services sector is broadly defined here, it contains the sectors Wholesale and retail trade, restaurants and hotels; Transport, storage and communication; Finance, insurance, real estate and business services; and Community, social and personal services.

[2] The labor income share has been corrected for the imputed wage income of self-employed individuals. To make the variable better fitting with the (non-agricultural) business ownership rate, the labor income share has been computed excluding the agricultural sector.

[3] No data available for 1972. Missing values for Belgium and Spain.

[4] No data available for 1972.

Level of economic development

It has been observed in various studies that the business ownership rate decreases as economies become more developed (Schultz, 1990; Yamada, 1996; see Carree et al., 2002, for an overview). Economic development is usually measured by per *capita*

income, but it is also reflected in the average *wage rate*. In the present discussion, we will include both per capita income and the wage rate.

A low level of prosperity usually coincides with a low wage level, implying little pressure to increase efficiency or the average scale of enterprise. Small firms in agriculture, crafts and retail trade are therefore dominant in such an economy. A major route for ambitious wage earners to increase their income, then, is to set up shop and become an entrepreneur. Subsequently, economic development leads to a rise in wages, which stimulates enterprises to work more efficiently and to reap economies of scale and scope (Chandler, 1990). Also, a declining share of agriculture and an increasing share of manufacturing diminish the opportunities for self-employment. At the supply side of the labor market an additional effect of rising wage levels is an increased attraction of wage-employment, increasing the opportunity cost of self-employment (Lucas, 1978). Iyigun and Owen (1998) argue that with economic development the 'safe' professional earnings will rise and fewer individuals will be willing to risk becoming a business owner.

In recent decades, statistical evidence points at a possible *reversal* of the negative relationship between real per capita income and self-employment at an advanced level of economic development. With rising per capita income, a differentiation of consumer demand for both goods and services creates new market niches and provides opportunities for business ownership. At the supply side of entrepreneurship, social psychology hypothesizes a hierarchy of human motivations, ranging from material needs to self-realization (Maslow 1970). By providing autonomy, entrepreneurship may become a more attractive occupational choice at higher levels of income.

However, this reversal is not universal, as witnessed by the continued decline of business ownership in some highly developed economies such as France and Japan (Verheul et al., 2002). Two opposing forces may be at play here: while rising wage levels will continue to increase the opportunity costs of self-employment, differentiation of consumer wants will create more opportunities for new enterprises. Occupational choices in countries with low uncertainty avoidance may be influenced more strongly by the latter effect than by the first. In high uncertainty avoidance countries it may be the other way around. Consequently, at advanced levels of economic development we conjecture a differential impact of increasing prosperity in low (UAI-) and in high (UAI+) uncertainty avoidance countries. In UAI+ countries the negative relationship between the level of prosperity and the self-employment rate will be undiminished across economic development. In UAI- countries the negative relationship between prosperity and the self-employment rate will be weaker or even reverse after a certain turning point.

Share of services

At the high end of economic development the share of the services sector usually increases relative to that of manufacturing. On average, self-employment rates in services are considerably higher than in manufacturing (see van Stel and Carree,

2004). It requires only relatively modest investments to set up an enterprise in many services. We assume that an increasing share of the services sector will increase the business ownership rate.

So far empirical research of this compositional effect on the business ownership rate is scant. Wennekers and Folkeringa (2002) investigated long-term trends in the business ownership rate of the Netherlands. Sector shifts were clearly seen to play a part, but within-sector trends turned out to be even more important. For an analogous conclusion about trends in the firm size distribution of six large OECD countries, see Loveman and Sengenberger (1991).

Relative earnings of self-employment
In a previous section we discussed a model of individual occupational choice. This model assumes that relative earnings of self-employment versus wage-employment will affect occupational choice. *Ceteris paribus*, the better the prospects of entrepreneurial income as compared to the wage income of employees, the more people will be attracted to become self-employed.[159] Parker (2004: 68-70) presents a survey of the empirical evidence for this relationship. Various investigations using a structural probit model, including relative earnings as determinants of individual occupational choice, give mixed results. Two time-series studies at a more aggregate level, also cited by Parker, find a significant contribution of aggregate earnings differentials to explaining trends in the UK self-employment rate.

In our empirical analysis we will use the macroeconomic labor income share as a (reverse) proxy for the (expected) entrepreneurial income relative to the wage income. The labor income share is defined as the sum of wages including 'imputed wage income of self-employed persons', expressed as a fraction of total income. This is admittedly a rough proxy.

The relationship between relative earnings and the business ownership rate may be moderated by the degree of uncertainty avoidance. In an occupational choice perspective, the weighing of expected entrepreneurial and wage income against one another also includes an assessment of the risks involved. In UAI- countries the entrepreneurial risks will be viewed more lightly and accordingly the effect of relative earnings may be stronger than in UAI+ countries.

Unemployment
(The threat of) unemployment is a factor diminishing the opportunity costs of self-employment, particularly when unemployment benefits are low relative to (minimum or average) wages. However, when structural unemployment is very high, this may

[159] In a microeconomic model of occupational choice (de Wit, 1993b), equality of entrepreneurial income and wages will determine the equilibrium number of self-employed. In this model, an exogenous wage increase will lower the (equilibrium) number of self-employed while an exogenous upward shift of profits will raise the equilibrium.

indicate bleak business opportunities and discourage business ownership (Hamilton, 1989 and Meager, 1992). Where the negative influence of rising unemployment begins to outbalance the positive effect of decreasing opportunity costs depends on a perception of uncertain future events, and may therefore be related to the level of uncertainty avoidance in a country. Hence we expect the positive effects of unemployment to dominate in UAI- countries, and the negative effects in UAI+ countries.

Social security entitlements
High social security entitlements for employees contribute to the opportunity costs of entrepreneurship, and may be expected to have a negative influence on the business ownership rate. This has been confirmed in several empirical investigations (Ilmakunnas, Kanniainen and Lammi, 1999; Parker and Robson, 2004; Hessels, van Stel, Brouwer and Wennekers, 2006) reporting negative effects on self-employment of employers' social security contributions and/or the unemployment benefit replacement rate.

Income disparity
Some scholars hypothesize that an equal income distribution may limit the required asset accumulation facilitating enterprise formation, while income disparity may be favorable for entrepreneurship (Ilmakunnas et al., 1999). At the lower end of the income distribution, inequality may act as a push factor to enter self-employment. Additionally, on the demand side of entrepreneurship income disparity is likely to create a more differentiated demand for goods and services. Empirical research by Ilmakunnas et al. suggests that income inequality positively influences the rate of self-employment, although reversed causality cannot be ruled out.

Financial variables
Starting and running a business requires financial capital. This capital is needed to purchase or rent the premises, to invest in equipment and/or vehicles, to purchase raw materials, to finance market research and advertising and to advance wages. The need for financial capital differs strongly with the line of business. Financial resources for business start-ups are often derived from self-financing (including savings, gifts, inheritances and lottery wins). Additionally, informal investors, mortgage loans, commercial credit and bank loans and (very rarely) venture capital can also be a source of start-up capital (Bygrave and Hunt, 2005).

Capital constraints, often related to lack of assets or collateral, may create serious impediments for business start-ups (Blanchflower and Oswald, 1998; Evans and Leighton, 1989; van Praag, 1996) and for young and growing firms (Chittenden, Hall and Hutchinson, 1996; LeCornu and McMahon, 1996). An influential paper by Evans and Jovanovic (1989) has stimulated research on credit rationing. For a survey of this literature, see Parker (2004). While a clear conclusion on the prevalence of credit rationing seems yet out of reach, there is ample evidence that self-employment rates are positively related to personal wealth (real estate and other assets).

Finally, the direct and indirect (opportunity) costs of financing a business depend on the rate of interest. Higher interest rates may be expected to have a negative effect on business ownership. Parker (2004: 104-105) weighs the empirical evidence. In particular, several UK and US time-series studies show a significant negative effect of the interest rate on the self-employment rate.

Demographic characteristics
With respect to gender, in most surveys women are found to be less likely to be involved in either self-employment or early-stage entrepreneurial activity than are men, although the difference varies across nations (Minniti, Arenius and Langowitz, 2005; Verheul, 2005). Econometric analysis of a large Swedish dataset of individual business start-ups has shown a remaining 'pure' gender effect after correcting for other differences such as education and previous management experience (Delmar and Davidsson, 2000). A higher *labor participation rate of women* thus in itself means a lower overall business ownership rate in the labor force.

The role of *population density* at the national level is less obvious. Every local area needs a minimum supply of facilities in retail trade, repair and personal services. Therefore, thinly populated regions will have relatively many small retail outlets, workshops and service providers. Conversely, urban areas will give rise to economies of scale through which small-sized entrepreneurship in particularly retailing comes under pressure (Bais, van der Hoeven and Verhoeven, 1995). On the other hand, networks and other supply side factors in urban areas are conducive to new entrepreneurship in many service industries (Audretsch and Keilbach, 2004).

Education is somewhat of an anomaly. On the one hand, research conducted on a Swedish sample at individual level and showing that nascent entrepreneurs attained on average a higher educational level[160] than those in a control sample (Delmar and Davidsson, 2000), has been reconfirmed in recent investigations across several high-income countries (Acs, Arenius, Hay and Minniti, 2004). On the other hand, research with respect to a static index of entrepreneurship leads to the opposite conclusion. For instance, in a recent comparative study across 27 OECD countries, countries with a higher level of secondary education tend to have a smaller proportion of self-employment (Uhlaner and Thurik, 2004).

With respect to the *age composition of the population*, Blanchflower, Oswald and Stutzer (2001: 686) reported that while "older people are more likely to be self-employed, it is younger people who say they would prefer to be self-employed". Earlier research also shows that people in the middle age cohorts have the highest prevalence of incumbent business owners (Storey, 1994). In many countries, prevalence rates of nascent entrepreneurship are highest in the age group between 25 and 34, while according to some research, a tendency towards start-ups at a younger

[160] In addition, nascent entrepreneurs were found to have more management experience.

age is also apparent.[161] *Ceteris paribus*, the ageing of the population in most developed countries implies a threat to the future development of business ownership.

7.4 Method and data

Method
First, we investigate the *direct* influence of uncertainty avoidance on the business ownership rate by means of a regression analysis of pooled panel data for 21 countries in 1976, 1990 and 2004, given the influence of (four years lagged) per capita income and some other control variables (also four years lagged). The control variables are chosen from table 7.2 on the basis of data-availability. We assume that the samples for 1976, 1990 and 2004 are sufficiently independent to warrant pooling them in one regression. Because uncertainty avoidance was measured only once (around 1970), its role in the pooled regression analysis may be interpreted as that of a country-specific time-invariant variable. Next, we use the years 1976, 1990 and 2004 as separate samples to investigate the stability of the direct relationship over time.

Second, we explore the possible *indirect* influence of uncertainty avoidance on the rate of business ownership. This means that we have added an interaction term between per capita income and uncertainty avoidance to the multiple regression analysis of the pooled sample for 1976, 1990 and 2004. Finally, we repeat this regression substituting UAI by a dummy variable representing two separate clusters of countries. In our dataset the following thirteen countries form the cluster[162] of low uncertainty avoidance: Denmark, Finland, Germany, Ireland, the Netherlands, Sweden, Great Britain, Norway, Switzerland, USA, Canada, Australia and New Zealand. Another eight countries, i.e. Austria, Belgium, France, Italy, Greece, Portugal, Spain and Japan, make up the cluster with high uncertainty avoidance. By comparing these two models we hope to find indications whether the effects of uncertainty avoidance are discrete or continuous (see also Cohen and Cohen, 1983).

Data
Harmonized non-agricultural business ownership rates for 23 OECD-countries are available from EIM's COMPENDIA data base.[163] These data include the owners of incorporated and unincorporated businesses but exclude unpaid family workers. The countries in COMPENDIA include 18 European countries as well as the USA, Japan, Canada, Australia and New Zealand. Data are available for the even years from 1972 onwards.

[161] Delmar and Davidsson (2000), EIM/EZ (2000), van Gelderen (1999:21) and various annual Executive Reports published by the Global Entrepreneurship Monitor.
[162] The clustering was carried out with the K-means algorithm. See Noorderhaven et al. (1999).
[163] COMParative ENtrepreneurship Data for International Analysis. See van Stel (2005). In the current paper, data from COMPENDIA version 2004.2 are used.

Additionally, Hofstede (2001) provides data on uncertainty avoidance for 21 of the 23 countries mentioned above.[164] Uncertainty avoidance is a key variable in Hofstede's well-known study[165] of cultural dimensions across some 50 different nations and regions. The uncertainty avoidance index (UAI) was computed on the basis of the country mean scores for three different survey questions already mentioned in a previous section. Because the surveys on which the index was based were held between 1967 and 1973, the stability of the index is a crucial aspect for our study into the rate of business ownership in the years 1976, 1990 and 2004. Hofstede (2001: 34) claims that national cultures are extremely stable over time. He argues that "… this stability can be explained from the reinforcement of culture patterns by the institutions that themselves are products of the dominant cultural value systems". In the long run, "cultures shift, but they shift in formation, so that the differences between them remain intact" (Hofstede, 2001: 255). Chapters 2 and 4 of Hofstede's book present abundant statistical information about the stability and reliability of the uncertainty avoidance index. Our best assessment is that this index can be used for explaining national rates of entrepreneurship during several decades following the measurement of the index.

An alternative would have been to use the uncertainty avoidance data reported by the GLOBE project (House et al., 2004). We refrain from doing so for two reasons. First, Hofstede's uncertainty avoidance index is well understood, and has been used in many previous studies. Hofstede (2001) also reports extensively on correlates of his uncertainty avoidance index with measures from over one hundred other studies. Comparable validation of the GLOBE uncertainty avoidance scales is not available. Secondly, there are some conceptual difficulties with the GLOBE uncertainty avoidance scales. GLOBE constructed two scales, the actual use of uncertainty avoidance mechanism in the respondent's society ('practices'), and the desired use of uncertainty avoidance mechanisms ('values'). These two scales are negatively correlated. The GLOBE practices scale is also negatively correlated to Hofstede's UAI scale, the GLOBE values scale positively (Sully de Luque and Javidan, 2004).[166] This makes the GLOBE scales difficult to interpret. The authors note that most countries with high uncertainty avoidance practices are technologically developed nations (Sully de Luque and Javidan, 2004: 621). This makes the index less relevant for the current study, as we are comparing levels of business ownership across developed countries only. Both GLOBE uncertainty avoidance scales are strongly correlated with economic prosperity, the 'practices' scale positively, and the 'values' scale negatively (Sully de Luque and Javidan, 2004: 631). Hofstede's UAI, in contrast, is only weakly correlated to economic prosperity (Hofstede, 2001: 201). Consequently, Hofstede's

[164] No data on Hofstede's indices are available for Iceland whereas for Luxembourg there are estimates that we have used for clustering only. See Noorderhaven et al. (1999).

[165] This study was first published in 1980, but the second edition published in 2001 gives more information on stability and cross-validation of the data.

[166] For the 19 countries in our dataset for which we have both Hofstede and GLOBE data on uncertainty avoidance, the correlations are: Hofstede UAI x GLOBE practices: -.643; Hofstede UAI x GLOBE values: .607; GLOBE practices x GLOBE values: -.869. All these correlations are significant at the 1% level.

index measures cultural characteristics of countries that are relatively independent of wealth, and thus this index forms a good complement to the economic indicators we also use in this study.

For the operationalization and sources of the control variables we refer to table 7.2. Besides the controls included in table 7.2 we also include year dummies in our analysis. Recent decades have witnessed a worldwide diffusion of new information and communication technologies as well as a widespread tendency towards deregulation of markets. Both phenomena have created opportunities for small scale business and new entrepreneurship. Audretsch and Thurik (2000 and 2001) label this as a regime switch from 'a managed to an entrepreneurial economy'. We try to catch these developments using year dummies as controls in our analysis.

Table 7.3 presents the correlation matrix of the pooled sample for 1976, 1990 and 2004. The highest (positive) correlations among the control variables include those between per capita income on the one hand and the female labor share and tertiary education on the other. Uncertainty avoidance and per capita income show a moderate degree of (negative) correlation in our sample.

7.5 Results

Direct influence of uncertainty avoidance
Table 7.4 presents the regressions on the pooled sample for 21 countries in 1976, 1990 and 2004. First, we regress business ownership on uncertainty avoidance, GDP per capita and the year dummy variables. This is the 'base model' shown in the first column of the table. The significantly *positive* coefficient for uncertainty avoidance is support for Baum's hypothesis stating that dissatisfaction with a climate of high uncertainty avoidance in large organizations may push enterprising individuals towards self-employment. GDP per capita and the year dummies are also significant and have the expected sign. Next, we introduce the other control variables one by one. In all but one of these regressions the coefficient for uncertainty avoidance is significantly positive. The only exception is the regression including the Gini index, which is based on 37 observations only. With respect to the significant control variables, the only counterintuitive result is the positive sign for the long term interest rate.
Subsequently, as shown in the second to last column of table 7.4, we regress business ownership on uncertainty avoidance while including all control variables that are significant in the previous regressions[167]. Finally, the last column shows the variables that are significant in a 'complete model'. These are uncertainty avoidance (+), per capita income (-), the share of services (+), the unemployment replacement rate (-) and the dummy variables for 1990 and 2004 (+).

[167] Excluding the Gini coefficient and the long term interest rate, due to the smaller available number of observations of these variables.

Table 7.3 Correlation matrix

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*
1. Business ownership rate	1													
2. Uncertainty avoidance	.49**	1												
3. GDP per Capita	-.24 #	-.38**	1											
4. Labor income share	-.42**	-.42**	.27*	1										
5. Unemployment	.31*	.09	-.01	-.10	1									
6. Female labor share	-.21	-.22	.67**	.19	.001	1								
7. Population density	-.03	.28*	.04	.22 #	-.01	-.14	1							
8. Share services	.21 #	-.26*	.54**	.10	-.02	.18	-.07	1						
9. Replacement rate unempl.	-.26*	-.18	.32*	.05	.14	.30*	.27*	-.035	1					
10. Gini index	.71**	.42**	-.21	-.35*	.32 #	-.32 #	-.06	.33*	-.54**	1				
11. Long term interest rate	.08	-.14	-.56**	-.08	.38*	-.36*	-.24	-.25	-.04	-.26	1			
12. Share age group 25-39 in adult pop. (25-64 yr)	.05	-.23 #	.42**	-.15	.18	.32*	-.15	.49**	.29*	-.11	.27 #	1		
13. Secondary education	-.06	-.23 #	.59**	.13	.18	.64**	.10	.26*	.48**	-.21	-.48**	.27*	1	
14. Tertiary education	.06	-.16	.73**	-.01	.27*	.66**	-.13	.44**	.30*	.11	-.60**	.38**	.70**	1
N	*63*	*63*	*63*	*63*	*63*	*63*	*63*	*63*	*63*	*37*	*40*	*63*	*62*	*62*
MEAN	0.11	62.9	14,762	.77	.056	.39	1.20	.42	.25	0.29	0.074	0.43	0.96	0.36
STANDARD DEVIATION	0.035	24.7	4,770	.06	.038	.059	1.12	.12	.14	0.044	0.025	0.033	0.23	0.20

Note: Correlations are based on a pooled sample of 1976, 1990 and 2004 (63 observations maximum).
# p<0.10; * p<0.05; ** p<0.01.

Table 7.4 The *direct* influence of uncertainty avoidance on business ownership, pooled sample 1976, 1990 and 2004 (21 countries)

	base model													*complete model*
Constant	.11	.18	.10	.18	.11	.076	.13	.001	.043	.026	.14	.11	.098	.094
	(7.0)	(3.8)	(4.6)	(5.0)	(7.0)	(4.5)	(7.7)	(0.0)	(0.9)	(0.6)	(4.4)	(7.0)	(1.8)	(5.0)
Uncertainty Avoidance	.041	.036	.043	.036	.048	.045	.031	.009	.041	.044	.036	.043	.035	.038
	(3.1)	(2.9)	(3.0)	(2.4)	(3.5)	(3.9)	(2.4)	(0.4)	(2.2)	(3.6)	(2.7)	(3.3)	(2.4)	(3.3)
GDP per Capita	-.38	-.32	-.32	-.29	-.35	-.59	-.39	-.29	-.26	-.43	-.37	-.40	-.50	-.57
	(3.9)	(2.8)	(2.6)	(2.6)	(3.8)	(7.2)	(4.8)	(1.8)	(2.0)	(4.3)	(3.9)	(4.1)	(4.6)	(7.0)
Labor income share		-.089												
		(1.3)												
Unemployment			.13											
			(1.1)											
Female labor share				-.21									-.13	
				(2.6)									(1.5)	
Population density					-.004									
					(1.4)									
Share services						.15							.10	.14
						(5.4)							(3.1)	(4.6)
Replacement rate unempl.							-.082						-.063	-.052
							(3.6)						(2.8)	(2.2)
Gini index								.51						
								(4.8)						
Long term interest rate									.78					
									(2.2)					
Share age group 25-39 in adult pop. (25-64 yr)										.22			.12	
										(2.0)			(1.0)	
Secondary education											-.025			
											(0.8)			

Table 7.4, continued

	base model													*complete model*
Tertiary education												.031		
												(1.1)		
Year dummy 1990	.023	.022	.015	.033	.023	.023	.032			.018	.026	.019	.033	.029
	(2.8)	(2.4)	(1.3)	(3.3)	(2.7)	(3.3)	(3.9)			(1.9)	(2.4)	(2.1)	(3.2)	(3.8)
Year dummy 2004	.046	.041	.037	.060	.044	.048	.059	.009	.051	.045	.055	.034	.065	.055
	(4.3)	(3.4)	(2.9)	(4.5)	(4.2)	(6.1)	(5.9)	(0.9)	(3.3)	(4.1)	(3.3)	(2.5)	(4.9)	(7.0)
N	63	63	63	63	63	63	63	37	40	63	62	62	63	63
R^2	.368	.385	.381	.429	.383	.567	.459	.592	.361	.399	.377	.373	.627	.601

Dependent variable: number of non-agricultural business owners per labor force.
Absolute heteroskedasticity consistent t-values are between brackets.

Table 7.5 presents the regressions in three separate sample years 1976, 1990 and 2004. For each year the left-hand column presents a regression including the control variables that were listed in the second to last column of table 7.4, while the right-hand column reports significant control variables only. The main finding for the sample of 1976 is a significantly positive influence of uncertainty avoidance on the rate of business ownership. In 1990 the coefficient of uncertainty avoidance is again positive, but no longer fully significant. In 2004 no influence of UAI is found. All regressions confirm the well-known negative influence of GDP per capita.

Table 7.5 The *direct* influence of uncertainty avoidance on business ownership, separate samples 1976, 1990 and 2004 (21 countries)

	1976	*1976*	*1990*	*1990*	*2004*	*2004*
Constant	.093	.060*	.16 #	.14**	.32 #	.33 #
	(1.4)	(2.2)	(1.9)	(3.4)	(1.8)	(2.0)
Uncertainty Avoidance	.054 #	.063**	.029	.032	-.007	-.0095
	(1.9)	(3.1)	(1.3)	(1.4)	(0.4)	(0.6)
GDP per Capita	-.39	-.52*	-.63**	-.58**	-.62**	-.59**
	(1.3)	(2.7)	(3.0)	(3.1)	(4.4)	(4.0)
Female labor share	-.15		.041		-.59	-.67 #
	(1.3)		(0.3)		(1.5)	(2.0)
Share services	.11	.15*	.16*	.13*	.047	
	(1.5)	(2.2)	(2.2)	(2.7)	(0.7)	
Replacement rate unemployment	-.030		-.093	-.10*	-.056	-.072*
	(0.8)		(1.7)	(2.3)	(1.5)	(2.3)
Share age group 25-39 in adult	.066		-.091		.40	.50**
pop. (25-64 yr)	(0.6)		(0.5)		(1.7)	(3.2)
N	21	21	21	21	21	21
R^2	.614	.558	.749	.747	.686	.672

Dependent variable: number of non-agricultural business owners per labor force.
Absolute heteroskedasticity consistent t-values are between brackets.
# p<0.10; * p<0.05; ** p<0.01.

The main outcome of table 7.5 is that the positive effect of uncertainty avoidance fades away over time. My interpretation would be that the advent of the entrepreneurial economy in recent years, as discussed in the Introduction, has created new pull factors mobilizing the relatively abundant supply of potential 'entrepreneurial capital' in countries with low uncertainty avoidance. So Baum's push hypothesis for high uncertainty avoidance and Shane's pull hypothesis for low uncertainty avoidance may now be equally valid, effectively countervailing one another in the regression for 2004. Another explanation could be that the measurement of uncertainty avoidance (which was carried out around 1970) has lost some of its validity 30 years onwards, but the arguments discussed in the Data section offer no specific support for this interpretation. The coefficients for GDP per capita and to a lesser extent for the share of services and the replacement rate are relatively stable over time. The two other control variables, i.e. the female labor share and the share of the age group 25-39, are

only significant in 2004. These results are consistent with the findings in the last two columns of table 7.4.

We conclude that there is evidence for a push effect of *high* uncertainty avoidance on the rate of business ownership. However, in recent years a pull towards entrepreneurship in a climate of *low* uncertainty avoidance may have gained dominance vis-à-vis this longstanding historical push effect of high uncertainty avoidance. We have also found consistent confirmation of the well-known observation of a negative bearing of per capita income on business ownership. Finally, most results support a positive influence of the share of services and a negative effect of the replacement rate.

Indirect influence of uncertainty avoidance
Next, we have explored the possible *indirect* influence of uncertainty avoidance on the rate of business ownership, by adding an *interaction term* between per capita income and uncertainty avoidance to the pooled panel regressions. The two left-hand columns of table 7.6 compare the results of the base model including this interaction term in addition to uncertainty avoidance, GDP per capita and the year dummy variables with the original base model as also presented in table 7.4. The main outcome is a significant (at 10% level) intermediate effect of uncertainty avoidance on the influence of GDP per capita.[168] What do these results mean in a quantitative sense? As an illustration, the results imply that for the country with the highest UAI-rate in the sample (Greece), an increase in real per capita income with $ 1.000 would imply a decrease of the business ownership rate with 0.61 percentage points, while for the country with the lowest uncertainty avoidance rate (Denmark), this increase in income would mean a decline in business ownership with 0.14 percentage points only. These differences show that the indirect effect exists indeed.

[168] This appears both from the significance level of the interaction term (p-value is .078) and from a loglikelihood test comparing the models in the first two columns of table 7.6. The LR test statistic is 3.4 while the 10% critical value is 2.71.

Table 7.6 The *indirect* influence of uncertainty avoidance on business ownership, pooled samples 1976, 1990 and 2004 (21 countries); base model using UAI and per capita income only

	UAI continuous effect		*UAI discrete effect*	
Constant	.11**	.064*	.14**	.12**
	(7.0)	(2.6)	(8.2)	(7.9)
Uncertainty Avoidance (UAI)	.041**	.11**		
	(3.1)	(2.9)		
Dummy UAI strong			.016 #	.060*
			(1.8)	(2.5)
GDP per Capita (YCAP)	-.38**	-.017	-.42**	-.28**
	(3.9)	(0.1)	(3.5)	(2.8)
UAI * YCAP		-.53 #		
		(1.8)		
Dummy UAI strong * YCAP				-.31 #
				(1.8)
Year dummy 1990	.023**	.022**	.025**	.024**
	(2.8)	(2.7)	(2.8)	(2.8)
Year dummy 2004	.046**	.043**	.050**	.047**
	(4.3)	(4.1)	(4.2)	(4.3)
N	63	63	63	63
R^2	.368	.400	.347	.383
Loglikelihood	137.3	139.0	136.3	138.1

Dependent variable: number of non-agricultural business owners per labor force.
Absolute heteroskedasticity consistent t-values are between brackets.
# $p<0.10$; * $p<0.05$; ** $p<0.01$.

The right-hand columns of table 7.6 present regressions in which uncertainty avoidance has been substituted by a dummy variable representing a high and a low uncertainty avoidance cluster of countries, as explained in the section on Method and Data. The results are similar to those including the continuous scale for UAI as discussed in the previous paragraph. Again, the model including both a direct and an indirect effect of uncertainty avoidance outperforms the model including a direct effect only (at 10% level). An increase in real per capita income with $ 1.000 would imply a decrease of the business ownership rate with 0.59 percentage points in the UAI+ countries and a decline with 0.28 percentage points in the UAI- countries.

Next, we have tested the robustness of the indirect effect by adding the share of services and the replacement rate as control variables. Table 7.7 reports the results. As can be seen from columns 2 and 4, the indirect effect then becomes somewhat smaller and is no longer fully significant.

Table 7.7 The *indirect* influence of uncertainty avoidance on business ownership, pooled samples 1976, 1990 and 2004 (21 countries), complete model

	UAI continuous effect		*UAI discrete effect*	
Constant	.094**	.058*	.11**	.093**
	(5.0)	(2.0)	(6.8)	(5.3)
Uncertainty Avoidance (UAI)	.038**	.089*		
	(3.3)	(2.6)		
Dummy UAI strong			.022**	.048*
			(2.9)	(2.2)
GDP per Capita (YCAP)	-.57**	-.31*	-.59**	-.50**
	(7.0)	(1.8)	(6.8)	(5.5)
UAI * YCAP		-.38		
		(1.5)		
Dummy UAI strong * YCAP				-.18
				(1.1)
Share services	.14**	.14**	.15**	.15**
	(4.6)	(4.6)	(5.5)	(5.3)
Replacement rate unemployment	-.052*	-.047*	-.052*	-.046*
	(2.2)	(1.9)	(2.5)	(2.0)
Year dummy 1990	.029**	.027**	.028**	.027**
	(3.8)	(3.6)	(3.9)	(3.6)
Year dummy 2004	.055**	.052**	.055**	.053**
	(7.0)	(6.1)	(7.2)	(6.5)
N	63	63	63	63
R^2	.601	.617	.617	.629
Loglikelihood	151.8	153.1	153.1	154.1

Dependent variable: number of non-agricultural business owners per labor force.
Absolute heteroskedasticity consistent t-values are between brackets.
# p<0.10; * p<0.05; ** p<0.01.

By and large there are serious indications for a differential effect of per capita income on entrepreneurship across the rate of uncertainty avoidance, but the robustness of these results is limited. A final observation on the basis of tables 7.6 and 7.7 would be that the statistical fit of a 'discrete effect' of uncertainty avoidance is not significantly better than that of a 'continuous effect'.[169]

7.6 Conclusions

The prevalence of entrepreneurship, expressed as the percentage of business owners in the labor force, differs strongly between countries. The causes of this disparity do not only have an economic basis but also stem from cultural differences between countries (Hofstede et al., 2004 and Noorderhaven et al., 1999). The persistence of the country

[169] Note that, in table 7.6, the R^2 of the continuous effect model is (slightly) higher compared to the discrete effect model while in table 7.7, this is the other way around.

differences throughout the economic cycles points at cultural determinants that are relatively constant per country.

Using a pooled dataset of a large number of OECD countries in 1976, 1990 and 2004, we have found a positive *direct* influence of uncertainty avoidance on business ownership rates, indicating that in those years a climate of high uncertainty avoidance in existing firms and organizations may push enterprising individuals towards self-employment (Baum's hypothesis, as discussed before). These findings also show that a personal trait (risk aversion) and its cultural counterpart (uncertainty avoidance) may have a diverging impact on entrepreneurship. Repeating these regressions in three separate sample years confirms these results in 1976 and 1990. However, for the year 2004 the main outcome is that uncertainty avoidance no longer has any direct influence on business ownership. Our interpretation would be that the advent of the entrepreneurial economy in recent years has created pull factors mobilizing the relatively abundant supply of potential 'entrepreneurial capital' in countries with low uncertainty avoidance. In recent years a pull towards entrepreneurship in a climate of *low* uncertainty avoidance has gained dominance vis-à-vis a longstanding historical push effect of *high* uncertainty avoidance.

We also found evidence for a negative *indirect* influence of uncertainty avoidance through a moderating effect on the influence of per capita income on business ownership. In low uncertainty avoidance countries the negative influence of per capita income on the rate of business ownership is clearly smaller than in high uncertainty avoidance countries. In a group of eight high-uncertainty avoidance countries a relatively strong negative relationship between GDP per capita and the level of business ownership suggests that rising opportunity costs of entrepreneurship are the dominant perception in this cultural environment. On the other hand, in a group of thirteen low-uncertainty avoidance countries the relatively weak negative relationship between business ownership and per capita income suggests that rising opportunities are a countervailing force in an environment of low uncertainty avoidance.

A closer look at the underlying development of the business ownership rate in all 21 countries between 1972 and 2004 reveals the following. In the group of low-uncertainty avoidance countries, eight out of thirteen nations show either a clear U-shape (Finland, Germany, the Netherlands and New Zealand) or a vaguely U-shaped trend (Australia, Great Britain, Sweden and USA), three show a continuously upward trend in entrepreneurship (Canada, Ireland and Switzerland), one shows a stabilization in the last twenty years (Denmark), while only one (Norway) shows a decreasing trend.[170] In the group of high-uncertainty avoidance countries, two out of eight

[170] However, in 2004 Norway had a significant rise in the business ownership rate compared to 2002 possibly indicating a stabilization or even reversal of the downward trend. To the contrary, while Canada and Switzerland show an increasing trend over the period 1972-1998, the business ownership rates of these countries are decreasing since 1998.

countries (France and Japan)[171] show a strongly decreasing trend, while six show an increase or a U-shape, sometimes followed by stabilization. While the large number of countries with rising business ownership rates across both groups bear witness to a worldwide trend toward more entrepreneurship related to ICT and deregulation, the differential indirect effects of uncertainty avoidance also suggest that in modern service economies high uncertainty avoidance may indirectly have a negative impact on the development of business ownership and may hamper the exploitation of new economic opportunities.

This study has some limitations that should be borne in mind when interpreting the results. First, the modest explanatory power of most of the regressions suggests that other cultural and psycho-sociological variables may also play a role[172]. Secondly, this chapter only studies the effect of uncertainty avoidance on the *level* of entrepreneurship. It would be relevant to repeat the study for the *dynamics* of entrepreneurship, although a lack of time series of harmonized business start-up data across countries may hamper the latter at least in the near future. Finally, business ownership rates are available for a far smaller number of countries than uncertainty avoidance data. This inhibits fuller testing of the direct and the indirect effect of uncertainty avoidance.

Nonetheless, the present results may already have some relevance for policymakers trying to promote entrepreneurship. While we would not advocate social engineering, the results do suggest that countries should investigate to what extent their educational system and relevant labor market, social and fiscal legislation foster a low or a high degree of uncertainty avoidance within the population.

[171] In addition Luxemburg, that estimates show to be a high uncertainty avoidance country, also has a declining trend.

[172] This includes individualism (Shane, 1993), post-materialism (Uhlaner and Thurik, 2004), dissatisfaction (Noorderhaven et al., 2004) and entrepreneurial culture (Suddle et al., 2006).

NEDERLANDSE SAMENVATTING (SUMMARY IN DUTCH)

Onderwerp, motivering en doelen van de publicatie

Dit boek bestudeert de mate van ondernemerschap op het niveau van landen, gemeten als het aantal zelfstandige ondernemers in procenten van de beroepsbevolking. Dit kengetal verschilt sterk tussen landen en laat daarbij trendmatige bewegingen en conjuncturele fluctuaties zien. Dit geldt ook voor de dynamiek in de mate van ondernemerschap, die eveneens in deze studie wordt onderzocht.

Ondernemerschap is geen eenduidig begrip. Een belangrijk onderscheid is dat tussen ondernemerschap als gedrag en ondernemerschap als beroep. In de onderhavige studie staat de beroepsmatige notie van ondernemerschap centraal. Deze opvatting beschouwt ondernemerschap als het werken voor eigen rekening en risico, ongeacht de rechtsvorm waarbinnen dit gebeurt (zoals eenmanszaak, maatschap en BV). In beginsel is de beroepsmatige notie van ondernemerschap conceptueel helder afgebakend van het begrip 'werken in loondienst', hoewel er in de praktijk tussenvormen en hybride vormen voorkomen. Daarbij is er over ondernemerschap als beroep het nodige statistische materiaal beschikbaar, zij het dat dit niet zonder haken en ogen is. Zo zijn metingen van aantallen zelfstandige ondernemers veelal pas na correctie vergelijkbaar tussen landen, en zijn tijdreeksen op dit terrein vaak behept met definitieveranderingen of andere reeksbreuken. Niettemin is ondernemerschap als beroep een binnen de geschetste beperkingen goed onderzoekbaar fenomeen.

Het is zowel wetenschappelijk als beleidsmatig van belang om meer inzicht te krijgen in de determinanten van het aantal zelfstandige ondernemers en van de dynamiek daarin. In de jaren vijftig en zestig van de vorige eeuw leken uitsluitend de zeer grote, veelal beursgenoteerde ondernemingen de sleutel tot welvaartsgroei en banencreatie te zijn geworden en vormden zelfstandige ondernemers ogenschijnlijk een uitstervend ras. Het kan echter verkeren, en sindsdien heeft het zelfstandig ondernemerschap zowel een herwaardering als een comeback doorgemaakt. Het economisch en maatschappelijk belang van ondernemerschap in het huidig tijdsgewricht is inmiddels boven twijfel verheven. Overheden over de gehele wereld proberen dan ook om het aantal ondernemers en het aantal nieuwe bedrijfsoprichtingen te bevorderen. Om dit doeltreffend te kunnen doen is het nodig om te weten welke technologische, economische, demografische en andere maatschappelijke krachten inwerken op het ondernemerschap, en hoe en in welke mate overheidsbeleid direct of indirect de mate van ondernemerschap kan beïnvloeden.

Eerder economisch onderzoek heeft een structureel, negatief verband laten zien tussen het economisch ontwikkelingspeil van een land, zoals gemeten via het inkomen per hoofd, en het percentage zelfstandige ondernemers in de beroepsbevolking. Dit verband blijkt zowel uit lange historische tijdreeksen voor economisch hoogontwikkelde landen als de VS, het VK en Nederland, als uit vergelijkende studies

tussen grote aantallen landen met een verschillend ontwikkelingsniveau. In de literatuur is hiervoor het volgende economische verklaringsmodel opgesteld[173]. Na de zogenoemde 'take-off' vanuit een vroeg ontwikkelingsstadium leiden industrialisatie en een daarmee verbonden structurele overgang van arbeid vanuit landbouw en huisindustrie naar meer grootschalige bedrijvigheid tot een geleidelijke daling van het aantal zelfstandigen. Voortgaande economische ontwikkeling en schaalvergroting in vele takken van bedrijvigheid gaan lange tijd hand in hand, zodat het aantal ondernemers verder daalt. Dit proces wordt ook aan de aanbodzijde gevoed doordat de opkomst van banen in loondienst en een geleidelijke toename van het reële loon de 'opportunity costs' van ondernemerschap als beroepskeuze sterk vergroten.

Echter, in werkelijkheid vindt in een vergevorderd ontwikkelingsstadium, zoals dat in de VS en het VK rond 1970 werd bereikt, een omslag plaats en begint het aantal ondernemers als aandeel in de beroepsbevolking weer te stijgen. In vele (maar niet alle) landen met een economisch hoog ontwikkelingspeil heeft zich een dergelijke opleving van ondernemerschap in de afgelopen decennia voorgedaan. Deze omslag is echter in strijd met het economische model dat immers een verdere daling van ondernemerschap voorspelt. Daarenboven blijkt de verklaringsgraad van dit model, als het wordt toegepast op een dwarsdoorsnede van landen, tamelijk bescheiden te zijn. Kennelijk zijn er ook andere determinanten in het spel. De vakliteratuur in andere disciplines geeft daarbij reden om te veronderstellen dat het hier onder meer gaat om technologische, institutionele en culturele factoren[174]. Dit suggereert dat een multidisciplinaire benadering zou kunnen helpen om meer inzicht te krijgen in de prevalentie van ondernemerschap op het niveau van landen.

Een multidisciplinaire theorie van de mate van ondernemerschap is momenteel nog niet voorhanden, er is amper begonnen met de ontwikkeling van een prototheorie. Het onderhavige boek stelt zich daarom ten doel een eerste proeve van een multidisciplinair theoretisch raamwerk voor de verklaring van de mate van ondernemerschap op het niveau van landen te ontwikkelen. Dit raamwerk poogt de basisvoorwaarden voor ondernemerschap te identificeren, aan te geven langs welke intermediaire kanalen deze condities de mate van ondernemerschap beïnvloeden en welke terugkoppelingsmechanismen, zoals leerprocessen en rolmodellen, hierbij aan de orde zijn. Een tweede doel van deze studie is om enkele, tegen de achtergrond van dit raamwerk relevante, causale verbanden empirisch vast te stellen.

[173] Dit model wordt hier generaliserend weergegeven, maar men zou het ook kunnen presenteren als een historische ontwikkelingsschets van bijvoorbeeld Nederland of het VK.

[174] Zoals een invloed van de ICT-revolutie op de transactiekosten en van ontslagbescherming, sociale zekerheid en pensioenstelsel op de 'opportunity costs' van ondernemerschap. Ook kan men denken aan de rol van het onderwijssysteem bij cultuuroverdracht en ontwikkeling van vaardigheden.

Korte samenvatting per hoofdstuk

Hoofdstuk 1 behelst een verkenning van het onderwerp middels historische casestudies. Begonnen wordt met een schets van diverse verschijningsvormen van ondernemerschap en de voorwaarden hiervoor gedurende de Gouden Eeuw van de Republiek der Zeven Verenigde Provinciën. Vervolgens komt het ondernemerschap in Engeland tijdens de Eerste Industriële Revolutie kort aan de orde, gevolgd door een summiere schets van wat de geleidelijke Britse economische neergang vanaf 1850 inhield voor de condities voor ondernemerschap. Deze cases bieden een impliciete introductie tot het multidisciplinair verklaringskader voor de mate van ondernemerschap, zoals dat wordt ontvouwd in hoofdstuk 3. Een volgende casestudy besteedt aandacht aan de 'creative destruction' functie van ondernemerschap tijdens de Tweede Industriële Revolutie (circa 1860-1920), en aan de met een scheiding van eigendom en management in naamloze vennootschappen gepaard gaande 'creative accumulation' tijdens de zogenoemde Management Revolutie (circa 1900-1970). Vervolgens wordt de 'renaissance' van het ondernemerschap tijdens de laatste 25 jaar van de vorige eeuw cijfermatig toegelicht.

Na deze casestudies betreffende historische tijdvakken, richt hoofdstuk 1 zich op de taalkundige wortels van het woord 'entrepreneurship' en op de geschiedenis van het denken over ondernemerschap. Bovengenoemde notie van ondernemerschap als beroep dateert traceerbaar uit midden 18^{e} eeuw. Daarnaast grijpt een in de economische en management wetenschappen meer recentelijk opgekomen opvatting van ondernemerschap als gedrag terug op de oorspronkelijke 15^{e}-eeuwse betekenis van het Franse woord 'entrepreneur' als 'iemand die iets voor elkaar krijgt'. Deze twee noties kunnen ook worden opgevat als aparte dimensies, te weten 'ondernemer versus werknemer' en 'vernieuwend versus beherend'. Uit een dubbele dichotomie van deze dimensies komen naast de 'executive manager' drie ondernemerstypes naar voren. Dit zijn de 'corporate entrepreneur', de 'Schumpeteriaanse' zelfstandige entrepreneur en de modale zelfstandige. De twee laatstgenoemden, en hun vele tussenvormen, belichamen de notie van ondernemerschap als beroep dat de focus vormt van de rest van dit boek. Hierbij zullen we een statisch perspectief en een dynamisch perspectief onderscheiden, zoals hierna wordt uiteengezet.

Hoofdstuk 2 gaat in op de doelen van de publicatie als geheel, geeft een overzicht van de onderzoeksbevindingen en bespreekt de conclusies. Dit hoofdstuk vormt de grondslag voor de onderhavige Nederlandstalige samenvatting.

In hoofdstuk 3 wordt een theoretisch raamwerk gepresenteerd ten behoeve van het onderzoek naar de verklaring van de mate van zelfstandig ondernemerschap op het niveau van landen. Dit multidisciplinaire raamwerk bestaat uit ketens van verbanden tussen verschillende determinanten en het niveau van ondernemerschap. In het raamwerk spelen drie analyseniveaus een rol: individueel persoonsniveau, bedrijfsniveau en geaggregeerd niveau. Verder wordt een onderscheid gemaakt in twee dimensies van ondernemerschap: een statische en een dynamische dimensie.

Vanuit statisch perspectief is het aantal zelfstandige ondernemers de belangrijkste indicator van ondernemerschap, ongeacht de rechtsvorm van hun bedrijf. Indicatoren vanuit dynamisch perspectief zijn 'nascent entrepreneurship'[175] en het bruto aantal bedrijfsoprichtingen.

Het raamwerk bestaat uit twee modules, waarbij de eerste module opgedeeld is in twee delen. Het eerste deel van Module I biedt een verklaringskader voor 'nascent entrepreneurship' op zowel individueel als geaggregeerd niveau. Dit denkmodel gaat uit van de veronderstelling dat individuen op bepaalde momenten in hun leven een afweging maken tussen een baan in loondienst en zelfstandig ondernemerschap. Bij dit beslisproces worden de gepercipieerde risico's van beide opties, zij het veelal impliciet, afgewogen tegen de verwachte materiële en immateriële opbrengsten ervan. Deze percepties zijn gebaseerd op de ingeschatte marktkansen en op de persoonlijke mogelijkheden. Het gewicht dat aan deze percepties gegeven wordt bij het beslissen, is afhankelijk van persoonlijke attitudes en voorkeuren. Zowel de prevalenties van (gepercipieerde) kansen, mogelijkheden en voorkeuren als de individuele beroepsafwegingen staan sterk onder invloed van technologische, economische, demografische, culturele en institutionele voorwaarden.
Het tweede deel van Module I behandelt de relatie tussen geaggregeerd ‘nascent’ ondernemerschap, het aantal bedrijfsoprichtingen en het feitelijk aantal zelfstandige ondernemers op landenniveau. Voor deze laatste variabele wordt uitgegaan van een onderliggend evenwichtsniveau, dat ook als het 'natuurlijke' niveau van ondernemerschap kan worden beschouwd. Dit evenwichtsniveau is in beginsel omgekeerd evenredig aan de mate van de economische ontwikkeling van een land, maar recent onderzoek suggereert dat dit verband in een vergevorderd ontwikkelingsstadium omslaat in een U-vormige relatie. Tevens wordt aandacht besteed aan 'feedback' in het geval dat het werkelijke niveau afwijkt van het veronderstelde evenwichtsniveau van ondernemerschap. De overheid kan op dit punt bijsturen door vorm te geven aan effectief beleid op het gebied van startende ondernemingen. Overheidsbeleid in brede zin is een belangrijke determinant van ondernemerschap. In een synthese van Module I wordt dit nader uitgewerkt. Er worden in hoofdlijnen vijf typen relevante beleidsmaatregelen onderscheiden:

- beleid gericht op het beïnvloeden van het aantal en de toegankelijkheid van ondernemerskansen, de zogenoemde vraagzijde van ondernemerschap (bijvoorbeeld technologiebeleid, deregulering en privatisering);
- beleid gericht op het beïnvloeden van de demografische groep potentiële ondernemers (bijvoorbeeld regionaal ontwikkelingsbeleid en immigratiepolitiek);
- beleid dat gericht is op het beïnvloeden van de beschikbaarheid van middelen en vaardigheden onder de populatie (bijvoorbeeld subsidies, kapitaalmarktbeleid, beroepsonderwijs en advies);

[175] Met 'nascent entrepreneurship' wordt gedoeld op individuen die actief bezig zijn met het opzetten van een nieuwe, eigen onderneming. Afgezien van de nogal poëtische term 'ontluikend ondernemerschap' is er geen goed equivalent in de Nederlandse taal.

- beleid dat gericht is op het beïnvloeden van relevante waarden van individuen en hun beroepsmatige preferenties (bijvoorbeeld algemeen vormend onderwijs en voorlichting);
- beleid dat gericht is op het beslisproces van individuen, met name de risicoperceptie (bijvoorbeeld hervorming sociale zekerheid, modernisering belastingstelsel, arbeidsmarktbeleid en faillissementswetgeving).

Module II schetst een raamwerk hoe de statische en de dynamische dimensies van ondernemerschap middels hun doorwerking op innovatie, economische verscheidenheid en concurrentie mede van belang zijn voor de bedrijfsprestaties van ondernemers, alsmede hoe deze individuele en geaggregeerde effecten uiteindelijk weer terugkoppelen naar de voorwaarden voor ondernemerschap en het ondernemersproces zelf. Deze 'feedback' speelt een essentiële rol in het verklaren van het niveau van nieuw ondernemerschap. Op individueel niveau betreft feedback vaak leereffecten van ondernemerschap en het creëren van rolmodellen. Op bedrijfstakniveau gaat het veelal om een herstructurering, leidend tot nieuwe ondernemende activiteiten.

Hoofdstuk 4 is het eerste van de vier empirische hoofdstukken die geschreven zijn tegen de achtergrond van het multidisciplinair raamwerk. Dit hoofdstuk presenteert en analyseert een op basis van CBS-materiaal geconstrueerde lange tijdreeks van het percentage zelfstandige ondernemers in de werkgelegenheid van drie grote sectoren van de Nederlandse economie (landbouw, nijverheid en diensten). De reeks omvat acht meetpunten in de periode 1899-1997. Ten gevolge van definitieverschillen is deze tijdreeks niet geheel zonder haken of ogen, maar zij spoort op hoofdlijnen met vergelijkbare reeksen voor de VS en het VK en lijkt een realistisch beeld te geven van de structurele trends in de mate van het zelfstandig ondernemerschap. Een zogenoemde 'shift-share' analyse van deze data suggereert dat zowel de langdurige daling van het aandeel ondernemers als de meer recente opleving ervan niet in eerste instantie een gevolg zijn van de op zich aanzienlijke veranderingen in de sectorstructuur, maar veeleer samenhangen met processen van schaalvergroting respectievelijk schaalverkleining binnen met name nijverheid en diensten. Deze bevinding onderbouwt het vermoeden dat er dieperliggende oorzaken dan sectorstructuurveranderingen aan de orde zijn, zoals deze in het theoretisch raamwerk zijn uiteengezet en deels in de volgende hoofdstukken empirisch zijn onderzocht.

Hoofdstuk 5 probeert de empirische verscheidenheid in de mate van 'nascent' ondernemerschap, zoals deze door de Global Entrepreneurship Monitor in 2002 is gemeten voor een groep van 36 landen met een sterk uiteenlopend economisch ontwikkelingsniveau, te verklaren middels een econometrisch regressiemodel. Allereerst wordt op basis van een beknopte literatuurstudie op het terrein van de economische ontwikkeling een U-vormige relatie verondersteld tussen de mate van 'nascent' ondernemerschap en het economisch ontwikkelingspeil. In enkele eerste regressieanalyses, waarbij het niveau van economische ontwikkeling wordt gemeten via het per capita inkomen dan wel een index van 'innovatie capaciteit', wordt dit

vermoeden significant bevestigd, zij het dat de verklaringsgraad van het model bescheiden is. Bij toevoeging van diverse controle variabelen blijft de U-vormige relatie tussen 'nascent' ondernemerschap en het economisch ontwikkelingsniveau in stand. Tevens worden significante bijdragen gevonden van ondermeer het totaal aantal zelfstandige ondernemers (+), een index voor sociale zekerheidsuitgaven (-) en het tempo van bevolkingsgroei (+), en gaat de totale verklaringsgraad van het model aanzienlijk omhoog.

Hoofdstuk 6 richt zich op de rol van maatschappelijke onvrede als bron van zelfstandig ondernemerschap. Allereerst wordt kort samengevat wat de arbeidspsychologie te zeggen heeft over diverse vormen van persoonlijke onvrede als motivatie voor baanverandering in het algemeen en van beroepskeuze voor zelfstandig ondernemerschap in het bijzonder. Daarnaast wordt de invloed van 'reality factors' zoals marktkansen, risico's en persoonlijke capaciteiten op de feitelijke beroepskeuze belicht. Ten tweede worden voornoemde bevindingen op individueel niveau gegeneraliseerd tot hypotheses op geaggregeerd niveau. Dit betreft een hypothese over de positieve invloed van geaggregeerde onvrede met de maatschappij dan wel het eigen leven op de prevalentie van zelfstandig ondernemerschap, alsmede de ook al hiervoor besproken hypothese van een negatieve invloed van het economisch ontwikkelingsniveau op het ondernemerschap. Deze hypotheses zijn getoetst met een regressieanalyse op 'gepoolde paneldata' voor 15 EU-landen in de jaren 1978, 1986, 1992 en 2000, waarbij naast twee maatstaven voor onvrede uit de Eurobarometer alsmede het per capita inkomen ook diverse controlevariabelen zijn meegenomen. Beide hypotheses blijven significant overeind in de regressieanalyse. Dit resultaat is robuust voor veranderingen in specificatie en het weglaten van landen uit de steekproef. Sterk positieve dummies voor de jaren 1992 en 2000 weerspiegelen de positieve invloed van ICT, globalisering, deregulering en de opkomst van een 'netwerkeconomie' op het ondernemerschap. Al met al wijst het onderzoek uit dat ondernemerschap niet alleen afhangt van 'pull'-factoren, maar dat ook 'push'-factoren een rol spelen. Daarbij kan een gevonden negatieve invloed van het werkloosheidspercentage worden geïnterpreteerd als nadere aanwijzing voor de hoge 'opportunity costs' van ondernemerschap in de meeste Europese landen.

Hoofdstuk 7 bestudeert de directe en indirecte invloed van culturele attitudes ten opzichte van onzekerheid, zoals gemeten in Hofstede's index van onzekerheidsvermijding, op de mate van ondernemerschap in een land. Allereerst worden de begrippen onzekerheid en risico uitgewerkt en van elkaar onderscheiden. Onzekerheid omvat zowel risico's als kansen, en is daarmee bij uitstek relevant voor ondernemerschap. Vervolgens passeren twee tegengestelde hypotheses ten aanzien van de invloed van onzekerheidsvermijding op ondernemerschap de revue. Regressieanalyse tussen onzekerheidsvermijding en de prevalentie van zelfstandig ondernemerschap in 21 landen laat in 1976 en 1990 een positief verband zien. Dit bevestigt de 'push'-hypothese die ervan uitgaat dat 'ondernemende types' in een onzekerheidsvermijdende cultuur eerder ontevreden zullen zijn met een baan in loondienst dan in landen waar de cultuur een minder strak georganiseerd bedrijfsleven

met zich meebrengt. In 2004 wordt dit positieve verband niet meer teruggevonden. Dit doet vermoeden dat in landen met lage onzekerheidsvermijding, de balans tussen push en pull factoren voor ondernemerschap verschuift naar de laatstgenoemde. Deze interpretatie wordt bevestigd door een regressieanalyse met gepoolde paneldata voor 1976, 1990 en 2004. Naast een (positief) direct effect wordt een indirect effect van 'uncertainty avoidance' gevonden. Naarmate de cultuur van een land minder door onzekerheidsvermijding wordt gekenmerkt, is de negatieve invloed van per capita inkomen op ondernemerschap er kleiner. Mogelijk worden daar bij welvaartsgroei de toenemende 'opportunity costs' van ondernemerschap in sterkere mate gecompenseerd door eveneens toenemende (percepties van) kansen voor ondernemerschap.

Conclusies

Als we het geheel van deze studie overzien, kunnen we de volgende conclusies trekken. Ten eerste biedt een multidisciplinaire analyse van de prevalentie van het zelfstandig ondernemerschap op landenniveau een duidelijk hogere verklaringsgraad dan een zuiver economisch model. Technologische, demografische, sociale, culturele en institutionele factoren leveren alle een verklaringsbijdrage. Ten tweede zijn er aanwijzingen dat zowel 'push' factoren, zoals onvrede en (dreigende) werkloosheid, als 'pull' factoren, zoals het perspectief van meer autonomie en de mogelijkheid om winst te maken, een rol kunnen spelen als prikkel tot de keuze voor het zelfstandig ondernemerschap. In veel Europese landen wordt de werking van dergelijke prikkels verzwakt door de hoge 'opportunity costs' van ondernemerschap ten gevolge van bijvoorbeeld de veel betere sociale zekerheid en pensioenvoorziening bij een baan in loondienst en van de sterke ontslagbescherming. Ten derde is aan het licht gekomen dat de invloed van de nationale cultuur op het ondernemerschap complex en soms zelfs paradoxaal is. Ten aanzien van 'onzekerheidsvermijding' is niettemin de voorzichtige conclusie, dat deze culturele karakteristiek remmend werkt op de geneigdheid om de ondernemerskansen te pakken die besloten liggen in de technologische en economische ontwikkelingen binnen een hoogontwikkelde diensteneconomie. Ten vierde lijken terugkoppelingsmechanismen een belangrijke rol te spelen in de verklaring van de prevalentie van zelfstandig ondernemerschap. Het lijkt aannemelijk dat het verdwijnen van het maatschappelijk rolmodel van de succesvolle zelfstandige ondernemer de neergang van het ondernemerschap in de naoorlogse periode heeft versterkt, zoals een geleidelijke terugkeer van dit rolmodel de huidige, zij het nog voorzichtige tendens naar een meer ondernemende samenleving kan ondersteunen. De vijfde en laatste conclusie betreft de veelvuldige aanwijzingen voor een structurele omslag in de rol van het zelfstandig ondernemerschap in de moderne economie. Deze trendbreuk blijkt het duidelijkst uit de opleving in de afgelopen decennia van het aantal zelfstandige ondernemers dan wel van het aantal nieuwe bedrijfsoprichtingen in de meeste, zij het niet alle, hoogontwikkelde economieën. Technologische en economische trends lijken de belangrijkste drijvende krachten achter deze omslag, terwijl vooral culturele en institutionele factoren bepalen in welke mate een land daadwerkelijk gebruik maakt van de geboden kansen voor meer ondernemerschap.

Aanbevelingen voor toekomstig onderzoek

Er is nog veel werk te doen aan de ontwikkeling van een theorie van het zelfstandig ondernemerschap op het niveau van landen. Dit betreft allereerst de verdere conceptuele ontwikkeling van de variabelen die (aspecten van) ondernemerschap meten en van de sleutelbegrippen in het verklaringsmodel, zoals de 'opportunity costs' van ondernemerschap. Voorts betreft het de formele afleiding van toetsbare hypotheses. Ten derde is het aggregatievraagstuk een grote theoretische uitdaging.
Maar ook voor toekomstig empirisch onderzoek biedt het onderhavige boek aanknopingspunten. Allereerst is het van groot belang om voor zoveel mogelijk landen consistente en vergelijkbare tijdreeksen van indicatoren van ondernemerschap-dynamiek te ontwikkelen. Dit omvat indicatoren van latent en 'nascent' ondernemerschap alsmede metingen van geslaagde pogingen om een eigen bedrijf op te richten. Voorts dienen diverse potentiële determinanten, zoals indicatoren van 'opportunity costs' en relevante houdingen en preferenties binnen de bevolking, te worden geoperationaliseerd en voor zoveel mogelijk landen te worden gekwantificeerd. Naar de mate dat betere data beschikbaar komen, kan ook een uitgebreidere verklarende analyse van de prevalentie van ondernemerschap uitgevoerd worden dan nu mogelijk was.

Beleidsaanbevelingen

Europa, waaronder Nederland, worstelt met een hardnekkige problematiek van stagnerende economische groei en hoge werkloosheid. Dit is een hoofdreden dat in veel Europese landen economische hervormingen op de politieke agenda staan. Terecht worden meer innovatie en concurrentiekracht nagestreefd, en wordt ondernemerschap als een onmisbare voorwaarde daartoe gezien. Hoe kan de Nederlandse samenleving de realisering van dit doel naderbij brengen? Hoewel de onderhavige studie niet expliciet was gericht op de beantwoording van deze beleidsvraag, bieden de onderzoeksbevindingen enkele aanknopingspunten.

De prevalentie van 'nascent' ondernemerschap in Nederland is naar internationale maatstaven gemeten laag. Ten eerste moet iemand hier veel opgeven om zelfstandig ondernemer te worden. Dit heeft te maken met een achterstandspositie voor ondernemers in de sociale zekerheid en de pensioenopbouw, maar ook met de ontslagbescherming voor werknemers en met de faillissementswetgeving. Deze regelingen dragen ertoe bij dat 'push' factoren om de stap naar een eigen bedrijf te zetten in Nederland zwak zijn, maar ze vormen ook 'disincentives' voor degenen die potentieel worden aangetrokken door 'pull' factoren zoals een marktkans of het perspectief van meer autonomie in het werk. Het wordt aanbevolen om bij de politieke afwegingen over de hervorming van dergelijke instituties ook expliciet hun effect op de voorwaarden voor ondernemerschap te bezien.
Ten tweede is het imago van zelfstandige ondernemers weliswaar verbeterd, maar maken nog steeds maar weinigen in hun jeugd serieus kennis met ondernemerschap als beroepsoptie en leren jongelui op school erg weinig over wat ondernemerschap

inhoudt en waarom het belangrijk is. Dit manco werkt duurzaam door in een geringe geneigdheid bij de bevolking om ooit zelf een eigen bedrijf te willen beginnen, en leidt er ook toe dat de meeste (toekomstige) ouders en leraren thuis respectievelijk op school weinig over ondernemerschap te melden hebben en dat ondernemerschap doorgaans geen belangrijk aspect zal zijn in de beleidsafwegingen van (toekomstige) politici en beleidsambtenaren. Het vormt zeker ook geen positieve bijdrage aan de ondernemerszin van (toekomstige) managers bij grote bedrijven en instellingen. Meer aandacht voor ondernemerschap in het onderwijs is een noodzakelijke voorwaarde om een meer ondernemende samenleving te bevorderen en in de Nederlandse cultuur te verankeren.

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A. (Sander) R.M. Wennekers (1947) has been active as a professional economist for more than 30 years. Since 1988 he holds a management position with EIM at Zoetermeer (the Netherlands), where he is in charge of the research program on SMEs and entrepreneurship. Sander is Ameritech Research Scholar at the Institute for Development Strategies of Indiana University, he participates in many professional organizations and he is a member of the Research Committee of the Global Entrepreneurship Monitor. His work at the crossroads of entrepreneurship and macroeconomics has been published in several books and academic journals.

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