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ENTREPRENEURSHIP IN THE REGION

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FOREWORD

The articles collected in this book are based on projects that have been financially supported by the *German Science Foundation* (DFG) in the framework of the priority program "Interdisciplinary Entrepreneurship Research" in the years from 1998 to 2004 Although not all of the projects had initially planned to focus on regions, the various discussions of the research results in the different phases of the priority program clearly showed that regional factors did indeed play an important role. This gave rise to the idea of organizing this collection of articles based on the priority program that in one way or another deal with the regional dimension in entrepreneurship.

This book would not have been possible without the vital support of a number of persons and institutions. We are particularly indebted to the German Science Foundation for the funding of the priority program. Rachelle R. Rinke was of invaluable help in the editing of the English language in the articles written by non-native speakers. Sandra Mueller did a great job in carefully preparing the camera-ready manuscript. Last but not least, the authors deserve gratitude for their work. We hope that this book will provide inspiration for further research in the field of entrepreneurship, particularly the investigations of regional factors that effect entrepreneurship and its impact on development.

Freiberg and Regensburg, August 2005

Michael Fritsch
Jürgen Schmude

1 INTRODUCTION AND OVERVIEW

Michael Fritsch and Juergen Schmude

1. Entrepreneurship in the Region

Entrepreneurship has a pronounced regional dimension. Differences in start-up rates, in entrepreneurial attitudes, and the success of newly founded businesses between regions indicate a distinct importance of space and the local environment for entrepreneurship. Empirical research has shown that such differences are not at all elusive but tend to be rather persistent and to prevail over longer periods of time.

Dealing with different aspects of entrepreneurship, the articles collected in this book all approach their topic from a spatial perspective. The various regional influences on entrepreneurship analyzed entail regional peculiarities and disparities in new business formation processes, employment effects of new firms, the importance of social capital and of network structures, as well as entrepreneurship education and training provided in the regions. The contributions to this book clearly show that there is a diversified set of approaches on how to relate entrepreneurship and new firm formation processes to regions. Differences between approaches include the understanding of what is the appropriate regional level of analysis. While most of the articles utilize the highly disaggregated level of the German districts ("Kreise"), others address larger regional entities like planning regions ("Raumordnungsregionen"), the federal states ("Länder"), or analyze the differences between the eastern and the western part of the country, whose divergent historical backgrounds are still imprinted in their socioeconomic development. The articles in this book also follow different research strategies for investigating the regional context of entrepreneurship and new business formation. While some analyze the influence of regional factors by in-depth case studies of certain regions, which are often based on data that have been raised by postal questionnaires and through personal interviews, others are conducting interregional comparisons that include all regions of the country. Such differences in the types of approaches not only depend on the particular question under investigation but also reflect the research traditions of the disciplines involved. The contributions of the different academic disciplines clearly demonstrate that their research methods are complementary in character. Entrepreneurship

research is an interdisciplinary issue that benefits from the contribution of various ways of approaching the issue.

All articles in this book are based on the priority research program "Interdisciplinary Entrepreneurship Research" that the German Science Foundation (DFG) has granted in the 1998-2004 period. The research reported here has been conducted in the final phase of the program between the years 2002 and 2004.

2. Entrepreneurial Regions, Employment Effects, and Innovation in Regional Systems – An Overview

The articles in this book cover three major issues. The first set of questions concerns the effect of regional characteristics on the entrepreneurial attitudes, behavior, and activities of the inhabitant population. What makes a region "entrepreneurial," and how could policy stimulate regional entrepreneurship? Such questions are examined for the regional population as a whole (chapter 2), for particular subgroups such as (potential) women entrepreneurs (chapter 3) and for students at universities (chapter 12). The second domain of the book addresses the employment effects of newly established businesses in quantity as well as the quality of the jobs generated by the start-ups (chapters 4, 5, 6, and 7). A third group of papers puts emphasis on the development of selected innovative industries within particular regional economic systems (chapters 8, 9, and 10).

Subsequent to the introductory chapter, Ingo Lückgen, Dirk Oberschachtsiek, Rolf Sternberg, and Joachim Wagner report empirical evidence from the Regional Entrepreneurship Monitor (REM), a research project that is related to the Global Entrepreneurship Monitor (GEM) focusing on ten German regions. Their results are derived from comparing the shares of nascent entrepreneurs from 2003 to those from 2001 in the regions under investigation (chapter 2). In the contribution by Friederike Welter and Lutz Trettin they investigate the spatial embeddedness of supporting networks for and of women entrepreneurs, with a particular emphasis on the emergence of the institutional formal network structure in two regional settings (chapter 3). While the authors observe a "bottom-up"-approach for the network evolution in the State of Mecklenburg-Western Pomerania – where women entrepreneurs have been the main driving force for network creation – a more "top-down"-mechanism is identified for the Munich region.

The subsequent contributions (chapters 4, 5, 6, and 7) deal with the employment effects of new businesses. On the basis of the Establishment register derived from the German Social Insurance Statistics, Antje Weyh examines survival and the development of employment in start-up cohorts in different regions and industries of West Germany. She analyzes the characteristics of start-up cohorts that created a relatively large number of jobs as well as the

factors which influence the success of these cohorts (chapter 4). One result is that new manufacturing firms have the best survival chances in rural areas whereas start-ups in the service sector show higher employment development in agglomeration areas. High regional start-up rates have, however, a negative effect on new firm survival indicating a high intensity of competition and market selection in these regions. Dirk Engel and Georg Metzger also analyze medium term employment effects of start-up cohorts drawn from the ZEW Foundation Panels (chapter 5). Their results suggest a comparatively good performance of firms set up by founders with an academic degree as well as of firms in high-technology sectors. Building on data provided by the same source, Michaela Niefert investigates differences in entry patterns and post-entry performance between Eastern and Western Germany firms as well as between patenting and non-patenting firms (chapter 6). She finds that in the time since the unification, Eastern German start-ups have been comparatively larger, have grown faster, and have relied on more seed capital and financial support than those in West Germany. Generally, involvement in patenting activities enhances the employment growth performance of newly founded firms.

Udo Brixy, Susanne Kohaut, and Claus Schnabel investigate wage setting and labor fluctuation in newly founded and in established firms with a linked employer-employee data set generated from the German Social Insurance Statistics (chapter 7). The authors show that start-ups are characterized by higher labor fluctuation, lower bargaining coverage, and lower wages than incumbent establishment. Their results, however, indicate that such differences disappear rather rapidly as new firms mature.

Chapters 8 to 10 focus on specific economic sectors such as knowledge-intensive services or the surgical instruments industry within particular regions. Ralf Binder and Björn Sautter investigate the effects of the regional environment on new firm formation and survival in the surgical instrument cluster of Tuttlingen, which is one of the most important locations of the industry world-wide (chapter 8). A particular emphasis of their analysis is on the importance of social ties within this cluster. They show that the relationships between the members of the cluster are often characterized by considerable mistrust towards actors outside as well as within the cluster. According to their analysis, social ties and personal trust between actors play a decisive role for getting access to critical resources. Knut Koschatzky and Thomas Stahlecker investigate structural ties of young firms of the knowledge-intensive business (KIBS) sector in the regional innovation system of the city of Bremen (chapter 9). A focus of the empirical analysis is the role of these firms for the transfer of knowledge and technology. They conclude that in the innovation system of Bremen, KIBS play a significant role for the modernization and development. In particular, they have an important function as being a bridge between the sector of public education and research (universities, public research institutions), on the one side, and the commercial application

of new knowledge, on the other side. Andreas Koch and Harald Strotmann in their contribution analyze determinants of innovation activity based on data from three German agglomerations (chapter 10). They find that the managerial characteristics of the firm founders as well as interaction between firms in networks are crucial for innovative behavior.

The contribution by Michael Fritsch and Pamela Mueller gives an overview of their research on the employment effects of new business formation, the evolution of regional entrepreneurship, and the transition of regional growth regimes (chapter 11). They emphasize the importance of indirect employment effects of new business formation. Analyzing the level of new business formation over a longer period of time, they find that the changes are rather small. This suggests that a policy that intends to stimulate start-ups can only be effective in the longer run. An analysis of typical patterns of start-up activity and regional development confirms this need of a long-run orientation of entrepreneurship policies.

Finally, Kerstin Wagner, Frank Bau, Juergen Schmude, and Michael Dowling investigate regional differences of entrepreneurship education in universities focusing on three regions (chapter 12). They particularly focus on the effects of regional structures on students' entrepreneurial attitudes. Surprisingly, those attitudes are hardly at all likely to depend on such regional structures. Rather they may be considerably determined by the type of faculty at which the courses of entrepreneurship education are located as well as by the size of the university.

3. Outlook

The articles in this book provide strong evidence for the importance of regional factors for entrepreneurship and new firm formation processes. They also demonstrate that a plurality of approaches in the analysis of entrepreneurship can be very fruitful. Entrepreneurship is a rather complex phenomenon, and there is no single appropriate way of analyzing the issue. The emergence and the success of a new firm should be explained and understood as a multi-dimensional product of numerous factors. For example, the success of a newly founded firm does not only depend on the abilities and resources of the founder but also on the availability of funds, on public policy, on technological development, on the industrial context and, of course, on regional parameters such as infrastructure, the regional workforce, local networks of customers and suppliers, spatial proximity to research institutes, the intensity of knowledge spillovers, and support by the public administration. Therefore, a variety of approaches, particularly the involvement of different disciplines, is needed in order to arrive at a proper understanding of entrepreneurship and new firm development. Further research programs should account for this need for a plurality of approaches. To organize a fruitful cooperation of dif-

ferent approaches and academic disciplines may be regarded a main challenge for future research on entrepreneurship.

Apart from this need for variety, the articles collected in this book clearly suggest that further research on entrepreneurship as well as entrepreneurship policy should account for the regional dimension. Space and location do matter a lot for entrepreneurship. Therefore, entrepreneurship policies of a "one size fits all"-type, i.e. operating with uniform measures that are performed nearly the same way all over the country may not be appropriate. This leads to the question of appropriate ways to regionalize entrepreneurship policies. One way of accounting for region-specific factors in national entrepreneurship policies could be to involve regional actors in the design, administration, and financing of the programs. Because nearly all new businesses are set up at a location close to the place where the founder lives, stimulating entrepreneurship could be an important element of a policy that tries to promote the endogenous growth potential of regions. How this could be effectively done is another question for further research.

2 NASCENT ENTREPRENEURS IN GERMAN REGIONS

Evidence from the Regional Entrepreneurship Monitor (REM)

Ingo Lückgen, Dirk Oberschachtsiek, Rolf Sternberg and Joachim Wagner

1. Introduction

Nascent entrepreneurs are people who are (alone or with others) actively engaged in creating a new venture, and who expect to be the owner or part owner of this start-up. Recently, an increasing number of empirical studies deals with the impacts of start-up activities on economic development of nations (Wong, Ho and Autio forthcoming; van Stel, Carree and Thurik forthcoming) and subnational regions (Acs and Armington, 2004; Fritsch and Mueller, 2004). Obviously different types of entrepreneurial activities may have different impacts on economic growth. Especially high growth potential entrepreneurship is found to have a significant (positive) impact on the dependent variables of economic growth in economically advanced countries. Given that newly founded firms are important for the economic development of nations and regions, and that nascent entrepreneurs are by definition important for the foundation of new firms, information about nascent entrepreneurs is important for understanding crucial aspects of the economy. This information, however, can not be found in publications from official statistics. Until the turn of the millennium, therefore, we knew next to nothing about nascent entrepreneurs in Germany. The situation improved considerably when results from the first German wave of the *Global Entrepreneurship Monitor (GEM)* survey became available in 1999.[1] The GEM project, however, is focused on

1 In the long-term "Global Entrepreneurship Monitor (GEM)" research project, which was created in 1998 (pilot phase, first data available for 1999), an international team of researchers (see www.gemconsortium.org for details and all country reports and global reports) documents and analyses the scope and causes of entrepreneurial activities and the complex relationship between entrepreneurship and economic growth in various countries and publishes the results each year (global reports and country reports). GEM started with ten participant countries; 31 countries were involved in the most recent study for 2003. Germany is one of the six countries which have been involved in the GEM project from the very beginning. The German country team is led by the third author. The results of recent years have shown that entrepreneurial ac-

variations of entrepreneurial activity between entire countries. The relevance of detailed information on nascent entrepreneurs at the *regional* level, and the lack of it for Germany, led us to start the research project *Regional Entrepreneurship Monitor (REM) Germany* in 2000. As part of this project, we performed a representative survey of the adult population in ten German regions, plus a survey and interviews with local experts in the field of entrepreneurship. A second wave followed in 2003. This paper summarizes our findings using data from these surveys and interviews.

The rest of the paper is organized as follows: Section 2 reports the shares of nascent entrepreneurs in the adult population in ten German regions in 2001 and 2003, and presents some descriptive explanations on the reasons for regional variation based upon entrepreneurial framework conditions. In section 3 we deal with the question whether nascent entrepreneurs are different from the rest of the adult population, and whether there is a typical nascent entrepreneur with a typical set of characteristics. Here we describe the relationship between the prevalence rate of nascent entrepreneurs and selected personal characteristics. The following two sections summarize findings from our econometric investigations using the REM data: In section 4 we look at studies which focus on the ceteris paribus effect of personal characteristics (like being male, or coming from a family with at least one self-employed family member) and of regional characteristics (like density of population, or price of land) on the propensity to become a nascent entrepreneur. Section 5 reviews findings from econometric studies which deal with selected special topics in nascent entrepreneurship: The role of gender and gender-specific differences in risk aversion; the professional background and Lazear's Jack-of-all-trades – theory; the employment status of nascent entrepreneurs and differences among the unemployed, the employed and those out of the labor force; the role of failure as a self-employed in the past and the taking a second chance; and characteristics of the (former) workplace and the role of small, young firms as 'hothouses' for nascent entrepreneurs. Section 6 concludes by putting our findings into perspective and identifying open questions for future research.

2. Nascent Entrepreneurship in Ten German Regions: the Evidence

The data used in this paper are taken from the research project Regional Entrepreneurship Monitor (REM) (Bergmann, Japsen and Tamásy, 2002; Lückgen and Oberschachtsiek, 2004). REM focuses on the extent of the difference

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tivities within a country are in statistical relationship with overall economic development and that interregional differences in entrepreneurial activities and attitudes are obvious (for further information on the GEM country reports Germany see http://www.wiso.uni-koeln.de/wigeo/, see also Sternberg and Lückgen, 2005). For the most recent global report of GEM see Acs et al. (2005).

in entrepreneurial activities between regions in Germany, its determinants and consequences for regional development. The concept of the Regional Entrepreneurship Monitor is similar to that of the Global Entrepreneurship Monitor (GEM), a multi-country study that investigates the same topics at a national level (see footnote 1).

Data collection was carried out in ten out of ninety-seven so-called planning regions or "Raumordnungsregionen" (Bundesamt für Bauwesen und Raumordnung, 2001). Even if we cannot claim that the data is representative for Germany as a whole, the regions were selected in such a way that they mirror the spatial structure with regard to old and new federal states (i.e. West and East Germany), highly industrialized versus more rural regions, center and periphery etc. Information relating to the average in the selected regions can be considered to be a valid instrument for information on Germany as a whole. The regions included in the REM project are Cologne, Munich, Lueneburg, Middle Schleswig Holstein, Main-Rhoen, Stuttgart, Middle Hesse, Western Saxony/Leipzig, Emscher-Lippe and Middle Mecklenburg/Rostock (for detailed information regarding the selection of the regions see Lückgen and Oberschachtsiek, 2004).

Data were collected in telephone surveys of the adult population, in mail surveys of local entrepreneurship experts, and in face-to-face interviews with selected experts in the regions. The two REM telephone surveys of the German population aged 18-64 were conducted using computer assisted telephone interviewing in the summer of 2001 and 2003. In each of the ten regions a random sample of 1000 people were interviewed, leading to a data set with 20,000 cases. The random sampling process ensures that the sample is representative of the population in the respective region. For further details on each of the REM surveys, see the specific reports on the methodology of this research project (Lückgen and Oberschachtsiek, 2005; Japsen, 2002).

The mail survey of regional experts was carried out in each of the ten regions to investigate the impact of entrepreneurial framework conditions (EFCs) on regional entrepreneurial activities. These framework conditions cover fields that affect entrepreneurial activities such as finance, physical infrastructure, government policy, government programs, technology transfer, entrepreneurial education, labor market, cultural and social norms, networks and female entrepreneurship (for details see Lückgen and Oberschachtsiek, 2004).

In the population survey the interviewees were asked whether they, alone or with others, were actively involved in starting a new business that will, as a whole or in part, belong to them. It was also asked whether this business did not pay full wages or salaries for more than three months to anybody, including the interviewee. Those who answered in the affirmative are considered to be *nascent entrepreneurs*.

According to the population surveys, the share of nascent entrepreneurs among adults aged 18 to 64 years in 2003 was 4.4 percent, and it was

0.8 percentage points higher than in 2001. Figure 2.1 reports detailed results for the ten regions in both years. Interregional differences in the order of magnitude point to differences in the level of entrepreneurial activity among the regions. The share of nascent entrepreneurs in 2003 is about twice as high in the regions of Cologne, Western Saxony/Leipzig and Munich, as in the regions of Emscher-Lippe and Middle Mecklenburg/Rostock. The largest changes between 2001 and 2003 took place in the regions of Western Saxony/Leipzig, Middle Hessen, Munich and Stuttgart. In these regions, the share of nascent entrepreneurs increased remarkably, e. g. in Western Saxony/Leipzig from 2.8 percent to 5.7 percent.

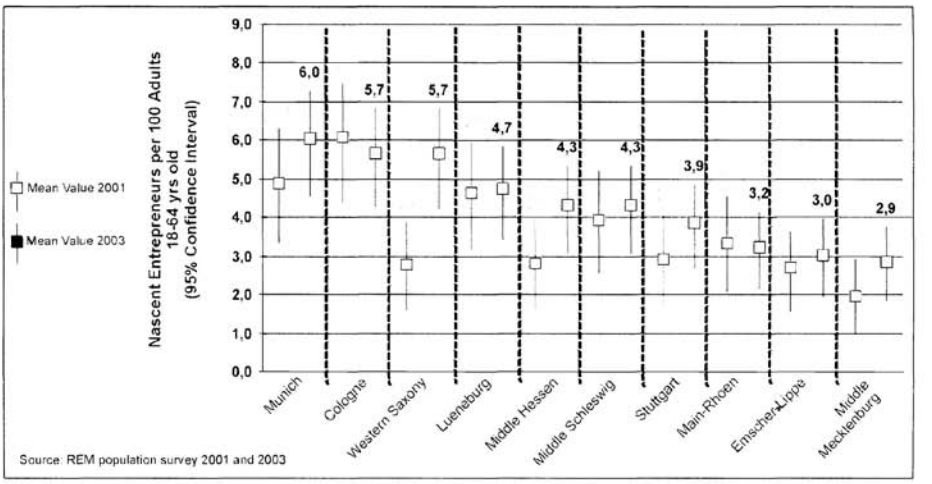

Figure 2.1: Share of nascent entrepreneurs in the ten investigated regions in summer 2001 and 2003

Why does the level of entrepreneurial activity differ between the ten regions? The REM project looks at two parameters influencing entrepreneurial activity: entrepreneurial attitudes and entrepreneurial framework conditions. Analyses for 2001 and 2003 show that on average, people from regions with a high share of nascent entrepreneurs (e. g., Munich and Cologne) state that they have the skills necessary to found a new business more often, they are less risk averse, and they see better chances for a successful start of a business more often than interviewees from regions with lower shares of nascent entrepreneurs (e. g., Emscher-Lippe and Mecklenburg/Rostock). These results illustrate that there is a strong relationship between entrepreneurial attitudes in a region and the regional level of entrepreneurial activity. Compared to entrepreneurial Attitudes, the EFCs – information which has been gathered in the mail surveys of the local entrepreneurship experts – have much less impact on the level of entrepreneurship activity in the regions (for details see Bergmann, Japsen and Támasy, 2002, and Lückgen and Oberschachtsiek, 2004).

3. Who is a Nascent Entrepreneur?

Definition of nascent entrepreneurs within REM is in line with the one used in GEM (see Reynolds et al. forthcoming), although, other definitions do exist as well. This section looks at the socio-demographic structure of nascent entrepreneurs. Here we discuss the question whether nascent entrepreneurs are different compared to the adult population as a whole. To do so we compare means and percentages for selected socio-demographic items. Given that we have information from two points of time, we furthermore discuss the variation of these items over time for those variables that were measured identically in both surveys.

The evidence is reported in table 2.1. Note that the number of nascent entrepreneurs is small compared to the size of the sample as a whole. To take this into account we do not only report means and percentages for the items under investigation; the bounds of the 95 percent confidence intervals are displayed, too.[2]

Socio-demographic characteristics are captured by sex, age, martial status, education, employment status, household size and the net household income. Results are displayed for nascent entrepreneurs and the adult population. If possible, these figures are reported for 2001 and 2003.

To analyze the socio-demographic structure, the percentages reported for nascent entrepreneurs and for the adult population are compared. If there is no overlap of the confidence interval – displayed in brackets – the difference between the shares of the two groups is statistically significant at an error level of five percent. To look at variation over time, focus on the percentages reported for either nascent entrepreneurs or the adult population in different years.

To start, we will focus on two basic socio-demographic characteristics, sex and age. First, concerning the adult population every second person is female. The share of females in the group of nascent entrepreneurs is statistically significantly lower in both years -31.5 percent and 36.7% in 2001 and 2003, respectively. This supports the theses that females are less likely to start a new business. While the share of females among nascent entrepreneurs increased between 2001 and 2003, the difference between the two years is not statistically significant. Second, while the adults are on average about 41.5 years old, the average nascent entrepreneur is younger (38.5 years in 2001, 37.5 years in 2003). A look at the confidence intervals reveals that these differences in age are statistically significant at a conventional level.

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2 The main target population interviewed in both years covers people aged between 18 and 64. However, in 2001 we interviewed people who were younger and older, too. Thus, all interviewees who are not aged between 18 and 64 were dropped. This lead to a smaller sample size in 2001 compared to the 2003 sample.

Next we look at the marital status. We asked the interviewee if he or she is not married, married or divorced. Nascent entrepreneurs are more often single (not married) and less often divorced compared to the adult population. This difference, however, is statistically significant for the category "not married" only. Compared to the share in nascent entrepreneurs, the share of unmarried people in the adult population is some eight percentage points lower in both years.

Third, we consider education. Note here that the items asked in the interview in 2001 and 2003 are different. In 2001, we asked for the highest exam passed only, while in 2003 the interviewee was asked to report every exam he or she passed. Statistically significant differences are found for three items: extended elementary school (Hauptschule), senior high school (A-level; German: Hochschulreife) and university (Hochschulabschluss). Nascent entrepreneurs are on average better educated than the adult population as a whole. For example, while the share of people in the adult population who finished extended elementary school is 28.6 percent this share is 22.2 percent only in the group of nascent entrepreneurs. Furthermore, while 53.3 percent of the nascent entrepreneurs hold an A-level, this share is much lower (41.5 percent) for the adult population as a whole. More than 46 percent of the nascent entrepreneurs hold a university diploma – almost 15 percentage points more than in the adult population as a whole.

Next, we look at the employment status of the individuals. Compared to the adult population as a whole, nascent entrepreneurs are more often unemployed and less likely to be a housewife (or retired). While we observe a statistically significant and large difference in the share of people working full-time between nascent entrepreneurs and the adult population in 2001, this difference disappears in 2003. On the other hand, the share of both part-time workers and unemployed among the nascent entrepreneurs increased between 2001 and 2003. This indicates that part-time workers and the unemployed became a more important source of entrepreneurship (self-employment) recently.

Last, we look at household size and net household income. To start with, the household size shows only small differences which are, in most terms, not statistically significant, too. In regards to net household income, the share of nascent entrepreneurs in the highest income class is higher compared to the adult population as a whole. Nascent entrepreneurs, therefore, tend to have a better financial background on average.

Table 2.1: The socio-demographic structure of nascent entrepreneurs and the adult population

	Nascent entrepreneur		Adult population	
Year	2001	2003	2001	2003
Sex				
Female	0.315 [0.259 0.370]	0.367 [0.321 0. 412]	0.494 [0.483 0.505]	0.496 [0.486 0.505]
Age	0.385 [0.371 0.399]	0.379 [0.369 0.389]	0.417 [0.415 0.421]	0.415 [0.412 0.417]
Marital status				
Unmarried	0.414 [0.356 0.474]	0.425 [0.378 0.472]	0.335 [0.325 0.346]	0.341 [0.331 0.350]
Married	0.454 [0.395 0.514]	0.483 [0.436 0.531]	0.534 [0.523 0.545]	0.539 [0.529 0.549]
Divorced	0.131 [0.090 0.171]	0.091 [0.064 0.118]	0.130 [0.122 0.137]	0.119 [0.113 0.125]
Education				
No exam		0.004 [-0.002 0.010]		0.006 [0.004 0.008]
Extended elementary school (Hauptschule)		0.222 [0.182 0.261]		0.286 [0.277 0.295]
Junior high school (Realschule, Mittlere Reife)		0.416 [0.370 0.462]		0.403 [0.394 0.413]
Senior high school (Abitur, Fachabitur)		0.533 [0.486 0.580]		0.415 [0.406 0.425]
dual training (Lehre, Berufsausbildung)		0.543 [0.496 0.590]		0.598 [0.589 0.608]
Master		0.086 [0.060 0.113]		0.069 [0.064 0.074]
University		0.461 [0.414 0.508]		0.313 [0.304 0.323]
Employment				
full-time working	0.660 [0.603 0.716]	0.554 [0.508 0.601]	0.518 [0.507 0.530]	0.526 [0.516 0.536]
part-time working	0.108 [0.071 0.145]	0.146 [0.112 0.179]	0.141 [0.134 0.149]	0.152 [0.145 0.159]
pupil, student	0.104 [0.067 0.140]	0.083 [0.057 0.109]	0.087 [0.081 0.094]	0.089 [0.084 0.095]

Continuation table 2.1:

	Nascent entrepreneur		Adult population	
Year	2001	2003	2001	2003
Housewife, retired	0.060 [0.031 0.088]	0.069 [0.045 0.093]	0.189 [0.180 0.198]	0.156 [0.149 0.163]
Unemployed	0.043 [0.019 0.067]	0.111 [0.082 0.141]	0.042 [0.038 0.047]	0.057 [0.052 0.061]
Civilian or military service	0.001 [-0.003 0.005]	0.012 [0.002 0.022]	0.005 [0.004 0.007]	0.003 [0.002 0.005]
out of the labor force	0.024 [0.006 0.042	0.021 [0.007 0.034]	0.012 [0.009 0.014]	0.012 [0.009 0.014]
Household size				
one person	0.239 [0.188 0.289]	0.231 [0.191 0.270]	0.208 [0.199 0.217]	0.200 [0.192 0.208]
two persons	0.289 [0.235 0.344]	0.306 [0.263 0.349]	0.208 [0.199 0.217]	0.306 [0.297 0.315]
more than two persons	0.466 [0.406 0.526]	0.463 [0.416 0.509]	0.450 [0.448 0.471]	0.493 [0.484 0.503
Net household income				
< 1500 Euro	0.213 [0.164 0.262]	0.179 [0.143 0.215]	0.223 [0.213 0.232]	0.187 [0.179 0.195]
>= 1500 Euro & <= 3000 €	0.342 [0.285 0.398]	0.406 [0.360 0.452]	0.413 [0.402 0.424]	0.391 [0.382 0.401]
>= 3000 Euro	0.327 [0.271 0.384]	0.350 [0.305 0.395]	0.205 [0.196 0.215]	0.296 [0.287 0.305]
Number of cases	272	437	7704	10000

This evidence from the two waves of the *Regional Entrepreneurship Monitor (REM) Germany* shows that certain types of individuals are more likely to be involved in creating a new venture, but that individuals from all categories are involved to some extent. The evidence considered so far is, however, only descriptive in nature, and it does not reveal the extent to which the various factors are interrelated. To give just one example, take the relationship between gender and nascent entrepreneurship on the one hand, and between labor force status and nascent entrepreneurship on the other hand. Men are more often involved in creating new ventures than women, and so are people who are working full time compared to those who are not in the labor force. Given that the share of men who are in paid full-time employment is much higher than the share of women, what is the ceteris paribus effect of being male, and of working full time, on the propensity of being a nascent entrepreneur? Descriptive bivariate comparisons can not reveal this. Multivariate analyses that tackle this topic are reviewed in the next section.

4. What Makes a Nascent Eentrepreneur? The Role of Personal and Regional Characteristics

4.1 The Choice Between Paid Employment and Self-Employment from an Individual's Perspective – Some Theoretical Thoughts

In section 4 we look at studies which focus on the ceteris paribus effect of personal characteristics (like being male, or coming from a family with at least one self-employed) on the one hand and regional characteristics (like density of population, or price of land) on the other hand on the propensity to become a nascent entrepreneur.[3] While values for the first group of variables stem from survey data collected during the REM I phase in 2001, values for the second group refers to publicly available data from secondary statistics (mainly from Bundesamt für Bauwesen und Raumordnung (BBR), 2001).

Empirical investigations of the ceteris paribus impact of individual and other characteristics and attitudes on the propensity to become a nascent entrepreneur are usually – either explicitly or implicitly – based on a theoretical framework that can be outlined as follows:

Consider a utility-maximizing individual that has the choice between paid employment and self-employment (taking the decision to participate in the labor market as given). This person will choose the option self-employment if the discounted expected life-time utility from self-employment ($DELU^s$) is higher than that from paid employment (DELUp). The difference Ni between $DELU^s_i$ and $DELU^p_i$,

(1) $N_i = DELU^s_i - DELU^p_i$.

Therefore, it is crucial for the decision of individual i, and he or she will choose self-employment if Ni is positive. DELUsi and DELUpi are determined by the expected monetary and non-monetary returns from self-employment and paid employment according to the utility function of the person and the individual's discount rate. Higher returns lead to higher values of DELU.

The expected monetary and non-monetary returns from both types of employment depend on variables related to individual i, summarized in the vector xi, and on variables related to the region j he lives in, collected in the vector y_j. The regional variables (i. e. the elements of y_j) include factors that are directly or indirectly influenced by future, current or past regional policy measures (like tax rates, quality of infrastructure, or the age structure of the population), and variables that are independent from regional policy (like natural climate or natural resources). Given that Ni depends on $DELU^s_i$ and

3 This section is based on parts of a previous publication by two of the authors (see Wagner and Sternberg, 2004).

$DELU^p_i$, and $DELU^s_i$ and $DELU^p_i$ depend on the monetary and non-monetary returns, N_i can be written as a function of x_i and y_j:

(2) $N_i = N_i (x_i, y_j)$.

Note that we assume here that a person chooses between paid employment and self-employment in the region he lives in.[4] A rational individual will consider each region j (j = 1, ..., k) and, given his individual characteristics and attitudes, compute $DELU^s_i$ and $DELU^p_i$ for all k regions (taking the costs of moving to a region into account) to choose the region with the maximum among these 2k values. Given high monetary and non-monetary costs of migration this often (but not always) means that a person will stay in the region he lives in – an empirically well-proved assumption for German entrepreneurs (see Sternberg et al., 1997).

Individual characteristics and attitudes (elements of x_i), and characteristics of the region (elements of y_j) including variables influenced by regional policy measures, which have a more positive or less negative impact on $DELU^s_i$ than on $DELU^p_i$ increase N_i (and vice versa). Given that the expected monetary and non-monetary returns from both types of employment, the utility function, and the discount rate of an individual are unknown to an observer, we cannot observe N_i. Therefore, we cannot test directly whether an individual or regional characteristic - say, age of a person, regional tax rates, or population density in a region - has a positive impact on N_i, or not. If, however, N_i is greater than the critical value zero, according to our theoretical framework, a person will choose to become an entrepreneur, and the decision to do so or not is observable. In our empirical model we will investigate the influence of x_i and y_j on the probability that a person becomes an entrepreneur by looking at his known decision pro or contra.

The theoretical hypotheses regarding a positive or negative influence of personal characteristics and attitudes, and of characteristics of the region, on this decision are discussed below in sections 4.2 and 4.3 together with a description of the way the elements of x_i and y_j are measured. Due to a lack of space, an extra table stating the analyzed determinants and the predicted sign of impact are not included here. Then the empirical results of our econometric study are presented.

4 Note that by focusing on the factors affecting the decision to become self-employed, as opposed to remaining in paid-employment, instead of looking at differences in the probability that people are self-employed rather than employees, one avoids confounding entry and survival effects: The probability of being self- employed at a point in time depends on the probability of switching into self-employment in the past and then surviving as a self-employed until the time of the survey (see Parker, 2004, 25-26).

4.2 An Empirical Model of the Determinants of Entrepreneurial Activities

In the theoretical model developed in section 4.1, the decision taken by person i to become a nascent entrepreneur or not is shaped by his personal characteristics and attitudes (collected in the vector x_i), and by characteristics of the region j he or she chose to live in (collected in vector y_j). In our empirical model we regress the observed decision of all persons from the REM survey aged between 18 and 68 on x and y. Selection of the elements included in x and y are, at least in part, data driven. Although we had full control over the design of the questionnaire used in the REM survey, we were unable to collect information on all individual characteristics that are important for the decision under consideration due to budget constraints (that limited the time per interview and the number of items to be included) and the willingness of the interviewees to report information on issues like the amount of personal wealth, or losses in bankruptcies in the past. Effects of variables not included in the empirical model are covered by the error term. Frankly, this might lead to an omitted variables bias – a problem common to many (all?) econometric investigations.

With that said, we will now turn to a discussion of the variables measured at the individual and at the regional level that are included in our empirical model. To start with the individual characteristics and attitudes, x_i has the following elements:

- *Sex* (a dummy variable taking the value one if the interviewee is male). Hypothesis: It is a stylized fact that men do have a higher propensity to step into self-employment than women, in Germany as in all other GEM countries (see Acs et al., 2004). Sex is included in our empirical model to control for this difference in behavior between men and women, and we expect a positive sign for the estimated coefficient of the dummy variable.
- *Age* (measured in years). Hypothesis: On the one hand, age is a proxy variable for personal wealth – the older a person is, the longer the potential period to accumulate wealth is. Given that young firms are often constrained by lack of credit because banks usually demand collateral to finance investments, a certain amount of wealth is crucial for starting a new business (see Evans and Jovanovic 1989). This leads to the expectation of a positive sign of the estimated coefficient of the age variable. On the other hand one has to acknowledge that starting a new business often leads to high sunk costs – think of all the effort to set up a business plan, doing market research, dealing with legal and administrative problems, etc. The shorter the expected life span of the new business is, the shorter the period in which these sunk costs can be earned back is. To put it differently, setting up a new business with high sunk costs is more attractive at the age of 45 than at the age of 60, ceteris paribus. This leads to the expectation of a negative sign of the estimated coefficient of the age variable. Given these two op-