

The role of the regional milieu for the decision to start a new firm: Empirical evidence for Germany

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Abstract

Although comprehensive data from official statistics on new firm formation and entrepreneurs starting a new business are lacking in Germany, we know from empirical studies that entry rates differ between regions, and that the propensity to become an entrepreneur is influenced by socio-demographic variables like sex and age. The focus of our paper is on the link of these two stylised facts. Our econometric study is based on data for 10.000 persons from a recent representative survey of the population in ten German planning regions. We use a version of the probit model that takes care of the regional stratification of the data, and the results of the nonlinear models are carefully interpreted and illustrated. We show that the region matters for the decision to start a new business *ceteris paribus*, i.e. after controlling for sex, age, education etc. In a second step we peek inside the black box of the regional effect by showing that the regional level of current start-up activity has a positive *ceteris paribus* effect on the propensity to become an entrepreneur, while the share of self-employed in the region does not matter. The consequences of these findings for regional policies to encourage new firm entry are discussed briefly in the concluding section.

Keywords: Entrepreneurship, Germany, regional milieu

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1. Introduction

Although comprehensive data from official statistics on new firm formation and entrepreneurs starting a new business are lacking in Germany, we know from empirical studies that entry rates differ between regions, and that the propensity to become an entrepreneur is influenced by socio-demographic variables like sex and age.

Empirical research on regional differences in new firm formation in Germany has only recently been reached a significant output among the hitherto limited amount of research been done in the field of entrepreneurship in this country. However, especially since the German Research Council decided to fund a six-year programme on interdisciplinary entrepreneurship research in 1998, several work was and will be done in this field (see Schmude and Leiner 2002 for the outcome of the first two years). Among the first work on interregional differences of firm births in Germany belongs research of Audretsch and Fritsch (1994) and Gerlach and Wagner (1994), both based upon secondary data. At least since 2000 data from the Global Entrepreneurship Monitor (GEM)¹ for Germany (more

¹ The Global Entrepreneurship Monitor (GEM) was set up in 1997 as a joint research initiative between the Babson College in Boston and the London Business School. The main aim was and is for an international team of start-up researchers to gather and analyse data on the complex relationship between entrepreneurship and economic growth, as a long-term project which publishes results each year. The German team works at the Department of Economic and Social Geography, University of Cologne. Starting with ten countries (including Germany) in the pilot year 1999 29 have participated in GEM in 2001. Three surveys are conducted in all countries annually: (a) telephone surveys of the adult population; (b) written and oral surveys of experts on start-ups and (c) various standardised secondary data. In 2001 information was received world-wide from more than 74,000 citizens and almost 950 experts (see Reynolds et al. 2001 for details). Three questions are at the core of the GEM project: To what extent does the level of start-up activities vary between countries? Does the level of entrepreneurial activities influence the rate of growth of the national economy and the

than 7,000 cases per year in 2000 and 2001, even 15,000 in 2002) do also provide helpful information about interregional differences although the focus of GEM - different than REM² - is on comparisons between complete countries. Results for 2000 show that urban agglomerations in general have higher level of entrepreneurial activities than rural areas or smaller cities. Even more obvious are the disparities between Eastern and Western Germany, in favour of the latter. On the level of the 97 planning regions („Raumordnungsregionen“) there are significant differences in terms of entrepreneurial attitudes and perceptions (summarized in an „index of entrepreneurial climate“ by Sternberg 2000b), but also in terms of the resulting level of entrepreneurial activity. The question whether the interviewee perceives good opportunities for starting a business locally within the next months reveals clearly the strongest differences between planning regions, between the 16 federal „Länder“ and between Western and Eastern Germany. Whereas GEM and REM are based on primary data from very recent phone interviews (and are able to cover different types of entrepreneurial activities), most of the other empirical research on interregional differences in new firm rates in Germany uses secondary data. The most comprehensive results of this kind of empirical research are to be expected

prosperity of a country? What makes a country entrepreneurial? Which factors restrict or promote start-up activities?

²REM stands for Regional Entrepreneurship Monitor. The authors of this paper are the leaders of the REM research project the aim of which is to measure and to compare entrepreneurial activities in ten German regions and to explain its differences. Whereas most of the conceptual elements are similar to GEM, REM compares subnational regions but not countries. Due to large sample sizes per region (1,000 people were interviewed in each of the ten regions) representative assessment for entrepreneurial activities in those regions are possible. Funding of the German Research Council (STE 628/7-1 and WA 610/2-1) is gratefully acknowledged. For further information about the REM project see Japsen and Bergmann (2001) and Bergmann (2002).

from work dedicated to the German Start-up Atlas (Fritsch and Grotz 2002) which will be based upon data from the German Social Insurance Statistics, as described and documented by Brixy and Fritsch (2002). Data restricted to Western Germany but for a long period between 1983 and 1997 shows that start-up rates in general (i.e., over all sectors) are lowest in agglomerations but the share of new firms in the service sector was relatively high in larger agglomerations (Fritsch/Falck 2002). Data based upon the Creditauskunftei Creditreform used by the ZEW (Centre for European Economic Research) are also helpful for conducting interregional comparisons in Germany. Nerlinger (1998) has shown that innovative start-ups in Western Germany are spatially more concentrated than start-ups in general and they prefer locations close to, but not that much within the city of large urban agglomerations. Bade and Nerlinger (2000) show that high start-up rates coincide with high share of SMEs among all firms in a region. Maps using this ZEW data base make clear that absolute figures for start-ups reflect the absolute size of the regions in terms of population or employment (see, e.g., fig. 54 on p. 190 in Sternberg 2000a), whereas in terms of relative frequencies (start-ups per employable persons) especially some urban city regions in Southern (Western) Germany stand at the top (see e.g., map 3 in Sternberg, 2000b, p. 207). Concerning start-up rates in general and for start-ups in R&D intensive sectors the Munich region is doubtless the No.1 region in Germany due to various reasons (Sternberg/Tamásy 1999, Sternberg 2001, Sternberg/Krymalowski 2002). Recent work from Audretsch and Fritsch (2002) reveals that a significant share of start-up activities in German

regions is connected with regional growth regimes and its variations over time.

Only a very limited number of international studies are by now dedicated to interregional differences in start-up activities within countries. The main reason is that comparable data for comparable regions in different countries do seldomly exist. However, there are some interesting hypotheses in this field expecting to be tested in due course. Sternberg (2000a) argues that there is a causal relationship between the degree of spatial concentration of new firms within a country and the level of entrepreneurial activities of the complete nation. Some of the larger GEM countries will probably organize a subgroup that analyzes exactly that topic with GEM data. First work done in Australia reveals encouraging results (Hindle/Rushworth 2001). Authors found that entrepreneurial activity as measured by participation in start-ups varied significantly between 11 defined regions. Factors statistically associated with high-start-up activity were personal acquaintance with someone who had recently started a business (role model argument) and the perception of good opportunities for starting a business locally. Hitherto the comparable work of Reynolds/Storey/Westhead (1994) is still the most comprehensive one in the field of secondary data based studies. Authors show that start-up rates of the regions within a country (they included France, Germany, Italy, Sweden, UK and the US) vary by factor 2 - 4. Thus, regions differ in terms of entrepreneurial activities and countries differ in terms of the regional distribution of there start-ups.

Traditional entrepreneurship research is based upon the supply-side perspective which emphasize the individual traits of potential or real entrepreneurs among all factors that determine entrepreneurship (for an overview see Chell et al. 1991, Evans/Siegfried 1994 and Reynolds/Storey/Westhead 1994). Although in literature there is enough empirical based causal logic critique of the pure supply-side perspective (e.g., Baumol 1986, Johannisson 2000), we can not ignore that some of the personal characteristics of the relevant individuals do have an impact on the propensity to start a new firm and/or on the development during the post-entry phase. Among such variables, sex, age and educational attainment belong to the one that hold the highest empirical evidence. With respect to Germany data from the Global Entrepreneurship Monitor (GEM) clearly reveals the statistical impact of sex and age on start-up prevalence rates. Per one female entrepreneur (nascent entrepreneurs and/or young entrepreneur)³ there were 2.26 male entrepreneurs in this country in 2001. TEA, the total entrepreneurial activity rate incl. nascent and/or young entrepreneurs, was 9.79% among men, but only 4.33% among women. Beside GEM other studies on Germany confirm the low participation rate of women among entrepreneurs in this country (e.g., Frick et al. 1998, Welter/Rosenblatt 1988, Lageman et al. 1999). With respect to age entrepreneurial activity and propensity to start a new firm seems to increase in Germany until the age group of 25-44 and declines afterwards (see Sternberg 2000a, p.62 for a look on start-up rates in Germany by sex and age groups based on GEM data). Less clear

³ For alternative definitions of entrepreneurial activities within GEM see Reynolds et al. 2001 and Sternberg et al. 2001 with respect to Germany.

are the empirical results concerning other individual related determinants like educational attainment or unemployment status (for contradictory results see, e.g., Pfeiffer/Falk 1999, Fritsch/Falck 2002).

Referring to international studies most of the results reported for Germany are confirmed. Again, GEM is currently the best and most comprehensive data source. The share of women and men among nascent entrepreneurs and young entrepreneurs differ significantly between and within countries, although some of these differences decreased among the meanwhile 29 GEM countries (as in 2001) since GEM started in 1999. In all GEM countries the share of men among nascent entrepreneurs and/or young entrepreneurs is significantly higher than the women's share. For all GEM countries the respective relation was 1:1.95 (for Western European countries: 1:1.93) in 2001. Differences between countries and groups of countries with strong entrepreneurial activities and those with minor activities are obvious. GEM data show a positive and highly significant statistical correlation between female entrepreneurship and national level of entrepreneurial activities (nascent entrepreneurs): the higher the share of female entrepreneurs, the higher the national rate of nascent entrepreneurs - and the higher national growth as measured in terms of GDP (Reynolds et al. 2001). The above mentioned relation is 1:1.47 in the US (a country with a high level of entrepreneurial activities), but 1:2.18 in Japan, the country with the second lowest total entrepreneurial activity rate among all 29 GEM countries in 2001). Focussing on Germany again, it is striking that there is a surprisingly high difference between nascent entrepreneurs

and young entrepreneurs, when the share of women is analyzed. While Germany ranks only 25 if the share of women among nascent entrepreneurs is considered (only India, Israel and Denmark have, from a relative perspective, even more male than female founders), Germany holds rank 6 among young, i.e. real, entrepreneurs in terms of female participation.

The focus of our paper is on the link of two stylised facts - the impact of the region and the impact of sociodemographic determinants like sex and age. Doing so we intend to combine two hitherto rarely connected perspectives of entrepreneurship research: the classical and still dominant supply-side perspective which focusses on the individual traits of entrepreneurs (incl. skills, capabilities, sex, age, educational attainment and others) and the demand-side perspective which emphasizes the context (spatial, social, economical) in which entrepreneurship occurs (see Thornton 1999 for an integration of both schools, see also Johannisson 2000 and Bolton/Westlund 2000 on this). We contribute to the literature by empirically investigating two issues:

- Does the region matter for the decision to start a new business in Germany *ceteris paribus*, i.e. after controlling for sex, age, education etc.?
- If region matters, what is inside the black box of the regional effect? How does the regional 'entrepreneurial milieu' affect the decision to start a new business?

Our econometric study is based on data for 10.000 persons from a recent representative survey of the population in ten German planning regions as part of the REM project (see footnote 2). We use a version of the probit model that takes

care of the regional stratification of the data, and the results of the nonlinear models are carefully interpreted and illustrated.

The rest of the paper is organized as follows: Section 2 introduces the survey data used, section 3 gives empirical information on the extent of nascent entrepreneurship activities in German regions, section 4 discusses results from an econometric investigation of the determinants of becoming a nascent entrepreneur and the role played by the regional milieu, and section 5 concludes.

2. The *Regional Entrepreneurship Monitor REM Germany 2001* survey

The data used in this paper are taken from a survey of the German population aged 14 years or older that was conducted using computer assisted telephone interviewing by TNS EMNID, a leading German opinion research institute, in the summer of 2001. This survey is part of the research project *Regional Entrepreneurship Monitor REM Germany* which focuses on the extent of the difference in entrepreneurial activities between regions in Germany, its determinants, and its consequences for regional development.

In 10 (out of 97) so-called planning regions (or *Raumordnungsregionen*, see Bundesamt für Bauwesen und Raumordnung, 2001) a random sample of 1.000 people was interviewed, leading to a data set with 10.000 cases.⁴ The

⁴ The data will be made available for public scientific use after the completion of the REM project.

questionnaire⁵ asked for socio-demographic characteristics (sex, age, education, marital status, size of household, employment status, income) and a number of items related to entrepreneurial activities (e.g., whether the interviewee is the owner of a firm that is currently actively run by her or him, whether she/he is currently engaged in starting an own business). This data set gives a snapshot of activities and attitudes related to self-employment and new firm formation in the 10 regions in the Summer of 2001. Even if we can not claim that the data are 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 (see fig. 1 for location of the ten regions). With a pinch of salt information relating to the average in the selected regions can be considered to be a valid instrument for information on Germany as a whole.

[Fig. 1 about here: Location of the ten REM regions]

3. The share of nascent entrepreneurs in selected German regions

In the survey discussed in the former section the interviewee was asked whether she/he is (alone or with others) actively involved in starting a new business that will (as a whole or in part) belong to her/him, and whether this business did not pay

⁵ An English version of the questionnaire is not yet available; a German version is available from the authors on request.

full time 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*.⁶ The share of this group in the population is 3.7 percent.

Table 1 reports detailed results for the ten regions. 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 the population is about twice as high in the regions Köln and München as in the regions Emscher-Lippe and Mittleres Mecklenburg.

[Table 1 about here: The share of nascent entrepreneurs in selected German regions]

4. What makes a nascent entrepreneur?

In this section the question what distinguishes nascent entrepreneurs from the rest of population is investigated econometrically. We test for the role played by both individual and regional factors in shaping the probability of becoming a nascent entrepreneur.

To start with the individual factors, we will look at the role played by sex; age (measured in years); and general human

⁶ This definition of a nascent entrepreneur is identical to the definition used in the GEM project in the year 2000; see Reynolds et al., 2000, p. 9. Please notice that the definition of nascent entrepreneurs has changed within GEM from 2000 to 2001 so that readers should carefully look at the respective reference years. The rate of nascent entrepreneurs for total Germany in 2001 is 4.3% when the value comparable to the REM 3.7% is considered. Difference is due to a larger coverage of rural areas in REM (that have entrepreneurial activities slightly below the national average).

capital measured by the level of education (a dummy variable showing whether or not a person has a higher education, i.e. went to school for at least 12 years, or holds a degree). Whether unemployment acts as a push factor into self-employment (e.g., due to the lower opportunity costs compared to people who have to give up their former job) is tested with a dummy variable. Two more dummy variables are included in the empirical model: The survey asks whether the interviewee personally knows someone who started a new business during the last two years, and we look for a positive impact of contact with such a 'role model' (see Sternberg 2000, p. 60). Furthermore, the interviewee is asked whether fear to fail would prevent him from founding a firm. If he answered this question in the affirmative we consider this as an indicator of a high degree of risk aversion, and we expect a negative impact on the probability of becoming a nascent entrepreneur.

Descriptive statistics for these variables are given in table 2. Among the nascent entrepreneurs we find more males, more people with higher education and with personal contact to a young entrepreneur, and less people who consider fear of failure to be a reason not to start a new business than among the rest of the adult population. Furthermore, nascent entrepreneurs are about 3.5 years younger on average. Note that the share of unemployed persons in both groups is about equal.

[Table 2 about here: Descriptive statistics]

The *ceteris paribus* role played by these characteristics in determining the probability of becoming a nascent entrepreneur

is investigated in an econometric model with a dummy endogenous variable taking the value one if a person is a nascent entrepreneur, zero otherwise.⁷ Results are reported in the column headed 'Model A' in table 3. From the prob-values⁸ it follows that according to this model, and in line with our priors, the probability of becoming a nascent entrepreneur is higher for males, and it diminishes with age, although not linear. It is lower for people with a high degree of risk aversion. Knowing a role model personally has a positive impact, and the same holds for a higher education although the coefficient is significantly different from zero at a level of 6.7 percent only. According to these results being unemployed does not matter.

[Table 3 about here: Estimation results for determinants of becoming a nascent entrepreneur]

Model A considers the role of personal attributes and attitudes only. From the descriptive evidence reported in table I we know that the level of entrepreneurial activity differs considerably between regions. If this points to interregional

⁷ To take the survey design described in section 2 above into account, the models were estimated with Stata 7.0 using the survey probit program `svyprobit` with the region as the primary sampling unit (psu) to control for clustering; see StataCorp, 2001, p. 321ff. for an overview of survey estimation.

⁸ We report prob-values instead of t-values for two reasons: First, the degrees of freedom for the t in `svyprobit` are the number of clusters (i.e., regions) minus one, and not the number of observations minus the number of estimated coefficients, and this might cause irritation; second, the prob-values give an immediate and exact impression of the empirical significance level of an estimated coefficient.

differences in what is often called 'entrepreneurial culture' we would expect that these differences influence the decisions taken by individuals living in a region. As a next step, therefore, we additionally test for the role played by the region in determining whether a person becomes a nascent entrepreneur.

Results for an augmented empirical model containing nine dummy variables for the regions (using the Emscher-Lippe region as the standard group) are reported in the column headed 'Model B' in table 3. All estimated coefficients of the region dummies are highly significant statistically, and an adjusted Wald test of the null hypothesis that all these coefficients are zero rejects the null with a p-value of 0.0000. This means that the region matters, *ceteris paribus*. Note that the estimated coefficients for the other variables included and their levels of significance do not differ much between Model A and Model B, with the exception of the unemployment dummy which is statistically different from zero now at an error level of 10 percent.

To peek inside the black box of the regional effects revealed by the dummies a third empirical model was estimated in which the dummy variables were substituted by two measures which mirror different aspects of the regional entrepreneurial culture: the share of *nascent entrepreneurs*, and the share of *active firm owners* (defined as the percentage of interviewees in a region that are actively running a firm of their own) in the population. A higher share of *nascent entrepreneurs* points to a better developed entrepreneurial culture in a region at the time of the survey, and we expect that this increases the

probability of becoming a nascent entrepreneur. The same effect might be expected from a higher share of *active owners*, signalling that many others did it successfully in the past, so I might expect to make it today, too. To put it differently, the share of nascent entrepreneurs is included as a proxy variable that should bundle all those hard to measure elements that form the regional milieu - if a region has a well developed culture of entrepreneurship, and if this is better than in other regions, a higher share of nascent entrepreneurs should indicate this. A higher share of active firm owners, on the other hand, points to a business structure that is orientated more towards small firms, and including this variable tests for the role of a historically grown regional firm size distribution.

Results for this model are reported as 'Model C' in table 3. The estimated coefficient for the regional share of nascent entrepreneurs has the expected sign, and it is highly significant statistically. However, from the empirical model we find no evidence for any influence of the share of active firm owners. The big picture from the results for the personal characteristics and attitudes is the same as in Model B: The probability of becoming a nascent entrepreneur is higher for males, people with higher education, unemployed persons, and for those who personally know a role model; it is lower for older people and for people with a high risk aversion.

Discussion of results hitherto was limited to the *statistical* significance of the estimated coefficients and the direction of influence conducted by the variables. Information on the extent of this influence, or on the *economic*

significance, however, is even more important. Evidently, a variable that has no statistically significant impact can be ignored from an economic point of view, but the opposite is not true: A variable that is highly significant statistically might not matter at all economically - if the estimated probability for becoming a nascent entrepreneur diminishes by 0.00001 percent when a person is 68 instead of 18 years old, we can ignore age of a person in any discussion on nascent entrepreneurs irrespective of any high level of statistically significance indicated by the prob-value.

Unfortunately, the estimated coefficients from a probit model (or for any other non-linear model) can not easily be used for statements about the size of the ceteris paribus effect of a change of the value of an exogenous variable (e.g., an increase in the age of a person by five years) on the value of the endogenous variable (e.g., the probability of becoming a nascent entrepreneur), because the size of this effects depends on both the value of the exogenous variable under consideration and on the values of all other variables in the model (see Long and Freese, 2001, 87ff.).

One way to ease interpretation of the estimation results is to compute the estimated values of the endogenous variable (here: the probability of becoming a nascent entrepreneur) for a person with certain characteristics and attitudes (male, 38 years old, with higher education, not unemployed, etc.), and then to see how a change in the value of one exogenous variable (e.g., the age) changes the estimated probability. With a lot of exogenous variables this procedure tends to lead to results not easy to survey.

A way out is to construct a limited number of types of persons using dichotomous variables that are statistically significant (ignoring those that are not) and to summarize the estimation results for various values of a significant continuous variable in a figure.

For expository purposes, we focus on unemployed men with higher education. Furthermore, for the moment we fix the two regional variables at their sample means. Next, we use combinations of the two dichotomous variables, high degree of risk aversion and personal contacts with a role model, to form four types of persons labeled TYP A to TYPE D and listed in table 4. For every type the estimated probability of becoming a nascent entrepreneur is then computed for values of the age variable between 18 and 68.⁹

[Table 4 about here: Types of persons for simulation]

Results are graphed in figure 2. From this it is obvious that age matters. For example, the estimated probability of becoming a nascent entrepreneur for a TYPE C person declines from .17 for an 18 year old youngster to .10 in the age of 68. For any given value of age, the probability to start a new business is much higher for a TYPE C person (who has no high risk aversion, and personally knows a young entrepreneur) than

⁹ All computations and graphics are done using SPost, an add-on package of ado-files for Stata written by J. Scott Long and Jeremy Freese (Scott and Freese 2001). Note that SPost does not work with Stata's svyprobit program, so the model has been reestimated using Stata's probit program with the option 'cluster', using the region as a cluster. The estimated coefficients that are needed to calculate the estimated probabilities are numerically identical for svyprobit and probit with this cluster option.

for any other person considered. Note that TYPE D and TYPE A have rather similar estimated probabilities although they are 'the opposite' regarding both high risk aversion and contacts with a young entrepreneur. This illustrates that the opposite effects of different determinants of becoming a nascent entrepreneur can net out.

[Figure 2 near here: Estimated probability for becoming a nascent entrepreneur for various types of persons]

The ceteris paribus impact of the statistically significant variable "share of nascent entrepreneurs in a region" is illustrated by comparing the results for a certain type of person (an unemployed man with higher education, personal contacts with a role model, and a high level of risk aversion) from a (fictitious) region with an average share of active firm owners at three different level of age (viz., 25, 45, and 65 years) for different values of the regional share of nascent entrepreneurs between 1.95 percent and 5.87 percent (the minimum and maximum value of the variable in our sample, respectively). The estimated probability of becoming a nascent entrepreneur increases with an increasing share of nascent entrepreneurs in the region, and it is always higher for younger persons than for older. A 25 year old person with the characteristics stated above has an estimated probability of becoming a nascent entrepreneur of 0.06 in the region with the lowest share of nascent entrepreneurs, while for a person with identical characteristics from the region with the highest

share of nascent entrepreneurs the estimated probability is 0.14 (see figure 3).

[Figure 3 about here]

5. Concluding remarks

Although comprehensive data from official statistics on new firm formation and entrepreneurs starting a new business are lacking in Germany, we know from empirical studies that entry rates differ between regions, and that the propensity to become an entrepreneur is influenced by socio-demographic variables like sex and age. The focus of our paper is on the link of these two stylised facts. Our econometric study is based on data for 10.000 persons from a recent representative survey of the population in ten German planning regions. We use a version of the probit model that takes care of the regional stratification of the data, and the results of the nonlinear models are carefully interpreted and illustrated. We show that the region matters for the decision to start a new business *ceteris paribus*, i.e. after controlling for sex, age, education etc.. In a second step we peek inside the black box of the regional effect by showing that the regional level of current start-up activity has a positive *ceteris paribus* effect on the propensity to become an entrepreneur, while the share of self-employed in the region does not matter. Obviously it is necessary to compare different regions in order to assess the *ceteris paribus* impact of regional attributes on individuals' propensity to start a firm in contrast to the impact of

personal characteristics like sex, age and others (see Backes-Gellner/Demirer/Sternberg 2002 for a study on the propensity to start a firm among 5,520 students of higher education institutions in Cologne, incl. the University of Cologne).

The implications of these findings for economic policy can be summarized as follows: Consider regional differences and specificities whenever programmes to foster start-ups are designed. Consequently identical programmes and instruments would have very different outcomes in different regions. Spatial implications for start-up policies are especially obvious when start-up clusters in the sense of spatially-sectoral concentrations of start-ups are considered (see Sternberg 2001 for the following conclusions). Concerning the situation in Germany in particular, there are several theoretical and empirical arguments why policies could potentially generate sectoral-spatial clusters with the help of start-up clusters in regions.

First, individuals' decisions to launch start-ups are made at the regional, or even the local level. The national framework conditions are of minor importance than the regional or the local ones. This differentiates start-ups from the locational choice of branch plants of large firms, for example, which generally cover a global area in their search. The personal and professional network around a potential start-up founder has a most considerable influence on the decision to launch a start-up. This network is primarily regional in nature, and less national. The quality of regions around Germany for supporting the launch of start-ups varies

considerably. The extreme differences such as exist between regions in the USA, for example - Silicon Valley is patently not representative of the USA! - are not to be found in Germany. By the same measure, however, the start-up climates and the entrepreneurial framework conditions do differ considerably between German regions. One cause of this is certainly the federal structure, which has resulted in the development of 16 different policies for promoting start-ups at state level alone - a lack of co-ordination is obvious as it can be observed for innovation policies as well. The initiation of clusters in a region is certainly difficult and drawn-out, even with start-up activities, but should still be attempted. For historical reasons of which all are aware, the framework conditions relating to start-ups still differ considerably between Western and Eastern Germany. From a federal point of view, the emphasis has to be on taking into consideration the comparative strengths of the regions and their endogenous potentials and to derive benefits from the spatial diversities. The idea of networking necessarily has a regional dimension. Even in times of rapidly developing information and communication technologies, face-to-face contacts remain the key factor in the transfer of tacit knowledge - i.e. non-codified, embodied knowledge - and are even becoming more important. But the necessity of face-to-face contacts requires spatial proximity as is the case in start-up clusters, for example. This regional dimension should also be emphasised and exploited by political initiatives within the regions themselves. National programmes for the promotion of start-ups, such as "Exist" or "InnoRegio", are therefore aiming in the

right direction (see BMBF 2000, 2002 for details on this federal programs).

Second, and this is why "Exist" and "InnoRegio" are not only regionally, but also nationally focussed, the interregional distribution of start-up activities and the interregionally varying nature of the framework conditions relating to start-ups have an influence on the national level of start-ups. The spatial clustering of start-ups is simultaneously the cause and the effect of a regional environment conducive to start-ups. The spatial proximity (e.g. to customers or sources of knowledge) is mostly more important for start-up founders than for other entrepreneurs in a cluster. The nation-wide start-up sector in Germany benefits from a spatial concentration of start-ups in a few regions. Their locations may change with time.

For these and other reasons, national and regional policies should support the genesis and later the development of start-up clusters (in the sectoral and regional sense as discussed) within a selected number of regions. The chances of achieving not just regional, but also national goals are better than expected. However, such a policy needs a lot of staying-power.

References

- Audretsch, David B. and Michael Fritsch, 1994, *The Geography of Firm Births in Germany*. *Regional Studies* 28, 359-365.
- Audretsch, David B. and Michael Fritsch, 2002, *Growth regimes over time and space*. *Regional Studies* 36, 113-124.

- Backes-Gellner, Uschi, Güldem Demirer and Rolf Sternberg, 2002, Individuelle und regionale Einflussfaktoren auf die Gründungsneigung von Hochschülern. In Jürgen Schmude and Robert Leiner (Eds.): *Unternehmensgründungen. Interdisziplinäre Beiträge zum entrepreneurship research.* Heidelberg: Physica. 63-96.
- Bade, F.-J. and Nerlinger, E. (2000): The Spatial Distribution of New Technology-based Firms: Empirical Results for West-Germany. *Papers in Regional Science* 79, 155-176.
- Baumol, William J., 1986, Entrepreneurship and a Century of Growth. *Journal of Business Venturing* 1, 141-145.
- Bergmann, Heiko, 2002, Entrepreneurial attitudes and start-up attempts in ten German regions. An empirical analysis on the basis of the theory of planned behaviour. Working Paper 2002-01, Department of Economic and Social Geography, University of Cologne.
- Bolton, Roger and Hans Westlund, 2000, Local Social Capital and Entrepreneurship. Paper Presented at the Conference on Entrepreneurship, Firm Growth and Regional Development in the New Economic Geography. Trollhättan, Sweden, 15-17 June, 2000.
- Brixy, Udo and Michael Fritsch, 2002, Betriebsdatei der Beschäftigtenstatistik der Bundesanstalt für Arbeit. In Fritsch, Michael and Reinhold Grotz, eds, 2002, Das Gründungsgeschehen in Deutschland - Datenquellen und Analysen. Heidelberg: Physica.
- Bundesamt für Bauwesen und Raumordnung, 2001, *Aktuelle Daten zur Entwicklung der Städte, Kreise und Gemeinden, Ausgabe 2000*, Bonn: Bundesamt für Bauwesen und Raumordnung.

Bundesministerium für Bildung und Forschung (BMBF), 2000:

InnoRegio. Die Dokumentation. Bonn: BMBF

Bundesministerium für Bildung und Forschung (BMBF), 2002:

EXIST-Konferenz am 12. und 13. November 2001 im

Wissenschaftszentrum Bonn. Dokumentation. Bonn: BMBF (see also www.exist.de)

Chell, Elizabeth, Jean M. Haworth and Sally Brearly, 1991, *The Entrepreneurial Personality.* London: Routledge.

Evans, Laurie Beth and John M. Siegfried, 1994, Empirical Studies of Entry and Exit: A Survey of the Evidence. *Review of Industrial Organizations* 9, 121-156.

Frick, Siegfried; Bernhard Lageman, Bernhard von Rosenblatt, Helmut Voelzkow and Friederike Welter, 1998, Möglichkeiten der Verbesserung des Umfeldes für Existenzgründer und Selbständige: Wege zu einer neuen Kultur der Selbständigkeit. Essen: RWI. (= Untersuchungen des RWI 25.)

Fritsch, Michael and Reinhold Grotz, eds, 2002, Das Gründungsgeschehen in Deutschland - Datenquellen und Analysen. Heidelberg: Physica.

Fritsch, Michael and Oliver Falck, 2002, *New Firm Formation over Industry, Space, and Time: A Multi-Level Analysis for Germany.* Paper Prepared for ERSA European Regional Science Association 42 European Congress, Dortmund, August 27 - 31, 2002

Gerlach, Knut and Joachim Wagner, 1994, Regional Differences in Small Firm Entry in Manufacturing Industries. In: *Entrepreneurship and Regional Development* 6, 63-80.

- Hindle, Kevin and Susan Rushworth, 2001, *Regional Differences in Business Start-up Rates in Australia: Implications for Future Research and Public Policy*. Paper Presented at the 2001 Australia New Zealand Academy of Management Conference, UNITEC and Massey University. Auckland.
- Japsen, Andrea and Heiko Bergmann, 2001, 'Regionaler Entrepreneurship Monitor (REM) - Konzept und erste Ergebnisse', Working Paper 253, Department of Economics and Social Sciences, University of Lüneburg.
- Johannisson, Bengt, 2000, *Modernising the Industrial District - Rejuvenation or Managerial Colonisation*. Taylor, M. und Vatne, E. (ed): *The Networked Firm in a Global World: Small Firms in New Environments*. Aldershot: Ashgate, 283-309.
- Lageman, B. et al., 1999, *Kleine und mittlere Unternehmen im sektoralen Strukturwandel*. Essen: RWI. (= Untersuchungen des RWI, 27).
- Long, J. Scott and Jeremy Freese, 2001, *Regression Models for Categorical Dependent Variables using Stata*, College Station, TX: Stata Press.
- Nerlinger, Eric, 1998, *Standorte und Entwicklung junger innovativer Unternehmen. Empirische Ergebnisse für West-Deutschland*. Baden-Baden: Nomos (=ZEW Wirtschaftsanalysen, 27).
- Pfeiffer, Friedhelm and Martin Falk, 1999, *Der Faktor Humankapital in der Volkswirtschaft: Berufliche Spezialisierung und technologische Leistungsfähigkeit*. Baden-Baden: Nomos.
- Reynolds, Paul D., Michael Camp, William D. Bygrave, Erko Autio and Michael Hay, 2001, *Global Entrepreneurship Monitor*.

2001 Executive Report. Kansas City: Kauffman Center for Entrepreneurial Leadership.

Reynolds, Paul D.; Michael Hay, William D. Bygrave, Michael Camp, and Erko Autio, 2000, *Global Entrepreneurship Monitor. 2000 Executive Report*. Kansas City: Kauffman Center for Entrepreneurial Leadership.

Reynolds, Paul D.; Michael Hay, Michael Camp, 1999, *Global Entrepreneurship Monitor. 1999 Executive Report*. Kansas City: Kauffman Center for Entrepreneurial Leadership.

StataCorp, 2001, *Stata User's Guide, Release 7*, College Station, TX: Stata Corporation.

Sternberg, Rolf, 2000a, *Entrepreneurship in Deutschland. Das Gründungsgeschehen im internationalen Vergleich*.

Länderbericht Deutschland 1999 zum Global Entrepreneurship Monitor (extended version). Berlin: edition sigma.

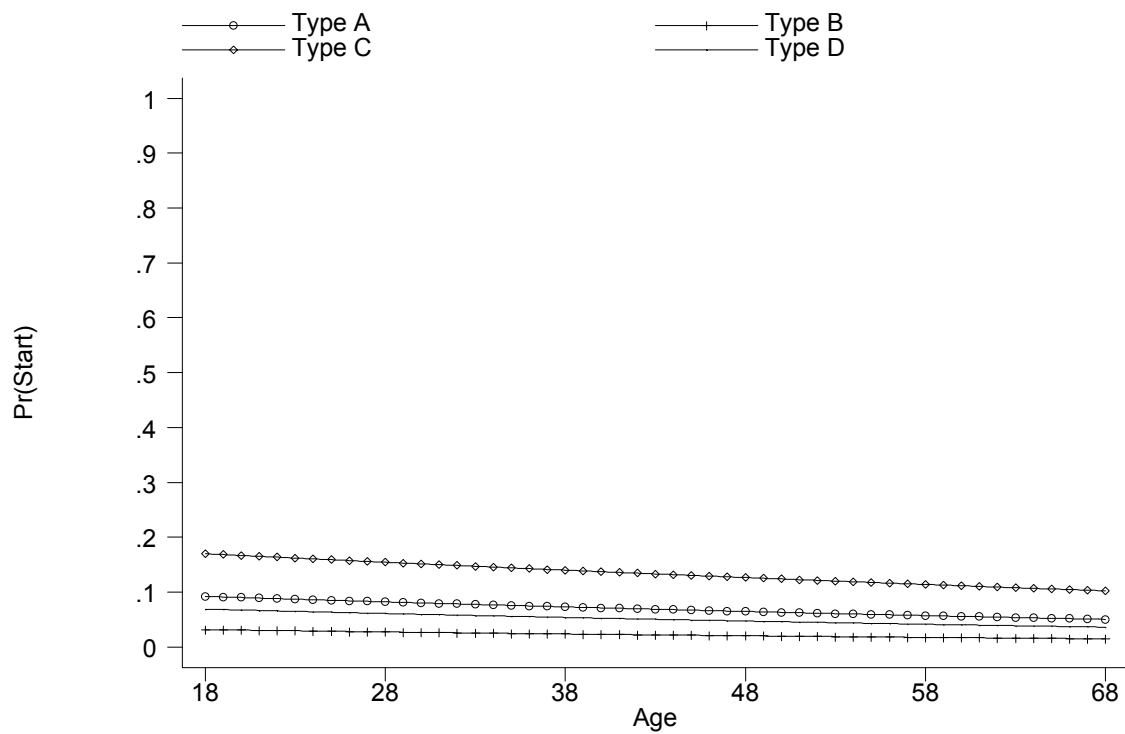
Sternberg, Rolf, 2000b, Gründungsforschung - Relevanz des Raumes und Aufgaben der Wirtschaftsgeographie. *Geographische Zeitschrift* 88, 199-220.

Sternberg, Rolf, 2001, *New Firms, Regional Development and the Cluster Approach - what Can Technology Policies Achieve?*. Paper Presented at the 6th Kiel Workshop in Economics on "Innovation Clusters and Interregional Competition". Kiel Institute of World Economics, Kiel University. Kiel 12.-13.11. 2001

Sternberg, Rolf, Heiko Bergmann and Christine Tamásy, 2001, *Global Entrepreneurship Monitor Länderbericht Deutschland 2001*, Köln: Wirtschafts- und Sozialgeographisches Institut, Universität zu Köln.

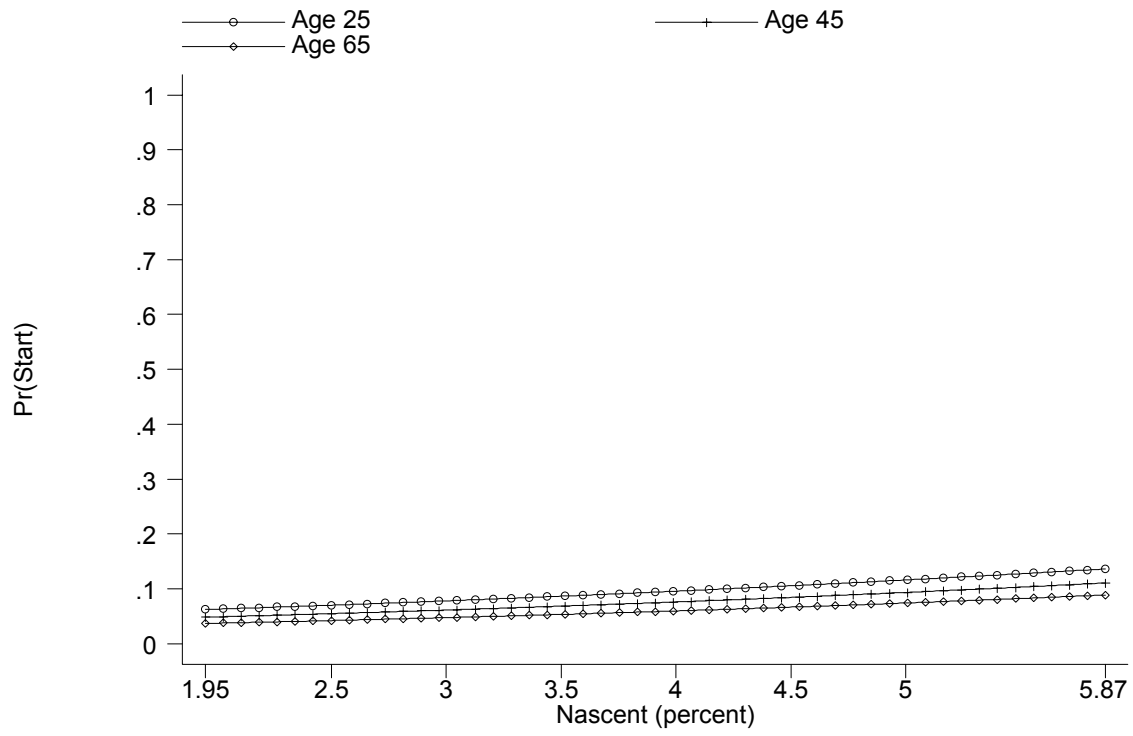
- Sternberg, R. and Mark Krymalowski, 2002: Internet Domains and the Innovativeness of Cities/Regions - Evidence from Germany and Munich. *European Planning Studies* 10, 251-274
- Sternberg, Rolf and Christine Tamásy, 1999: Munich as Germany's No.1 High Technology Region - Empirical Evidence, Theoretical Explanations and the Role of Small Firm/Large Firm Relationships. *Regional Studies* 33, 367-377.
- Thornton, Patricia H., 1999, The Sociology of Entrepreneurship. *Annual Reviews of Sociology* 25, 19-46.
- Welter, Friederike and Bernhard von Rosenblatt, 1998, Der Schritt in die Selbständigkeit: Gründungsneigung und Gründungsfähigkeit in Deutschland. *Internationales Gewerbearchiv* 46, 234-248.

Fig. 2: Estimated probability for becoming a nascent entrepreneur for various types of persons



Source: Own calculations based on weighted data from the Regional Entrepreneurship Monitor REM Survey 2001

Fig. 3: Estimated probability for becoming a nascent entrepreneur for various age groups



Source: Own calculations based on weighted data from the Regional Entrepreneurship Monitor REM Survey 2001

Table 1: The share of nascent entrepreneurs in selected German regions in 2001

Region	Share of nascent entrepreneurs in the population (percent)
Emscher-Lippe	2.53
Köln	5.87
Lüneburg	4.25
Main-Rhön	3.11
Mittelhessen	2.63
Mittleres Mecklenburg	1.95
München	4.63
Schleswig-Holstein Mitte	3.61
Stuttgart	2.92
Westsachsen/Leipzig	2.55
Average	3.74 ¹

¹ the respective share of nascent entrepreneurs for Germany as a whole according to GEM was 4,33% in 2001. Thus, the level of entrepreneurial activities has been lower in the average of the ten REM regions compared to all German regions in this year.

Source: Own calculations based on weighted data from the Regional Entrepreneurship Monitor REM Survey 2001

Table 2: Descriptive statistics¹

Variable	All		Nascent entrepreneurs		Others	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Sex (Dummy, 1=male)	0.45	0.50	0.64	0.48	0.44	0.50
Age (years)	43.24	13.52	39.64	11.36	43.37	13.57
Higher education (Dummy, 1=yes)	0.38	0.49	0.53	0.50	0.38	0.48
Unemployed (Dummy, 1=yes)	0.05	0.21	0.06	0.23	0.05	0.21
Fear of failure a reason not to start (Dummy, 1=yes)	0.47	0.50	0.24	0.42	0.48	0.50
Personal contact with a young entrepreneur (Dummy, 1=yes)	0.43	0.50	0.75	0.43	0.42	0.49
Regional share of nascent entrepreneurs (%)	3.42 ²	1.14	3.81	1.22	3.40	1.13
Regional share of active firm owners (%)	10.49	2.09	10.80	1.95	10.48	2.10
Number of cases	7894		272		7622	

Source: Own calculations based on data from the Regional Entrepreneurship Monitor REM Survey 2001

¹ For a detailed definition of the variables see text.

² 3.42 is the mean value of the sample used for estimations; in the text, the mean value 3.74 was used which is the weighted mean value for the complete sample

Table 3: Estimation results for determinants of becoming a nascent entrepreneur

Variable	Model A		Model B		Model C	
	Coeff.	P> t	Coeff.	P> t	Coeff.	P> t
Sex (Dummy, 1=Male)	0.2612	0.001	0.2630	0.000	0.2623	0.000
Age (Years)	-0.0061	0.007	-0.0063	0.009	-0.0063	0.008
Higher education (Dummy, 1 = Yes)	0.1351	0.067	0.1231	0.070	0.1133	0.082
Unemployed (Dummy, 1 = Yes)	0.1732	0.175	0.2077	0.098	0.1978	0.103
Fear of failure a reason not to start (Dummy 1 = Yes)	-0.3895	0.000	-0.3719	0.000	-0.3728	0.000
Personal contact with a young entrepreneur (Dummy 1 = Yes)	0.5281	0.000	0.5291	0.000	0.5279	0.000
Regional share of nascent entrepreneurs(%)					0.1118	0.000
Regional share of active firm owners(%)					-0.0010	0.888
Region Köln (Dummy, 1 = Yes)			0.2743	0.000		
Region Lüneburg (Dummy, 1 = yes)			0.2148	0.000		
Region Main-Rhön (Dummy, 1 = yes)			0.0541	0.003		
Region Mittelhessen (Dummy, 1 = yes)			-0.0522	0.000		
Region Mittleres Meck- lenburg (Dummy, 1=yes)			-0.2165	0.000		
Region München (Dummy, 1 = yes)			0.1921	0.000		
Region Schleswig-Hol- stein (Dummy, 1=yes)			0.0834	0.000		
Region Stuttgart (Dummy, 1 = yes)			-0.0314	0.005		
Region Westsachsen/ Leipzig (Dummy, 1=yes)			-0.0581	0.000		
Constant	-1.9346	0.000	-1.9980	0.000	-2.3145	0.000
Number of cases	7894		7894		7894	

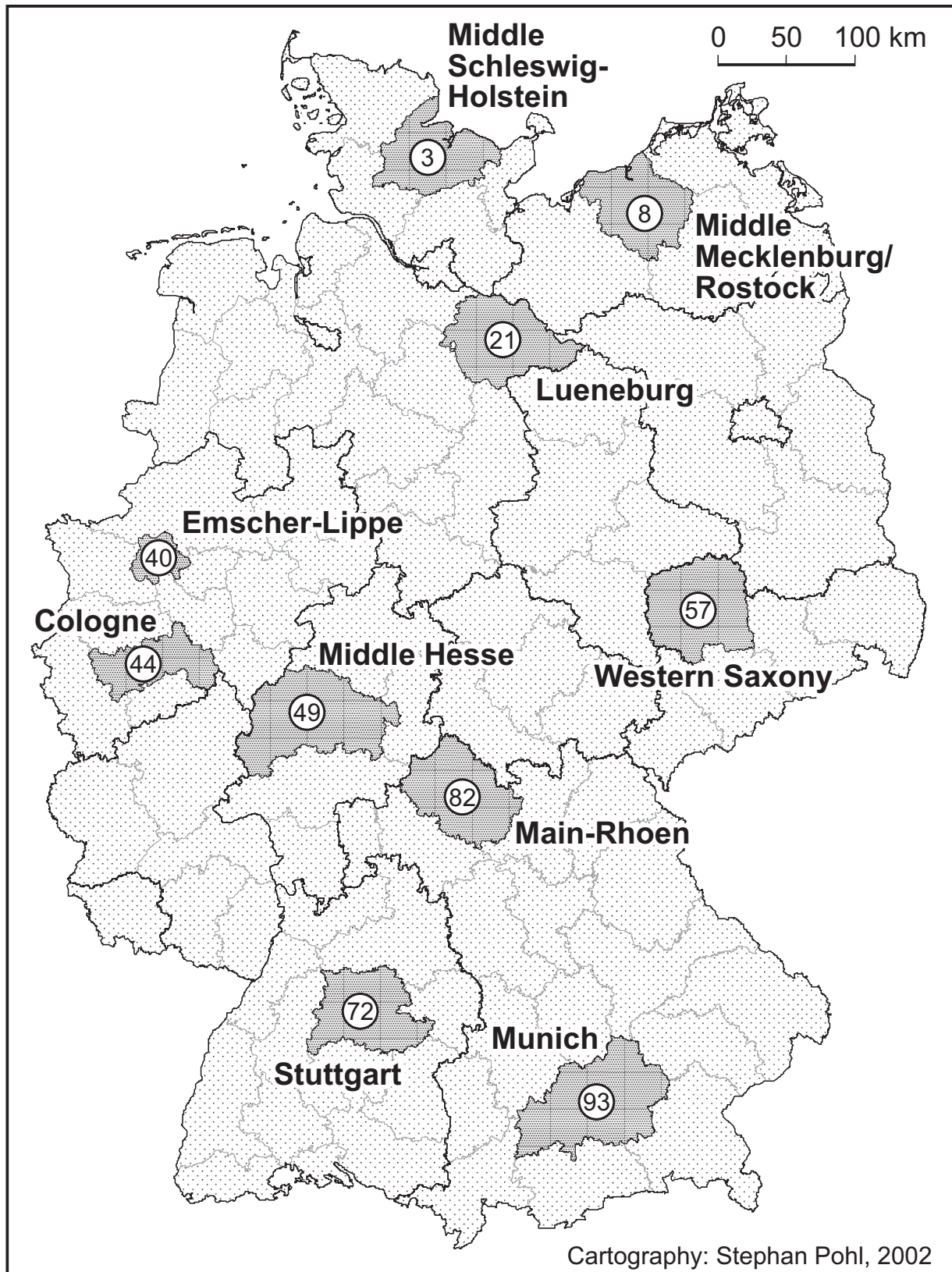
¹ The models were estimated by Stata 7 using the program svyprobit with the region as a cluster.

Table 4: Types of persons for simulation

Variable	Type			
	A	B	C	D
Sex (Dummy, 1 = Male)	1	1	1	1
Higher education (Dummy, 1 = yes)	1	1	1	1
Unemployed (Dummy, 1 = yes)	1	1	1	1
Fear of failure a reason not to start (Dummy, 1 = yes)	1	1	0	0
Personal contact with a young entrepreneur (Dummy, 1 = yes)	1	0	1	0
Regional share of nascent entrepreneurs (%)	3.42	3.42	3.42	3.42
Regional share of active firm owners (%)	10.49	10.49	10.49	10.49

¹ For a detailed definition of the variables see text.

Fig. 1: The REM case study areas



Numbers indicate the official number of the respective planning region (one out of 97).