



Munich Personal RePEc Archive

Entrepreneurship, Innovation and Spatial Disparities: Divisions and Changes of Self-employment and Firms

Bögenhold, Dieter and Fachinger, Uwe
Centre for Research on Ageing and Society, University of
Vechta

29. November 2009

Online at <http://mpa.ub.uni-muenchen.de/19245/>
MPRA Paper No. 19245, posted 12. December 2009 / 15:54



**Working Paper 3
November 2009**

**Economics and
Demography**

Dieter Bögenhold und Uwe Fachinger

**Entrepreneurship, Innovation and Spatial Disparities:
Divisions and Changes of Self-employment and Firms**

IMPRESSUM

Working Paper Nr. 3
Zentrum Altern und Gesellschaft, Vechta
Centre for Research on Ageing and Society, Vechta
November 2009

Die »Beiträge des Zentrums Altern und Gesellschaft« werden herausgegeben von
Prof. Dr. Gertrud M. Backes

Kontakt:
Hochschule Vechta – Universität
Zentrum Altern und Gesellschaft
Driverstr. 22
D-49377 Vechta
Tel.: +49(0)4441/15-233
Fax: +49(0)4441/15-614

Email: info@zag.uni-vechta.de
Web: <http://www.zag.uni-vechta.de>

ISSN 1869-0009

© bei Autorin/Autor 2009 – Alle Rechte vorbehalten.

Prof. Dr. Dieter Bögenhold, School of Economics and Management, Free University of Bolzano
and Centre for Research on Ageing and Society, University of Vechta
Univ.-Prof. Dr. Uwe Fachinger, Head of the Department Economics and Demography, Institute
for Gerontology and Centre for Research on Ageing and Society, University of Vechta

ZUSAMMENFASSUNG

Der Beitrag behandelt die Entwicklung beruflicher Selbständigkeit in den letzten Jahrzehnten in Deutschland. Dabei gliedert sich die Arbeit in zwei Teile. Im ersten theoretisch orientierten Teil wird der Begriff Entrepreneurship erörtert und mit Blick auf seine Grenzen und Überschneidungen mit den Begrifflichkeiten berufliche Selbständigkeit und Innovation diskutiert. Obwohl die Begriffe nur eine partielle Schnittmenge haben, wird im politischen Diskurs die Forderung der Steigerung von Entrepreneurship und volkswirtschaftlichen Innovationen unmittelbar mit der Erhöhung beruflicher Selbständigkeit gleichgesetzt. Der zweite Teil des Beitrages widmet sich der konkreten Untersuchung von Entwicklungsverläufen selbständiger Erwerbsarbeit seit dem Anfang der 1990er Jahre bis 2006 in Deutschland auf Basis der Mikrozensus des Statistischen Bundesamtes. Dabei wird die grundsätzliche Zunahme der Selbständigen in diesem Zeitraum deutlich. Allerdings verbergen sich hinter dieser generellen Entwicklung gravierende strukturelle Änderungen. Ein Großteil der Zunahme „neuer“ beruflicher Selbständigkeit fällt in die Kategorie von Ein-Personen-Selbständigkeit und Kleinstfirmen. Die Gleichsetzung von Entrepreneurship mit Innovationstätigkeit und steigender Selbständigkeit erscheint per saldo problematisch mit Blick auf wirtschaftspolitische Diskussionen über die Notwendigkeit von Wirtschaftswachstum. Die Differenzierung nach Regionen, Wirtschaftssektoren und Geschlecht ergibt ein Bild, das sehr uneinheitlich ist und sich keineswegs mit der einen oder anderen Form kausaler Zuschreibungen fassen läßt.

ABSTRACT

Topic of the paper is the development of professional self-employment during the last decades in Germany. The discussion is divided into a theoretical and an empirical section. The first theoretical part deals with the term entrepreneurship and asks for its overlapping with categories of self-employment and of innovation. Although these terms cover only partially the same meanings, political discourse often equals the slogan to foster entrepreneurship and innovation with an increase of self-employment. The second section of the paper is concerned with concrete investigation of development patterns of occupational self-employment since the beginning of the 1990th until 2006 based upon microcensus data for Germany. First of all, the overall increase of self-employment becomes visible but the principle lines hide further fundamental structural changes. A majority of those „new“ self-employed people belongs into the category of solo-self-employment and micro firms without further employees. An equation of entrepreneurship with innovation activities and increasing self-employment ratios falls too short and is problematic with respect to discussion on economic policy needs to increase growth. Differentiation for regions, economic sectors

and gender offers a picture which is contradictory and which does not correspond with some causal explanations as found conventionally.

CONTENTS

1	Introduction.....	5
2	Entrepreneurship – Theoretical Considerations	6
2.1	Entrepreneurship, Innovation and Self-employment	6
2.2	Certainty and Uncertainty: Firm Strategies.....	8
2.3	Creative Destruction and Complexities.....	11
2.4	Institutional Context of Entrepreneurship	12
3	From Entrepreneurship to the Study of Self-employment: Observations on the German Case.....	14
3.1	Trends of Self-Employment	15
3.2	Solo-Self-employment: A New Matter of Investigation.....	17
3.3	Self-employment and Regional Diversification	21
4	Entrepreneurship, Self-Employment, Regions: From Glamourising Vision to Differentiated Analysis	25
5	Bibliography.....	27

LIST OF FIGURES

Figure 1: Self-employment rate 1957 to 2007	15
Figure 2: Self-employed People in Germany, 1989 - 2005	16
Figure 3: Self-employed People as Percentage of Labour Force, 1989 – 2005.....	18
Figure 4: Self-employed people with and without employees	19
Figure 5: Self-employed people with and without employees differentiated by gender	21
Figure 6: Regional specific self-employment rate 2005	23
Figure 7: Regional and sector specific self-employment rate 2005	24

1 Introduction

The idea of the article is to discuss the issue of self-employment not only within the conventional scope of entrepreneurship discussion but within an integrated framework which combines entrepreneurship studies with labour market research. The integration of entrepreneurship analysis with studies on social stratification and mobility provides some very relevant issues and further questions in the field of entrepreneurship. With growing solo-self-employment a new social phenomenon in the structure of the labour market and the division of occupations has emerged in which different social developments are overlapping each other. The question for the landscape of self-employment in general and for solo-self-employment in particular is of crucial research interest: What forces their emergence? Must they be regarded primarily as a result of “pushes” by labour market deficiencies or are they a response to new lifestyles and working demands which act as „pulling“ factors into self-employment? In other words, does solo-self-employment serve as a valve of a pressing labour market or must it be regarded more positively as a new option in the classic division of labour by which an increasing number of people find new self-reliant and also stable jobs?

If one wants to talk about structural changes, data are needed which cover a broader time-frame. Therefore, we use German microcensus data from the Statistical Office Germany which are available for the periods from 1989 until 2005 to obtain further indications and specifications of the changes within the field of self-employment. Our main interest is to ask for structural changes of self-employment by observing the period since 1991. The questions are (i.) do we find significant differences in the development between West- and East-Germany and between administrative districts, and (ii.) which differences can be located when asking for gender differences. To make it short, we consider which factors matter when talking about changes in entrepreneurship and self-employment: Regions, gender or occupations.

In the analysis, we want to draw a more holistic picture of self-employment and related changes in economy and society and in the division of work and occupations, by taking numerous facets of self-employment into account. The paper has *two* parts: The *first* part discusses the issues entrepreneurship, innovation and self-employment as we find those items in current academic discussion and related policy recommendations. All related debate very often goes back to some basic assumptions which one finds in much broader scenarios within works provided by Schumpeter, Hayek, Kirzner, among others. They conceptualize a strong link between entrepreneurship, innovation *and* self-employment. What we want to convey is that entrepreneurship, innovation and self-employment only overlap in *some* parts. The category of self-employment is no guarantee for economic welfare success or in-

novation. It reflects structural changes within economy and society which condition the division of labor and organizations and working opportunities and which come up with new breeding grounds for small grants of new forms of self-employment, sometimes only part-time self-employment. Many of these new organizational entities seem to be reactions to social and economic changes. Those self-employed cannot be regarded as innovators in a Schumpeterian sense.

The *second* part refers to empirical findings, which are exclusively based upon investigation on the German case. While many regional studies are carried out on an international scale, the recent paper focuses on *intranational* differences as sources of regional disparities. Although a first inspection is carried out on a rather descriptive data inspection, the findings allow assuming that variables as population sizes, self-employment profiles and specifics of regions, economic sectors, and gender highly matter.

2 Entrepreneurship – Theoretical Considerations

2.1 *Entrepreneurship, Innovation and Self-employment*

Entrepreneurship cannot be translated directly into a category for labour market analysis - e. g. self-employment - because the term itself seems to be more or less an umbrella term for different or diverse economic phenomena of business life. The idiom 'entrepreneurship' covers diverse issues, such as those relating to small and medium-sized enterprises, innovative ventures, business start-ups, socioeconomic perspectives, and market behaviour, among others. As this is the case, there is no precise and commonly shared statistical source from which international comparisons of specific levels of entrepreneurship can be drawn. When discussing links between entrepreneurship and the division of occupations and changes in the labour market the analytical category of 'self-employment' seems more precise and adequate for operationalizing a quantifiable understanding of entrepreneurship. Self-employment as a labour market category can be numerically counted and individual fractions of the category can be compared. However, referring to self-employment raises up the difficulty that it usually serves as a kind of proxy for entrepreneurship but self-employment and entrepreneurship are never the same. Entrepreneurship covers only parts of the category of self-employment and the population of self-employed people includes people who can rarely be identified as entrepreneurial agents (Stam 2008).

Entrepreneurship is treated as a policy instrument to introduce innovation in order to initiate positive effects for the economy and the labour market. Regarding the question what innovation really means it is necessary to operate with a wide understanding of the term inno-

vation. Within the extremely extensive literature, one can go back to classic thought provided by Joseph A. Schumpeter (1963) who provided a typology of different innovation segments in order to demonstrate that innovation processes may include very different items. He distinguished between five different matters of innovation (Schumpeter, 1963: 66):

(1.) The introduction of a *new good*,

(2.) The introduction of a *new method of production*, that is one not yet tested by experience in the specific branch of manufacture, and which needs by no means to be scientifically new, even more, it can also be a new way of handling a commodity commercially,

(3.) The opening of a *new market*, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before,

(4.) The conquest of a *new source of supply* of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has to be created first, and

(5.) The carrying out of a *new organization* of any industry, like the creation of a monopoly or the breaking up of a monopoly position.

Having in mind the broad scenario of interpretations and applications of innovation we should take into account that no single pattern of innovations exists but diverse ways of innovations as formerly not known “new combinations”. Innovation research is an elementary part of the broader debate on stimulating economic growth. A long tradition exists in discussing how to implement further growth most appropriately. Competing approaches are still coexisting although recent debate is moving towards a so-called unified growth theory “... in which variations in the economic performance across countries and regions could be examined based on the effect of variations in educational, institutional, geographical, and cultural factors on the pace of the transition from stagnation to growth. ...”; (Galor 2005: 284-85).

Acknowledging that growth has become the strategically most crucial index of policy orientation, innovation is getting similar importance since innovation is always seen as initiating and keeping the driving force of growth in motion (Schumpeter 1947, Part II, Ch. 2). One of the issues to foster innovation is fostering entrepreneurship. The link between innovation, entrepreneurship and growth (Audretsch and Thurik 2001) has become centrally proclaimed and underlined. Many of the theoretical and empirical literature have been provided not

only to each of the dimensions but also to their practical interplay. The multicomplex concert of entrepreneurial driven innovation as growth engine includes a wide and open understanding of the different elements of innovation and of competition as discovery *process* (Hayek 2002, Kirzner 1973) which ultimately includes several *soft*-dimensions (besides *hard* factors as financing and given technology) as productive means, as – among others - e.g. human resources, knowledge (including educational skill and education), system of industrial relations, social and organization networks, working behaviour and mentalities (Audretsch 2002, 2007).

Creation and discovery are mysterious processes but - whatever else may be required - scientists are reasonably certain that incentives matter (Scotchmer 2004, preface). Innovation is the key to competitiveness in a globalise economy, which opens the door to sustainable growth and to more employment. Innovation processes are highly embedded in societal trends towards increasing ratios of knowledge in diverse spheres (Warsh 2006). Processes of industrial renewal in the global economy take place within an universal framework of permanent reconfigurations of the wider structure of economy and society. One of these tendencies is the internationally noticeable process of tertiarization which reduces employment and companies in the secondary sector – especially in the manufacturing industry – and which increases employment and ventures in services. Acknowledging this trend as a major source of change helps to demystify conventional debate in which especially rising numbers of entrepreneurs are glamorized and rhetorically sold as a positive outcome of policy activities. The general trend that in the production sector the relative number of white collar employees increases affects the division of labour within companies as well as between them (Bögenhold and Fachinger 2008). Shifts in the sectoral division of national and international economies need to be acknowledged in order to see potential for firm dynamics including niches for new small firms (Bögenhold and Fachinger 2007).

2.2 Certainty and Uncertainty: Firm Strategies

The division of work and the division of private companies can be interpreted from the perspective of company strategies and from the perspective of global social changes. The first perspective rationalizes changes in the structure of corporations or the division of labour primarily as an effect of firm strategies. Firms can enlarge, can move, downsize or close down and this will have certain effects on the system of the organization of the firms. The alternative view is based upon the idea that societies evolve globally as well as specifically and that those changes provide new and changing frameworks for the landscape of labour and business organizations.

Much of what we observe as firm strategies to increase flexibility is nothing else than an attempt to minimize uncertainties. A study, which addressed the phenomenon systematically and early, was the book by Frank H. Knight (1971). Knight discussed strategies of business organizations in relation to issues of planning certainties. While competition between enterprises is modulated under the premise of perfect competition where all participants share all the same relevant information, Knight argues that modern dynamic economic societies do not meet with this premise: "... With uncertainty absent, man's energies are devoted altogether to doing things; it is doubtful whether intelligence itself would exist in such a situation; in a world so built that perfect knowledge was theoretically possible, it seems likely that all organic readjustments would become mechanical, all organisms automata. With uncertainty present, doing things, the actual execution of activity, becomes in a real sense a secondary part of life; the primary problem or function is deciding what to do and how to do it....", (Knight 1971: 268).

Knight's premise is that we are in a world of dynamics and related uncertainties. If we want to understand the economic system adequately, we have to have a better understanding of uncertainties and corresponding zones of complexities. The issue of uncertainty separates expectations and certainties. In economic life, nearly all future prospects and activities are based upon specific assumptions. These assumptions are adverted to data of competitors, the business cycle, labour markets, innovation and technology standards and institutional settings. The problem for business corporations is how to act *despite* uncertainties. "... The significance of change is that it gives rise to the problem of the control of action, and in this respect the difference between predictable and unpredictable change is conspicuous...", (Knight 1971: 315). Risks are distinguished as static *or* dynamic risks. Static risks are managed by routines while dynamic risks are related to challenges provoking new types of answers: "... Problems of action arise out of departures from routine in changes of all sorts...", (Knight 1971: 315).

The corporation does not only deal with uncertainties which are located outside of the corporation but also within the own organization. Organizational theory had started to discuss "human factors" inside of the organizational borders, which were treated in different ways through theorems of "bounded rationality" (Simon 1955) or as "moral hazards" (Alchian and Demsetz 1972). Although literature discussed the issues not always systematically, one crucial point often was the question how a corporation is changing over time. Does the administration change if companies are successfully growing, what's about the emergence of organizational buffers and lacks of control?

According to Blau, two contradictory tendencies are coming up: "The large homogeneous personnel components in large organizations simplify supervision and administration, which

is reflected in a wider span of control of supervisors ... and a lower administrative ratio ... in large than in small organizations. Consequently, organizations exhibit an economy of scale in administrative manpower.... At the same time, however, the heterogeneity among organizational components produced by differentiation creates problems of coordination and pressures to expand the administrative personal to meet these problems ...", (Blau 1974: 320).

What Blau explained principally differs very much regarding to different economic sectors and to different organizational environments. Different transaction costs are responsible that companies come up with organizational answers this or that way but transaction costs are very difficult to get practically estimated. Specific organizational structures are often the result of search strategies to minimize transaction costs. In wide parts, these search routines reflect trial-and-error-strategies which gives an idea of what Chandler (1962) meant by his famous credo of "structure follows strategy".

Business historian Chandler discussed that

- (i.) strategies are the result of routines of repetition,
- (ii.) the fact of uncertainties can sometimes imply contradictory strategies,
- (iii.) new moments of crisis are potentially new starting points of changing organizational conceptions and interpretations.

In "The Visible Hand" Chandler (1977) made clear that for reasons to reduce transaction costs strategies of vertical integration are favoured. In addition, in "Strategy and Structure" (1962) Chandler demonstrated just the opposite explanation, e.g. how the emergence of organizational buffers may initiate company processes of reorganization. Here, advantages of a multidivisional structure are related to a reduction of transaction costs. Chandler: "... The basic reason for its success was simply that it clearly removed the executives responsible for the destiny of the entire enterprise from the more routine operational activities, and so gave them the time, information, and even psychological commitment for long-term planning and appraisal.... (The) new structure left the broad strategic decisions as to the allocation of existing resources and the acquisition of new ones in the hands of a top team of generalists. Relieved of operating duties and tactical decisions, a general executive was less likely to reflect the position of just one part of the whole ..."; (Chandler 1962: 382).

2.3 Creative Destruction and Complexities

Empirically, company strategies, which deal with the issue of uncertainties, differ. In some cases, strategic planning essentially leads to industrial dynamics. In case of certainty no scenario of planning is needed since all parameters are known but an economy which is interpreted as being in a permanent storm of “creative destruction” (Schumpeter 1947) is always in a flux of creating new things. Creative destruction is a contradictory expression, which seeks to highlight the fact that competition and inherent processes towards monopolistic and oligopolistic competition are only one part of the overall economic game. However, processes of creation of new firms, new ideas and even new business leaders, which are running simultaneously, are often neglected. Deaths and births are two sides of the same coin, and Schumpeter dubbed creative destruction as an essential fact about capitalism. Innovation is the steady new “fresh blood” through which new ideas and new people flow into the economy and which keeps the “capitalist machine” going. However, creativity is almost combined with destruction elsewhere. When new products appear, consumer demands change, and existing production and related markets are rendered obsolete.

Innovation and technical progress are due to the Schumpeterian framework of thought no external factors but they belong to the economic system as internal factors. The crucial question is not what capitalism does with economic structures but how capitalism creates and destroys the own structures. Basic assumption of its dynamics is the existence of competition for innovation: Companies compete always for new ways of innovation. Innovation is regarded as introducing a new combination of things which did not exist before or which were not done in that way before. Implementation of a new combination is the successful test on the market (Schumpeter 1963).

Regarding this background, entrepreneurs are treated as agents to introduce new inputs into the economy. Schumpeter defined an entrepreneur as a person who comes up with the aforementioned “new combinations” which are commonly called innovation. In this context the activity of entrepreneurs is fundamental for economic development.

Entrepreneurship is regarded as an institution that has to carry out the function of providing innovations. According to Schumpeter the economic function of entrepreneurship is to initiate and to continue the process of creative destruction as the „permanent storm of capitalist development“. In this view entrepreneurs act as personifications of economically necessary functions of economic change. Schumpeter's definition is notable since he considers only those economic actors as entrepreneurs who create “new combinations” and this almost with loaned capital. The last point is remarkable as that there are always risks taken. In this

sense, entrepreneurial being is „not a profession and as a rule not a lasting condition“ (Schumpeter 1963: 78).

Here, Schumpeter introduces entrepreneurial activities ultimately linked to sources of uncertainties. Only those business people who deal with uncertainties are regarded as (innovative) entrepreneurs, since an entrepreneur is by definition only an entrepreneur when he or she is risk taking *and* innovative. The link between Knight, Schumpeter, Hayek and further ideas of evolutionary economics (Nelson and Winter 1982) or evolutionary entrepreneurship (Kirzner 1973, 1985) is given through the idea of management of uncertainties under conditions of asymmetric information. Management processes are always practiced in and against dynamic environments under processes of uncertainties; they are realized under generalized hypotheses and normative assumptions in order to reduce complexities.

2.4 Institutional Context of Entrepreneurship

In economic models complexities are reduced to try to come up as simple as possible in order to deduce core principles which can be applied to all situations. The institutional framing with particular socio-spatial-cultural characteristics including social, legal and demographic specifics is often neglected in such models. However even if a social environment is recognized as a variable that has to be taken into account, it does not imply to have fully integrated the working mechanism of the inner principle adequately into the model. Engerman and Sokoloff (2003) express clearly that economic growth theories can be better formulated by a more sensitive understanding of institutions: “Economists do not have a very good understanding of where institutions come from, or why societies have institutions that seem conducive to growth, while others are burdened by institutions less favourable for economic performance. Until they do, it will be quite difficult to specify the precise role of institutions in processes of growth. ... what little we know about the evolution of institutions suggests caution about making strong claims about their relationship to growth ...” (Engerman and Sokoloff 2003: 28).

The consequence for research on entrepreneurship is that not only the context of entrepreneurship has to be acknowledged (Baumol and Strom 2007) but also its change in temporal sequences. Baumol (1990) exemplified that in his historical analysis of entrepreneurship and he expresses that entrepreneurship *as such* can not always be equated with economic upswings and positive effects of innovations. He explains that "... entrepreneurs are always with us and always play *some* substantial role. But there are a variety of roles among which the entrepreneur's efforts can be reallocated, and some of those roles do not follow the constructive and innovative script that is conventionally attributed to that person ..."; (Baumol 1990: 894). An analytic look on the development over centuries indicates that frame-

works of economies can vary considerably and that mentalities and further cultural dispositions change (Munro 2006) which is an argument that specifications of space and time should be considered when talking entrepreneurship (Bögenhold 1995).

Network research (Nohria and Eccles 1995, Scott 2007) increased a conceptual understanding that economic cycles are best interpreted as socially controlled and organized interaction processes of individual and corporate actors. Economic activities function along specific „ties“ of contacts which are organized according to specific social circles of communication. Organizational networks can be seen analogously to social networks. The difference is that organizational networks focus on interaction between organizations compared to ego-centred networks based on social action of human agents. Michael E. Porter (1990) argues that it is more reasonable to compare regions instead of referring to aggregate economies and their aggregate data. Regions are the core *subject* of socioeconomic analysis. When talking about “microeconomics of prosperity“ (Porter 2000) the term serves as a research program. Nowadays discussion on growth and regional policies often claims the need to foster clusters, a discussion which is based upon a perspective spread by Porter (see Stern, Porter, Furman 2000).

A great part of recent literature on innovation (Kaiserfeldt 2005) is led by questions for adequate socioeconomic contexts generating innovation. Social networks are explicitly treated as “extra-market externality“ (Westlund 2006) and a direct link between “networking“ and „entrepreneurial growth“ is postulated (Johannisson 2000). In the discussion clusters as sources of innovation through cooperation has increased significantly (Karlsson 2007), and the growth of *socioeconomic* elements is simultaneously expressed within entrepreneurship literature. Looking at specific models of economic success and growth we are arriving at a matrix of particular combinations of information processing, product generation, opportunity and market finding and regional characteristics (Asheim et al. 2006, Asheim and Coenen 2005), which are based upon issues of material and immaterial dimensions of production and organization (in the same direction see findings of Mugler, Fink, Loidl 2006). Especially, the rising importance of knowledge as factor of production (Bell 1973, Castells 2004, 2005 as sociologists, and Warsh 2006 as historian of economic thought) underlines those dramatic changes in economic regimes of production (Dolfsma and Soete 2006). Audretsch (2007) makes clear that knowledge has evolved being the *key* factor within discussion on economic progress.

Acknowledging the institutional context of entrepreneurship implies the recognition of social factors being of strategic importance to arrive at an adequate understanding of growth patterns. These social factors include items as language, mentalities, family structures, systems of basic and higher education, industrial relations, trust, or knowledge. They constitute dif-

ferent societal regimes of production, which always have specific faces in divergent regional contexts. In that sense business historians explained it as „cultural factors in economic growth“ (Cochran 1960) and Buchanan and Ellis stated that „the really fundamental problems of economic growth are non-economic“ (Buchanan and Ellis 1955, 405).

If one agrees with Buchanan and Ellis, one also has to agree with far-reaching consequences since non-economic factors have to be analyzed and understood in order to explain economic growth. According to these ideas, Audretsch (2002) listed in his discussion of major factors several social *soft* factors as *key* factors influencing entrepreneurship beside catchwords as finance and taxes. The most important of these soft factors are culture, networks and social capital. Finally, the focus of analytical observation must be narrowed down to local entities that are regions rather than nations. Here, Porter's ideas on the microeconomics of prosperity matches with thought on the core-periphery model as delivered by Krugman (1991). Looking at regions enables seeing specific paths and path dependencies of economic and social development, which allow analysing regional prosperities within its own logics of evolution (Audretsch et al. 2008).

Having discussed entrepreneurship in context with innovation and self-employment (Bjerke 2007), the partial overlap of the three items was considered. Self-employment often serves as the practical translation of what is sometimes a bit mysteriously coined entrepreneurship. While entrepreneurship has a close link with innovation and the dynamics of capitalism, self-employment – as analytical category - often stands a bit apart. The question is if all forms of self-employment are closely connected to the innovative and dynamic parts of the economy where new elements and ideas are set up keeping the capitalist engine in motion. The next part of the article wants to shed light at the question by referring empirically to the German case.

3 From Entrepreneurship to the Study of Self-employment: Observations on the German Case

The main interest of the empirical research is to ask for structural changes within the category of self-employment by observing a period of 15 years.

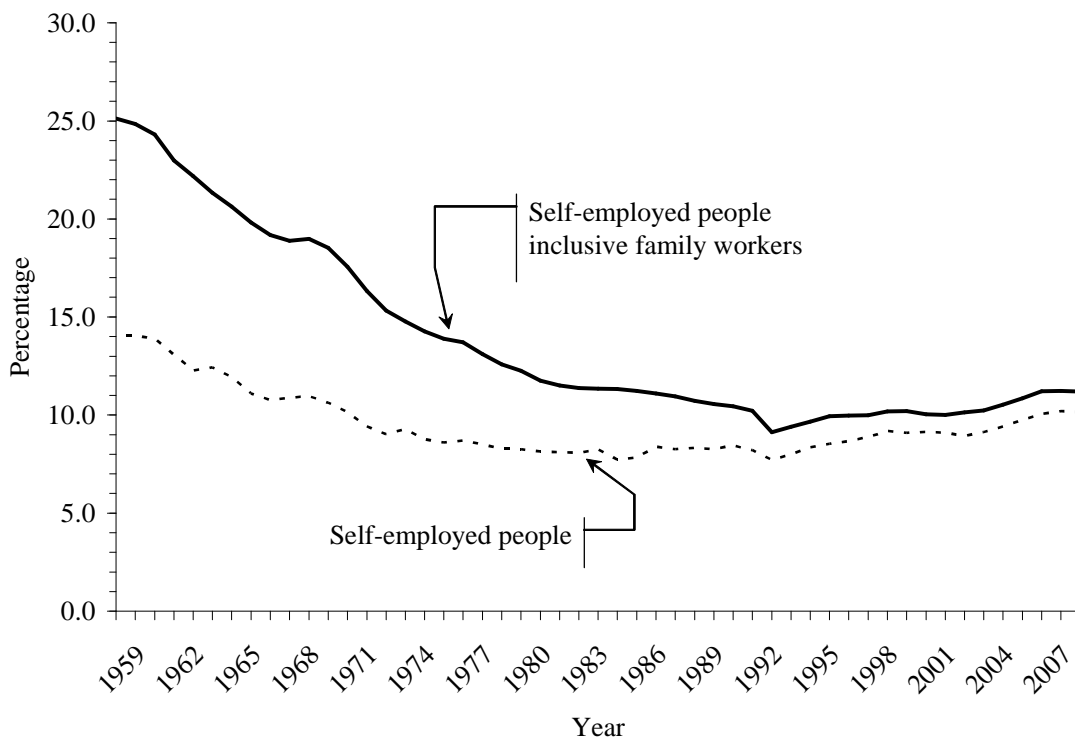
Since public discussion on entrepreneurship is often done in a very glamorizing way in which self-employed people are regarded as personalized agents of entrepreneurship, which operate as heroes of capitalist dynamics, our study is led by the attempt to develop the field more realistically. In the following part we want to take some important facets of self-employment into account to draw a more holistic picture of self-employment within the di-

vision of work and occupations. The questions are do, regions, does gender or do occupations matter when talking about changes in self-employment.

3.1 Trends of Self-Employment

Figure 1 shows the development of self-employed people as percentages of self-employed to the labour force (ratio I) and as a portion of self-employed people and family workers to the labour force (ratio II) over the period from 1957 to 2007. Over the time span of 51 years, self-employment ratio I has decreased from 13.0 % to 8.1 % in 1991 and since then, a small increase has taken place. The ratio II is a reflection of the structural changes in the economy that is characterised by the term tertiarisation: an increase of the service sector, e. g. portrayed by the rising numbers of employed people and the growing share of GDP. Service sector increases are often mirrored by a decline of the agricultural sector. The decline is for a large part due to the shrinking number of farmers and therefore also a result of the ongoing concentration within the economy. Hence, over the period, not only a reduction of self-employed people took place but also the number of family workers decreased drastically, which further indicates the structural changes in the economy.

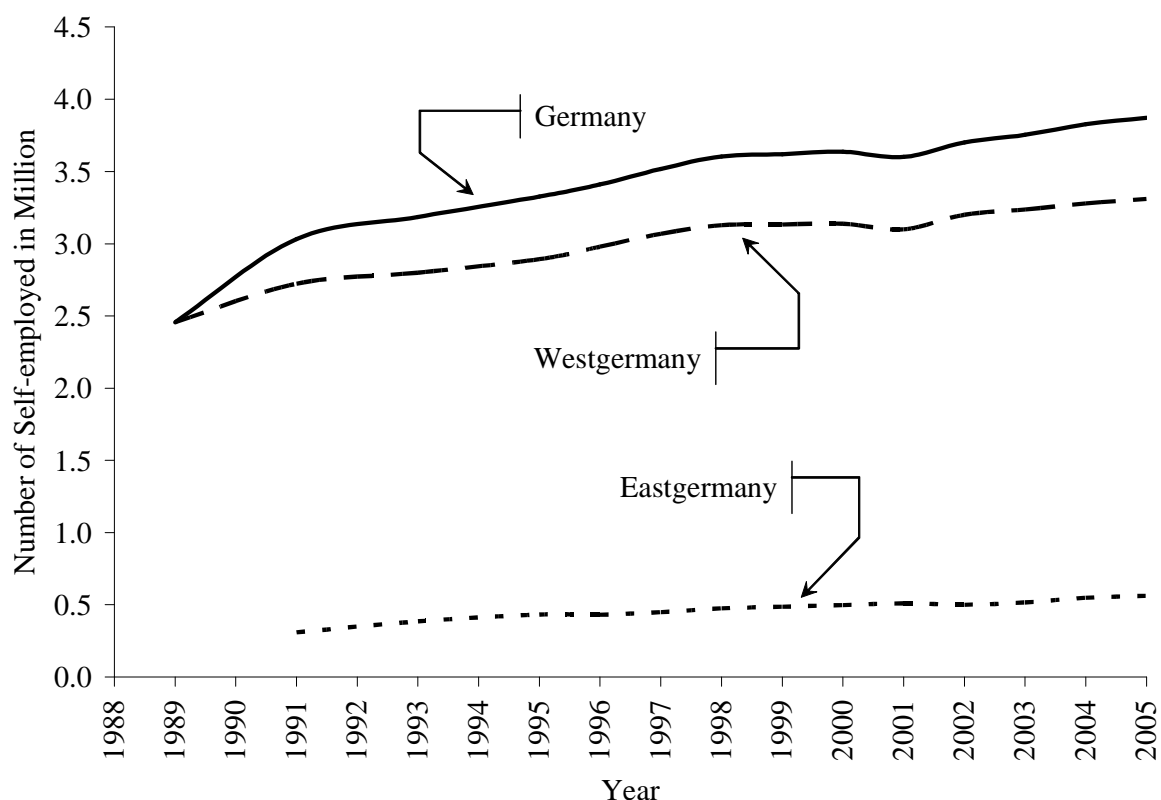
Figure 1: Self-employment rate 1957 to 2007



Source: Federal Statistical Office Germany and own calculations.

The overall development in Figure 1 hides structural changes that took place within self-employment and no information about the underlying forces can be yielded. For a closer look, an analysis at an individual basis is necessary. The microcensus database enables a closer look at the development of self-employment. Unfortunately, we could only use data since 1989 and 1991 respectively, and not for the whole time period of 51 years. On the other hand, as we are especially interested in comparing the development in West- and East-Germany, the relevant time span is covered.

Figure 2: Self-employed People in Germany, 1989 - 2005



Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany.

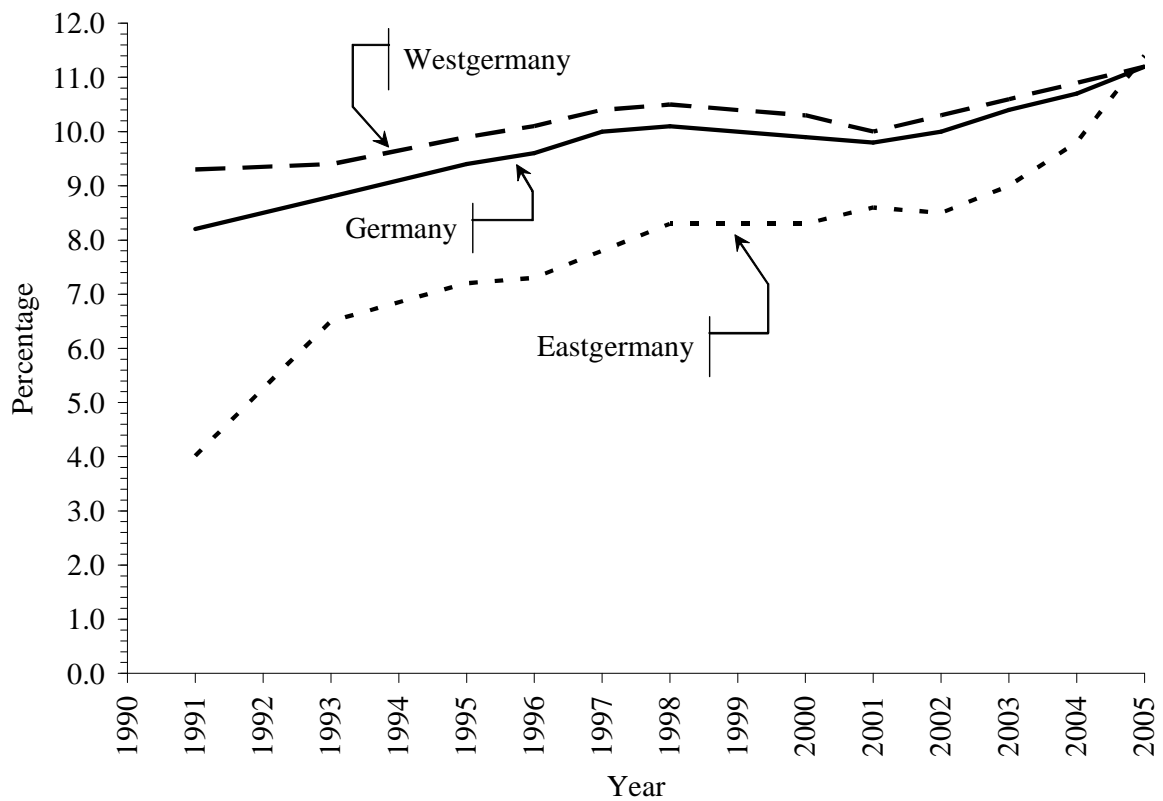
Figure 2 shows the - somewhat unexpected - development of the number self-employed people in West- and East-Germany as the profiles have nearly the same shape – only the number is much lower in East-Germany. As the labour market structure in East-Germany was totally different from West-Germany, the growth at the same pace is astounding. East-Germany was a former communist country where the transition phase with its dramatic institutional and economic shocks might have led to a different entrepreneurial engagement level, when compared to the long standing market economy of West Germany which did not experience such an abrupt change (Grilo / Thurik (2005a): 146). Therefore one would have expected a sharp increase over the first years after the unification due to the restructuring of

the economy and the process of adaptation to the “capitalistic” market structure in West-Germany – but the development is as stable as in West-Germany without any sharp alterations.

Another look is gained, when self-employed people as percentage of the labour force is considered as shown in Figure 3. The development of the rate of self-employment in West- and East-Germany is quite different between 1991 and the mid-1990s. During this time, an adjustment of East- to West-German structures took place. Here the somehow expected steep increase until 1993 can be seen as an indication of the economic transition and the adjustment of the labour market structure in East-Germany to the structures of West-Germany. From 1993 to 2003, the development of the self-employment rate is more or less the same for West- and East-Germany. A new phase of increasing percentage of self-employment in East-Germany set in 2003, so that in 2005 the percentage of self-employed people in West- and East-Germany is nearly the same. However, the increase is mainly caused by a reduction of the labour force and not by an increase of the number of self-employed people (see Figure 2).

3.2 Solo-Self-employment: A New Matter of Investigation

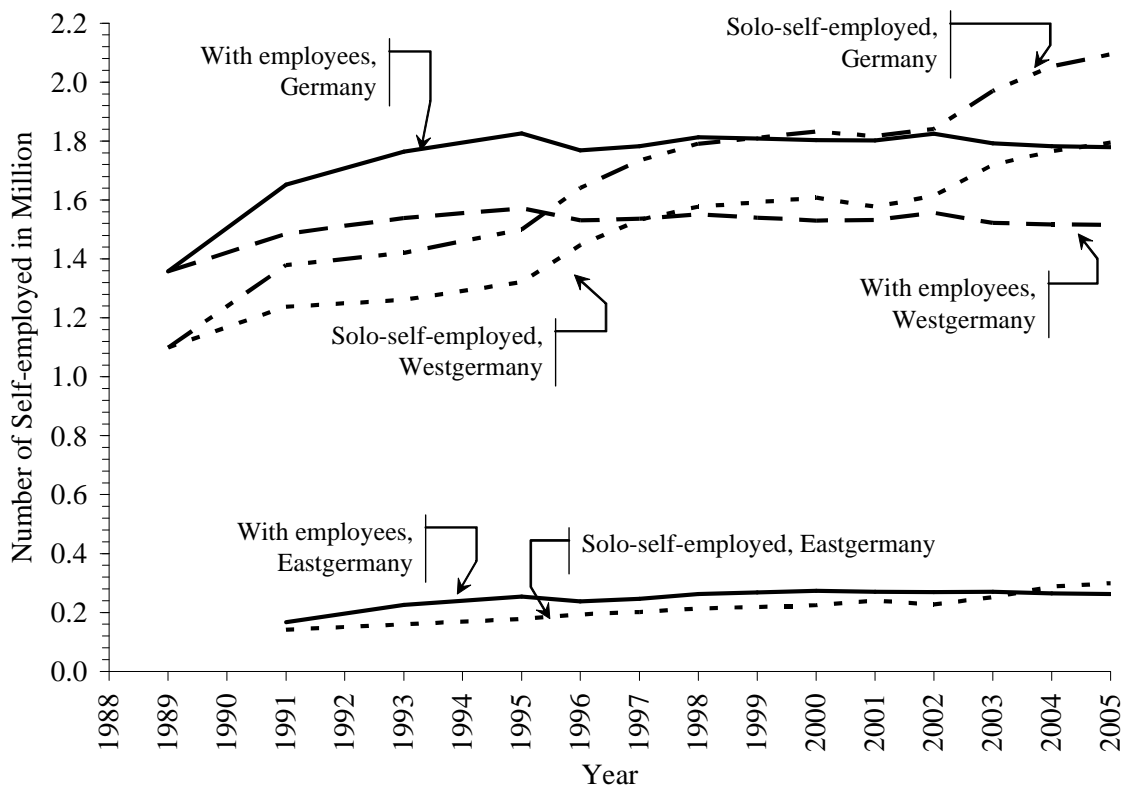
To get a better understanding of the underlying forces of the development of self-employment, the self-employed people are differentiated in those, who work alone (possibly having officially or unofficially support from family members) and those, who have at least one employee. Even this somewhat crude measure delivers a clear result: The development of self-employment is mainly due to an above-average increase in the numbers of solo-self-employed people as can be seen in the following figure. The analysis shows that the steady rise in the numbers of self-employed people in Germany led to the fact that more than 50 percent of all self-employed people belong to the category of solo-self-employment in the meantime – and this applies for West- and East-Germany.

Figure 3: Self-employed People as Percentage of Labour Force, 1989 – 2005

Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany.

Furthermore, the profiles in Figure 4 provide additional information about the structural changes in self-employment. It can be seen, that the rise in solo-self employment took place especially in West-Germany and that the process happened in two phases. The first started in 1995 and ended two years later and the second phase started in 2002.

The development during the first period is an indication for the effect of at least two changes in law. The first bundle of causes is the changes of labour market regulations and of the industrial law since 1995. Since then it is easier for firms to outsource jobs and to do business with the same people as freelancers. The second bundle consists of changes of welfare state regulations. A new scheme was introduced in 1995: the statutory long-term care insurance. With this scheme, the market concept was introduced. The expectation was, that with more competition the quantity and quality of the services would improve, and – as a result – many new one-person firms emerged especially by women who formerly worked as nurses in hospitals or nursing homes.

Figure 4: Self-employed people with and without employees

Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany.

The second phase of drastic increase in solo-self-employment is due to another severe change of labour market regulations in connection with further reforms of the welfare state system which took place at the beginning of the third millennium: the so called Agenda 2010. The effect of this reworking yielded essentially the other increase of solo-self-employment beginning in 2002.

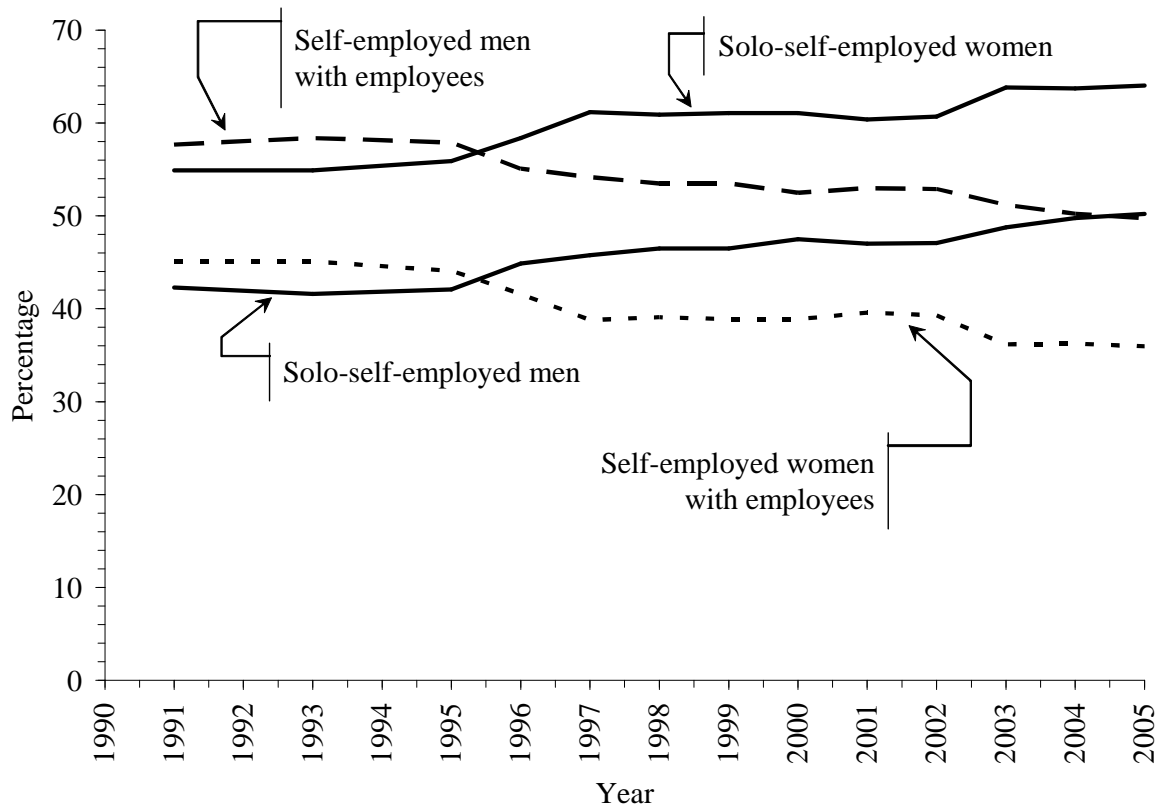
Overall, the analysis indicates that the increase of self-employment is due to special “innovations” and the reorganization of labour. The two pushes of solo-self-employment are for once a reflection of changing laws and administrative regulations, fostering explicitly or implicitly people to become self-employed. The introduction of the new body of law regarding long-term care as the 11. Book of the Social Security Statute Book opened a new sumarket in the sense of Schumpeter (Schumpeter, 1963: 66). This was accompanied by measures reducing the administrative complexities, which are regarded as an obstacle for becoming self-employed (see e.g. Grilo and Thurik (2005b)). On the other hand, the organization of labour was restructured by companies, which led to outsourcing of work to previous employees

which led to a new legislation concerning the social security of those dependent self-employed people. The new legislation took place at the end of the 1990s¹.

Considering the combination of solo-self-employment and gender, Figure 5 gives information that the structural development seems to be parallel to each other. The profiles of solo-self-employed men and solo-self-employed women follow the same time path – just the level is different and the profile for women is steeper. Figure 5 summarizes the trend. This result is somewhat contradictory to the results of Henrekson and Roine (2005), where “... the fact still remains that an entrepreneurial culture and a welfare state seem very remotely related.”

The effect of the increase in solo-self-employment is compensated by a decline of self-employed with employees. Overall, the relation of self-employed women to self-employed men is reasonably stable over the period. There is only a small increase in percentage of self-employed women in West-Germany from 26 % to 29 % and in East-Germany from 28 % to 30 %. Concerning the division of gender, no indications of a fundamental structural change can be found as the relation between male and female self-employment proved to keep relatively stable.

¹ „Gesetz zur Korrekturen in der Sozialversicherung und Versicherung von Arbeitnehmerschutzrechten“ from 19. December 1998, Bundesgesetzblatt 1998, Teil I, Nr. 85, S. 3843-3852, and its modification „Gesetz zur Förderung der Selbständigkeit“ from 20. December 1999, Bundesgesetzblatt 2000, Teil I, Nr. 1, S. 2-4. For early discussion of the impacts see Bögenhold, Fachinger, Leicht 2001).

Figure 5: Self-employed people with and without employees differentiated by gender

Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany.

3.3 Self-employment and Regional Diversification

The matter of regional differentiation is hardly acknowledged although the process of structural changes is very specific in respect to different regions. The consequences of structural changes become more transparent, when looking at the regional division. In order to follow the arguments of Michael E. Porter (1990) and to give an impression about the heterogeneous situation within Germany, self-employment rates are shown for the administrative districts of Germany for the year 2005.

A look at the regional distribution yields an inconsistent picture and backs up the argumentation of Porter (1990): There is a high self-employment rate in some metropolitan regions such as Munich, Berlin, Frankfurt and Hamburg, but not in Bremen or Hanover. In Saxony and in northern parts of Hesse, the self-employment rate is above average as well. Very remarkable is also the fact, that regions with high self-employment rate border on regions with a very low rate. It may be deduced that there is no smooth transition from one region to another. Regions with high and regions with low self-employment rates are coexisting within

the nearest neighbourhood. This raises the question for the reasons behind this pattern, which can only be answered by detailed comparative regional studies.

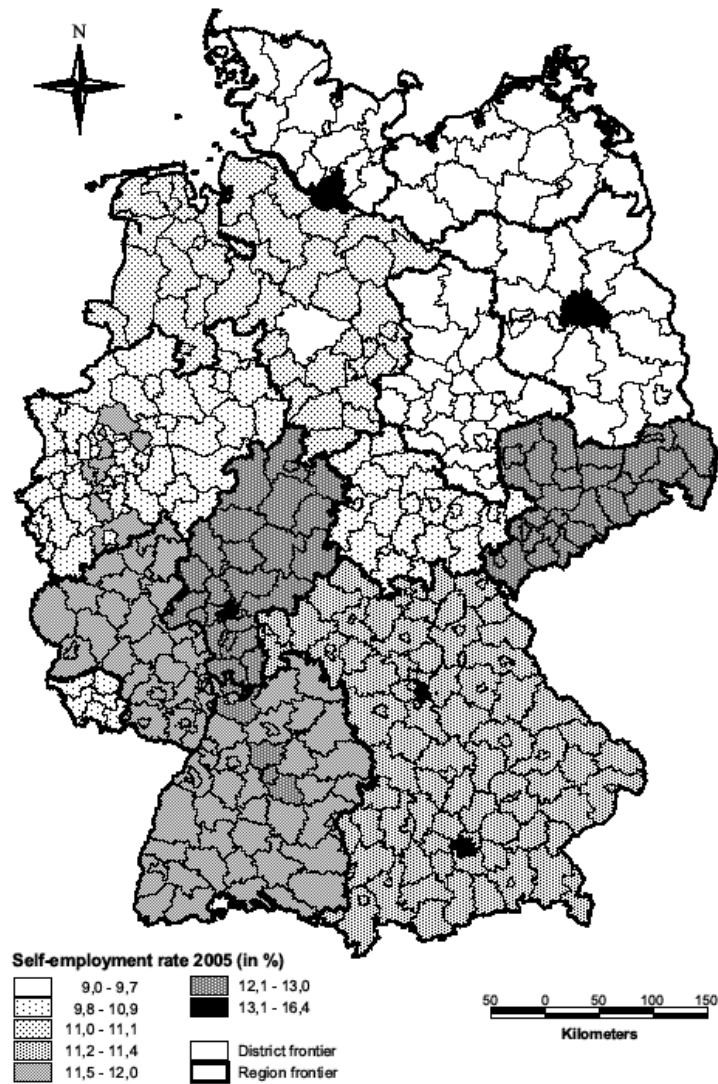
Considering the sectoral structure of the economy with respect to self-employment the situation turned out to be even more heterogeneous. Given a high rate of self-employment, for some regions Figure 7 the degree of tertiarisation is inconsistent (Figure 7). There are regions with a low rate of self-employed people in the tertiary sector, where the rate of self-employment is also low – as for example in the Weser-Ems region – and there are other regions with a high rate of self-employment in the tertiary sector and a high self-employment rate.

In general, the findings show that differences between regional levels cannot be reasonably explained simply according to the East-West-scheme which has been done very often. Sometimes the simple relationship of high self-employment rate and a high rate of self-employed people in the tertiary sector that has been supposed is not the case.

Regarding our findings and with respect to future developments, the question concerning the *nature* of self-employment is of particular interest. As Figure 7 indicates, in almost all regions, the majority of self-employed people is working on their own in one-person firms. However, also the share of solo-self-employed people varies from region to region the ratio is between 69.0 % in the Munich region or 71.1 % in the Berlin region down to 50.1 % in regions in Lower Saxony.

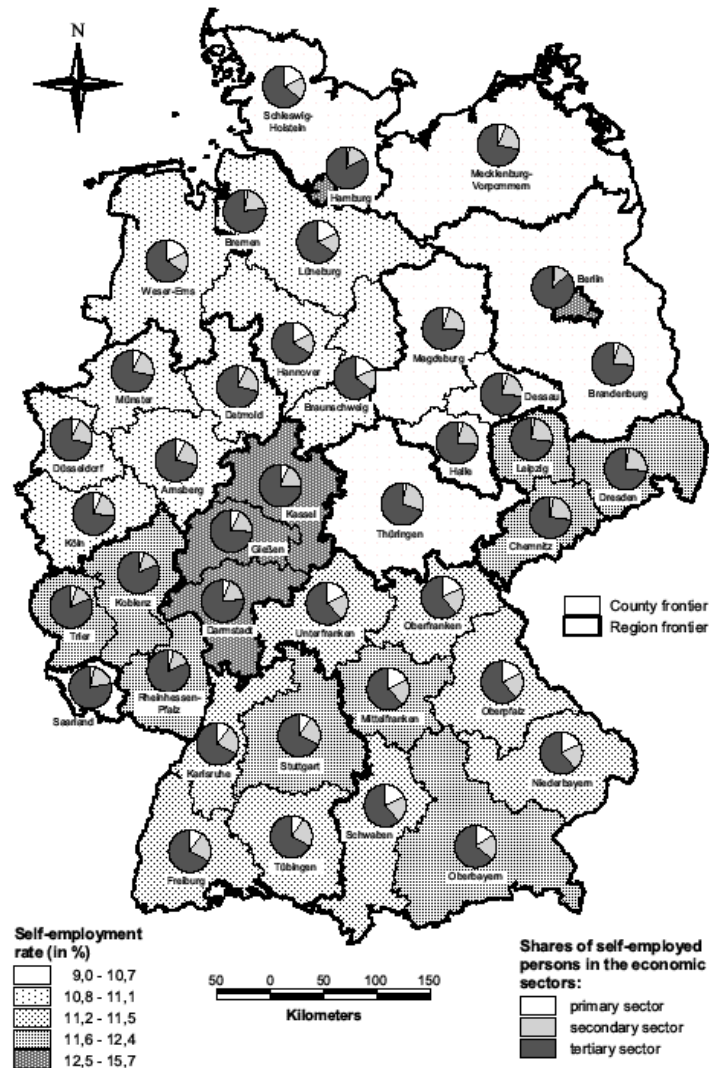
The dealing with special subgroups of occupational independence is thoroughly complex. New facets of self-employment have to be discussed. Under the label of self-employment, losers of the labour market – whose place in the structure of dependent work is uncertain – are summed up, just like the emerging new and highly autonomous forms of entrepreneurial activities – due to the ever-increasing importance of knowledge (see for a recent analysis about entrepreneurial decision Hessels et al. (2008)).

Figure 6. Regional specific self-employment rate 2005



Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany; we are grateful to Helmut Bäurle, who draw up the map.

Figure 7: Regional and sector specific self-employment rate 2005



Source: Own calculations based on the scientific use files of the microcensus of the Federal Statistical Office Germany; we are grateful to Helmut Bäurle, who draw up the map.

Over the last decades we have witnessed an advance of women in occupational independence. But also this development differs from region to region and no general effect for Germany can be formulated. The same is true for the increase of solo-self-employment: We cannot say that a high rate of solo-self employment definitely goes hand in hand with a high rate of self-employed women. Sometimes the contrary is the case as the numbers for the administrative district of Frankfurt show with an above average rate of 63 % for solo self-employment and a rate of 27.4 % for self employed women, which is well below the aver-

age. Overall, there are regions where nearly every third self-employed is female, while in other regions only every fourth person is female. However, there are regions with low rate of female self-employment and high solo-self-employment, whereas in the administrative district of Stuttgart both rates are high.

4 Entrepreneurship, Self-Employment, Regions: From Glamourising Vision to Differentiated Analysis

Our discussion has touched many crucial aspects for a better understanding of entrepreneurship. While following ideas introduced primarily by Schumpeter that economies always need “fresh blood” out of social and economic innovations in order to keep the capitalist engine in motion, we partly agreed that entrepreneurship might be an appropriate instrument to “transport” diverse forms of innovation. However, the conventional equation that entrepreneurship has to be translated by the labour market category of self-employment was questioned theoretically *and* empirically. Self-employment is heterogeneous and has diverse elements, social logics and social path-dependencies leading to the fact that fractions of self-employment can be very constitutive as sources and agents of innovation but other fractions are simultaneously very non-entrepreneurial in a Schumpeterian sense of running enterprises in routines without ever having ideas of innovation. The last group is very often driven by needs to keep the firms running to secure living and they are created out of diverse motives, very often also against a background of unemployment.

The idea of the paper was to discuss the issue of self-employment in a framework which combines labour market research with a wider socioeconomic context. Which forces push self-employment and how much do regions and gender matter? And how can we explain the explosion of solo-self-employment compared to “regular” self-employment?

What we tried to explain is that the introduction of an institutional context to the debate on entrepreneurship, innovation, and self-employment considerably helps to arrive at a better understanding of many phenomena under discussion. The turn to an economy within an institutional context helps to realize a turn from an *economy in abstracto* to an *economy in concreto*. When talking entrepreneurship it must be related to real societies and economies with concrete time-space coordinates. Empirical results and economic history provide the genuine background which indicates how economies and societies are really evolving (Baumoll et al. 2007).

The shift towards markets creates new business opportunities opening up for other already established firms or for business start-ups through self-employment trying to cover these segments. The up and down of business activities in economies must always be taken as bal-

ance between births and deaths of which the metaphor of creative destruction gives an idea. In that understanding an analysis of self-employment in a given year or in a short period of time is almost not more than a snapshot of capitalist dynamics.

Our findings illustrate that the social and economic process after the German reunification proves the adjustment of the ratio of self-employed people in East-Germany to the West-German level. In 2005 the gap between East- and West-Germany is nearly closed. Therefore persisting differences between regional levels cannot reasonably be explained anymore simply according the East-West-scheme but must be better interpreted in a multi-complex framework of intra-national relations and different growth and labour market patterns within Germany. Attempts to explain variation primarily with the German history of having post-communist parts in the East and “purely” capitalist parts in the West will fall too short. What we can empirically observe is that all of Germany is *fragmented*.

At first sight, the heterogeneity has no clear and systematic logic of economic and social evolution. The unity of variation in regional levels of self-employment ratios concerning sectoral and further classification is contradictory when trying to relate different levels to different sizes of metropolitan or rural areas or to different levels of economic prosperity. All possible explanations according mono-causal explanatory schemes can be confronted with counterfactual examples of regional development elsewhere. Regional differences within self-employment ratios - which have no one-to-one fit with different levels of economic prosperity or different levels of unemployment - are striking and make monocausal explanations difficult. Our findings suggest that self-employment has to be explained by inherent modes of regional working and dynamics.

What Porter labelled the “microeconomics of prosperity” (Porter 2000) seems to provide the analytic key for future analyses in order to decode different patterns of development. A first inspection and evaluation of the data suggests that we can conclude with a slogan that *regions matter*. In this respect, we observe a *unity of diversity* and a *diversity of unity*. Following the conclusion that regions matter we can further suggest that *culture matters* (Harrison and Huntington 2000), since regional differences can be regarded as different levels of historically grounded specific socio-economic differences. Regional differences are heterogeneous and contradictory as well as homogenous from different perspectives of analysis and must be taken as elements and variables of a holistic entrepreneurship research (Bögenhold 2007).

The non-identity of entrepreneurship and self-employment has been discussed in the beginning of the paper: Not everything labelled entrepreneurship can be translated with the category of self-employment and vice versa not all self-employed people can be regarded as

proper entrepreneurs. Too heterogeneous are standards of living, labour, biographies, expectations and aspirations of people. Especially, the high and increasing portion of solo-self-employment among the category of self-employment highlights the fact that not all self-employed people match with the idea of an “entrepreneur as permanent opportunity seeker and finder” (Kirzner 1973) but many of them are close to low incomes and their existence is to be explained against a background of experienced or feared unemployment.

Celebrating a revival of entrepreneurship by indicating the increasing numbers of self-employment is not serious since the explosion of solo-self-employment has not very much in common with a revival of entrepreneurship. These tendencies have better to be explained by global sectoral changes including labour market trends, secular processes towards tertiarization and the emergence of new professions which can be operated through free-lanced activities or micro-firms.

5 Bibliography

- Alchian, A.A. and H. Demsetz (1972), ‘Production, Information Costs, and Economic Organisation’, *American Economic Review*, **62**, 777-795.
- Asheim, B. and L. Coenen (2005), ‘Knowledge Bases and Regional Innovation Systems: Comparing Nordic Clusters’, *Research Policy*, **34**, 1173-1190.
- Asheim, B.; L. Coenen and J. Vang (2006), ‘Face-to-Face, Buzz and Knowledge Bases: Socio-spatial Implications for Learning, Innovation and Innovation Policy’, Universities of Lund, Aalborg und Oslo, Working Paper.
- Audretsch, D.B. (2002), *Entrepreneurship: A Survey of the Literature*, Research under Commission of the Commission of the European Union, Enterprise Directorate General, Brussels.
- Audretsch, D.B. (2007), *The Entrepreneurial Society*, Oxford: Oxford University Press.
- Audretsch, D.B. and R. Thurik (2001), ‘Linking Entrepreneurship to Growth’, Paris: OECD Publishing, OECD Science, Technology, and Industry Working Papers 2001/2.
- Audretsch, D.; O. Falck; M. Feldman and S. Heblich (2008), ‘The Lifecycle of Regions’, Munich, CEPR Discussion Paper 6757.
- Baumol, W.J. (1990), ‘Entrepreneurship: Productive, Unproductive, and Destructive’, *Journal of Political Economy*, **98** (5), 893-921.

- Baumol, W.J.; R.E. Litan and C.J. Schramm (2007), *Good Capitalism, Bad Capitalism and the Economics of Growth and Prosperity*, Yale: Yale University Press.
- Baumol, W.J. and R.J. Strom (2007), 'Entrepreneurship and Economic Growth', *Strategic Entrepreneurship Journal*, **1**, 233-327.
- Bell, D. (1973), *The Coming of Post-Industrial Society. A Venture in Social Forecasting*, New York: Basic Books.
- Bjerke, B. (2007), *Understanding Entrepreneurship*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.
- Blau, P.M. (1974)., *On the Nature of Organizations*, New York: Wiley.
- Bögenhold, D. (1995), 'Selbständige Erwerbsarbeit in sozial- und wirtschaftshistorischer Perspektive', in J. Schmude (ed.), *Neue Unternehmen: Interdisziplinäre Beiträge zur Gründungsforschung*, Wirtschaftswissenschaftliche Beiträge, (113), Heidelberg: Physica Verlag, pp. 11 – 23.
- Bögenhold, D. (2004), 'Creative Destruction and Human Resources: A Labor Market Perspective on Firms and Human Actors', *Small Business Economics*, **22** (3-4), 165-177.
- Bögenhold, D. (2007), 'Entrepreneurship im Kontext: Zur Wichtigkeit sozialwissenschaftlicher Aspekte der Gründungsforschung', in M. Fink, D. Almer-Jarz and S. Kraus (eds), *Sozialwissenschaftliche Aspekte des Gründungsmanagements – Die Entstehung und Entwicklung junger Unternehmen im gesellschaftlichen Kontext*, Stuttgart: IBIDEM, pp. 28-51.
- Bögenhold, D. and U. Fachinger (2007), 'Micro-firms and the Margins of Entrepreneurship: The Restructuring of the Labour Market', *The International Journal of Entrepreneurship and Innovation*, **8** (2007), 281-293.
- Bögenhold, D. and U. Fachinger (2008), 'Do Service Sector Trends Stimulate Entrepreneurship? A Socio-economic Labour Market Perspective', *International Journal of Services, Economics and Management*, **1** (2), 117-134.
- Buchanan, N.S. und H.S. Ellis (1955), *Approaches to Economic Development*, New York: Twentieth Century Fund.
- Castells, M. (ed.) (2004), *The Network Society: A Cross-cultural Perspective*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.
- Castells, M. (2005), *The Rise of the Network Society*, Malden: Blackwell.

- Cochran, Th.C. (1960), 'Cultural Factors in Economic Growth', *Journal of Business History*, 515-530.
- Chandler, A.D. (1962), *Strategy and Structure. Chapters in the History of the American Industrial Enterprise*, Cambridge: Harvard University Press.
- Chandler, A.D. (1977), *The Visible Hand: The Managerial Revolution in American Business*, Cambridge: Harvard University Press.
- Davidsson, P.; F. Delmar and J. Wiklund (2006), 'Entrepreneurship as growth; growth as entrepreneurship', in P. Davidsson; F. Delmar and J. Wiklund (eds), *Entrepreneurship and the Growth of Firms*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing, , pp. 21-37.
- Engerman, S.L. and K.L. Sokoloff (2003), 'Institutional and Non-Institutional Explanations of Economic Differences', National Bureau of Economic Research (NBER), *Working Paper* 9989.
- Galor, O. (2006), 'From Stagnation to Growth: Unified Growth Theory', in P. Aghion and S. Durlauf (eds), *Handbook of Economic Growth*, Amsterdam: Elsevier, pp. 171-293.
- Grilo, I. and R. Thurik (2005a), 'Entrepreneurial Engagement Levels in the European Union', *International Journal of Entrepreneurship Education*, **3** (2), 143-168.
- Grilo, I. and R. Thurik (2005b), 'Latent and Actual Entrepreneurship in Europe and the US: Some Recent Developments', *International Entrepreneurship and Management Journal*, **1** (1), 441-459.
- Harrison, L.E. and S.P. Huntington (eds) (2000), *Culture Matters. How Values Shape Human Progress*, New York: Basic Books.
- Hayek, F.A. (2002), 'Competition as a Discovery Procedure', *The Quarterly Journal of Austrian Economics*, **5** (3), 9-23.
- Henrekson, M. and J. Roine (2005), 'Promoting Entrepreneurship in the Welfare State', Working Paper, Stockholm: IUI, The Research Institute of Industrial Economics.
- Hessels, J.; M. van Gelderen and R. Thurik (2008), 'Entrepreneurial aspirations, motivations, and their drivers', *Small Business Economics*, **33**, 323-339.
- Johannisson, B. (2000), 'Networking and Entrepreneurial Growth', in D.L. Sexton and H. Landström (eds), *Blackwell Handbook of Entrepreneurship*, Oxford: Blackwell, pp. 368-386.

- Kaiserfeld, Th. (2005), 'A Review of Theories of Invention and Innovation', Royal Institute of Technology, Stockholm, Sweden, Working Paper.
- Karlsson, C. (2007), 'Clusters, Functional Regions and Cluster Policies', Jönköping: CESIS, Working Paper 84.
- Kirzner, I. (1973), *Competition and Entrepreneurship*, Chicago: University of Chicago Press.
- Kirzner, I. (1985), *Discovery and the Capitalist Process*, Chicago: University of Chicago Press.
- Knight, F.H. (1971), *Risk, Uncertainty and Profit*, Chicago: The University of Chicago Press.
- Krugman, P. (1991), *Geography and Trade*, Cambridge, MA: MIT Press.
- Mugler, J; M. Fink and St. Loidl (2006), *Erhaltung und Schaffung von Arbeitsplätzen im ländlichen Raum*, Wien: Manz.
- Munro, John (2006), 'Entrepreneurship in Early-Modern Europe (1450-1750): An Exploration of Some Unfashionable Themes in Economic History', University of Toronto, Institute for Policy Analysis, Working Paper No. 30.
- Nelson, Richard R. and Sidney G. Winter (1982), *An Evolutionary Theory of Economic Change*, Cambridge: Harvard University Press.
- Nohria, Nitin and Robert G. Eccles (eds) (1995), *Networks and Organizations. Structure, Form, and Action*, Boston: Harvard Business School Press.
- Porter, M.E. (1990), *The Competitive Advantage of Nations*, New York: Free Press.
- Porter, M.E. (2000), 'Attitudes, Values, Beliefs, and the Microeconomics of Prosperity', in L. E. Harrison and S. P. Huntington (eds), *Culture Matters. How Values Shape Human Progress*, New York: Basic Books, pp. 14-27.
- Schumpeter, J.A. (1963), *The Theory of Economic Development*, New York and Oxford: Oxford University Press.
- Schumpeter, J.A. (1947), *Capitalism, Socialism and Democracy*, London: Allen & Unwin.
- Scott, J. (2007), *Social Network Analysis*, London: Sage.
- Scotchmer, S. (2004), *Innovation and Incentives*, Cambridge: MIT Press.
- Simon, H.A. (1955), 'A Behavioral Model of Rational Choice', *Quarterly Journal of Economics*, **69**, 99-118.

Stam, E. (2008), 'Entrepreneurship and Innovation Policy', Jena Economic Research Paper, 006-2008.

Stern, S.; M.E. Porter and J.L. Furman (2000), 'The Determinants of National Innovative Capacity', Cambridge: National Bureau of Economic Research (NBER), Working Paper 7876.

Warsh, D. (2006), *Knowledge and the Wealth of Nations. A Story of Economic Discovery*, Norton: New York.

Westlund, H. (2006), 'The Social Capital of Regional Dynamics: A Policy Perspective', University of Tokyo. Center for International Research on the Japanese Economy, Working Paper F 423, 2006.