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Regional Entrepreneurial Heritage in a Socialist and a Post-Socialist Economy

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Abstract:
This paper sheds light on regional differences of self-employment in a socialist economy on the eve of its transition toward a market economy and differences with regard to start-up activities after transition. It shows that regions with a long entrepreneurial tradition have higher self-employment rates than regions where these traditions played only a minor role before the introduction of a socialist centrally planned economy. These regions have also higher start-up rates after transition. It seems entirely likely that some regions have a certain entrepreneurial heritage that is an important resource embedded in the region. Even the introduction of socialism did not eradicate or reverse the geography of private sector activity. It is recommended that policy should stimulate and activate region-specific entrepreneurial potentials to attain a sustainable regional development.

Keywords: Entrepreneurial Culture; Transition

Jel codes: L26 ; P25 ; R11

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1 Introduction

This paper is devoted to contributing to the literature on the role of entrepreneurial culture for regional development (see e.g. Wagner and Sternberg, 2004). The focus of this paper is to investigate whether introducing a socialist centrally planned economy (CPE) destroyed regional entrepreneurial culture.

The region of analysis is the eastern part of Germany, which formed the socialist German Democratic Republic (GDR) until the German reunification in 1990. In the course of reunification the market economy was immediately adopted in the new eastern part of unified Germany.

There is evidence that there are pronounced differences between regions with regard to the distribution of private sector activities in socialism and with regard to start-up activities after reunification. These differences can be explained by entrepreneurial tradition or, to put it differently, by a certain “entrepreneurial heritage” - reflected by higher self-employment rates (SER) - which some regions inherit.

The entrepreneurial heritage was deprived during socialism, but was still reflected in an “entrepreneurial residual” just before the fall of the Berlin Wall in 1989. There is evidence that regions with a higher residual and, in turn, with a long entrepreneurial tradition have higher start-up rates (SUR) after the transition. Thus, the main finding of this paper is that even four decades of socialism did not destroy entrepreneurial culture and its regional distribution.

This finding is an overwhelming indication of regional differences with regard to entrepreneurial climate. There seem to be path-dependencies linked to deeply region-specific factors that outlast even historical structural breaks of economic development like the introduction of a CPE and a shock transition towards the market economy (ME) system.

The paper proceeds as follows: First, the focus is on entrepreneurship from a general regional perspective (Chapter 2). Second, the role of private sector

activities and regional differences in the industrial structure in the GDR are described (Chapter 3). Third, data and methodological issues are raised (Chapter 4). Fourth, the results are presented and discussed (Chapter 5 and 6). The final chapter concludes (Chapter 7).

2 Entrepreneurship and the region

Regional differences with regard to entrepreneurial activities can be detected across several countries (see e.g., Reynolds et al., 1994; Sutaria and Hicks, 2004; Fritsch and Falck, 2007). Audretsch and Fritsch (2002) develop the concept of regional growth regimes to explain regional differences in start-up activity. The concept of regional growth regimes encompasses region-specific factors such as “sticky” regional knowledge, regional industrial structures and the underlying technological regimes, and the density of economic activity.

The role of entrepreneurial culture, which was found to be positively related to entrepreneurial activities in the region in many studies (see e.g., Wagner and Sternberg, 2004; Tamasy, 2006; Lafuente et al., 2007; Bosma et al., 2008), is not mentioned explicitly in this approach. However, it seems that some regions have especially appropriate socio-cultural traits and informal institutions making them conducive for effective entrepreneurial activity (Fornahl, 2003).

In a recent contribution Lafuente et al. (2007) find that entrepreneurial tradition is important for regional start-up activities. More precisely, the authors compare Catalonia, distinguished by a long entrepreneurial tradition and characterized by a currently high level of start-up activity, with the rest of Spain and find that the presence of many entrepreneurial role models in Catalonia explains the higher level of start-up activity there. In another recent contribution Yuko (2009) proves the importance of historical legacy in explaining entrepreneurial activities across regions in Japan.

Entrepreneurial culture and the concept of regional growth regimes can complement each other. Obviously the current features of a distinct regional

growth regime do not appear out of nowhere. Rather they are the result of historical economic and social developments. Fritsch (2004) shows this by using the example of East and West Germany. Both parts of the country differed with regard to entrepreneurial activities in the 1990s after reunification due to the different historical pathways in both parts of the country since the end of the Second World War. Entrepreneurial tradition may play a role in the process of establishing regional growth regimes, whereby the current regional growth regime reflects a certain entrepreneurial culture.

The importance of entrepreneurial tradition can be tested by looking at its perpetualness despite heavy exogenous shocks. Welter (2007) and Kawka (2007) descriptively mention that the density of entrepreneurial activities in former socialist East Germany follows historical spatial patterns. The present paper is devoted to exploiting these findings by showing that regions that have a long entrepreneurial tradition have higher rates of self-employment and start-up activities even though there had been major exogenous shocks. This includes the introduction of a CPE and its transition toward a ME.

To the author of the current study's best knowledge, there is no study that includes the regional distribution of private sector activities within a socialist planned economy in the analysis of start-up activity in a transition country, but there are several studies that focus on start-up activity and transition in general (see Smallbone and Welter, 2001 for an overview).

3 Regional entrepreneurial heritage and residual

It is assumed that every region has a certain "entrepreneurial heritage". The regions whose development was shaped by entrepreneurial talent since the early times of industrialization may have developed socio-cultural traits conducive for entrepreneurship and particular entrepreneurial role models may have played a dominant role (see Lafuente et al., 2007; Fornahl, 2003). Thus, regional entrepreneurial heritage is understood here as the role and impact of entrepreneurs in the course of economic development.

In the special case of a CPE, every region had a certain heritage at the time this particular economic system was introduced. This heritage was suppressed during socialism and an entrepreneurial residual remained at the time of the transition towards an ME. The structural development in the CPE gives us information about the shaping of the heritage and the resulting residual. This process can be exemplified by the development of the eastern part of Germany, which was the GDR during socialist times.

3.1 The role of private firms in a CPE: the case of the GDR

Entrepreneurship in socialist societies was generally seen as an anachronism and a bourgeois element (Thomas, 1996). The self-employment rate (SER) in former socialist Eastern European countries, and thus also in the GDR, decreased tremendously over time and was very low in the late 1980s (Acs and Audretsch, 1993). Production in the GDR normally took place in combines, huge vertically-integrated production complexes. The output of these units was totally tuned to the requirements of the central planners, who made most of the production decisions (Bannasch, 1990).

Since the introduction of central planning mechanisms in the GDR around 1950, several waves of nationalization took place that decreased the SER from 20.4% in 1955 to 1.8% in 1989. Between 1952 and 1961 the number of self-employed in agriculture, for instance, decreased from 1,215 million to 9,000 individuals. After a massive expropriation in 1972 no industrial private firm remained (see e.g. Pickel, 1992 for details).

The remaining entrepreneurs constituted a “hard core” (Aslund, 1985). Of 184,600 self-employed persons in 1989, approximately 82,500 were self-employed in the manufacturing trade sector (excluding construction) (*produzierendes Handwerk*). These individuals were primarily engaged in the processing or manufacturing of goods. 39,900 individuals were self-employed in retail and commerce, and 18,600 individuals in the private construction sector (Statistical Yearbook of the GDR, 1989). These firms served the basic needs of the population and even the central planners acknowledged that these needs could not be met by large combines (Brezinski, 1987). Even

though private sector activity was restricted everywhere, regions had different self-employment rates (SER) in 1989 (Kawka, 2007). These rates are a useful proxy for entrepreneurial activities in socialist CPEs (Chilosi, 2001) and the differences may be explained by the geography of entrepreneurial heritage, which can be described by focusing on the spatio-sectoral structure of the GDR.

3.2 Regional industrial structures and entrepreneurial heritage

The spatio-sectoral structure of the GDR was characterized by the capital-agglomeration of East Berlin, three agglomerations in the southeast of the country, several moderately populated areas and rural areas (see figure A.1).

The Berlin-agglomeration was like an island surrounded by a rather rural area. Berlin had the function of being a capital and a center for industry and transport. Moreover, the agglomeration offered the main technical, social and cultural services (Zimm and Bräuniger, 1984). The three southern agglomeration zones comprise the area of Chemnitz-Zwickau and the area of Dresden-Upper Elbe Valley, both located in Saxony, and the agglomeration of Halle-Leipzig-Dessau located in the western part of Saxony and the southeast of Saxony-Anhalt. Scherf and Schmidt (1984) give a detailed overview of the structural elements and the regional development of these agglomeration zones.

The Chemnitz-Zwickau area was dominated by machine and technical instrument construction, electrical engineering, textiles and light industries during GDR times. In this region, the textile industry and electrical engineering can be traced back to the early period of industrialization and have a tradition of entrepreneurial talent and a skilled workforce (Tipton, 1976). This region is the cradle of the German machine construction industry which primarily developed in accordance with the needs of the textile and light industries. The Dresden area developed similarly. Moreover, a tradition of electrical engineering and electronics was one of the reasons why

Dresden became the center of the GDR microelectronics industry in the 1980s (Weber, 2003).

The Dresden and Chemnitz areas could be characterized by a high industrial diversity even during GDR times. A significant proportion of firms, especially in textiles and light industry were small and medium-sized in pre-socialist times and comparatively small even after the combine structures were introduced. The two regions were heavily marked by the industrial structure that emerged before the GDR was founded (Scherf and Schmidt, 1984). These regions had a high entrepreneurial heritage at the time of the introduction of the CPE around 1950, the time the CPE was introduced.

In contrast to these two agglomeration zones, the Halle-Leipzig-Dessau agglomeration was vastly dominated by a few large production complexes in chemicals, lignite coal mining, and energy production. Many of these industries emerged in the early 20th century (Stokes, 2000). The purpose, before and after the introduction of socialism, was to create regionally interrelated, closed raw material production cycles in lignite coal mining, electricity generation and large-scale chemical production (Mohs et al, 1984).

This agglomeration zone contained large-scale industries and had a low industrial diversity and prevalence of small- and medium sized firms that may have worked as seedbeds for new firms or helped to disseminate the role model of the entrepreneur. These regions had a lower entrepreneurial heritage around 1950.

Next to the agglomeration areas there were moderately congested old industrialized regions. These regions were shaped mainly by traditional industries at the time socialism was introduced. These regions are in close spatial proximity to the Chemnitz and Dresden agglomerations, but are also concentrated to the west of Berlin, in the southwest of the GDR, and to the south of Magdeburg. These regions had a relatively high entrepreneurial heritage at the time socialism was introduced, but were shaped differently by the structural planning in the GDR (Hasenpflug and Kowalke, 1991).

Another type of moderately congested region includes newly industrialized regions. These regions were rural in the past, but were industrialized in the GDR. These regions were concentrated in the far east of the GDR and were used for the massive exploitation of raw materials in the period of socialism. These included the energy center around Cottbus in Lower Lusatia which is located southeast of Berlin (Mohs et al, 1984). These regions had no entrepreneurial tradition and heritage around 1950.

The same applies to rural areas, especially in the north and central regions of the GDR. In pre-socialist times there was a high degree of interregional migration due to the lack of adequate employment opportunities. The level of education and skills in these sparsely populated regions was rather low in general. Large landowners (*Gutsherren*) dominated in these areas and were generally hostile towards industry. The peasants had been serfs for a long time and were completely dependent on the landowners. This, and the lack of employment opportunities, created an environment of regional backwardness (Benthien et al., 1984; Tipton, 1974). During the existence of the GDR the central planners tried to enforce the industrialization of the rural northern areas by building large-scale industrial plants for the metallurgy and the chemical industries (Mohs et al., 1984). However, most regions remained dominated by agriculture and the factories mainly served as suppliers within combines located in the south of the GDR (Benthien et al, 1984).

Altogether, some regions had a very dispersed industrial structure and contained industries that had a comparatively long tradition. These regions were in favor of small and medium sized firms in pre-socialist times. These industries included textiles, engineering industries, and the heterogeneous light industry. Other regions were rural or were dominated by large-scale production (e.g. chemicals, energy, metal fabrication).

3.3 The entrepreneurial residual and the measuring of it

With the introduction of the CPE, the entrepreneurial heritage was suppressed and crowded out by appropriations and collectivization. This is reflected in the decrease in private sector activities.

In regions with a higher entrepreneurial heritage, the socio-cultural traits conducive for entrepreneurship may have been passed on from generation to generation and shielded to a certain degree from external influences like the introduction of socialism. Therefore, the decrease in private sector activities may not have been as tremendous as elsewhere. Thus, this strive for independence may reflect a deeply embedded regional socio-cultural trait.

The deprivation of private sector activities then led to an “entrepreneurial residual”. This residual reflects the core of the regional resource of entrepreneurial tradition or culture that remained in the region. A measure for such a residual can be the regional distribution of SERs as already stated before (Chilosi, 2001). The self-employed were not allowed to produce industrial goods after 1972, but the pure existence of regional differences may reflect a different regional attitude for choosing self-employment.

The process from the original heritage to the remaining residual may have been affected by the regional structural planning in the GDR. Regional planning objectives mainly included the intensification of heavy industries with large-scale production, regional industrial mono cultures and the industrialization of former rural areas. This meant the rural northern and central regions, the mono-industrial Halle-Leipzig-Dessau agglomeration and regions in the far east of the GDR that were rich in lignite coal were favored (Berentsen, 1985; Wild, 1992). Regional planning policy also tried to reshape regional structures, in nearly all cases at the cost of traditional industries.

Thus, high proportions of employment in traditional industries indicate that a region had on average a pronounced entrepreneurial tradition and was not reshaped that much which both should be reflected, in turn, by a higher entrepreneurial residual (SER) in 1989. The characteristics of the manufacturing industries in 1989 have no predictive power because entrepreneurship was not allowed in manufacturing.

> *H1: Regions with high employment shares in traditional industries have higher SERs immediately before transition (entrepreneurial residual).*

The SER and the aggregate industry shares in 1989, in turn, should explain the distribution of entrepreneurial activities after the transition towards a market economy since it is argued that even large exogenous shocks cannot reverse this historical trend. The effect is expected to be stronger for start-up activity in manufacturing because starting a firm in this sector is regarded here as a strong deliberate choice for the occupation self-employment.

> *H2: Regions with high proportions of employment in traditional industries just before transition have more entrepreneurial activity in manufacturing after transition*
>
> *H3: Regions with a high SER just before transition have more entrepreneurial activity in manufacturing after transition.*

4 Data and Methods

The study was conducted by using a unique dataset that contained data on the current NUTS3-level (districts) for self-employment, industrial shares of nine broad sectors (eight industries) and data on population structure. All of this data came from the GDR Statistical Offices (see Rudolph, 1990 for a description of the original data; and Kawka, 2007 for a detailed description of the adjustment of the data toward the current regional stratification).[1] This data was presumably not falsified because it is not sensitive with regard to socialist propaganda like official data on productivity (Kawka, 2007). Data on current start-up activity is provided by the German Social Insurance Statistics which has information on every firm with at least one employee obliged to pay social insurance (see Fritsch and Brixy, 2004 for details).

The primary focus in the present paper is on non-agricultural self-employment, but unfortunately the data for self-employment in 1989 also includes agriculture. This is not a severe problem because the overall share of self-employed in agriculture within the whole group of self-employed was

[1] A special thanks should go to Dr. Rupert Kawka for providing this adjusted data. The data for East Berlin is not used, because it is not reliable and because it is not possible to distinguish between East and West Berlin with current data.

very low in 1989 because it was a key sector for nationalization in the GDR as pointed out above.

The industry classification of the GDR refers basically to the international NACE classification on a broad level at least. The industries for which data are used in this study are energy, chemicals, metallurgy, “engineering”, light industry, textiles, food processing and construction (see Rudolph, 1990 and Table A.1 in Appendix). Unfortunately it is not possible to distinguish between machine construction and electrical engineering, which is therefore summarized as engineering. Engineering, textiles and light industry are grouped together and referred to as the “traditional industries”, whereas the chemical industry, energy production, and metal fabrication are referred to as “large-scale industries”. It is acknowledged that this is a very broad aggregation, but it is sufficient for testing the stated hypotheses.

The labor market approach was chosen for calculating the SER and SUR (Audretsch and Fritsch, 1994). Thereby, the number of start-ups is divided by the employed and unemployed population. Individuals from both groups are confronted with the decision of whether or not to start a firm. For the SER in 1989 the denominator is the population between 20 and 64. Using the whole population between 20 and 64 instead has different reasons. Individuals in a CPE did not really face the decision of whether to start a firm like in a market economy due to the rigidity of the system. Moreover, unemployment was absent officially and therefore unreported.

$$SUR = \frac{start - ups}{(Employees + Unemployed)} \quad / \quad SER89 = \frac{self - employed}{population \;\; 20 - 64}$$

The empirical analysis focuses on descriptive and multivariate methods. It is checked whether spatial autocorrelation is an issue by relying on the procedure proposed by Florax et al. (2003). For this study a simple binary-contiguity matrix which indicates whether two spatial units share a common border is employed. The weighting matrix is row-standardized. To avoid the problem of heteroskedasticity the Huber-White-Sandwich Procedure is applied in all regressions (Huber, 1967; White, 1980). The NUTS3 regions

are the regional level of analysis which are roughly comparable to US counties.

There is a lot of noise in the data for start-up activity in the early 1990s due to the radical transition of the East German economy (see further on). Moreover, diverse forces in the “wild times” of the catching up process of the East German economy in the 1990s may dominate the effects of entrepreneurial tradition. For these reasons, the analysis of start-up activity is restricted to the period from 2000 to 2005. The average SURs of this period are used as dependent variables.

5 The development of self-employment in the GDR

Unfortunately, there is no data available on the administrative units introduced after German reunification for the GDR period except the data for 1989. The so-called *Bezirke* are the administrative spatial units in the GDR for which there is data for earlier years (see Figure 5.1). Bezirke that contained regions with a long entrepreneurial tradition were Karl-Marx-Stadt (Chemnitz) and Dresden, whereas the Bezirke Leipzig, Halle, and Cottbus contained mono-industrial and newly industrialized regions. Mainly rural, traditionally industrial as well as newly shaped regions were located in the southwestern Bezirke, Magdeburg and Potsdam. Frankfurt/Oder and the northern Bezirke were nearly completely rural areas.

5.1 Regional differences between 1950-89

Between 1955 and 1989 the number of self-employed decreased tremendously. The sharpest decrease took place in the 1950s due to agricultural collectivization. As mentioned earlier, the private sector in the GDR in the late 1980s mainly consisted of the manufacturing trade sector. In 1988 40% to 50% of all self-employed were in the manufacturing trade sector (see Table 5.1) (Statistical Yearbook of the GDR, 1989). This relative homogeneity in the distribution of self-employment is important to keep in mind, because different types of self-employed were affected differently by

the private sector policy of the GDR (trades vs. manufacturing) (Brezinski, 1987).

The development of self-employment within the whole trade sector (*Handwerk*) over time was marked by regional differences.[2] The number of private firms in the trade sector per 1000 individuals in 1957 was highest for the southern regions of the GDR. The Bezirk Halle, which contained a huge share of the Halle-Leipzig-Dessau mono-industrial agglomeration, had a strikingly lower number of private firms in the trade sector per 1000 individuals than the Bezirke Karl-Marx-Stadt and Dresden which mainly consisted of regions with a long entrepreneurial traditional (Statistical Yearbook of the GDR, 1958).

When looking at the regional distribution in 1988, the lowest decrease can be found in the Bezirke Karl-Marx-Stadt and Dresden, the historically entrepreneurial industrial centers. The northern Bezirke had strong decreases, although they had an already comparatively low level in 1957 (Statistical Yearbook of the GDR, 1989).

Another indicator is the proportion of firms organized in socialist trade cooperatives (*Produkionsgenossenschaften im Handwerk* = PGH) to all the firms in the trade sector. The decision to remain private as opposed to joining a PGH is considered here as striving for independence and an indicator of entrepreneurial spirit. Once again the southern regions are found to be ranked highest. Individuals in the regions with an entrepreneurial tradition prefer a private mode of production. The levels are low in general, but in the most northern region, the Bezirk of Rostock (5.4%), the proportion of PGHs to all firms in the trade sector was three times higher than in the southern Bezirk of Suhl (1.8%) (Statistical Yearbook of the GDR, 1989) (Table 5.2 shows several rank correlation coefficients regarding the presented indicators)

[2] A distinction between manufacturing and non-manufacturing trades is not available on the level of Bezirke for the 1950s.

<<Table 5.1 about here>>

<<Table 5.2 about here>>

5.2 The distribution of self-employment rates and industries in 1989

Table 5.3 gives an overview of the distribution of sectors in manufacturing within the GDR in 1989. The proportion of employees in manufacturing was about 47% for the whole GDR. The minimum and maximum values reveal large regional differences. In the NUTS3 region Annaberg 62.5% of employees were employed in manufacturing. Annaberg is located near Chemnitz, the heartland of early industrialization and more than 85% of all employees in manufacturing worked in traditional industries in 1989. In comparison, less than 12% did so in the NUTS3 region Merseburg-Querfurt where the percentage of employees in manufacturing was 68%. The Merseburg-Querfurt region is located in the Halle-Leipzig-Dessau agglomeration and the largest individual plants in the whole of the GDR (the chemical plants in Leuna and Schkopau) were located here (for more details see Table 5.3).

<<Table 5.3 about here>>

The SER in the GDR was on average 1.84%, whereas there were pronounced regional differences extending from 0.41% in the rural northern city district of Neubrandenburg (percentage of employees in manufacturing: 45%) to 3.38% in the Weißeritz district close to Dresden (percentage of employees in manufacturing: 53.5%) (see again Table 5.3). Figure 5.2 reveals that regions with high SERs were concentrated around Chemnitz in the southeast of the former GDR. Higher SER can be found also to the west of Berlin and in the southwest of the GDR, which were shaped by traditional industries. The regions to the north and west of Leipzig as well as the regions to the far east of Leipzig had lower SER than the surrounding areas. These regions were mono-industrialized and/or dominated by the chemical and energy industry. The rural northeast of the GDR had the lowest SERs.

<<Figure 5.2 about here>>

An interesting issue here is that the rural regions could be much more easily reshaped by socialism due to the lower degree of industrialization and industrial tradition stemming from the ancient capitalist development. Therefore, it is important to distinguish the degree of industrialization - reflected in the percentage of employees in manufacturing – from the composition of the manufacturing sector – reflected in the proportion of individual industries within the manufacturing sector. The latter may help to explain regional differences of self-employment when assuming the same degree of industrialization between regions and thus the ease of reshaping the regions (see Table 5.4 for correlations of the SER with industry shares).

<<Table 5.4 about here>>

When the share of employment in manufacturing was high and this employment was composed of the traditional textiles and light industry, SERs were higher. SERs were lower, when the manufacturing employment was mainly composed of employment in the large-scale chemical and energy sectors. Employment in metal fabrication and engineering does was not systematically related to the level of self-employment (see Table 5.5 for results of bivariate regressions).

<<Table 5.5 about here>>

The percentage of employees in manufacturing and the proportions of employment of construction and the food processing sector within manufacturing employment are highly negatively correlated. That means that construction and food processing were overrepresented in rural areas. This, in turn, explains their significant negative relationship with the SER (see again Table 5.4).

A multivariate approach reveals that the percentage of employees in manufacturing has a significantly positive effect on the SER. The same is true for textiles and light industry within manufacturing. The share of

employment in the energy sector within manufacturing has a significantly negative effect, whereas the effect for the chemical sector share within manufacturing employment vanishes (see again Table 5.5). Regions dominated by the chemical industry were industrialized in the early 20th century, whereas regions dominated by the energy sector were done so only since the 1950s. In a sense, regions dominated by the chemical industry have at least an *industrial* tradition.

In the multivariate approach only the sector employment shares that significantly explained the SER in a bivariate setting were included to avoid multicollinearity. The proportions of employment in construction and food processing of the manufacturing employment were also not included due to the highly negative correlation to the proportion of employment of manufacturing within the region. Population density was also examined, even though externalities often "caught" by this variable played no role in a socialist economy, because such externalities did not emerge spontaneously by actions of private actors. Unemployment was absent officially in the GDR for ideological purposes and therefore by definition not a factor for explaining self-employment.[3]

6 Entrepreneurship in East Germany since 1989

6.1 Preliminaries: The Restructuring of the East German economy

The East German transition implied a historically unique deindustrialization and decline in the economy (Sinn, 2002). It faced a competition, supply, wage, regulation, and mental shock with the adoption of the ME framework of West Germany (see Brezinski and Fritsch for details, 1995). Many firms either state-owned or private during GDR times left the market. Other firms were integrated as extended workshop benches into big West German companies after privatization. The output in manufacturing in 1991 reached only 34% of the level in 1989 (Hall and Ludwig, 1995). The bulk of firms

[3] The significant negative effect may have to do with the fact that town districts were especially shaped by socialist planning (Friedrich and Häußermann, 1998).

present today in East Germany were founded after 1989, whereby in the first years after reunification start-up activity and growth in self-employment was very high (see Fritsch, 2004 for details).

Table 6.1 gives an overview of the development of the manufacturing sector. The average regional percentage of employment in manufacturing decreased from 45.8% in 1989 to an average value of 36.5% for the period from 2000 to 2005. The deindustrialization process is mostly reflected by the decrease employment share of engineering from 17.1% to 6.6% (see Table 6.1 (1) and (2)). The employment share of employees in metal fabrication and construction increased.

The development of the construction sector was positively affected by a boom triggered by German reunification. This boom also had a positive influence on the development of the industry “manufacturing of basic and especially fabricated metal products”, which explains the increasing employment share there (Beer, 2004). The construction sector dominates the composition of manufacturing in East Germany. On average approximately 35% of all employees within manufacturing worked in this sector between 2000 and 2005 (Table 6.1 (6)).

The correlation between the share of industries in 1989 and the average values for the period 2000 and 2005 shown in Table 6.1 reveals that there was in general no structural change with regard to the relative composition of manufacturing industries except for the construction sector.[4]

6.2 The role of entrepreneurial heritage for current start-up activities

In view of the present research the SER in 1989 reflects a certain “entrepreneurial residual” that should explain current start-up activity. It was argued that starting a firm in manufacturing reflects a deliberate choice.

[4] There is a significantly negative correlation between the employment share of construction in 1989 and this share between 2000 and 2005. This phenomenon is related to population density. The correlation between population density and the employment share of construction was significantly positive in 1989, but is significantly negative for the average value of the period from 2000 to 2005.

The share of start-ups in manufacturing was on average about 20.3% in the period from 2000 to 2005. Thereby, the construction sector accounted for more than 68% of the start-up activity in manufacturing (13.9% of overall start-up activity; see Table 6.2). There is a certain “construction bias” (Rammer and Czarnitzki, 2003) within the East German start-up activity.

<<Table 6.2 about here>>

Interestingly, the textile industry, which explained the SER in 1989, makes up only 3% of the current start-up activity in manufacturing excluding construction. Moreover, between 2000 and 2005 textiles comprised on average only about 2.46% of all current employment within manufacturing when not including construction (see again Table 6.1). The heterogeneous light industry, which also explained the SER in 1989, is much more strongly represented with regard to current employment shares and proportions of the regional start-up activity. The share of start-ups in the energy sector within the entire regional start-up activity is also comparatively low.

To test the effect of the entrepreneurial heritage on the current start-up activity, first the SER in 1989 is used to explain the current SURs. In a second approach a variable that measures the industrial component of the entrepreneurial residual is employed. This is:

$$Heritage \quad Indicator = \ln\left(\frac{Emp \quad in \quad Textiles \quad and \quad Light \quad Industry \quad in \quad 1989}{Emp \quad in \quad Energy \quad in \quad 1989}\right)$$

Separate analyses for construction and for services were carried out to test whether the SER in 1989 and the heritage indicator play a role there.

Figures 6.1 to 6.3 show the regional distribution of SURs in manufacturing excluding construction (Figure 6.1); construction (Figure 6.2) and service (Figure 6.3). The figures reveal that regions in the south have higher SURs in manufacturing when construction is excluded, whereas the northern regions have higher SURs in the service sector. The area around Berlin has particularly high SURs in construction, which may be explained by the

construction boom; a lot of construction activity has occurred since Berlin became the new German capital. The regions in the center of East Germany, to the west of Leipzig and to the southeast of Berlin that were shaped by the chemical industry and lignite coal mining score low regardless of the SUR analyzed. The high SURs in the north can partially be explained by the rise in the tourist industry.

<<Figure 6.1-6.3 about here>>

Bivariate regressions, where the SURs in manufacturing excluding construction, construction and services are separately regressed on the SER in 1989 (a) and the other proposed heritage indicator (b), show that there is no effect on services, but there is an effect on manufacturing and construction.

<<Table 6.3 about here>>

It was also tested whether the SER in 1989 and the heritage indicator have an effect on the average SUR between 2000 and 2005 in manufacturing (excluding construction) and in construction when checking for several other explanatory variables (see Table 6.5).

For the regional knowledge base is controlled for by the average employment share of highly skilled employees in this period. That is, people with a degree in engineering and/or natural sciences. The average GDP growth is included in the specification to measure cyclical influences. The average regional unemployment rate is included due to several push and pull arguments related to this variable (Parker, 2004). Moreover, a Harris-Type market potential function is employed to monitor demand effects. It measures the distance weighted population in other regions (including West German regions and Berlin). The employment density is used, i.e. the number of establishments per inhabitant, as a control variable for agglomeration effects (Armington and Acs 2002). Some East German regions had to deal with especially dramatic structural change after 1989, which may imply a lack of

entrepreneurial opportunities in the region. This special transition effect is modeled by a variable that measures the change of employment within manufacturing (excluding construction) between 1989 and the average value of the period from 2000 to 2005. Finally, employment shares of up to 17 aggregated manufacturing industries (depending on the concrete specification) within the regional employment are checked for.

The proportion of small firms in the region is not looked at because this is highly correlated with some of the other control variables like the employment density which comes as no surprise. The inclusion of such a firm size indicator implies multicollinearity. Moreover, Fritsch and Falck (2007) recently found this variable to be a proxy for start-up activity in a region rather than an explanatory variable. The variable population density is also not included. It is highly correlated with employment density and the regional knowledge stock.[5]

The same set of variables in the specification for analyzing start-up activity in the construction sector. The only change is that instead of the aggregate industry shares, only the employment share of construction within the regional employment is controlled for.

In the regression analysis of the SUR in manufacturing (excluding construction), which employs the proposed heritage indicator, the start-ups in the textile, energy and light industry are excluded from the analysis to avoid any bias that has to do with the current industry structure (Table 6.4 presents the final correlation matrix for the employed independent and dependent variables).

<<Table 6.4 about here>>

Tests on spatial dependence could be rejected in all specifications. Therefore OLS regressions with robust standard errors are employed. The results show

[5] Running regressions where population density is employed as the only control variable to avoid multicollinearity and to “catch-it-all” does not change the results of the heritage variables. Results can be obtained upon request.

that the SER in 1989 as well as the proposed heritage indicator have a significantly positive effect on the measured average start-up rates in manufacturing (excluding construction) for the period from 2000 to 2005. The effect of the heritage variables for the SUR in construction vanishes.

<<Table 6.5 about here>>

The control variables are mainly insignificant. Interestingly the share of highly-skilled employees in the region has a significantly negative effect on regional start-up activity in manufacturing. This result can be explained by the highly positive correlation of this share with population density. Thus, highly skilled employees are concentrated in the city districts of the NUTS3 regions, whereas the start-up activity is higher in the surrounding area.[6]

7 Concluding Remarks

Some regions within a country are lagging behind in terms of entrepreneurial activity, whereas other regions have a pronounced tradition in entrepreneurship and persistently higher rates of start-up activity. It seems that there are characteristics locked in these regions, which are affecting these path-dependencies.

The present paper focused on two questions. First, whether there is a region-specific entrepreneurial heritage that is preserved even after a tremendous exogenous shock like introducing a socialist centrally planned economy (CPE) and, second, whether the preserved part of this heritage, in turn, explains entrepreneurial activities after another heavy shock of economic development, which was the transition of this socialist economy towards a market economy. The country analyzed here is the former German Democratic Republic (GDR), which introduced a market economy and reunified with the Federal Republic of Germany in 1990.

[6] Employing larger spatial units to mitigate this negative knowledge effect is not suitable due to heterogeneity of the entrepreneurial history of regions and the low number of remaining aggregated units. This does not allow any valid estimations.

A unique data set that reflects the regional distribution of self-employment rates (SER) in a socialist economy on the advent of the transition towards a market economy showed that regions with a long entrepreneurial tradition have higher SERs although socialist planning and nationalisation heavily distorted economic activities. Regions that have not been industrialized, have a strong tradition in large-scale sectors, or which have been newly industrialized have lower SERs.

The positive effects of heritage and residual on the level of start-up activities can be found even more than 10 years after the transition towards a market economy, whereby the effect plays a role only for manufacturing. Thus, four decades of socialism could not destroy entrepreneurial culture!

The results are important for policy as they show that entrepreneurship is a deeply embedded regional resource. Regions with low entrepreneurial tradition may be transformed into entrepreneurial hotspots but this is a long-term project. Such regions have not been entrepreneurial for centuries and this cannot be reversed in a few years. Therefore, it may well be the case that stimulating entrepreneurship and expecting effects in some regions in the short term will be rather fruitless.

Concerns of whether start-ups in manufacturing are “good” for regional growth were not addressed in this paper. A detailed analysis of employment effects and regional growth is clearly warranted in future research. Another aim of future research should be to focus in more detail on the role of entrepreneurial culture and heritage and their effect on entrepreneurship.

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Figures and Tables

Figure 5.1: Bezirke of the GDR (Source: RWI-Mitteilungen, 1990)

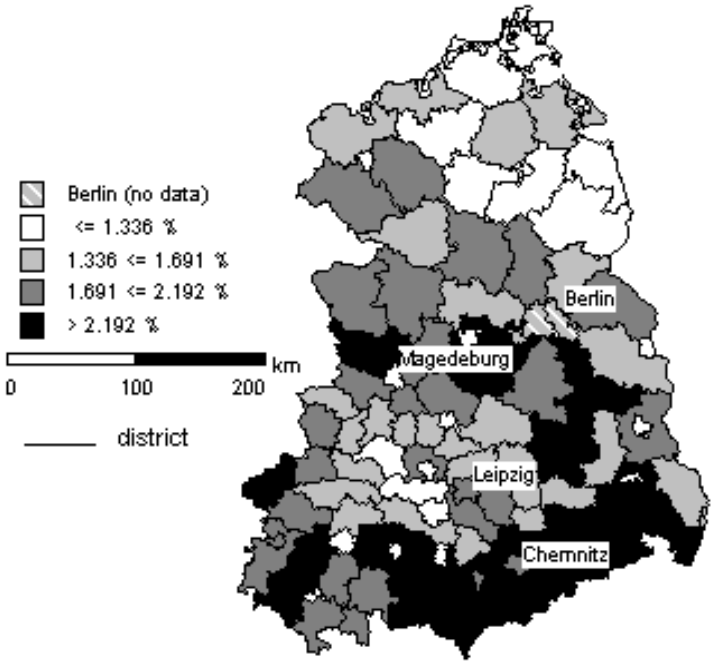

Figure 5.2: The regional distribution of SER in 1989

Table 5.1: Indicators for private manufacturing trades in the GDR

Location	Bezirk	SER 1988	Share of SE in private *manufacturing* trades of all SE 1988	Private trade firms per 1000 individuals 1957	Private trade firms per 1000 individuals 1958	Share of PGHs out of all trade firms 1988
South East	Karl-Marx-Stadt	2.52	50.54	16.69	7.30	2.6
	Dresden	2.50	45.31	14.66	6.21	2.4
South West	Gera	1.95	44.83	14.70	5.41	2.0
	Suhl	2.14	47.14	19.89	6.21	1.8
	Erfurt	1.85	47.48	14.18	5.14	3.4
Mid West	Magdeburg	1.74	45.86	12.96	4.91	4.4
	Leipzig	1.97	42.58	13.66	5.15	4.2
	Halle	1.34	45.58	11.07	3.57	3.8
Mid East/ Berlin	Cottbus	1.68	46.67	12.50	4.63	2.6
	Frankfurt	1.37	45.90	10.90	3.91	3.3
	Potsdam	1.83	41.41	11.72	5.04	3.6
North	Schwerin	1.43	48.08	11.57	4.21	3.9
	Neubrandenburg	1.12	46.51	10.41	3.33	2.8
	Rostock	1.07	45.00	10.13	2.92	5.4

Table 5.2: Spearman rank correlation coefficients for private manufacturing trade firms in the GDR

		1	2	3	4	5
1	SER 1988					
2	Share of SE in private *manufacturing* trades out of all SE 1988	0.0857				
3	Private trade companies per 1000 individuals 1957	0.9429***	0.1956			
4	Private trade companies per 1000 individuals 1988	0.9945***	0.1034	0.9637***		
5	Share of PGHs out of all trade companies in 1988	-0.5303**	-0.2574	-0.6095**	-0.5793**	
N=14 (Data excluding East Berlin) / *** p<0.01, ** p<0.05, * p<0.1						

Table 5.3: The industrial structure of the GDR in 1989

	GDR	NUTS3 Level			
	Mean	Mean	S.D.	Min	Max
SER 1989	1.84	1.80	0.61	0.42	3.39
Proportion of employees in manufacturing	46.78	45.82	11.33	19.47	68.37
Share of employees within manufacturing...					
Textiles	5.89	5.18	9.24	0.00	45.74
Light	13.98	14.54	8.56	1.70	46.62
Engineering	38.59	37.23	13.90	7.32	68.22
Energy	6.62	5.76	10.18	0.30	56.34
Chemicals	8.79	7.76	10.90	0.03	68.12
Metals	3.60	3.70	9.01	0.00	56.61
Food Processing	8.69	10.54	7.02	2.53	53.82
Construction	13.84	15.29	8.30	3.21	47.17
Traditional Industries	58.46	56.95	17.91	11.19	85.87
Large Scale Industries	19.01	17.22	17.32	1.00	78.65
ln[Population Density]	4.95	5.28	1.10	3.78	8.07

N=111/ Data excluding East Berlin. The NUTS3-regions Eisenach and Wartburgkreis are merged together. The whole economy including agriculture and the public sector is used as a basis

Table 5.4: Correlation matrix reporting variables on which the SER in 1989 was regressed on

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	SER													
2	Proportion of emp. in manufact. *Share of emp. within manufact. .*	0.361***												
3	Textiles	0.542***	0.360**											
4	Light	0.463***												
5	Engineering													
6	Energy	-0.240**	0.207**		-0.177*	-0.395***								
7	Chemicals		0.234**	-0.181*	-0.250***	-0.292***								
8	Metals					-0.274***								
9	Food Processing	-0.368***	-0.755***	-0.271***			-0.200**	-0.162*						
10	Construction	-0.443***	-0.653***	-0.260***	-0.251***	-0.160*		-0.276***		0.441***				
11	Traditional Industries	0.599***	0.273***	0.485***	0.486***	0.667***	-0.471***	-0.440***	-0.334***	-0.310***	-0.378***			
12	Large-Scale Industries	-0.258***	0.337***	-0.267***	-0.326***	-0.558***	0.592***	0.653***	0.464***	-0.296***	-0.267***	-0.727***		
13	ln (Population Density)	-0.195**	0.349***		-0.308***	0.312***				-0.292***				

N=111 (Data excluding East Berlin. The NUTS3 regions Eisenach and Wartburgkreis are merged together) /*** p<0.01, ** p<0.05, * p<0.1/ correlation coefficients are only reported if significant

Table 5.5: Regression Results (bivariate/ multivariate) for determinants of SER in 1989

	(1) Bivariate				(2) Multivariate
		SER 1989 (Dep Var)			
Independent Variable	Coef	Model	rho/ lambda	sigma	Spatial Lag
Share of emp. in manufacturing	**0.0089**** **(0.00449)**	*Spatial Lag*	0.467*** (0.107)	0.511*** (0.0324)	**0.0132***** **(0.00494)**
Share of emp. within manufacturing…					
Textiles	**0.0275***** **(0.00452)**	*Spatial Lag*	0.411*** (0.0986)	0.463*** (0.0319)	**0.0178***** **(0.00447)**
Light	**0.0276***** **(0.00603)**	*Spatial Lag*	0.501*** (0.0835)	0.461*** (0.0289)	**0.0114**** **(0.00542)**
Engineering	**0.0018** **(0.00412)**	*Spatial Lag*	0.540*** (0.0948)	0.514*** (0.0334)	**/** **/**
Chemicals	**-0.0074**** **(0.00331)**	*OLS*	/ /	/ /	**-0.0055** **(0.00413)**
Energy	**-0.0152***** **(0.00532)**	*Spatial Error*	0.553*** (0.0827)	0.492*** (0.0314)	**-0.0104***** **(0.00355)**
Metals	**-0.0045** **(0.00449)**	*OLS*	/ /	/ /	**/** **/**
Food Processing	**-0.0154**** **(0.00654)**	*Spatial Lag*	0.463*** (0.103)	0.511*** (0.0329)	**/** **/**
Construction	**-0.0244***** **(0.00529)**	*Spatial Lag*	0.467*** (0.0855)	0.481*** (0.0280)	**/** **/**
Traditional Industries	**0.0161***** **(0.00255)**	*Spatial Lag*	0.363*** (0.0856)	0.452*** (0.0302)	**/** **/**
Large-Scale Industries	**-0.0091***** **(0.00240)**	*OLS*	/ /	/ /	**/** **/**
ln (Population Density)	**-0.2640***** **(0.0329)**	*Spatial Error*	0.743*** (0.0622)	0.404*** (0.0272)	**-0.206***** **(0.0457)**
					rho 0.459*** (0.0859)
Robust standard errors in parentheses/ *** p<0.01, ** p<0.05, * p<0.1 Observations N=111 (Data excluding East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together)					sigma 0.363*** (0.0258)
The table provides the bivariate results in rows from the left to the right. The results of the multivariate approach is shown in the right column					

Table 6.1: The industrial restructuring of East Germany

	Deindustrialization/ Industry Shares				Industry Shares within Manufacturing		Industry Shares within Manufacturing (excluding construction)	
	Emp_Sector / Emp_All	Emp_Sector / Emp_All	correlation col. (1) and (2)	Emp_Sector / (Emp+Unemp)_All	Emp_Sector / Emp_Manufac	Emp_Sector / Emp_Manufac	Emp_Sector / Emp_Manufac	Emp_Sector / Emp_Manufac
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable	1989	Mean(2000-05)		Mean(2000-05)	1989	Mean(2000-05)	1989	Mean(2000-05)
Service	NA	51.42	NA	36.17	/	/	/	/
	NA	[0.8217]	NA	[0.7418]	/	/	/	/
Manufacturing	45.8223	36.652	0.516***	25.6256	/	/	/	/
	[11.3323]	[9.5654]	[0.000]	[7.0092]	/	/	/	/
Textiles	2.7489	0.6889	0.911***	0.4867	5.1841	1.6413	5.8836	2.4618
	[5.2606]	[1.3411]	[0.000]	[.956]	[9.2409]	[2.9242]	[10.2641]	[4.2711]
Light	6.7596	4.6223	0.687***	3.2483	14.5351	12.175	17.0742	19.2458
	[4.962]	[2.8835]	[0.000]	[2.1504]	[8.5615]	[5.4268]	[9.5446]	[8.1319]
Engineering	17.1354	6.6304	0.687***	4.7101	37.2291	18.0598	44.0955	27.4955
	[7.8745]	[4.1842]	[0.000]	[3.1628]	[13.8999]	[10.2935]	[16.0605]	[13.3024]
Energy	2.8772	2.0166	0.601***	1.391	5.7628	5.897	6.8515	9.546
	[5.9353]	[2.0212]	[0.000]	[1.331]	[10.1769]	[5.3399]	[11.6339]	[8.7934]
Chemicals	3.8434	2.2007	0.638***	1.5402	7.7641	5.5548	8.8858	8.4058
	[6.488]	[2.1105]	[0.000]	[1.4884]	[10.8951]	[4.8752]	[12.0616]	[6.9727]
Metal	1.8263	4.5137	0.454***	3.1392	3.695	11.7098	4.263	18.301
	[4.574]	[2.8237]	[0.000]	[1.9988]	[9.0092]	[5.8314]	[10.3413]	[8.6938]
Food Processing	4.2322	3.244	0.186*	2.2424	10.5353	8.9863	12.9463	14.544
	[1.6989]	[1.8925]	[0.051]	[1.2845]	[7.0178]	[5.138]	[9.3486]	[8.8854]
Construction	6.3993	12.7356	-0.413***	8.8677	15.2945	35.976	/	/
	[2.7843]	[3.1762]	[0.000]	[2.0127]	[8.3025]	[8.7534]	/	/

N=111 (Data excluding East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together) / Standard deviations in parentheses/ The whole economy including agriculture and the public sector is used as a basis

Table 6.2: Average start-up rates between 2000 and 2005 in East Germany

Industry	Start-ups within specific industry / All start-ups	Start-ups within specific industry / All start-ups in manufact.	Start-ups within specific industry / All start-ups in manufact. (excluding construction)	Start-ups per 100,000 individuals
Service	76.09	/	/	669.36
	[0.4811]	/	/	[110.51]
Manufacturing	20.34	/	/	179.28
	[3.9677]	/	/	[44.63]
Manufacturing	6.42	/	/	56.03
(excl. construction)	[1.7606]	/	/	[16.09]
Textiles	0.20	1.00	3.04	1.79
	[0.1992]	[.9254]	[2.6474]	[1.82]
Light	1.80	8.87	27.77	15.77
	[0.726]	[2.9833]	[6.0169]	[6.68]
Engineering	1.43	7.33	22.87	12.41
	[0.5386]	[3.3065]	[8.0387]	[4.59]
Energy	0.29	1.40	4.55	2.53
	[0.1937]	[.8853]	[2.9508]	[1.7]
Chemicals	0.37	1.78	5.61	3.21
	[.2128]	[.9623]	[2.7093]	[1.84]
Metal	1.59	7.64	24.45	13.78
	[.5926]	[2.1882]	[6.8742]	[5.2]
Food Processing	0.75	3.67	11.71	6.55
	[.3317]	[1.4263]	[4.2687]	[2.9]
Construction	13.92	68.30	/	123.25
	[2.9896]	[6.0529]	/	[34.78]

N=111 (Data excluding East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together)/ Standard Deviations in parentheses/ The whole economy including agriculture and public sector as a basis

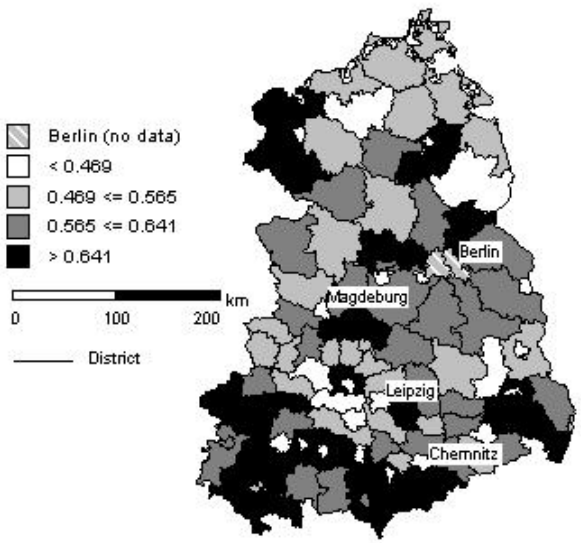

Figure 6.1: Manufacturing (excluding construction)

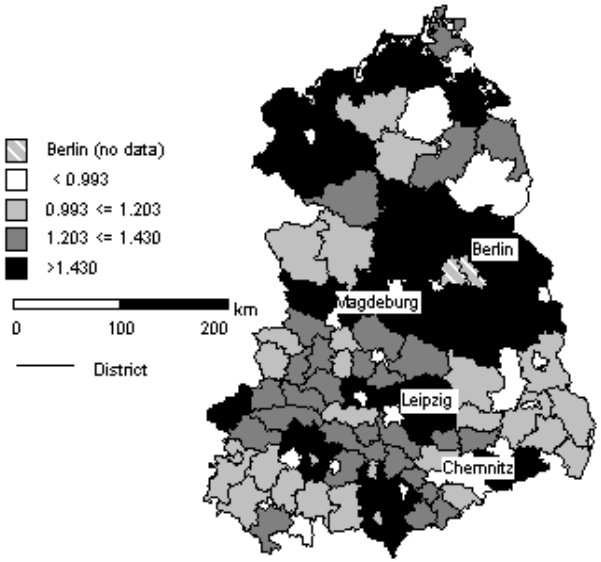

Figure 6.2: Construction

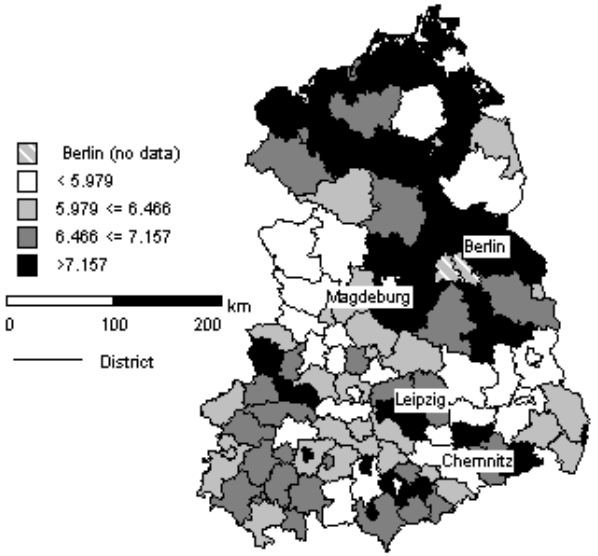

Figure 6.3: Service

Figure 6.1-6.3: SUR across industries (average: 2000-2005)

Table 6.3: Correlation matrix for variables used in the regression on the average SUR in the period 2000 to 2005

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	SUR Manufacturing (without x1)	1												
2	SUR Manufacturing (without x2)	0.927***	1											
3	SUR Construction	0.468***	0.501***	1										
4	SUR Service			0.277***	1									
5	SER 1989	0.577***	0.513***	0.327***		1								
6	Heritage Indicator	0.598***	0.535***	0.340***		0.630***	1							
7	Market Potential	0.277***	0.297***		-0.355***	0.327***	0.255***	1						
8	GDP Growth	0.199**	0.265***			0.199**	0.210**		1					
9	Share of Highly Skilled Workforce	-0.456***	-0.422***	-0.515***		-0.167*	-0.386***		0.221**	1				
10	Unemp. Rate			0.252***		-0.161*		-0.221**	-0.333***	-0.487***	1			
11	Emp. Density			-0.245***	0.465***	0.184*				0.220**	-0.550***	1		
12	Deindustrialization			0.302***				-0.322***		-0.348***		-0.221**	1	
13	ln (Pop. Density)	-0.520***	-0.498***	-0.623***		-0.161*	-0.291***			0.684***	-0.501***	0.420***	-0.470***	1

N=111 (Data excluding East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together) /*** p<0.01, ** p<0.05, * p<0.1/ correlation coefficients are only reported if significant/ x1: Construction/ x2: Construction, Textiles, Light Energy

Table 6.4: Bivariate regression results for SUR (2000-05)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS with Robust SE					
Dependent Variables	SUR Manufacturing		SUR Construction		SUR Service	
	Excluding construction	Excluding construction, textiles, light, energy				
Self-Employment Rate 1989	0.152***		0.186***		-0.0254	
	(0.0216)		(0.0437)		(0.161)	
Heritage Indicator		0.0340***		0.0757***		0.0460
		(0.00485)		(0.0173)		(0.0625)
Constant	0.288***	0.301***	0.899***	1.102***	6.739***	6.614***
	(0.0370)	(0.0129)	(0.0881)	(0.0466)	(0.351)	(0.183)
Observations	111	111	111	111	111	111
R-squared	0.333	0.286	0.107	0.115	0.000	0.004

Robust standard errors in parentheses/ *** p<0.01, ** p<0.05, * p<0.1 (Data East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together)

Table 6.5: Multivariate regression results for determinants of average SUR (2000-2005)

	(1)	(2)	(3)	(4)
	OLS with robust SE			
	SUR Manufacturing		SUR Construction	
Dependent Variables	Excluding construction	Excluding construction, textiles, light, energy		
Self-Employment Rate 1989	0.0564**	\	0.0608	\
	(0.0258)	\	(0.0412)	\
Heritage Indicator	\	0.0143**	\	0.0103
	\	(0.00651)	\	(0.0161)
Market Potential	-0.00292	-0.00600	-0.0351	-0.0325
	(0.0103)	(0.00675)	(0.0272)	(0.0285)
GDP Growth	0.297	0.478	2.727	2.795
	(0.732)	(0.406)	(1.740)	(1.741)
Share of Highly Qualified Workforce	-0.0337**	-0.0267***	-0.0650***	-0.0647***
	(0.0165)	(0.00853)	(0.0241)	(0.0245)
Unemployment Rate	0.00105	-0.000623	-0.0105	-0.0121*
	(0.00321)	(0.00176)	(0.00717)	(0.00712)
Employment Density	0.00207	-0.000851	-0.00828	-0.00705
	(0.00537)	(0.00294)	(0.0101)	(0.0105)
Degree of Deindustrialization	0.0180	-0.0156	0.124	0.0952
	(0.0650)	(0.0441)	(0.146)	(0.144)
Industry structure	Yes	Yes	\	\
(Emp. in 18 of 19 aggregated sectors)	Yes	Yes	\	\
Share of Employees in Construction	\	\	6.222***	6.697***
	\	\	(0.933)	(0.903)
Constant	0.159	0.286	1.717	0.553
	(1.144)	(0.718)	(2.523)	(2.975)
Observations	111	111	111	111
R-squared	0.721	0.616	0.559	0.557

Robust standard errors in parentheses/ *** p<0.01, ** p<0.05, * p<0.1 (Data excluding East Berlin.; The NUTS3 regions Eisenach and Wartburgkreis are merged together)

Appendix

Table A.1: Concordance of industries in terms of GDR and NACE classification

"GDR" Industry	NACE
Light	19-22; 26; 36; 37
Chemicals	24; 25
Metallurgy	27;28
Engineering	29-35
Food Processing	15; 16
Energy	10-14; 23; 40; 41
Textiles	17; 18
Construction	45

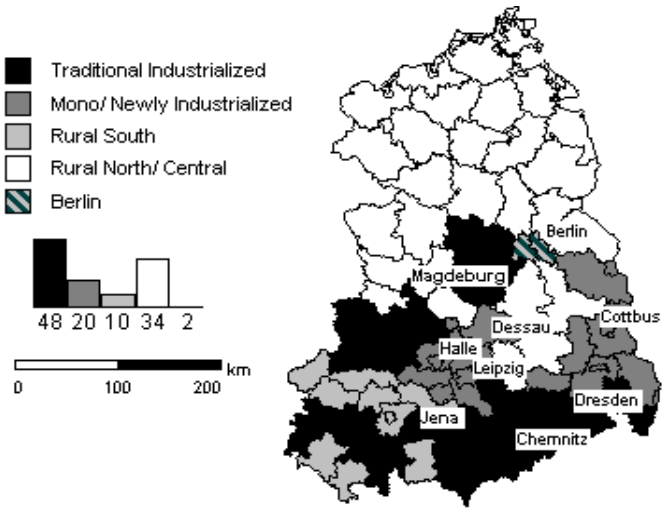

Figure A.1: The geography of entrepreneurial heritage and industrial structures