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The German Mezzogiorno? Supplements to the Natural History of East German Regional Development

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1 Introduction

Every country in the world is characterised by a heterogeneous spatial structure and the existence of regional disparities, and the aim of regional policy is to moderate these inequalities in the spatial development of economic activities. There are certain countries where spatial disparities are extremely large and areas lagging behind belong to one specific geographic area which feature a dual economic structure. There are, specifically, two large areas amongst the developed countries of the European Union whose economic performance lags behind the EU average and whose development paths are unique in many ways. An investigation into the unique development specifics of these two large, but coherent, territories – the regions of Southern Italy (the Mezzogiorno) and Eastern Germany – has attracted the interest of regional scientists for a long time (*Burda,* 2005; *Desmet–Ortín,* 2007; *Hall–Ludwig,* 1993; *Lentz,* 2010; *Trigilia,* 1994).

Today, the name "Mezzogiorno" is synonymous with long-term underdevelopment, whilst the other large area in question was reintegrated into the "mother country" after half a century of separation. Underdevelopment can be detected in almost all elements of the economy, the infrastructure and living conditions. Regions mentioned above are among the main beneficiaries of EU support, but, in addition to the enormous amount of EU funding, the national budget continuously assists development programmes with financial subsidies. We can ask with some justification whether these huge financial subsidies contribute seriously to reducing developmental disparities in a positive way and whether these areas are then enabled to achieve higher positions in the economic and social development rankings

In the literature we can find several cases where development difficulties in the eastern provinces are explained by means of the "Mezzogiorno phenomenon", and occasionally they refer to the Southern Italian failures – that is, fruitless efforts linked to continuous financial subventions – as a negative example in the elaboration of development paths (*Hall–Ludwig,* 1993; *Hallett–Ma,* 1993; *Page,* 2002; *Sinn–Westermann,* 2000).

The underlying reasons for the low performance are many and varied. A partial or total absence of driving forces of classical, developed capitalism characterises the development of the Italian macro-region even today (*Cafiero,* 2000; *Cannari,* 2010; *Horváth,* 1993; *Villari,* 1979). Agriculture was the main activity in Southern Italy during the first half of the 20th century, the sector having a 56 percent share of total employment in 1936 and regional incomes remaining below 60 percent of average values in the north. In present-day East Germany, on the other hand, the agricultural employment represented 22 percent in the period between the two world wars, when income per capita levels exceeded the average West German average by 27 percent. The majority of the East German provinces

belonged to the most dynamically developing regions of Europe at that time, with their internationally renowned engineering – optical, chemical and vehicle production – companies being among the most competitive firms on the continent.

Post-WW2, political constraints forced the German states to strike out along new paths. Five East German Länder and East Berlin were under Soviet occupation, and the planned economy of the German Democratic Republic created in 1949 gave rise to specific patterns of socio-economic development. At beginning of 1950s governmental instruments were used to ameliorate the situation in lagging Southern Italy. The "Mezzogiorno programme" facilitated a (slow) catching-up process in these eight regions. In the meantime, the development rate of the previously advanced German provinces was considerably slower in the newly formed state than in West German Länder, and in the year of German reunification, labour productivity indices of East German areas were one-third of the West German average, whilst indices for the Italian South were 60 percent lower than in the country's developed areas. Nevertheless, in the first years of the 2000s, the East German states showed more rapid convergence with the developed regions' average values than did the Southern Italian regions (*Sinn–Westermann*, 2000).

The weight of the two macro-regions in terms of the economic and human sectors has remained smaller than their share of the population. In spite of large-scale emigration, the population of the Southern Italian provinces (35.5 percent of the country's total in 1936 and 34.5 percent in 2007) has only shown a slight decrease due to higher reproduction rates and immigration. In the meantime, due to wartime damage, the proportion of the population of East Germany decreased by 10 percent compared to the 1930s. The decline is much more significant in terms of employment and industrial production (*Table 1*).

Table 1

The weight of the eastern states in Germany, 1939–2009 (as percentage share in the total Federal Republic)

	1939	1950	1960	1989	1991	2009
Surface area	30.4	30.4	30.4	30.4	30.4	30.4
Population	29.2	26.9	23.5	20.9	19.7	20.0
Employed persons	27.7	27.4	25.0	26.1	21.2	19.8
Employed in production	30.4	29.5	31.6	48.7	18.9	17.8
Industrial output	29.4	28.6	22.5	15.2	4.0	12.9

Source: Hall–Ludwig, 1993. 38. p.; Statistisches Bundesamt Deutschland, 2011.

The present paper aims to explore how various eras have left their mark on the recent regional development of East German states (Länder), what kinds of spatial transformation have occurred, what factors can be detected behind these changes and how spatial disparities have evolved in this vast, but backward, area in developed Europe.

2 Historical pre-conditions. Spatial structure of the German Empire

After the *unification of Germany* in 1871, the dozens of provinces and free states showed a very heterogeneous picture. Large disparities were evident in the sectoral structure of their economy, in the manner and extent to which they were able to integrate modern European development trends and in their population numbers and settlement networks alike.

The 26 provinces comprising the constitutional monarchy, duchies, principalities and free city states showed enormous disparities in terms of their respective population size. The average population of a political unit was 1.6 million, but the difference in terms of the population numbers between the largest and the smallest originally independent entity was over seven-hundredfold. In the closing years of the 19th century, population numbers in seven political units (e.g. Schaumburg–Lippe, Waldeck, Schwarzburg–Sonderhausen) remained below 100 thousand. By contrast, the number of inhabitants of the Kingdom of Prussia was 30 million, of Bavaria 5.6 million and of Saxony 3.6 million. The population of Prussia, the largest state of the unified Germany was 60 percent of the country's total population.

Rural inhabitants made up 64 percent of the total in the 1870s, but accelerated industrial development was accompanied by a rapid increase in the urban population. The dominance of the latter was clear by 1910, its share rising to 60 percent. Berlin stood at the top of the urban hierarchy with 2 million inhabitants and twenty cities formed the metropolitan area network with over 200 thousand inhabitants each. Macro-regions which served as political and economic hubs were powerful organising centres (*Table 2*). The cities with a population above 100 thousand constituted 5 percent of the population of Germany in 1871, 21 percent by 1910 and, due to a massive urbanisation wave, 32 percent by 1939.

The dominance of Prussia resulted in the rapid growth of Berlin. The population of the city was 198 thousand in 1818, 702 thousand in 1871 and 2.1 million in 1910. The central function of Berlin was obviously a result of the presence of political institutions, 25 percent of all employees working in public administration (*Urwin,* 1982). At the same time, the specific feature of German state organisation

was that the centres of political units were also given a significant role in state-building, which inevitably resulted in the continuous strengthening of poly-centrism. For this reason, Berlin was not able to exert such a powerful influence on state organisation as for example, Paris or London.

Table 2

Changes in the population of large cities, 1850–1910, '000s

	1850	1871	1910	Growth, 1871–1910, 1871=100
Berlin	412	826	2071	251
Hamburg	175	826	931	321
Leipzig	63	107	679	635
Munich	107	169	596	352
Dresden	97	177	548	309
Cologne	97	129	517	400
Breslau (Wrocław)	111	208	512	246
Frankfurt am Main	65	91	415	456
Düsseldorf	27	69	359	520
Nürnberg	54	83	333	401
Hannover	28	88	302	343
Essen	9	52	295	567
Chemnitz	34	68	288	425
Stuttgart	47	92	286	311
Magdeburg	52	84	280	333
Bremen	53	83	247	298
Königsberg	73	112	246	219
Stettin (Szczecin)	47	76	236	310
Duisburg	9	32	229	715
Dortmund	11	44	214	486
Kiel	16	32	212	663

Source: Reulecke, 1978. pp. 24–26.

The metropolitan centres of the Central German political units (Leipzig, Dresden, Magdeburg and Chemnitz) developed in the most heavily industrialised areas. The development energies of centres in Silesia, West and East Prussia (Breslau, Stettin and Königsberg respectively) were primarily administrative and political in nature.

The evolution of wages also shows significant territorial disparities. As a result of the obsolete sectoral structure of the economy and the low standard of qualifi-

cation in eastern regions, average wages remained below the national average: the national average wage of a qualified metal industry worker was 90.1 Pfennig: 102.2 in Berlin, 79.0 in Breslau, 76.7 in Königsberg (*Bessel,* 1978). Low income levels had a negative impact on the living standards of the population. The housing conditions in East Prussia were much worse than elsewhere, the health of the population and the provision by all areas of the social infrastructure were below the national average.

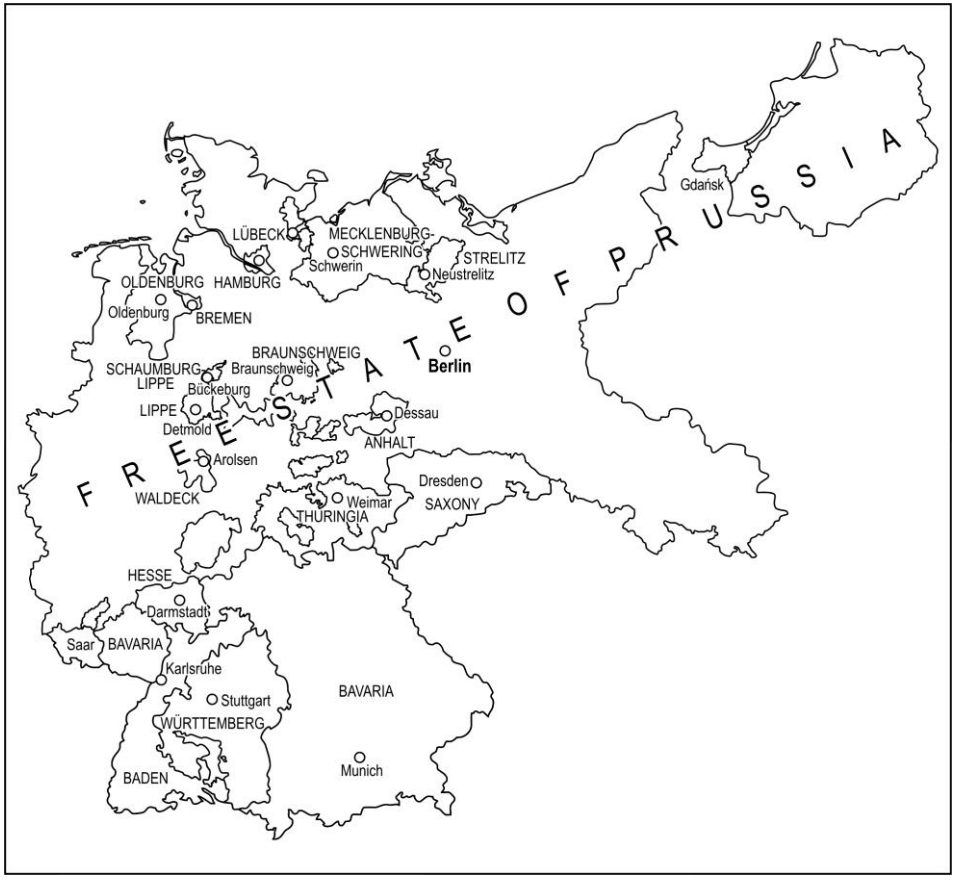
Germany lost a part of its national territory post-WWI, and the country's population decreased by 13 percent. However, the losses were much more severe in heavy industry sectors, with 44 percent of pig iron production, 38 percent of steel production and 26 percent of coal-mining capacity now located outside the country's borders. The more industrialised eastern parts of the country were attached to Poland with the detachment of one-third of Upper Silesia. The changes taking place in the economic structure of the eastern regions were unfavourable. The weight of industry decreased and agriculture resumed its dominance. 14 percent of the country's population was concentrated in these Trans-Elbian (east of the River Elbe) areas, which produced only 10 percent of GNI and 23 percent of German agricultural products.

Successive governments of the *Weimar Republic* elaborated various programmes and measures to support the East Prussian provinces *(Figure 1).* The objectives behind spatial development concepts were manifold. The basic aim of the nationalist approach to the support of peripheries along the border was to ensure protection against Poland. Concepts with economic objectives sought to counterbalance the unfavourable position of eastern areas, and the influence of special interest groups counting on reaping the benefits of public aid programmes was not insignificant either (*Buchta,* 1959; *Fiedor*, 1972). Finally it was the nationalist approach which undertook to resolve the Eastern Question. This produced constantly growing support for the National Socialist Party even among Protestant farming communities. While the Party gained only 6.2 percent of the national vote during the parliamentary elections of 1924, in 1930 the figure was already 22.5 percent in East Prussia (*Bessel,* 1978).

Present-day East German territories (then a part of Central Prussia) were classified as intermediate regions. North Brandenburg, Mecklenburg–Schwerin and Vorpommern were agricultural areas. Industrial development in the southern areas (Saxony, smaller and larger principalities and duchies) was launched by the construction of the Leipzig-Dresden railway line (the second railway line in Germany), and, besides light industry, the chemical, energy, glass and machine-building industries (based on lignite mining in Upper Saxonia and East Brandenburg) constituted the main forces of spatial development.

Figure 1

State organisation of the Weimar Republic



Source: New World Encyclopedia.

War preparations were the priority of the *Third Reich's* economic policy and were based on autarchy. This philosophy had no significant impact on the country's spatial structure but traditional industrial centres became the primary beneficiaries, although the four-year plan adopted in 1936 considered the decentralisation of production as a basic principle of industrial development.

The defence interests of military preparations left their mark on the spatial structure of industry also. To defend the country from external attack, a part of the industrial facilities in densely industrialised border areas of the Ruhr, Upper Silesia and Saxony were delocalised to the Hannover–Magdeburg–Halle triangle in Central Germany (*Hardach,* 1976). Vast rural areas of the province of

Mecklenburg were still excluded from mainstream development policy; only the city of Rostock was included in military developments where new military industrial companies were established. The proportion of agricultural workers was 65–70 percent in the northern regions in 1925, and this did not drop below 60 percent even at the outbreak of World War II. Meanwhile, in the southern regions the corresponding figure was only 14–30 percent.

Most industrial indices of Central German provinces (Saxony, Saxony-Anhalt, Brandenburg and Thuringia) led the development rankings, even though the last two did not belong to the group of developed regions. In terms of per capita industrial output, the index of Central Germany (without Berlin) was 725 marks, 609 marks in western parts of the country and 249 marks in the eastern provinces, as opposed to the German average of 600 marks. Berlin stood first in the ranking list with 855 marks (*Hardach,* 1976). The weight of the Central German provinces − with 29 percent of the population − in various economic sectors exceeded their share of the total population. 43 percent of the German textile industrial output originated from these areas as well as 39 percent of machinery and vehicle construction and 34 percent of electrical products.

In the aftermath of the Great Economic Depression, provinces introduced pro-employment programmes to remedy enormous unemployment (*Conze–Raupach,* 1967). Public works programmes were launched, thousands of the urban unemployed were employed in rural areas for soil improvement works, some provinces organised agencies to recruit young settlers in large industrial centres, and labour retraining centres were organised in several cities.

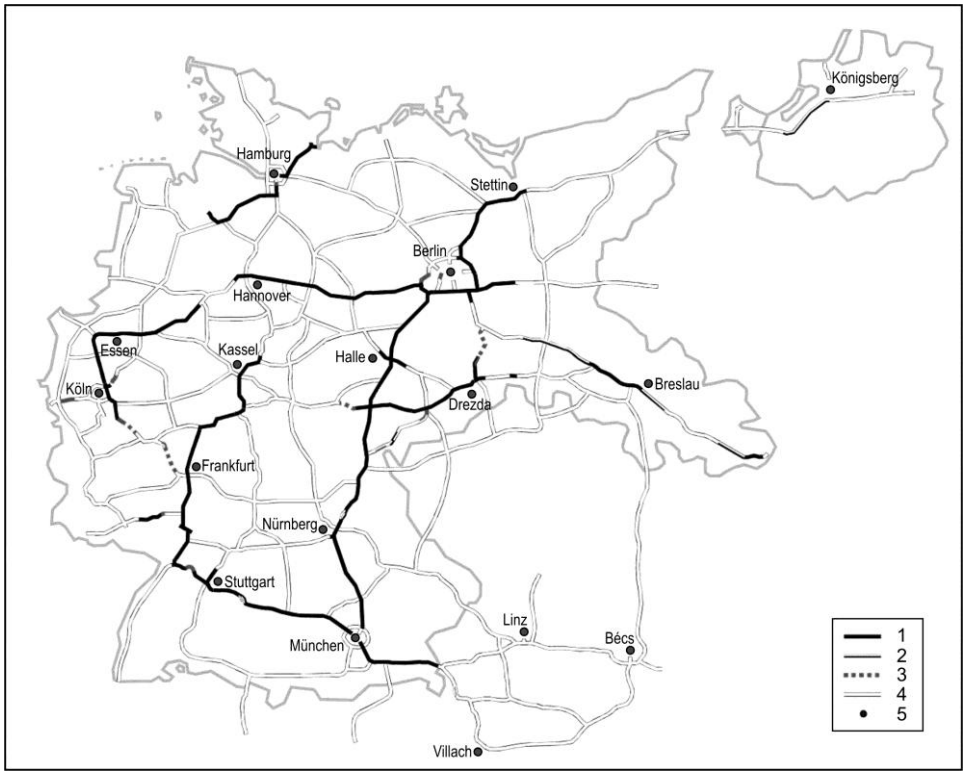
The most significant job-creation undertaking of Hitler's Germany was the development of the military and vehicle industries and of the motorway network. More than one million new jobs were created in the transport sector (in the automobile industry, the public road network and related activities) by 1938 (*Owery,* 1995). The total length of motorways exceeded 3,000 km by 1939, and most large German cities were linked to the network (*Figure 2*).

3 The Sovietisation of Central Germany

The four-power treaty concluding WWII placed Central German Länder under Soviet control. Former eastern territories were either attached to Poland (Lower and Upper Silesia, Pomerania, West Prussia and the southern half of East Prussia) or to the USSR (the northern half of East Prussia). The Soviet belt was completed by East Germany respecting the new German state boundaries. The basic principles of the victorious powers in the reorganisation of Germany (demilitarisation, degasification, political decentralisation and economic deconcentration) were designed to prevent the strongly centralised state machinery, the group of major

Figure 2

Germany's motorway network in 1939



Key: 1 –Two lane motorway in operation; 2 –Single-lane motorway in operation; 3 – Motorway under construction; 4 – Planned motorway; 5 – Motorway construction HQ.
Source: Author's construction based on Zeller, 2006, p. 58.

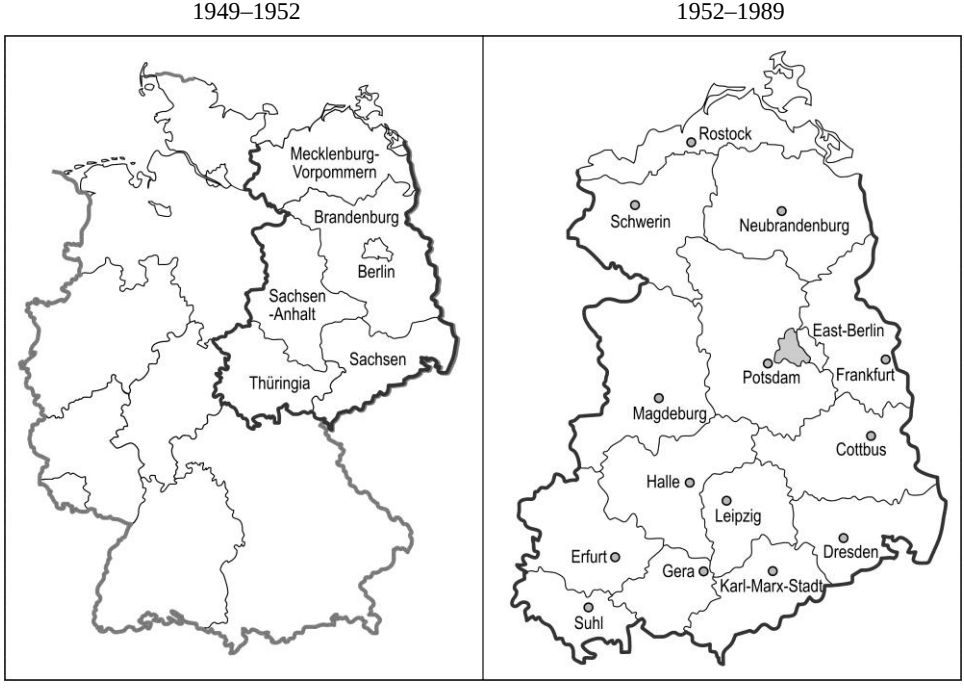
industrialists, "Junker" landowners and the military elite from ever regaining power, although these basic principles were not adopted in the zone of influence of the USSR. The communist German Democratic Republic was established in 1949.

Institutions for a planned economy were created and a system of state administration was reorganised following the Soviet pattern. Districts *(Bezirke)* replaced states *(Länder)* as new basic units of territorial public administration *(Figure 3).* These new territorial units followed the borders of earlier states. Due to its special status, East Berlin was originally not counted as a *Bezirk* but it was claimed as the „capital city of the GDR" (though legally, it was not even fully part of the GDR's territory). In 1961, after the construction of the Berlin Wall, East Berlin came to be recognised in GDR administration as the *Bezirk* Berlin.

The *Bezirke* (with the exception Berlin, which consisted of a single municipality) were again divided into rural district *(Landkreise)* and urban districts *(Stadt-kreise).*

Figure 3

Territorial administrative units of East Germany



The State Planning Commission designed basic units of long-term spatial planning according to the formerly existing *Länder.* This system had two formal specifics: on one hand, they refrained from using historical names, and, instead, they divided the country into Northern, Central, Southern and South-western regions according to their geographical position. Berlin and Magdeburg were integrated into the Central region, whilst Saxony and part of Saxony-Anhalt (Halle *Bezirk*) constituted the southern region.

As a result of the damage caused by the war (the destruction of half of the industrial facilities and a 70 percent loss in the high-technology sectors) and the reparations paid to the USSR (in which framework 1,700 factories were disassembled and moved to Russia), the national product volume at the end of the 1940s remained below 60 percent of the 1936 value. Economic recovery in East Germany advanced faster: industrial production in the eastern provinces in 1948

reached 71 percent of the 1936 volume, but only 60 percent in western provinces. However, this temporary lead disappeared after a couple of years and the economic performance of western areas showed continuous improvement. The East German economy under total state control was unable to perform well under competition (*Herrigel*, 1996). Besides restrictions imposed by the planned economy, economic performance further decreased due to massive outmigration from East Germany. At the outbreak of World War II, Central German states had 16.7 million inhabitants, but due to the large number of refugees from the east this number had risen to 18.65 million by 1946. Three million left the country between 1950 and 1961, 60 percent of them active wage-earners, the majority qualified skilled workers and highly qualified intellectuals (*Hardach*, 1976).

The foundations of the regional structure of the new East Germany were defined by historical heritage. The demographic and economic centres of gravity were located in southern (Halle, Leipzig, Dresden and Karl Marx Stadt [Chemnitz] districts) and south-western (Erfurt, Gera, Suhl districts) regions. 38.4 percent of the country's territory held 55.7 percent of the East German population. These areas provided 70.4 percent of industrial output and 76.2 percent of the total export volume of the country. The weight of the capital city, East Berlin in terms of population was 6.4 percent, 5.0 percent in industrial production and 5.7 percent in exports (*Ostwald*, 1989).

The capital had stronger positions in the R&D sector, institutions in Berlin employing 17.2 percent of R&D staff. In the spatial location of science, again historical structures prevailed, in that the number of R&D staff employed by industrial firms, universities and academic institutions in Dresden, Leipzig, Jena, Halle, Magdeburg, Rostock and Potsdam reached 10–20 thousand *(Figure 4).* A significant factor in the education policy of communist governments was the foundation of new, primarily technical, institutes of higher education (*Baar*, 1977).

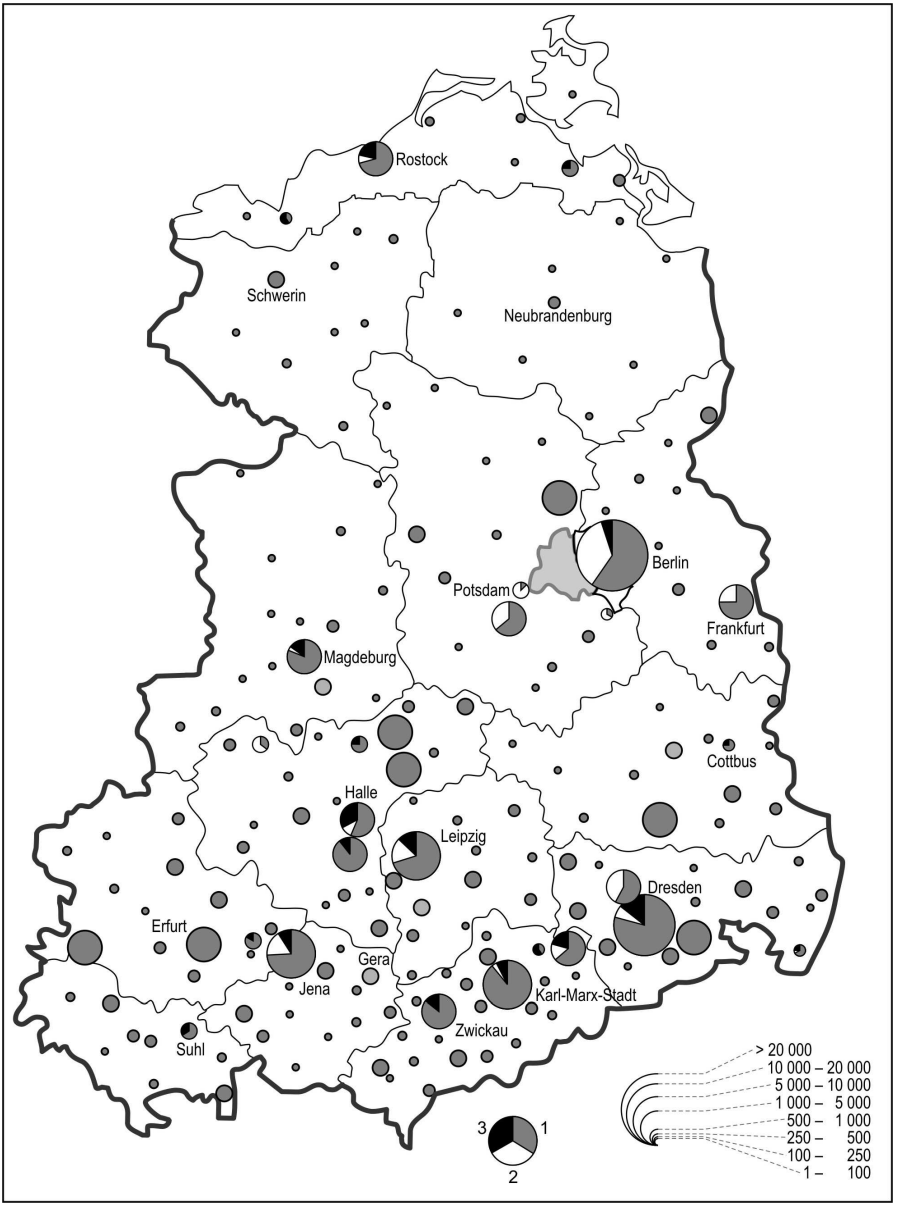
The main objective of the German planned economy in the period from the 1950s to the 1970s was to

- implant traditionally less developed branches of industry,
- develop high- technology sectors in the larger industrial centres,
- create industrial centres in former agricultural areas and, with it, elimination of the significant difference between urban and rural areas (The best example of implementation of this target is the construction of the Eisenhüttenkombinat started in 1950 in 100 km southeast of Berlin.)

The spread of industrial-scale agriculture also facilitated the structural transformation of weakly industrialised agricultural areas. A slow but evident change was witnessed in the evolution of territorial disparities in industrial development (*Berentsen*, 1981; *Nemes Nagy*, 1979).

Figure 4

Territorial structure of R&D in the GDR, 1987



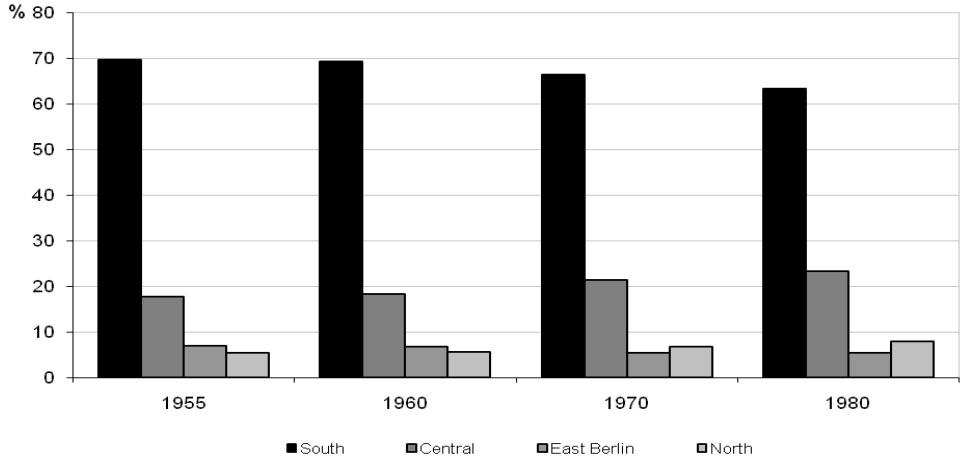
Key: 1 – Business research units; 2 – Academic research institutes of the National Academy of Sciences of the GDR; 3 – Colleges, universities.

Source: Ostwald, 1989, 62. p.

The weight of northern and central German regions in industrial production showed a small percentage increase, while that of southern regions and East Berlin decreased between 1955 and 1980 *(Figure 5).* A specific feature of East German economic governance was the operation of large industrial conglomerations (Combines). The Ministries of Industry were responsible for 156 combines, and Regional Economic Councils directed 96 large companies. More than half of the HQs of combines were located in industrial agglomerations, which also held half of the member companies and three-quarters of the R&D sector.

Figure 5

The macro-regional distribution of industrial output, 1955–1980



Source: Author's construction based on Mohs–Grimm, 1984, p. 10.

The impacts of the structural transformation of the economy were also felt in the evolution of the spatial structure of migration. In the 1950s and the following decade the higher fertility indices of northern agricultural areas also transformed the territorial structure of the population. Extensive industrial development resulted in a positive migration balance to eastern (Cottbus, Frankfurt am Oder) and northern (Rostock, Schwerin) districts and East Berlin, while southern industrialised areas recorded a negative migration balance.

The change in the power system and the economic restructuring of the country left their mark on the urban network. East Germany was one of the most urbanised countries in Europe. In the middle of the 1970s, 75.3 percent of the country's population lived in cities. At the peak of the settlement hierarchy, the order of cities by size (Berlin, Leipzig, Dresden, Chemnitz, Magdeburg) had shown remarkable stability since the beginning of the 20th century. A small num-

ber of seats of new territorial-administrative units and industrial centres, the so-called socialist towns, advanced in the ranking of cities. Neubrandenburg, for instance had 22 thousand inhabitants in 1950, but after becoming a district seat and an important industrial location, its population had increased to 91 thousand by 1990, and from its previous 86th position in ranking it rose to 19th. The population of Eisenhüttenstadt, the main metallurgical centre of the GDR, increased from 12 thousand to 52 thousand, and the population of Schwedt, the capital of petroleum refining, increased from 7 thousand to 53 thousand over forty years. A period of stability followed the changes taking place at intermediate level in the settlement network. Massive population movements benefited certain towns in the northern and eastern regions, whilst small and medium-sized towns in southern metropolitan areas experienced a slow but gradual population decline.

The operational resources of the East German economy and society had been exhausted by the 1980s, the driving forces of spatial development had weakened and, simultaneously, international and domestic political events leading to German re-unification had accelerated. In 1990, a reunified Germany was faced with an unprecedented problem: what policy to pursue in relation to the backward part of the country which held one-third of the national territory and 22 percent of the population *(Table 3).*

In the year of reunification, GDP per capita in East Germany was only 49.7 percent of the German average of €20 thousand. Obsolete industrial and low-quality agricultural products, an outdated production infrastructure, an unmotivated labour force and the collapse of foreign economic relations foreshadowed the fear that, in order to integrate this part of the country into the German and European economic area, enormous financial support would be required. Such large-scale development tasks in Europe were required only in the Italian Mezzogiorno.

Table 3

Major data of German macro-regions, 1992

Macro-region	Area		Population		GDP1995	
	'000 km^2	%	millions	%	€ billions	%
North	64.2	18.0	12.5	15.5	255.2	16.6
North Rhine-Westphalia	34.1	9.6	17.5	22.6	349.0	22.6
Central-West	43.5	12.2	10.7	13.4	224.1	14.5
Baden-Württemberg	35.8	10.0	10.0	12.5	217.8	14.1
Bavaria	70.6	19.8	11.6	14.4	254.5	16.5
East Germany	108.8	30.4	18.0	22.4	241.4	15.7
Germany total	357.0	100.0	80.3	100.0	1542.0	100.0

Source: Eurostat, Regional Statistics.

4 The regional impacts of the collapse of the GDR

Following the reunification of Germany in 1990, East Germany was transformed from the most developed territory of the former COMECON area into the least developed part of the newly formed state. The building of the market economy and the transformation of the political system significantly changed the development possibilities of East Germany which had never been able to boast of its strength. The mechanisms and institutions of the planned economy were eliminated, the economic structure underwent massive transformation, and unfavourable migration trends began to emerge. The unification of the two parts of Germany produced an immediate and drastic reduction of formerly huge transportation costs, and the impacts of this transformation activated processes of differentiation in the new states of this part of the country (*Heimpold,* 2010).

Reunification produced the most serious economic consequences in the industrial sector. The low level of competitiveness of the bulk of eastern industrial companies became evident during the transition from a centralised system – the planned economy – to the market economy. Weak industrial performance was due to a combination of factors – i.e. outdated capital stock, the collapse of the former Comecon markets, an obsolete product structure and low productivity.

The sectoral structure of employment was also deeply transformed. Whilst industry contributed 40.1 percent to GDP in 1989, due to rapid de-industrialisation this had fallen to below 20 percent by 1994 (Volkswirtschaftliche Gesamtrechnungen der Länder). During the initial three years of transformation, the number of industrial employees showed a drastic decrease in East Germany: the number of workers and staff employed in the industrial sector of the GDR was 3.2 million in 1987, but the number of workers employed in manufacturing in 1992 was only 2.1 million in the new *Länder* (including Berlin). This decline in employment by one-third was not only a consequence of the closing of production units, but also of the many old functions of the major companies (in health, education and culture) which were integrated into the domain of community or private services.

Large firms were totally eradicated form East German industrial statistics. In 1988, the GDR had 46 large firms employing from 5–10 thousand workers, 72 employing 10–30 thousand, 18 employing 30–50 thousand and 9 employing over 50 thousand workers; while today this category is represented by a mere 4 firms employing 5–10 thousand and 1 employing 10–30 thousand workers (*Lentz,* 2010).

The percentage of *agricultural* workers fell from 10.2 percent to 3.8 percent during the 1989–1994 period, whilst those in market services (finance, consultancy, insurance, real estate etc.) rose from 6.4 percent to 20 percent. The transformation of the employment structure showed a heterogeneous picture in each economic sector and there were significant regional disparities also *(Table*

4). In the category of developed services, the R&D sector showed a strikingly deteriorating position – in contrast to general trends. Research units were closed with the disappearance of the large industrial firms, and the institutional network of the (East) German Academy of Science was also eliminated. The R&D sector, employing 86 thousand in 1989, had lost half of these by 1991, and only 32 thousand R&D employees were recorded in 1993 (*Hüfner,* 2002; *Krull,* 1991; *Mackrakis–Hoffmann,* 1999).

The decrease in the number of *employees* was fairly similar in each *Land* – some 20 percent. The largest decline was experienced in agriculture and heavy industry. The most moderate initial recession in East Germany was experienced in Saxony, which was home to the most modern base for mechanical engineering. In fact, the number of employees in manufacturing industry rose by one-fifth in this province. The changes in Brandenburg were even more favourable. Its central position near Berlin made it an attractive investment site, and the number of employees in manufacturing industries rose by one-third. The most striking growth occurred in the banking and financial services sectors, where the number of employees within the territory of the former GDR doubled. On the other hand, there was a remarkably weak transformation to a market economy in the large rural areas of Mecklenburg-Vorpommern.

Unemployment rates rose constantly in line with the economic restructuring. At the end of the first phase, the rate of unemployment was between 12 percent and 16 percent, climbing to 16 percent–20 percent during the following 10 years. It started to decrease gradually from 2005, varying between 12 percent and 14 percent from province to province. The highest unemployment rates were recorded in Saxony-Anhalt and Mecklenburg-Vorpommern during each phase *(Figure 6).*

The changes did not leave the *spatial structure of the population* in the new states undisturbed. The unfavourable trends emerging in the 1980s in the demographic structure of the GDR gradually worsened, and new phenomena affected the settlement structure. The opening of borders resulted in a massive movement of the population from the eastern states to West Germany, the east-west migration beginning in 1989. It reached its peak in 1991, when 240 thousand East German inhabitants (1.6 percent of the population) migrated to western states, primarily to North-Rhine-Westphalia, Bavaria and Baden-Wurttemberg. The number of migrants coming from western to eastern states was considerably lower – 64 thousand. Migration gradually decreased during the following years, and the annual average number of migrants was below 50 thousand by the end of the 1990s. With the exception of Berlin and Brandenburg, the eastern states suffered a considerable loss of population during the first decade post-reunification *(Table 5).* Between 1989 and 2001, 7.5 percent of the East German population had moved to western *Länder* (*Brücker–Trübswetter,* 2007).

Table 4

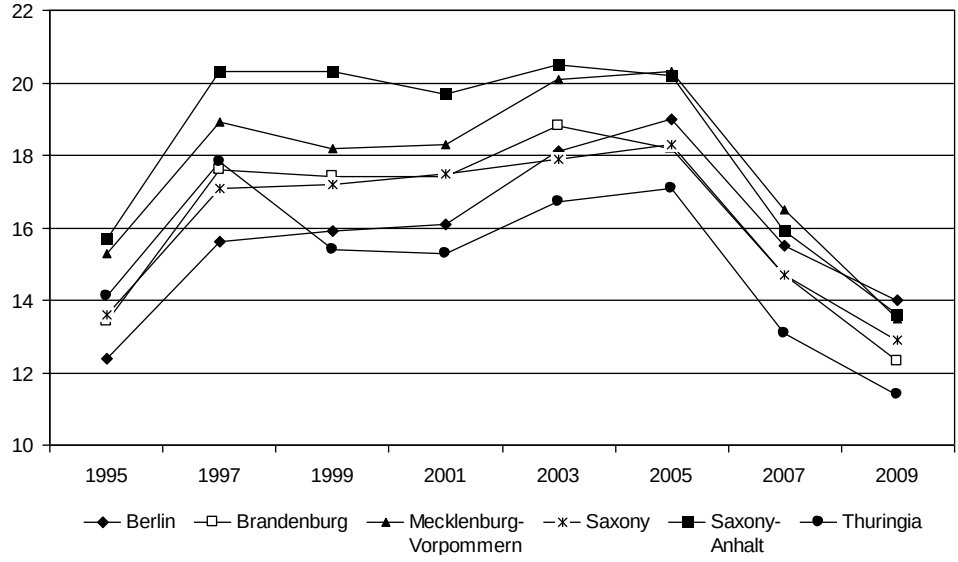
The changing number of employees in East German provinces, 1990–1992, %

	Berlin	Brandenburg	Mecklenburg-Vorpommern	Saxony	Saxony–Anhalt	Thuringia	Total
Agriculture	–65.8	–62.3	–45.3	–45.7	–52.2	–59.4	–52.9
Minig	–30.5	45.1	–32.5	–13.3	–25.3	–51.4	–31.2
Energy	–30.1	–40.8	–27.6	–41.1	–43.1	–42.4	–40.1
Manufacturing	–12.3	33.6	1.9	21.2	16.4	14.0	16.4
Trade	–1.7	–16.0	–11.3	7.9	–20.7	11.2	4.1
Transport, post, telecommunications	–37.1	–1.1	–36.3	–5.6	1.9	–10.0	–12.9
Financial intermediaries	87.4	116.6	23.3	81.3	136.7	122.5	95.0
Other services	–26.8	–18.8	–22.8	–21.2	–17.7	–17.4	–20.6
Total	–20.6	–19.1	–20.7	–18.7	–21.3	–21.0	–21.1

Source: Informationen zur Arbeitsmarktstatistik der Bundesagentur für Arbeit. Nürnberg, various years.

Figure 6

The evolution of the unemployment rate by Länder, 1995–2009, %



Source: Author's construction based on data from Statistisches Bundesamt, Wiesbaden, 2011. Genesis-Online Database.

Table 5

The change of population numbers of East German Länder, 1990–2008

	1990	1995	2000	2008	Change, 1990–2008, 1990=100
Berlin	3,400,426	3,472,009	3,386,667	3,416,255	100.5
Brandenburg	2,641,152	2,536,747	2,601,207	2,535,737	96.0
Mecklenburg-Vorpommern	1,963,909	1,832,298	1,789,322	1,679,682	85.5
Saxony	4,900,675	4,584,345	4,459,686	4,220,200	86.1
Saxony-Anhalt	2,964,971	2,759,213	2,648,737	2,412,472	81.4
Thuringia	2,683,877	2,517,776	2,449,082	2,289,219	85.3
Total	18,555,010	17,702,388	17,334,701	16,553,565	89.2

Source: http://epp.eurostat.ec.europa.eu.

The migration behaviour of the East German generations of young adults constitutes a specific phenomenon. One determining factor is the attractiveness of cities with universities, whilst another is the tendency of qualified young adults to prefer places offering higher quality employment e.g. the states of Baden-Wurttemberg, Bavaria, Hessen, Bremen and Hamburg, the cities of Dresden, Leipzig and Erfurt in the East and Berlin (*Herfert–Lentz,* 2010). The annual migration loss in these age groups in several East German large and medium-sized cities and towns (Jena, Gera, Halle, Cottbus, Rostock, Frankfurt am Oder) ranges from 2 percent to 8 percent.

One further factor behind the changes in the *settlement structure* is related to suburbanisation. East German metropolitan areas were affected by marked suburbanisation during the 1990s. The reasons behind this are many and various. On one hand, the opening of the housing market and the growing number of private cars facilitated the movement of inhabitants from central urban districts towards settlements in the agglomeration ring of the city. During the early 1990s, suburban settlements in the proximity of large cities with a population below 2,000 showed dynamic growth, whilst the population of core cities decreased. However, this tendency reversed in the early 2000s, due to various measures, the development of inner residential districts became permanent. In the third phase of spatial mobility following east–west migration and the development of suburbs we can witness the flow of upper classes to large cities.

The transformation of the metropolitan network did not result in significant changes in the ranking of cities. The population of metropolises with over 100 thousand inhabitants did, in fact, decline, but almost all kept their former positions in ranking. The top multifunctional cities with strong economies (Berlin, Dresden, Leipzig, Erfurt) were able to maintain or increase population numbers during the two decades following reunification *(Table 6).*

Based on the development trends, the settlement network of East Germany can be classified into three regional types (*Herfert–Lentz,* 2010). The first category contains dynamic metropolitan areas (Berlin, Leipzig, Dresden and the so-called Thuringian string of towns located between Jena and Eisenach). The second group contains conurbations of cities with population losses considerably exceeding the avarage in Saxony-Anhalt (Magdeburg, Halle, Dessau), East Thuringia (Gera, Greiz), Saxony (Zwickau, Chemnitz), the Polish borderland areas (Görlitz, Frankfurt am Oder) and the Baltic maritime towns (e.g. Greifswald). The third type is constituted by towns remote from main centres. The medium-sized towns in the state of Mecklenburg-Vorpommern and Brandenburg belong to this category.

The first post-reunification decade brought radical changes to the economic and settlement structure of the East German federal states. The economic growth stemming from infrastructural investment, privatisation and the revival of small enterprises at the beginning of the 1990s came to a halt by the middle of the

decade and stabilised at the West German average level during the whole of the decade that followed. Factors influencing economic growth in the long-term show a high level of spatial concentration. Berlin, Potsdam, Dresden, Leipzig, Chemnitz, Halle (Saale), Jena and Erfurt can be regarded as the growth centres of the eastern *Länder.* The favourable economic structure of these towns is characterised by a high level of labour productivity, state-of-the-art and satisfactory levels of qualification of employees, a large export potential and a high level of R&D activities, and the existence of agglomeration effects.

Table 6

The evolution of population numbers of East German metropolises, 1989–2009, '000s

	1989	Rank, 1989	1995	2001	2005	2009	Rank, 2009	Population change, 1989–2009, 1989=100
Berlin	3,438	1	3,471	3,388	3,395	3,442	1	100.1
Leipzig	530	2	520	502	502	514	3	96.9
Dresden	501	3	501	495	495	517	2	103.2
Chemnitz	302	4	302	256	247	243	4	80.5
Halle	300	5	283	243	237	232	5	77.3
Magdeburg	288	6	259	230	229	230	6	80.0
Rostock	253	7	227	199	199	201	8	79.4
Erfurt	217	8	211	200	203	204	7	94.0
Potsdam	141	9	141	142	148	155	9	110.0
Gera	132	10	124	110	104	100	12	75.8
Schwerin	130	11	114	100	97	95	13	73.0
Cottbus	129	12	125	111	105	101	11	78.2
Zwickau	119	13	111	102	98	94	14	79.0
Jena	106	14	101	101	103	104	10	98.1
Dessau	101	15	107	97	92	88	15	97.1

Source: www.citypopulation.de [August 7, 2011].

5 The price and impacts of reintegration

An extremely short time was needed to achieve the formal reintegration of the new East German *Länder* into the unified German state. Long preparations did not precede the building of market economy institutions and the democratic political system since the West German legal system had to be adopted. The transformation was assisted by huge public funding, and a great number of the political decisions supporting the region's integration were derived from the concept of the social state. Public transfers granted to the new *Länder* are considered by certain authors to be among the final consequences of World War II and as recompense for the sacrifices born by the eastern territories (*Eltges–Strubelt*, 2010). Without enormous capital injection, the (collapsed) East German economy would not have been able to achieve any growth. Investment (two and a half times greater than those in West Germany) were for initial infrastructural developments by the state, incentives involved the privatisation of state property and encouraging the wide-scale spread of small and medium-sized enterprises to replace the old, large combines.

Unit labour costs in the manufacturing sector remained higher in eastern areas than in West Germany until the end of the 1990s, and this necessitated enormous and intense investment in capital stock. €24 billion were spent on investment funding between 1991 and 2004 in East Germany, involving 58 thousand separate investments. The volume of investment reached €122 billion and approximately 776,000 jobs were created. Meanwhile, the per capita labour cost dropped below the West German average in every eastern state. The decrease in per capita wage costs not only raised the international competitiveness of East German industry, but produced other disadvantages also. The significant decrease was supported by growing productivity – which, of course, automatically contributes to a reduction in the required labour force. In the first decade of the 2000s the growth of added value was no longer a clear trend in the east. Growth rates in the different provinces showed wide variations around the national average. The biggest growth dynamics were witnessed in 2006 when the growth rate was 4.5 percent in Saxony, 3.7 percent in Mecklenburg–Vorpommern and 3.6 percent in Thuringia as opposed to the 3.5 percent national average. In 2009, in contrast with the –5.5 percent average rate of German recession, the added value decreased by 1.1 percent in Berlin, 2.2 percent in Mecklenburg-Vorpommern and 5.6 percent in Saxony-Anhalt.

Large financial resources have been spent by the German state and society to improve the backwardness of the new East German states. Article 72 of the German constitution fixing the traditional fundamental principles of the social market economy declares that: "The Federal Government shall have the right to legislate on these matters if and to the extent that the establishment of equal living conditions throughout the Federal territory or the maintenance of legal or eco-

nomic unity renders Federal regulation necessary at national level". The German legislator applied this constitutional doctrine in legal materials on the reduction of spatial disparities. Article 1 of the Law on Spatial Planning (Raumordnungsgesetz) declares that the entire territory of the Federal Republic has to be developed, a specific spatial policy has to be designed and coordination between plans and development programmes with spatial impacts has to be achieved.

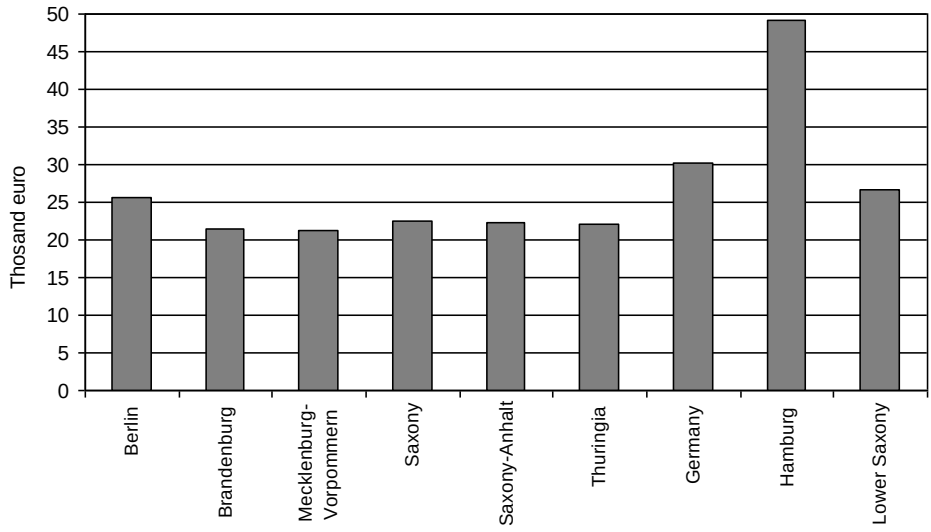
The German state wishes to create equal living conditions for citizens over the entire territory of the country and to moderate regional disparities. Another objective of Federal spatial policy is to encourage the exploitation of development potentials in structurally weak rural areas, to enhance employment opportunities, to cooperate in the organisation of the housing market, to develop the infrastructure and urban functions and to actively participate in environmental protection.

The need for powerful public intervention on order to reduce spatial inequalities is unquestionable. The region – despite its incontestably significant progress, showed severe backwardness in comparison with western states in 2009 *(Figure 7).* The disparities in the income-producing capacities of the eastern states are relatively significant. GDP per capita in Berlin only reaches 85 percent of the German average – followed by southern provinces with their 73−74 percent values, and the indices seen in Brandenburg (71 percent) and Mecklenburg-Vorpommern (70 percent) also do not lag behind the other provinces. GDP by purchasing power parity (PPP) in the eastern states and in Germany show a deteriorating performance in terms of European comparison. Berlin was above the national average in 1995 in respect of this index, but in the following years its position deteriorated in relation to the EU average *(Table 7).*

East German states occupy the last six positions in the development ranking of the 16 German *Länder.* The West German state with the weakest performance (Lower Saxony) shows a lower GDP value than Berlin, the most developed eastern *Land.* The per capita performance in the capital was only half of the most developed *Land*, Hamburg. We obtain a somewhat more differentiated picture if we examine per capita GDP values in smaller territorial units, i.e. NUTS3 areas. In East German areas, performances below the national average show an even spatial distribution. Of the 102 NUTS3 areas (metropolises, urban townships and districts) only 8 had GDP values above the national average (€30,200), whilst GDP in 41 NUTS3 areas remained below two-thirds of the national average (€20,000). With the exception of Saxony-Anhalt, we can find at least two high performing regions in each state. In 41 out of the 327 West German NUTS3 areas, GDP by PPP does not reach €20,000, but in 104 it exceeds €30,000. In East Germany, 40 percent of NUTS3 areas, in West Germany, 12 percent can be regarded as low-performing. Two-thirds of the weakly developed areas are in the provinces of Mecklenburg-Vorpommern, Saxony, Lower Saxony, Rheinland-Pfalz and Bavaria.

Figure 7

GDP per capita in some German states, 2008, PPP



Source: Author's construction based on http://epp.eurostat.ec.europa.eu.

Table 7

GDP per capita by PPP in East German states as percent of the EU average, 1995–2008

	1995	2000	2005	2008
Berlin	131	109	101	99
Brandenburg	86	82	82	82
Mecklenburg-Vorpommern	85	80	81	81
Saxony	87	80	86	86
Saxony-Anhalt	80	78	82	85
Thuringia	79	78	82	84
Germany	129	118	117	116

Source: Author's calculations based on http://epp.eurostat.ec.europa.eu.

6 Regional subsidies

The majority of the backward areas receiving economic structural support in the framework of regional policy are located in the eastern *Länder (Figure 8).* €21 billion were devoted to restructuring programmes as a result of constitutional regulation post-reunification (between 1991–2010). In Germany 79 percent of the funds were absorbed by manufacturing industry (Deutscher Bundestag, 2009). Some 80–90 percent of the funds were dedicated to the economic development purposes of the new East German provinces. The amount of support which these regions received annually exceeded €1 billion from 1992 to 2001 (peaking in 1993 at €2.02 billion in support). Distribution among the provinces is very much in line with their size of population *(Figure 9).*

The financial contributions for creating equal living standards for the population are regulated by Articles 106–107 of the German Constitution. In the light of these articles, 75 percent of the revenues from personal income tax is to be distributed among states according to their share of the country's population and the Federal law allocates 25 percent of the revenues to states with lower tax capacities under Federal law. Further, the Federal government maintains special funds for supporting backward spatial communities with low tax incomes. According to the Article 91a of the Constitution, "In the following areas the Federation shall participate in the discharge of responsibilities of the Länder, provided that such responsibilities are important to society as a whole and that federal participation is necessary for the improvement of living conditions (joint tasks): 1) improvement of regional economic structures, 2) improvement of the agrarian structure and coastal preservation" (Basic Law for the Federal Republic of Germany. 80. p.).

The other major group of financial instruments supporting the reorganisation of the East German territory contains those of the EU's Cohesion and Structural Funds. 70 percent of the near-€20 billion of Structural Funds (€13.6bn) allocated to Germany during the programming period 1994–1999 were absorbed by the new provinces. Similar rates are seen in the two planning periods which follow *(Table 8).* The rate of EU support granted to the East German provinces during the programming period 2007–2013 declined by almost one third compared to the previous period. This is due to the fact that the income and development possibilities of several NUTS2 regions in three provinces (Brandenburg, Saxony and Saxony-Anhalt) showed significant improvement and fell into a category featuring a phased reduction in funding. The weight of the financial aid received by the new provinces decreased slightly, but it still represents two-thirds of the total amount.

Table 8

The distribution of EU funds among German Länder, 2000–2013, € million

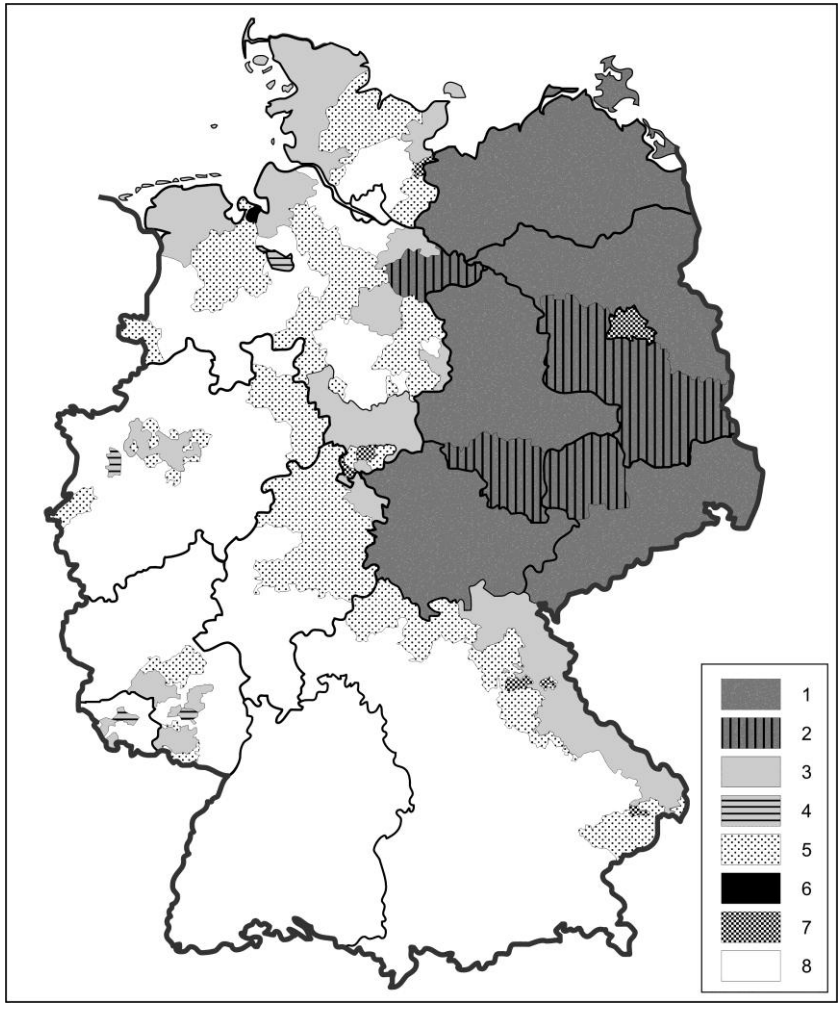
	2000–2006			Total	2007–2013		Total
	Objective 1	Objective 2	Objective 3		Convergence objective	Regional competitiveness and employment objective	
Berlin	729	–	–	729	–	1,212	1,212
Brandenburg	2,983	–	–	2,983	2,120[1]	–	–
Mecklenburg-Vorpommern	2,442	–	–	2,442	1,670	–	1,670
Saxony	4,694	–	–	4,694	3,963[2]	–	3,963
Saxony-Anhalt	3,235	–	–	3,235	2,576[3]	–	2,576
Thuringia	2,783	–	–	2,783	2,107	–	2,107
New Länder	19,958	–	–	19,958	12,436	1,212	13,648
Old Länder	–	3,510	4,688	8,198	799	8,045	8,844
Germany total	19,958	–	–	28,156	13,235	9,257	22,492

Note: 1 – 48 percent of funds are allocated to phasing out regions; 2 – 22 percent of funds are allocated to phasing out regions; 3 – 30 percent of funds are allocated to phasing out regions.

Source: Author's construction based on Deutscher Bundestag 2004, 2009.

Figure 8

Areas eligible for support for the improvement of Regional Economic Structures, 2007–2013

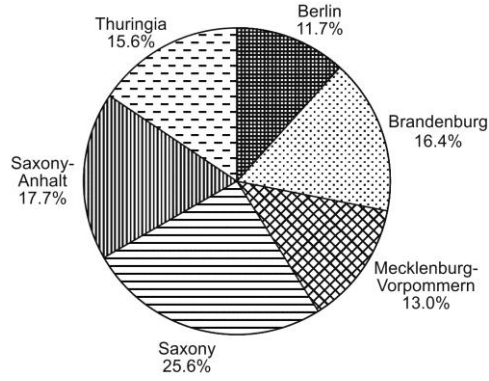


Key: 1 – Eligible area type 'A', regions with the lowest economic performance; 2 – Regions listed among eligible area type 'A' due to their statistical features; 3 – Eligible area type 'C', economically weak regions with a higher performance than type 'A' (in old provinces); 4 –Small-sized (urban/micro-regional) areas in category 'C'; 5 – Eligible area type 'D', rural areas receiving limited support (in old provinces); 6 – Small-sized (urban/micro-regional) areas in category 'D'; 7 – Eligible area under category 'C', and 'D'; 8 – Non-eligible areas.

Source: Deutscher Bundestag 2009. 173. p.

Figure 9

The regional distribution of support for economic restructuring in the new Länder, 1991–2010



Source: Author's construction based on data from Deutscher Bundestag 2009.

A major public financial package promoting eastern cohesion consists of social services (unemployment benefits, pensions, health insurance). The primary objective of these services is clearly not the equalisation or levelling-up of regional living standards. The positive balance of payments collected and transfers to wealthier regions can be diverted to poorer regions to compensate for their missing sources of income. For instance, an annual €8 billion were spent on unemployment insurance in the eastern provinces in 2003, whilst they spent €18.5 billion on unemployment benefit payments. The margin is covered by Federal funds. The unemployment insurance collected in the six new provinces comprises 17 percent of the national total whilst the benefits allocated there amount to 33 percent. The same level of compensation can be seen in the field of pensions (*Eltges–Strubelt,* 2010; *Rosenfeld,* 2010).

Financial resources transferred to the eastern *Länder* by the German government and the European Union are primarily in the domain of social welfare and health care services and are targeted at raising wages and pensions and improving the overall income position of the population. In the GDR wage costs in the manufacturing industry constituted 7 percent of the West German average at the end of the 1980s reaching already 70 percent by the end of the decade post-unification. Over 60 percent of the funding was devoted to causes with a direct impact on living standards. In light of the eastern solidarity contract the annual contribution of the federation to the budget of the provinces is 25 billion euros. Besides direct subventions, various tax reliefs are used to foster the development of infrastructure. Eastern provinces received approximately 750 billion euros support during the decade post-unification. This transfer of an annual 80 billion

euros contributes to the East German GDP with 30 percent and amounts to nearly 4 percent of the GDP of western Länder (*Blum–Ragnitz–Freye* et al. 2009).

It is becoming increasingly evident that other activities promoting the augmentation of regional income levels will be required in the future utilisation of financial transfers. Regarding the spatial distribution and quantity of modern forces of spatial development, the eastern part of the country still shows a rather unfavourable picture compared with former provinces. With respect to two significant factors of the new European growth path – modern industry and research and development – this region shows considerable backwardness.

7 Two driving forces of sustainable development: industry and R&D

Industry was touched most severely by the economic transformation of the highly industrialised East Germany. Its weight decreased significantly both in terms of the labour market and of income generation. There were fundamental changes both in the size of companies and in their ownership. In 1989 the proportion of employment in industry was above 45 percent in the federal states of Saxony-Anhalt, Saxony and Thuringia. In 2009, however, this index was above 30 percent only in Saxony and Thuringia. The role of industry in the income-generating capacity of regions, in strengthening competitiveness and in spreading technological innovation is still hugely decisive. In their absence, growth is considerably slower in weakly industrialised regions and the opportunities for convergence are much less favourable. The privatisation of East German enterprises was carried out by the German Property Agency (Treuhand). By the end of 1994, 6,400 companies had been bought by private investors and 1,600 were re-privatised, 300 companies had become the property of the local community and 3,700 firms were closed down (*Stack*, 1997). The era of reindustrialisation began in 1994 in the new Länder. The main driving forces of the process were West German investors and foreign direct capital. The West German business world did not show much interest, only one-tenth of East German companies being set up by West German firms. Certain parts of the old, large companies were privatised, and SMEs were established. The large company sector is totally lacking, and only 4 percent of German firms employing over 1,000 employees (30 firms) are located in the east (*Ragnitz*, 2005).

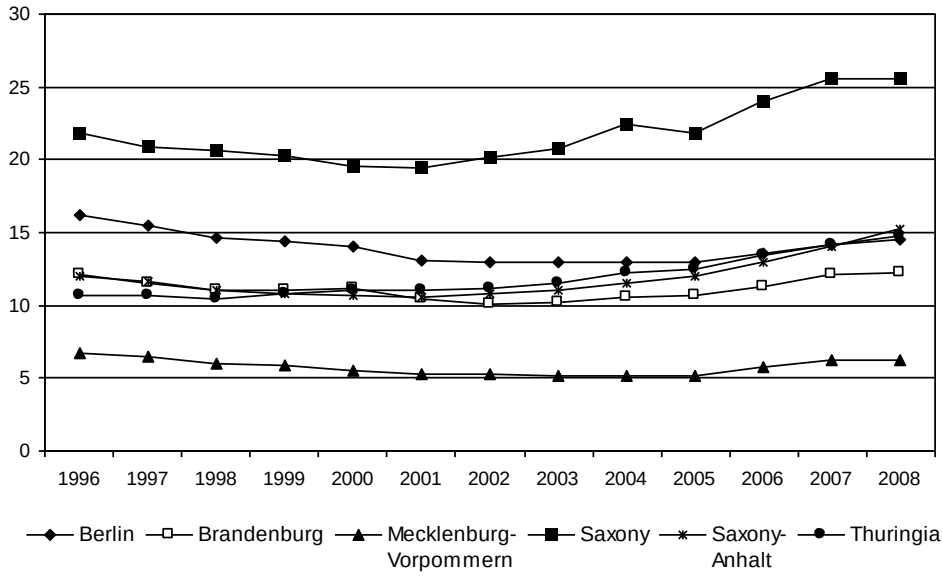
Sister companies perform almost exclusively production tasks, activities with a high added value remaining with the parent companies. Applying this periphery model has hindered the growth of productivity from the very beginning since the manufacture of new products and the use of the latest technological processes has

remained solidly with companies in the west. Furthermore, the site industry has had a negative impact on the professional structure of labour, there being much less demand for highly qualified manufacturing experts (*Ragnitz,* 2009). At the same time, it is worth noting that, with respect to employment in high technology sectors, eastern and western provinces do not show many serious differences. Thuringia led the ranking order of German states in 2007 (11.7 percent), followed by Hesse (10.2 percent) and Saxony (10.0 percent).

Clearly the economic stabilisation impact of industry is a highly positive factor. During the 12 years following the development of the new East German industrial structure from 1996, the added value of industry rose by 17–38 percent in three southern provinces with a traditional industrial structure (Saxony, Saxony-Anhalt and Thuringia), whilst it stagnated in Brandenburg and declined in Berlin and Mecklenburg-Vorpommern *(Figure 10).* In provinces with an adequate industrial base, production rates increased by an annual 2.5–3.5 percent until 2007.

Figure 10

The evolution of industrial added value in East German provinces, 1996–2008, €m, current prices



Source: Author's construction based on http://epp.eurostat.ec.europa.eu.

Despite the unarguably positive evolution of income generation and labour productivity, serious structural weaknesses prevail in East German industry. Its structure is incompatible with the requirements of sustainable development. Industry in the new provinces mainly specialises in labour-intensive sectors, and production functions dominate. Technology-intensive sectors with higher development potential are under-represented in the industry of these regions. Their export potential lags behind that of West German industry; and R&D capacities are (*Heimpold,* 2010).

The quantity, structure and spatial distribution of *research and development* capacities constitutes the other major element of sustainable development, and by the end of the 1980s, the number of employees in R&D stood close to 100 thousand The large companies also operated research institutions, 24 thousand employees were employed in the 59 research institutes of the Academy of Sciences of the GDR and a significant number of research institutes operated under the control of ministries. The role of the higher education sector in the GDR was much more modest, with the 9 universities and a small number of colleges of technology carrying out research. Higher education in East Germany in the pre-1990 era did not consider research to be among its priorities and the size structure of higher education also posed obstacles to research: in 22 out of the 45 specialist institutions, the number of students was below 1,000 (*Hüfner,* 2002).

Re-unification produced substantial changes in the East German higher education system and in the research network. The number of higher education institutions doubled and that of universities increased fivefold – with the result that there are now 43 universities in the higher education system of eastern *Länder.* One part of the institutional network of the Academy of Sciences was closed and the remainder placed under the control of a new research management body, whilst most company research units disappeared. Research became a priority in higher education (*Krull*, 1991; Bundesministerium für Bildung und Forschung, 2011). As a result of this reorganisation, the number of R&D employees declined by one-third. Currently, East German R&D indices considerably lag behind the national average *(Table 9).* The dominance of Berlin is due to the simple fact that Berlin once more became the capital of the whole re-united country, and so it no longer makes sense to look at the concentration of functions in Berlin as part of the eastern territory of the country.

The operation of the new research network is the responsibility of four research associations and societies (the Fraunhofer-Gesellschaft, the Max-Planck-Gesellschaft, the Leibniz-Gemeinschaft and the Helmholz-Gemeinschaft). These four research organizations maintain altogether 89 research institutes employing 18,600 people in the East German Länder. Even though this figure is only three quarters of that of the former Academy of Sciences, the number of institutes shows a significant increase. The majority of these (38) are operated by the

Leibniz Gemeinschaft, 42 percent of whose research staff are located in the East German federal states. The other three institutions control lower numbers (19 percent, 21 percent and 14 percent respectively).

Table 9

Major R&D indices in the East German states, 2007

	R&D expenditure as % of GDP	Sectoral distribution of R&D expenditure, %			Number of employees, '000s
		Business	Government	Higher education	
Berlin	3.3	1.4	1.1	0.8	25.7
Brandenburg	1.2	0.3	0.6	0.3	6.6
Mecklenburg-Vorpommern	1.3	0.4	0.5	0.4	4.6
Saxony	2.6	1.3	0.7	0.6	23.2
Saxony-Anhalt	1.1	0.3	0.4	0.4	6.4
Thuringia	1.8	0.9	0.4	0.5	9.7
Germany	2.5	1.8	0.3	0.4	506.5

Source: Author's construction based on http://epp.eurostat.ec.europa.eu.

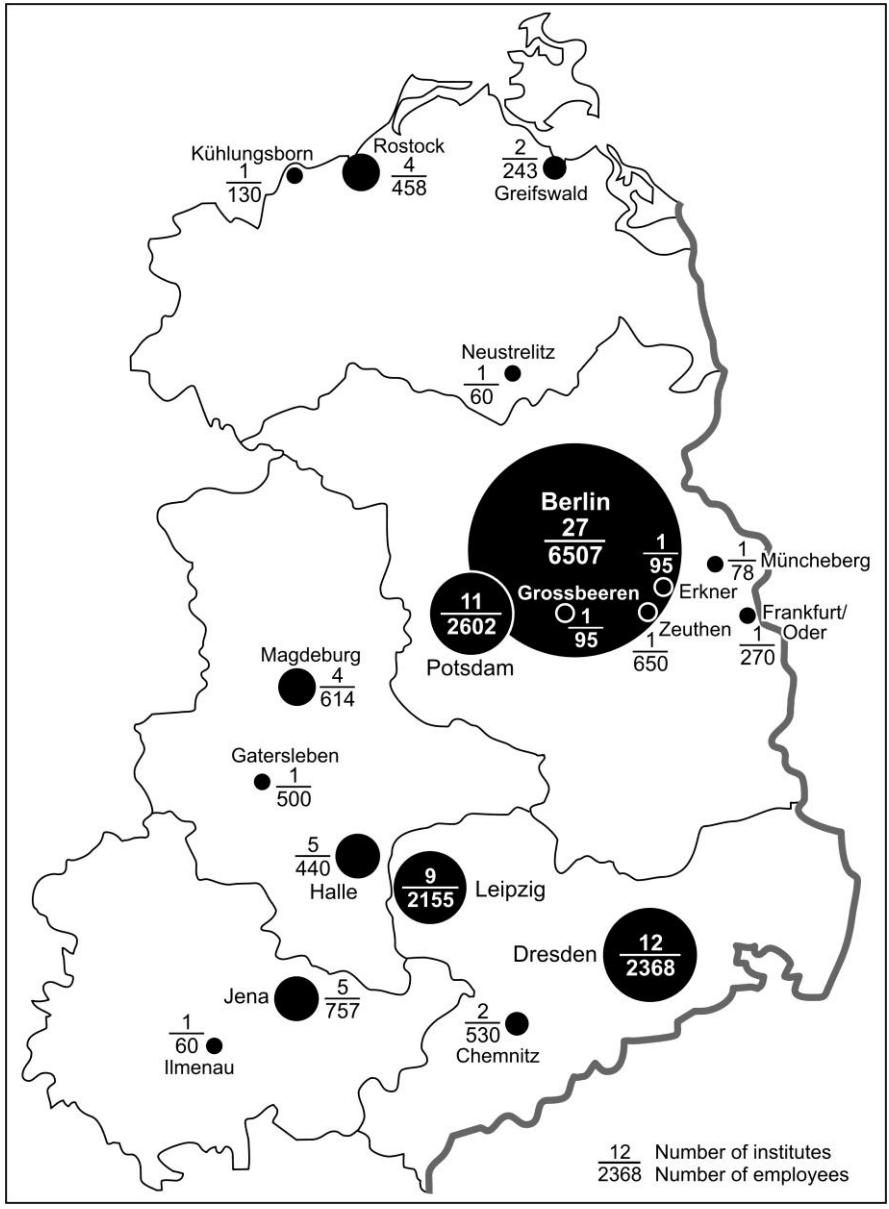
The changes, however, had a negative impact on the spatial structure of higher education, the weight of Berlin increasing (due to the re-emergence of Berlin as national capital). Currently, 32 percent of the higher education institutions and 35 percent of the employees in non-university research establishments are concentrated in the capital *(Figure 11).* The second most important research centre of East Germany is Potsdam, where 2,600 researchers are employed in 11 institutes. Dresden ranks third with 2,400 employees in 12 establishments.

Per capita R&D expenditure in East Germany showed a gradual increase from the mid-1990s until 2001, after which it declined somewhat and then stagnated. In 1991 the amount was only €200, but by 2007 it showed a 2.5-fold increase, reaching €458. For the sake of comparison, old western federal states showed a 50 percent growth rate during this period. In 1991 per capita R&D expenditure was already €814 and by 2007 it had reached €1223. Research intensity in the business sector was much higher in Western Germany than in the eastern areas, but this is due to structural differences. The eastern *Länder* were mainly home to SMEs and to large companies with HQ located elsewhere. In the latter cases, R&D of any strategic significance was carried out at company headquarters.

East German economic restructuring and cohesion were characterised by a high degree of the exploitation of innovation. Innovative activities won new markets in both East and West Germany, although the innovative propensity of the private sector is significantly lower in the new provinces than in West Germany.

Figure 11

Regional distribution of research institutes supported by the government, 2010



Source: Author's design based on web pages of the Fraunhofer-Gesellschaft, the Max Planck-Gesellschaft, the Leibniz-Gemeinschaft and the Helmholz-Gemeinschaft.

An examination of data from the individual states reveals that the expenditure of the business sector reaches 50 percent of whole R&D expenditure in Saxony and Thuringia. This implies that the development of R&D activities in the business sector is in harmony with the development of the public research infrastructure which was successful in stabilising the research potential in the new provinces. This evolution can be seen in the gradual rise in the number of researchers. Technological innovation would contribute to the cohesion of East Germany by providing new and permanent positions for companies in regional and international markets.

8 Conclusion

Several general and unique features can be registered in the development problems and assets of the backward East German macro-region. If we compare these characteristic features of the regional development with specialities of Italian South, it can be stated that measures taken in order to ameliorate the backwardness, the central control of income and consumption, subsidies and the inadequate support of productive activities can be regarded as shortcomings of the cohesion policy applied in both countries. Although the qualification level of the East German labour force is much higher than of Southern Italy, these macro-regions are significantly lagging behind the developed areas of their respective countries. It is reasonable to conclude that the productivity gap is not so much due to the low qualification level of the labour force, but to a lack of business culture and a weak infrastructure. As a result of cohesion policy there is more evidence of convergence in welfare sectors than in the evolution of the GDP index. This was witnessed in Italy until the mid-1970s and in Germany until 1997.

The underlying reasons behind most disparities are rooted in the regional development history of the respective countries. The metropolitan network has always played an important role in the transformation of German regions throughout centuries. German metropolises continuously renewed the strong positions which they had obtained in regional organisation and the spread of innovation during the era of the industrial revolution, and successfully retained control according to modern paradigms of spatial development. Consequently, the revitalisation of East German territories was more spectacular following reunification than the Italian Mezzogiorno. According to most prognoses made at the beginning of the 1990s, the economic performance of East German Länder would reach 60 percent of the German average in a period of forty years, but in 2007 i.e. at the halfway mark in the time span of the prognosis, GDP per capita in the eastern states was already 74.2 percent of the national average.

The development history of Germany provides another useful lesson in the regional development of industry. Since the end of the 19th century, industrialisation (manufacturing industry and industry-related services) has played the major role in the evolution of the spatial structure. The institutionalisation of the decentralised organisation of industry was a prerequisite for strengthening regional autonomy. There was only one period in the development history of Germany, the decade-plus era of the Third Reich, when economic policy refrained from using this development potential. On the available historical evidence of the effective operation of cooperative mechanisms of action of institutional, sectoral and inter-settlement interactions, the development path of the new German states cannot be considered analogous with the Mezzogiorno phenomenon.

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