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THE ECONOMIC INTEGRATION OF EAST GERMANY

25 years after the fall of the Berlin Wall

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25 YEARS AFTER THE FALL OF THE BERLIN WALL:

THE ECONOMIC INTEGRATION OF EAST GERMANY

Citizens of the German Democratic Republic (GDR) regained their civil liberties when the Berlin Wall fell 25 years ago. Since then, they have been able to travel freely and have been free to choose where to live and work. The fall of the Berlin Wall was quickly followed by preparations for German Unification at a speed unparalleled in history: the first free Volkskammer elections on 18 March 1990, the economic, monetary and social union on 1 July 1990, and finally, the unification of Germany when the GDR was included in the jurisdiction of the Basic Law of the Federal Republic of Germany. The integration of the economies of East and West Germany, however, has proven to be a drawn-out process.[1]

MOBILITY OF WORK AND CAPITAL: SWIFT INITIAL SUCCESS …

Migration between East and West almost balanced

After the Wall fell, many people in the West had better professional opportunities than in the East. Though there was no mass migration of millions of people within a few months, as feared would be the case, a net figure of 1.9 million people left East Germany between 1990 and 2013 (FIG. 1). In the years after the turn of the millennium, net migration to the West declined, and lately there has even been a small gain in internal migration for the East (including Berlin). Population development in the East has been shaped in past years by the negative natural net population balance and the positive migration balance with foreign countries and, in fact, has less to do with the internal migration between East and West (FIG. 2).

Industrial production in East Germany is more capital intensive than in West Germany

Conversely, net capital flowed eastwards – also thanks in part to extensive subsidies. Investment per worker was 30 percent higher in East Germany than in West Germany in the first ten years after the German Unification (FIG. 3). After the fall of the Wall, East Germany had caught up massively in terms of capital resources; however, capital stock was still lower than in the West. Capital resources per worker were around 90% of West German levels in 2011 (FIG. 4). Manufacturing industries in East Germany, however, use considerably more capital to produce their products and services than in West Germany.

Ailing GDR factory hall.

The modernisation of capital stock in the corporate sector allowed productivity to shoot up, at least in the first half of the 1990s. State-of-the-art newly built plants required a much smaller labour force thanks to modern equipment. Many who had been forced to work in maintenance and repair in state-owned firms in order to keep worn-out equipment provisionally running, were no longer needed.

Modern chemical park on the territory of the former Leunawerke.

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The modernisation of capital enabled economic performance per capita and productivity, which was only two-fifths of West German levels at the beginning, to increase rapidly in the first half of the 1990s (FIG. 5). However, higher productivity went hand in hand with employee lay-offs. As a result, unemployment increased rapidly in East Germany in the 1990s and rose above 20% by the mid-2000s. After this, employment levels rose and the demographic change led to a decrease in labour force potential. As a result, the rate of unemployment in the East markedly decreased, and the gap between East and West narrowed in terms of unemployment (FIG. 6).

… THAT LATER REVERTED TO STAGNATION IN THE CONVERGENCE PROCESS IN EAST GERMANY

Starting in the mid-1990s, the speed of the convergence process levelled off considerably in terms of overall growth and productivity, and in the 2000s, there was little change in the gap between East and West in terms of these parameters. In 2013, the per capita gross domestic product was 70%, and productivity was nearly 80%, of West German levels (FIG. 5). The fact that the convergence process slowed down, and later more or less stagnated, is not surprising from the point of view of economic theory. Economic convergence in the initial years after the Unification was comparatively vigorous. East Germany caught up to West Germany faster than international and historical comparisons had led us to expect.

Full convergence will not necessarily take place

A complete convergence does not have to necessarily take place. When regions have very different drivers behind their economic progress, for example different resources concerning research and development, this can lead to permanent differences in the growth paths of better-equipped and more poorly equipped regions. These differences are highlighted when regions have different potentials for achieving economies of scale.

PERSISTENT STRUCTURAL WEAKNESSES IN EAST GERMANY

Main structural shortcomings: small size of firms and lack of headquarters

In comparison to West Germany, East Germany has considerable structural weaknesses even 25 years after the fall of the Wall.[II] One key issue is that the firms are much smaller, in other words, on average only half as large as their West German counterparts (FIG. 7). Of the 500 firms on the newspaper DIE WELT's list of 500 largest firms, only 34 have headquarters in the new federal states (FIG. 8). The headquarters of the vast majority, 466, are in West Germany. Smaller firm size and a lack of headquarters, where research and development (R&D) is predominantly located, are reflected in further structural weaknesses in the new federal states.[III] A lot less investment is made in research and

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development in East Germany's corporate sector in relation to gross domestic product than in the economically stronger West German states (FIG. 9).[IV] More than 50% of R&D expenditure comes from the corporate sector in Baden-Württemberg, Bavaria and Hesse. In contrast, the public sector (universities, non-university research institutes) contributes to far more than 50% of the total R&D expenditure in the East. The research intensity of Saxony is most notable, where the

Technische Universität Dresden.

proportion of public and private R&D expenditure, taken as a whole, is already higher than the federal average and close to the politically established target of 3% in relation to the gross domestic product.

R&D weakness in the East German corporate sector can be traced back to economic structures. A large number of corporate headquarters with the corresponding strategic corporate functions and a higher number of technology-intensive sectors would lead to higher R&D intensity in Eastern Germany. New products and processes, however, can be introduced even if a firm does not carry out its own R&D activities. Even though firms in the new federal states spend less on R&D, according to the survey results of the IAB Establishment Panel, the frequency with which East German firms launch novel products on the market and implement process innovation differs little to their West German competitors (FIG. 10). This can be explained by the fact that many East German firms belong to corporate groups, and the R&D activities are carried out in the parent firms in West Germany or abroad, or in other firms outside of East Germany. This technology is then transferred to the East German subsidiaries.[V] The fact that firms in East Germany are on average smaller than their West German counterparts has further negative consequences. They have a harder time entering international markets than larger firms as a result of a lack of capital reserves and limited management capacities.[VI] The ranking of export quotas of industries in the German states is nearly identical to the ranking of the average size of industrial firms based on employment (FIG. 11).

FROM DE-INDUSTRIALISATION TO RE-INDUSTRIALISATION

The fact that there was no mass migration after the fall of the Berlin Wall was certainly the result of the political course set in the spring of 1990.

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This course moved irreversibly towards German Unification, and the introduction of the Deutsch Mark in East Germany was one milestone along the way. The politically motivated exchange rate of 1 to 1 for wages and other current payments, and the subsequent jump in wage rates were, however, not beneficial for industrial

GDR citizens queuing up for changing GDR marks into DM.

companies in East Germany as they were experiencing excessive numbers of employees, lower productivity and collapsed markets. The result was a loss in price competitiveness. A rapid de-industrialisation began; the number of industrial employees decreased by two-thirds in just a short period of time. This is only partially visible in macroeconomic figures because most of the reduction in employment occurred before 1991.

However, since the mid-1990s, there has been a re-industrialisation, at least in terms of value creation.[VII] The number of industrial employees rose only slightly after the end of the de-industrialisation period (FIG. 12). Growth rates for value creation in industry (manufacturing) were higher than the macro-economic growth rates for most years subsequent to 1995, i. e. the sector acted as a growth engine (FIG. 13). At the same time, the construction sector became less important. Nevertheless, industry in Eastern Germany is less important for total economic value creation in East Germany than in West Germany even a quarter century after the fall of the Wall. While industry contributes around 15% to value creation in the East, this figure amounts to 23% in the West (FIG. 14). Today, industrial productivity per worker in the new federal states is only 71% of West German levels.

Revival of East Germany's manufacturing sector

The fact that industry has gained a foothold in East Germany is ultimately the result of wage developments. Industrial unit labour costs were higher in East Germany by the end of the 1990s than in West Germany. It wasn't until later that they fell below West German levels, thus strengthening the competitiveness of East German industry. Recently, unit labour costs have become more and more equalised between East and West Germany (FIG. 15). Improvements in unit labour costs also laid the foundation for East German industry to break even around the turn of the millennium.[VIII]

Despite all of the progress: Industrial companies in East Germany still sell the

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majority of their products and services on domestic markets.[IX] These were the findings of the IAB Establishment Panel. In 2012, East German companies generated 32% of their turnover in the new federal states, 37% in the old federal states and 30% abroad (FIG. 16). Nonetheless, East German industry was able to gain ground in terms of exports, as the percentage of foreign sales was only 18% in 2000.

RELATIVELY SLIGHT DIFFERENCES BETWEEN EAST GERMAN STATES

Berlin has overcome its weak growth performance

The differences between the East German states are relatively slight in terms of economic performance per capita (FIG. 17) and have even become smaller for the most part over time. The state with the highest economic output per capita in East Germany is Saxony (24,226 euros), and the state with the lowest is Mecklenburg-Vorpommern (22,817 euros). The differences between the states in West Germany are greater, with economic performance ranging from 38,490 euros per capita in Hesse to 27,684 euros per capita in Schleswig-Holstein. Berlin has overcome its initial weakness in growth and, since 2005, has been growing at a much more dynamic rate than the other East German states (FIG. 18).

EAST GERMANY'S TRANSFER DEPENDENCY HAS DECREASED CONSIDERABLY – HOWEVER, IT STILL REMAINS

Dependency on fiscal transfers continues

The persisting gap in productivity is connected with the fact that more is consumed than produced in East Germany. East Germany displays a negative trade balance for goods and services (FIG. 19). At the beginning, consumer demand in East Germany (including Berlin) exceeded production by nearly 50%; this figure has dropped to around 12%. This deficit is primarily financed by income that East German commuters earn in the West, and through transfers within the framework of the statutory pension insurance. These income streams allow the available income of private households in the new federal states, including Berlin, to reach 83% of West German levels, even though the gross domestic product per capita is only 71% of Western levels.[X]

EAST GERMANY'S PROSPECTS ARE CLOUDED BY DECLINES IN LABOUR FORCE POTENTIAL

Gap in terms of GDP per capita might slightly grow

Just as worn-out real capital was the most obvious shortcoming in East Germany in the early 1990s, the labour force may prove to be the bottleneck in the future. This is the result of the demographic change. The labour force potential in East Germany decreased

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between 1991 and 2013 by around 2.3 million, i. e. 21%, while it rose in West Germany by around 2.5 million or nearly 6% (FIG. 20). This is reflected in job vacancies, particularly in small East German businesses (FIG. 21). This is the result of decreases in the number of births, migration, and an ageing population in East Germany. The consequences may be profound as an IWH growth projection, published in the year 2012, shows.[XI] Demographic change, which will have a greater impact in East Germany than in West Germany, might lead to a long-term lowering of the ratio between labour volumes and population numbers in East Germany. The further convergence of labour productivity between East and West Germany, one component of the projection, is insufficient in offsetting the negative effects of demographic change (FIG. 22) so that further convergence in production per capita is scarcely expected.

THE INTERNATIONAL VIEW

Compared to other post-transition economies, East Germany has developed well

East Germany's persisting deficits in economic performance and productivity, when compared to West German levels, should not hide the fact that it has a respectable track record when compared with neighbouring Central and Eastern European regions. This is mostly because of the massive support it received from the West – help which the other transformation economies did not receive to the same extent. The gap in productivity between East and West German states remains at 20 percent; that between West Germany and the eleven Central and Eastern European EU member states is still around 60 percent when current prices are compared. According to this calculation, even the Czech Republic is 57 percent behind Western levels (FIG. 23). When differences in purchasing power are taken into consideration, differences in per capita GDP are much lower in the case of the Czech Republic (FIG. 24). Germany on the whole, which was regarded for a long time as the "sick man of Europe", seems to have overcome its weaknesses. This can be seen in price competitiveness, which has improved considerably since the mid-1990s (FIG. 25).

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FIGURES

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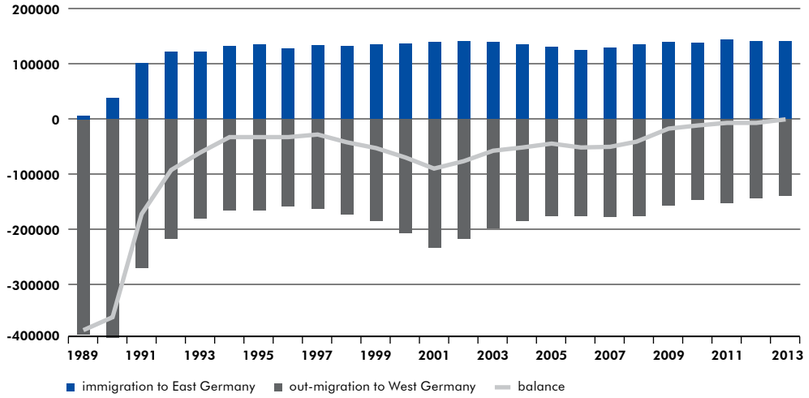
FIGURE 1

EAST WEST MIGRATION IN GERMANY: OUTMIGRATION HAS DECREASED WHILE IMMIGRATION HAS MARGINALLY GONE UP

Out-migration from East[A] to West Germany, in-migration from West to East Germany[A], net migration balance, 1989-2013



Source: Federal Statistical Office, Wiesbaden 2014, calculations and diagram by IWH.

Since 1989, almost five million people migrated from East Germany (including Berlin) to West Germany. The net loss accumulated up to 1.9 million people. In recent years, outmigration peaked off while migration flows from west to east slightly increased. In 2012, the migration balance was almost zero and in 2013, the migration balance was even positive – for the first time since 1989. Net migration from East Germany excluding Berlin to West Germany is, however, still slightly negative. The decreasing negative migration balance to a large extent results from the improvement of the labor market performance. The unemployment rate went down considerably.

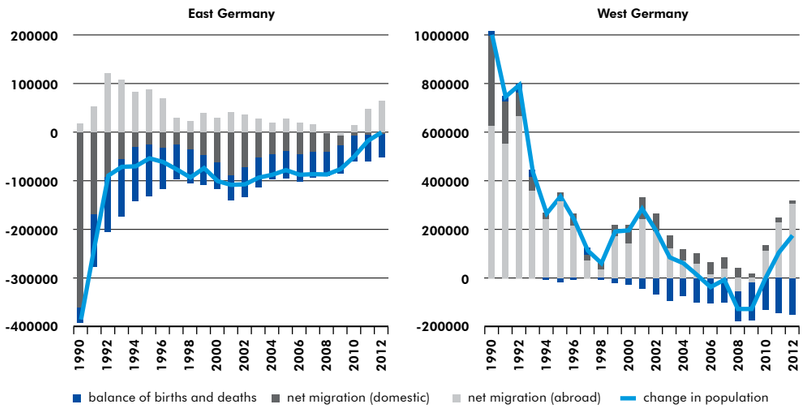
Contact: *Walter Hyll*

[A] East Germany including Berlin.

FIGURE 2

DEMOGRAPHIC CHANGE IN EAST GERMANY: POSITIVE BALANCE OF IMMIGRATION FROM ABROAD COMPENSATES FOR NEGATIVE BALANCE OF BIRTHS AND DEATHS

Demographic change in East Germany and West Germany 1990-2012 and its sources



Source: Federal Statistical Office, Wiesbaden, several editions of population statistics and birth statistics.

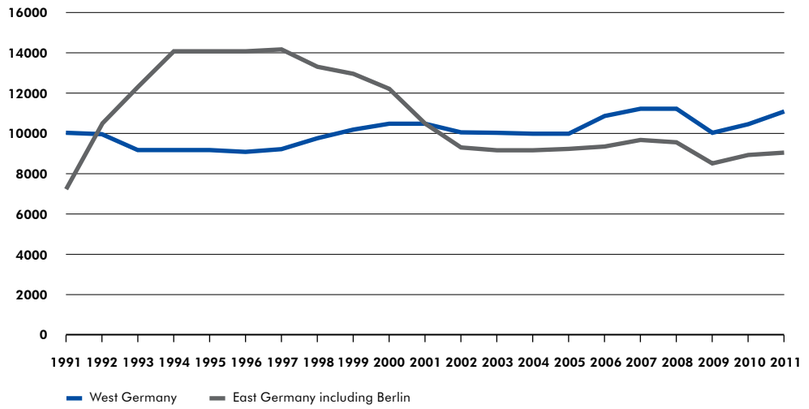
The population in East Germany has strongly decreased, but in 2012, this decline has come to a temporary halt. Population growth is generally composed of live births, deaths (which add up to the natural population change), and migration. These components affected East German's demographic development differently during the last two decades. The internal migration balance was highly negative at first, but continuously declined and has been more or less balanced in 2012. In this year, the deficit of births is more or less compensated by foreign migration inflows. The deficit of births was high after unification, but decreased by the mid nineties. This deficit has remained relatively stable thereafter, exceeding, however, pre-unification levels.

Contact: *Walter Hyll*

FIGURE 3

INVESTMENT IN FIXED ASSETS WENT DOWN IN EAST GERMANY MAINLY DUE TO DECREASING CONSTRUCTION ACTIVITY

Gross fixed capital formation per worker in East and West Germany 1991-2011, Euro, price-adjusted (2005), chain-linked



Source: Regional Accounts VGRd, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of 2013, 2014; calculations and diagram by IWH.

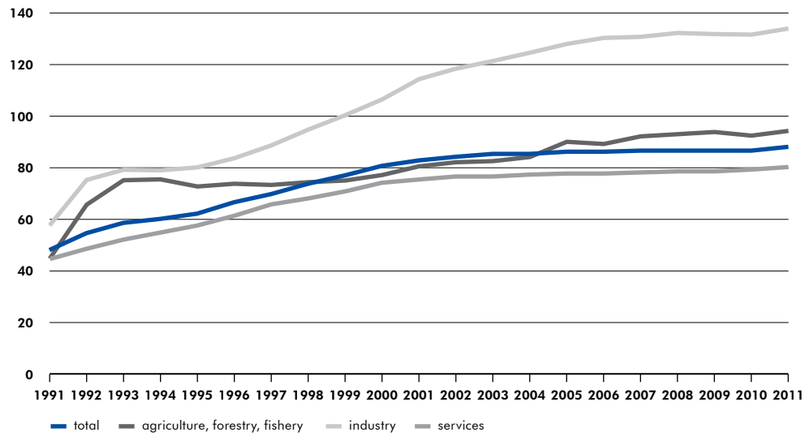
During the first years after unification, gross fixed capital formation per worker in East Germany increased strongly, remaining above the West German level until the year 2001. Since then, East German investment per worker is below the West German level. This development has mainly been driven by public and private investment in dwellings and other buildings. Whilst the investment boom of the early nineties was meant to remove the shortage of dwellings, commercial property, and infrastructure, it later declined distinctly due to oversupply. The level of investment in equipment, however, has remained relatively constant during the period considered.

Contact: *Maike Irrek*

FIGURE 4

CAPITAL STOCK PER EMPLOYEE IN EAST GERMAN INDUSTRY EXCEEDS THE WEST GERMAN LEVEL

Capital stock per employee in East Germany, West Germany = 100%, 1991-2011[A]



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of 2014, calculations and diagram by IWH.

The capital stock per worker in East Germany grew rapidly during the nineties, but slowed down afterwards. Capital intensity converged towards the West German level, but has not reached it. The relation between the capital intensity in East and West Germany differs, depending on the various economic branches. Endowment with capital in the service activities was low at the beginning, and it still does not reach more than 80 percent of the West German level in the year 2011. By contrast, the East German industry has a capital intensity that has been markedly higher than its West German counterpart since the year 1999. This is partly so because capital intensive branches such as energy are more important in East Germany. A more important cause for the high capital intensity is that economic policy highly subsidized private investment in East Germany for many years.

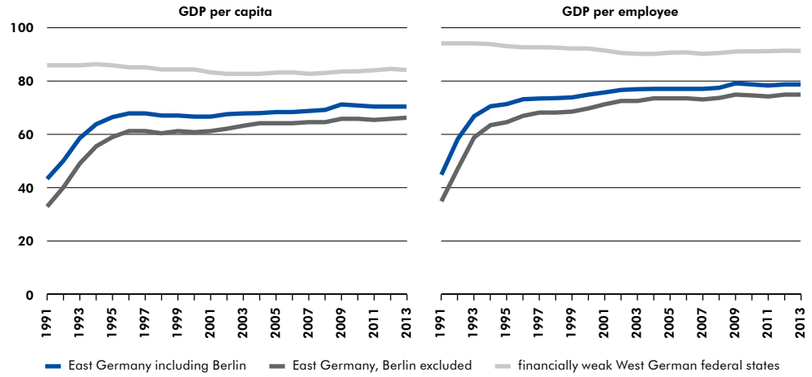
Contact: *Maike Irrek*

[A] East Germany including Berlin.

FIGURE 5

GROSS DOMESTIC PRODUCT PER CAPITA AND PRODUCTIVITY IN EAST GERMANY: A GAP PERSISTS EVEN IN COMPARISON TO STRUCTURALLY WEAK WEST GERMAN FEDERAL STATES

Gross Domestic Product (GDP), current prices, per capita and per employee, West Germany, Berlin excluded = 100%



Source: Statistical Office of the Federal State of Baden-Württemberg, Stuttgart, as of May 2014, calculations and diagram by IWH.

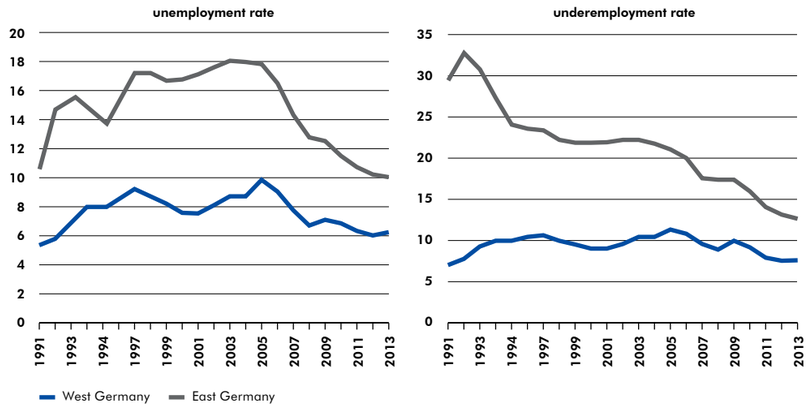
The economic development in East Germany after unification was initially fully in line with many economists' expectations: Gross Domestic Product (GDP) per capita and per employee grew rapidly in the first half of the 1990s, thanks to generous public support for the modernization of the physical capital stock. Then, catching up slowed down until 2001. Later, a modest convergence was visible again until 2009. The gap has remained more or less unchanged since 2010. Taking GDP per hours of work, a similar development pattern is visible. A considerable gap in terms of GDP per capita and per employee persists even in comparison with financially weak West German federal states.

Contact: *Gerhard Heimpold*

FIGURE 6

UNEMPLOYMENT AND UNDEREMPLOYMENT RATE IN EAST GERMANY: SIGNIFICANTLY DECLINING – BUT STILL HIGHER THAN IN WEST GERMANY

Unemployment rate[A] and underemployment rate[B] in East Germany[C] and West Germany between 1991 and 2013, in %



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014; Statistik der Bundesagentur für Arbeit, calculations and diagram by IWH.

For approximately ten years, the unemployment rate has been falling sharply in East Germany. In 2013, it amounted to 9,9%, in West Germany to 6.2%. Although the unemployment rate in East Germany is still significantly higher than in the West, the difference has dropped considerably.

The favorable development in East Germany was mainly due to two factors: First, the demand for labor has increased. Between 2005 and 2013, the number of employed persons rose by 189,000 people or 3.4% in East Germany (compared to 8.0% in West Germany:). Second, the labor force potential decreased, due to demographic developments and migration losses, significantly by 410,000 persons or 5.6%. In West Germany, it rose by 1.5 million persons or 4.2%.

However, it should be noted that the number of unemployed is strongly influenced by labor market policies. This fact can be illustrated by using the concept of underemployment, that comprises not only the number of registered unemployed, but also persons funded by labor market policies. In East Germany, the rate of underemployment decreased from 32.9% in 1992 to 12.5% in 2013. In the same year, in West Germany it amounted to 7.5%.

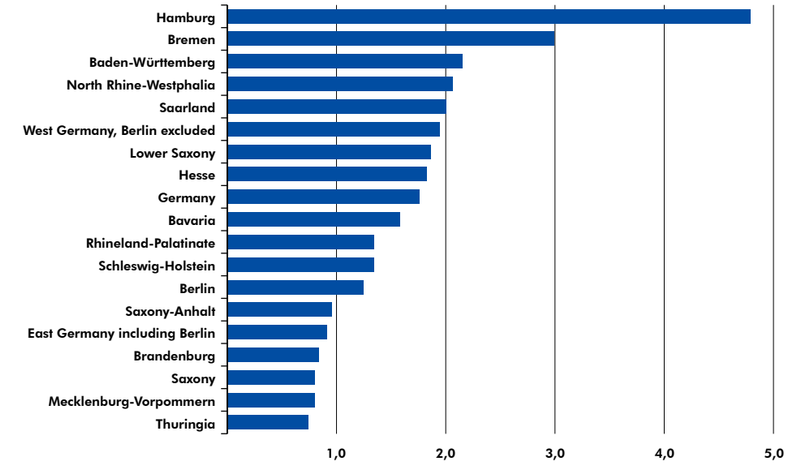
Contact: *Hans-Ulrich Brautzsch*

[A] Unemployment rate as percentages of total economically active population (definition of IWH).
[B] Underemployment rate as percentage of labor force potential (definition of IWH).
[C] East Germany, Berlin excluded.

FIGURE 7

SMALL FIRM SIZES IN EAST GERMANY

Average turnover per unit liable to turnover tax, 2012, m Euro



Source: Federal Statistical Office 2014, calculations and diagram by IWH.

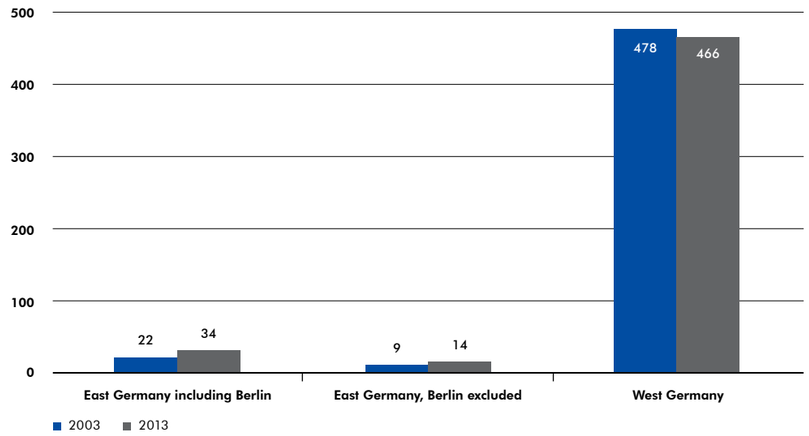
East Germany's enterprise landscape switched from large industrial trusts to small firms. The large industrial trusts which typically had a five digit number of employees could not be privatized as entire entities and were split up. Small private firms had been marginalized under the centrally planned regime for ideological reasons. East Germany faced the challenge of building up a completely new private small business sector. 25 years later, the average firm size, measured by turnover per unit liable to turnover tax, is only half of the West German firm size. This has far reaching consequences: Small firms show disadvantages in terms of productivity, they face difficulties when it comes to export activities, and they often do not conduct own research and development.

Contact: *Gerhard Heimpold*

FIGURE 8

LACK OF HEADQUARTERS IN EAST GERMANY: A PERSISTING GAP

Regional distribution of headquarters of the TOP 500 firms in Germany based on the rankings published by DIE WELT



Source: WELT.de präsentiert die 500 größten Unternehmen in Deutschland. Stand: 29.06.2004 (electronic version); DIE WELT: Die größten 500 deutschen Unternehmen 2013 (electronic version); in individual cases assignment to federal states by IWH, calculation and diagram by IWH.

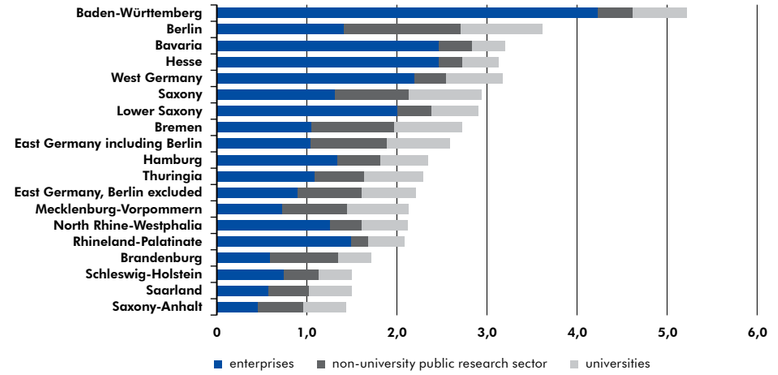
East Germany hosts only a small minority of headquarters of the TOP 500 firms in Germany. A survey published by the German Newspaper DIE WELT shows that the overwhelming majority of the TOP 500 (466) nowadays have their headquarters in West Germany. Only a minority of 34 is located in the Eastern part of the country (20 are in Berlin). The spatial pattern has not changed much since 2003. The increase in headquarters in favor of East Germany (+12) was mainly for the benefit of Berlin (+7). Obviously, once chosen a location, the probability of re-location is a very rare case. The spatial pattern has its origins to a large extent in the Cold War period after 1945. Numerous companies re-located their headquarters to the western part of Germany. Moreover, the "socialist headquarters", the large industrial trusts ("Kombinate"), were not competitive after unification. They had to be split up into smaller entities in the course of privatization. Investors were often interested in buying only the production facilities. The lack of headquarters has negative consequences, such as a lower potential for the creation of value added, lower wages and tax revenues.

Contact: *Gerhard Heimpold*

FIGURE 9

REGIONAL INNOVATION SYSTEM IN EAST GERMANY IS DIFFERENT: STRONG PUBLIC RESEARCH, BUT WEAK RESEARCH IN THE ENTERPRISE SECTOR

Share of expenditures for research and development (R&D) in Gross Domestic Product (GDP) 2012, %



Source: Federal Statistical Office, Wiesbaden 2014; Stifterverband Wissenschaftsstatistik, Essen; Regional Accounts VGRdL, calculations and diagram by IWH.

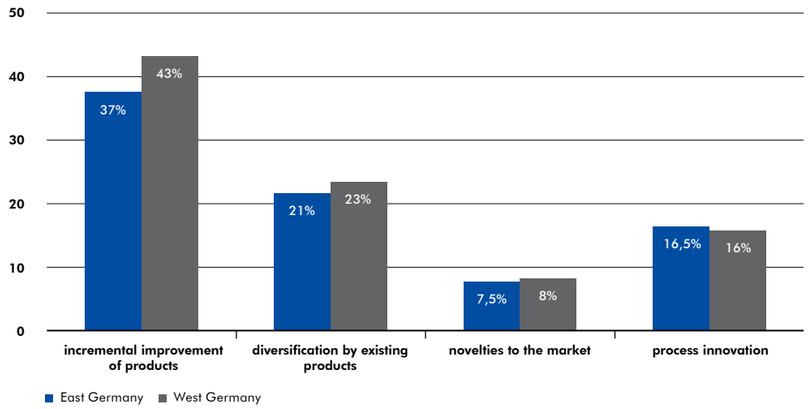
East Germany has a system for research and development that is different from that in West Germany. While enterprises in economically prospering West German states, e. g. Baden-Württemberg, Bavaria and Hesse, invest much more in R&D than the public sector does, the opposite is true for East Germany. However, the public research sector in East Germany is not strong enough to compensate fully for the less developed R&D activities of enterprises. The majority of the East German federal states and some structurally weak West German states lag behind in terms of R&D expenditures. Saxony is an exceptional case in East Germany, being very close to the politically fixed benchmark of 3% related to GDP. The well developed public research sector of the capital in mind, Berlin's leading position does not come as a surprise. There is a chance that, in the long run, the other East German regions might benefit from this hotspot of R&D.

Contact: *Gerhard Heimpold*

FIGURE 10

EAST GERMAN MANUFACTURING ENTERPRISES ARE ON A PAR WITH WEST GERMAN FIRMS WHEN IT COMES TO MARKET NOVELTIES

Proportion of manufacturing enterprises in East[A] and West Germany introducing the respective kind of innovation in 2012



Source: IAB Establishment Panel, 2013 survey, extrapolated to the basic population; calculations and diagram by IWH.

Innovations spur economic development and increase the competitiveness of firms. The share of manufacturing enterprises that undertake incremental innovation or diversify their product range by already existing products is slightly higher in West Germany than in the eastern part. However, with respect to market novelties, East German manufacturing enterprises are, however, on a par with their West German counterparts (share of 8% of all enterprises). The same is the case with the frequency of process innovations. This is the case although investment in research and development is markedly lower than in West Germany. Apparently, factories in the East quickly implement innovations that are mainly developed elsewhere.

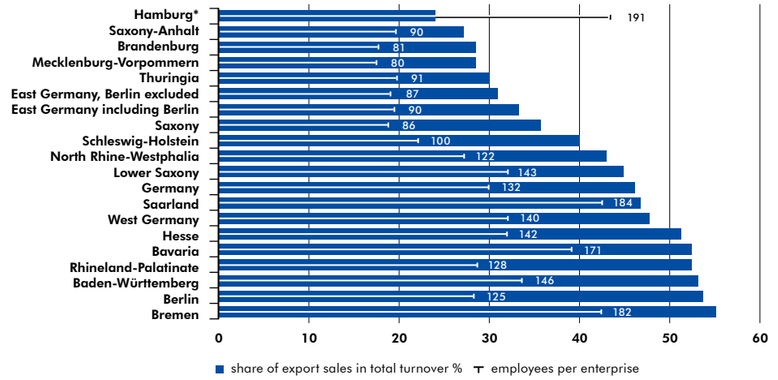
Contact: *Cornelia Lang*

[A] East Germany including Berlin.

FIGURE 11

LACK OF LARGE MANUFACTURING ENTERPRISES IN EAST GERMANY GOES ALONG WITH A LOWER EXPORT INTENSITY

Number of employees per enterprise and share of exports in total turnover for enterprises of the Manufacturing, Mining and Quarrying sectors 2013 with 20 or more employees



Source: Statistisches Bundesamt, Wiesbaden 2014, calculations and diagram by IWH.

The widespread absence of large manufacturing enterprises in East Germany goes along with a low export intensity. The share of exports in total turnover (export intensity) in manufacturing enterprises was much lower in the eastern part of Germany compared to their West German competitors (33% vs. 47%). The reason behind this becomes clear when we look at the East West gap in terms of firm size. The manufacturing enterprises located in the East German federal states are on average smaller than their western counterparts. The fact that both firm size and export intensity are low has also to do with disadvantages in small firms compared to large companies in terms of financial resources and management capacities. Reversely, the non-exporting firms cannot benefit from the positive impact of export activities, i. e. from the productivity-increasing „learning by exporting“.

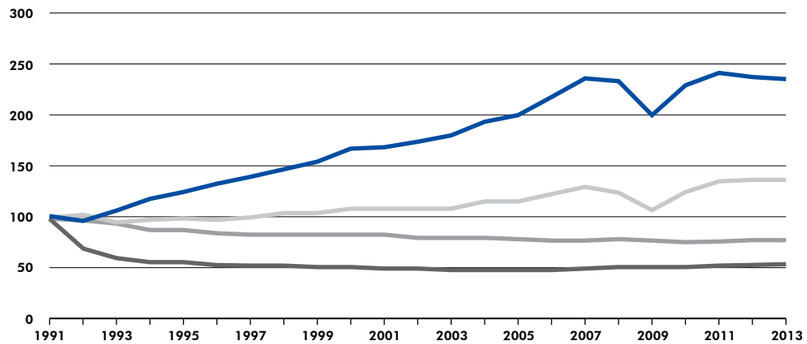
Contact: *Gerhard Heimpold*

* The exceptional situation of manufacturing enterprises in Hamburg can be explained by the low export intensity of the mineral oil sector that is important in Hamburg.

FIGURE 12

EAST GERMAN MANUFACTURING SECTOR: SIGNIFICANT INCREASE IN GROSS VALUE ADDED, WITH MORE OR LESS CONSTANT EMPLOYMENT

Changes in gross value added and employment in the manufacturing sector in East Germany[A] and West Germany between 1991 and 2013, 1991 = 100



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, as of May 2014; calculations and diagram by IWH.

The production in the East German manufacturing sector touched its bottom in 1992. With the rebuilding of competitive production capacities and the development of new products, value added in the East German manufacturing sector increased significantly. Between 1992 and 2013, value added rose by 4% on average. In contrast, West German industrial production expanded only by 1.½ % per year. However, the production level in the East after the transformation shock was particularly low. In 1991, value added per capita in the manufacturing sector amounted to 23.0% of the West German level, while in 2013, it reached 46. ½%.

Due to the slump in production and the job cuts, employment in the manufacturing sector in East Germany declined drastically until 1993. The number of employed persons was more than two-fifths below the level of 1991. Up to the middle of the last decade, employment continued to decline slightly. Thereafter, industrial employment increased moderately. In West Germany, since the early 1990s, the number of employees in manufacturing decreased steadily. In 2013, employment was a fifth below the level of 1991. In 2013, there were 63 industrial workers per 1,000 inhabitants in East Germany, compared to 95 in West Germany.

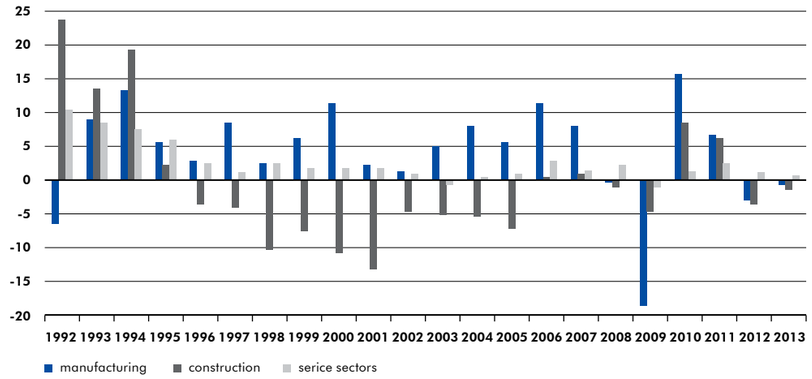
Contact: *Hans-Ulrich Brautzsch*

[A] East Germany including Berlin.

FIGURE 13

EAST GERMANY: CHANGES IN THE DRIVING FORCES OF THE ECONOMIC GROWTH

Annual rate of change in gross value added in the manufacturing, construction and service sectors in East Germany[A] between 1991 and 2013, in %, price-adjusted, chain-linked



Source: Regional Accounts VGRdL, as of May 2014, calculations and diagram by IWH.

Until 1994, in East Germany the construction industry had the highest growth rates. This sector benefited especially from government programs to modernize the infrastructure and from government support to investments in real estate. Later, construction output decreased significantly, due to high vacancy rates for residential and commercial buildings.

Production growth has been driven by manufacturing and business services from the mid-1990s. Gross value added in the East German manufacturing sector has increased considerably since 1993, albeit from very low levels. The production decline during the Great Recession (2009: -18.6%) was almost as strong as in West Germany (2009: -20.9%). The service sector has grown significantly. The highest growth rates were achieved in the first half of the 1990s, when the private service sector expanded considerably. From the second half of the 1990s, the growth rates weakened significantly.

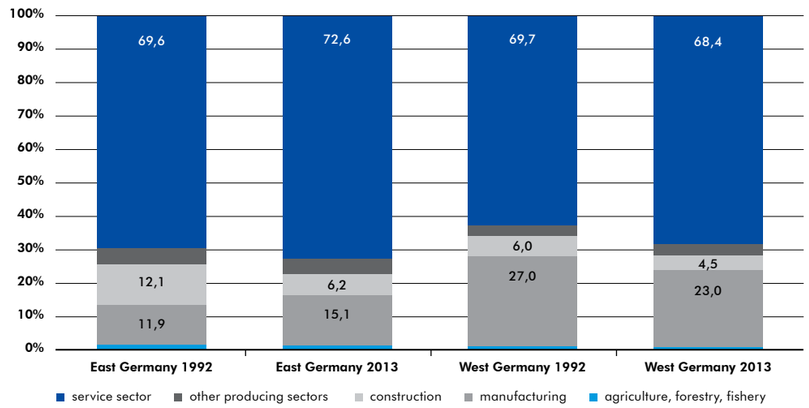
Contact: *Hans-Ulrich Brautzsch*

[A] East Germany including Berlin.

FIGURE 14

SHARE OF EAST GERMAN MANUFACTURING IN VALUE ADDED SLIGHTLY INCREASED AFTER STRONG DE-INDUSTRIALIZATION

Shares of sectors in gross value added in East Germany[A] and West Germany in 1992 and 2013, in %



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014, calculations and diagram by IWH.

In 2013, the East German manufacturing sector had a share in gross value added of 15.1%. This corresponds to a slight increase by 3.2 percentage points compared to the figure in the year 1992. In contrast, the share of West German manufacturing sector fell from 27.0% in 1992 to 23.0% in 2013. Thus, the difference between East and West Germany has reduced from 15 to 8 percentage points.

The share of construction in gross value added amounted to almost 12.1% in 1992. The importance of the construction industry has decreased significantly since the infrastructure and the housing stock are largely modernized. In 2013, the share of the construction industry amounted to only 6.2%. However, the share of construction in East Germany is still higher than in West Germany, where it was 4.5% in 2013.

In 1992 already, the share of the service sector in East Germany was higher than in West Germany. This was among others due to the very high share of the public service sector. In 2013, the share of the service sector in total gross value added in East Germany was 72.6%, which was above the West German figure (68.4%).

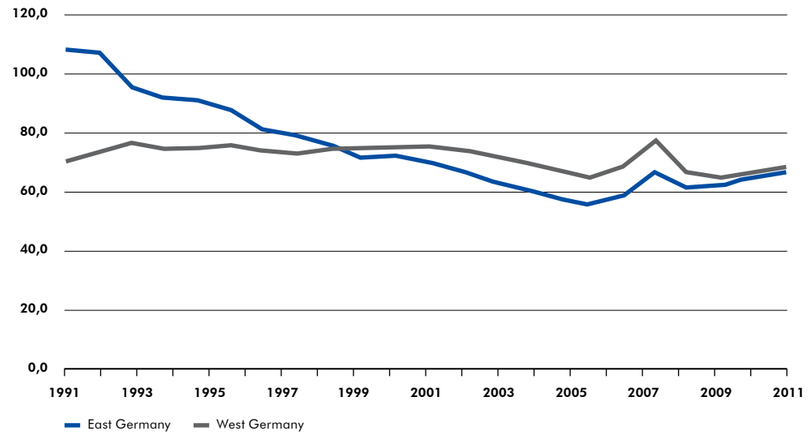
Contact: *Hans-Ulrich Brautzsch*

[A] East Germany including Berlin.

FIGURE 15

LABOR COSTS CONVERGE IN EAST AND WEST GERMAN INDUSTRIES

Unit labor costs[A] in the manufacturing sector in East Germany[B] and in West Germany between 1991 and 2013



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014, calculations and diagram by IWH.

In the early 1990s, labor costs in the East German manufacturing sector exceeded the gross value added. Until the mid-1990s, unit labor costs in the East German manufacturing sector were significantly higher than those in West Germany. Later, the gap decreased significantly. From 2000 onwards, unit labor costs in the East German manufacturing sector were lower than in West Germany.

The development of unit labor costs in East German industries is, on the one hand, attributable to the significant increase in productivity. This was only possible because private investors have built up a modern capital stock. To a large extent this has been supported by public subsidy schemes. As a consequence, the employment intensity of production has declined significantly. In the first years after unification, the decline in employment contributed to a considerable extent to the strong productivity growth in the East German manufacturing sector. Beginning in the mid-1990s, the wage development has contributed to the decline of the labor unit costs: Since then, the wage increases remained behind the productivity gains until recession started (2008/2009). One reason for the low wage growth is that the share of employees paid according to collective agreements is lower than in West Germany.

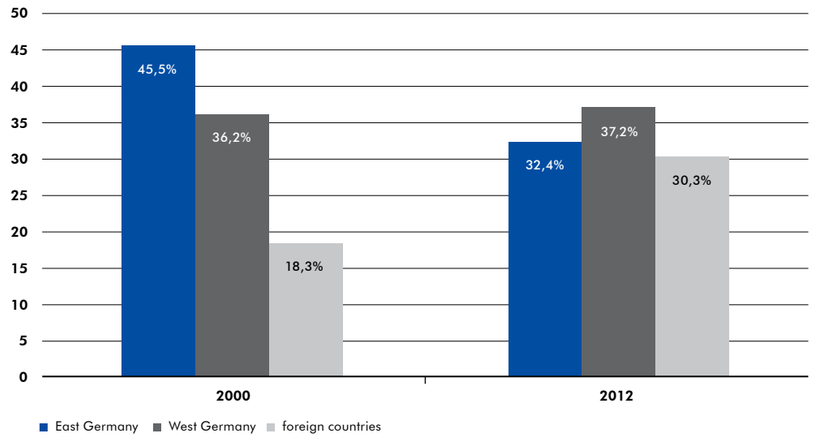
Contact: *Hans-Ulrich Brautzsch*

[A] (compensation per wage earner)/(gross value added per employee) * 100.
[B] East Germany including Berlin.

FIGURE 16

SALES OF EAST GERMAN MANUFACTURING ENTERPRISES BY REGIONS: SHARE OF FOREIGN MARKETS HAS MARKEDLY INCREASED

Share of sales areas in total sales, %, in 2000[A] and 2012[B]



Source: IAB Establishment Panel, 2001 and 2013 surveys, extrapolated to the basic population; calculations and diagram by IWH.

East German manufacturing enterprises mainly sell their products and services on the domestic market. However, in comparison with the year 2000, the share of sales on domestic markets has decreased, from 45.5% to less than a third in 2012. Accordingly, East German manufacturers succeeded in increasing their exports in recent years. The proportion of sales to foreign countries increased from 18.4% in 2000 to 30.3% in 2012. With regard to sales in West Germany, subcontracting plays an important role.

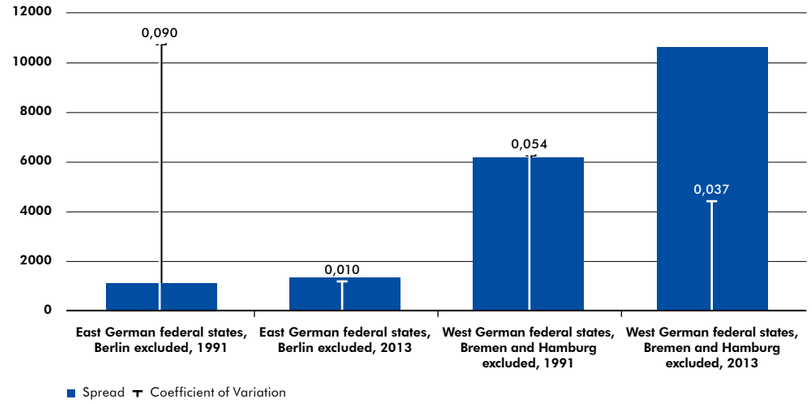
Contact: *Cornelia Lang*

[A] Enterprises in East Germany including East Berlin.
[B] Enterprises in East Germany including Berlin.

FIGURE 17

COMPARISON BETWEEN FEDERAL STATES SHOWS SIGNIFICANTLY LOWER SPATIAL DISPARITIES IN EAST GERMANY

Spatial disparities in terms of Gross Domestic Product (GDP) per capita, unadjusted prices, in East Germany and in West Germany, 1991 and 2013



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014, calculations and diagram by IWH.

Comparing the East German federal states with respect to GDP per capita, almost 25 years after the fall of the Berlin Wall, using the measure of spread, the spatial disparities in East Germany are still lower than in West Germany, and, taking the coefficient of variation, the variation has even become smaller. A certain decline in variation was also visible in West Germany, but to a lesser extent. Significant progress in terms of GDP per capita growth notwithstanding, even in Saxony, which shows the highest GDP per capita among the East German federal states, GDP per capita is lower than in Schleswig-Holstein which has the lowest value among the West German states.

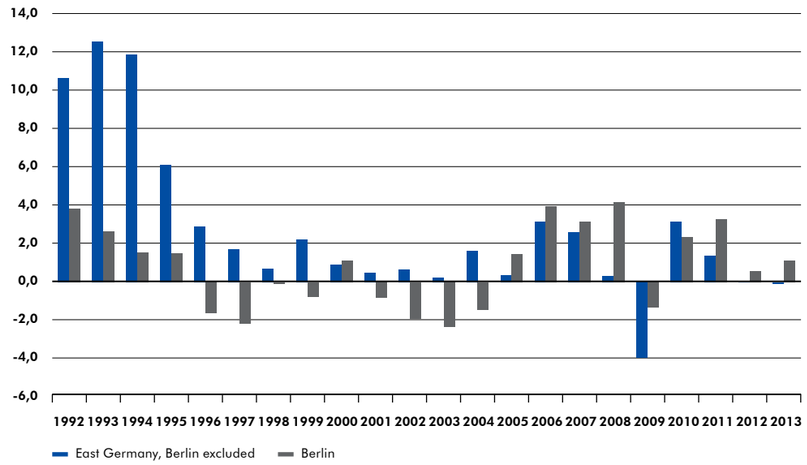
Contact: *Gerhard Heimpold*

Spread: absolute difference between maximum value and minimum value, coefficient of variation: ratio of standard deviation and mean value.

FIGURE 18

BERLIN'S ECONOMY: HEALTHY GROWTH AFTER INITIAL WEAKNESS

Gross Domestic Product, annual rate of change, price adjusted, chain linked, %



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014, diagram by IWH.

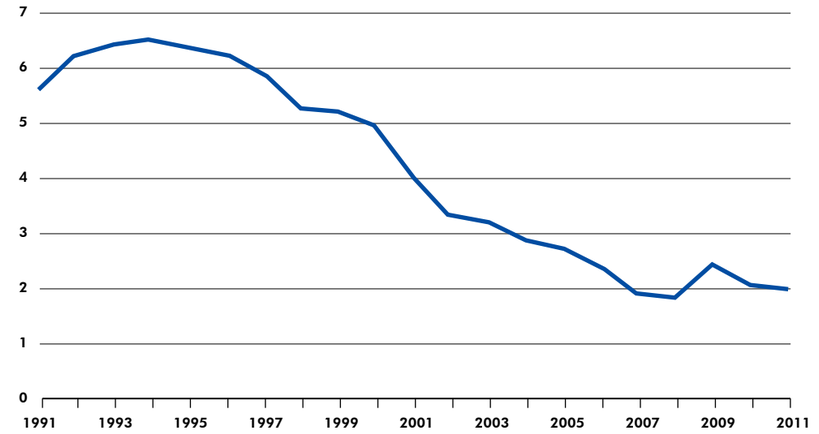
Big cities are frequently engines of growth. After the fall of the Wall, Berlin should have benefitted from strong demand-side impulses and from improved supply-side conditions because the city was no longer in an isolated position. However, Berlin's actual growth performance was disappointing over a long period. In the period from 1996 to 2004, GDP went down in almost every year. Later, however, Berlin's economy has grown faster than those of other East German federal states. Berlins weak growth performance was also existent in comparison to West Germany in the period from 1996 to 2004. Later, change rates in Berlin were partly above, partly below the western rates.

Contact: *Gerhard Heimpold*

FIGURE 19

AN INDICATOR FOR THE COSTS OF UNIFICATION

East Germany's[A] trade and service balance as a percentage of the West German Gross Domestic Product (GDP)[B]



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014; calculations and diagram by IWH.

The economic convergence process in East Germany would not have been possible without considerable transfers of resources from West Germany to the East. In the first years after unification, the aggregate demand for goods and services, i. e. the sum of private and public consumption and of gross fixed capital investment, exceeded the level of production in East Germany (including Berlin) by more than 40%. The gap between demand and production was mainly closed by fiscal transfers and by public and investment largely financed by the West German economy. The gap related to the West German Gross Domestic Product displayed in the figure indicates the economic burden for the West German economy. The East German trade deficit amounted to more than 6% of the West German GDP until the mid 1990s. Later, it went down to 2% (and to 12% relative to GDP in the East). Earnings of people living in East Germany and working in the West as well as transfers via the social security systems (the pension scheme in particular) close the gap.

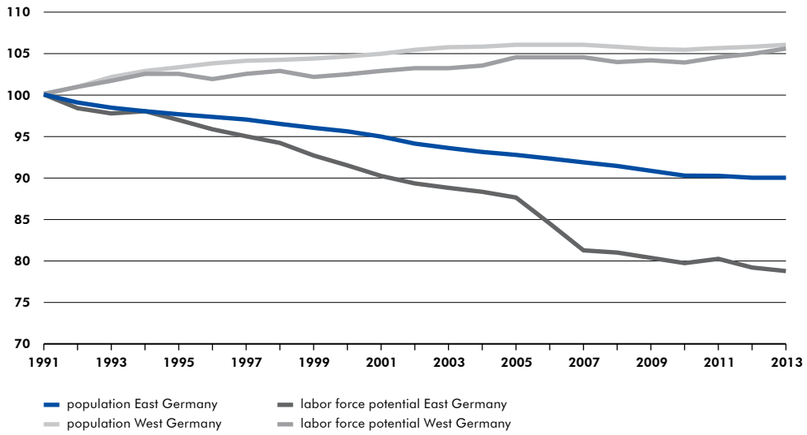
Contact: *Axel Lindner*

[A] East Germany including Berlin.
[B] West German GDP: including Berlin.

FIGURE 20

SIGNIFICANT DECLINE IN THE LABOR FORCE POTENTIAL IN EAST GERMANY

Change rate of population and labor force potential in East Germany[A] and West Germany between 1991 and 2013, 1991 = 100



Source: Regional Accounts VGRdL, Statistical Office of the Federal State of Baden-Wuerttemberg, Stuttgart, as of May 2014; Statistik der Bundesagentur für Arbeit, Arbeitsmarkt in Deutschland – Zeitreihen bis 2013, Juli 2014; IAB-Kurzbericht 18/2014, calculations and diagram by IWH.

The potential labor force includes all persons aged 15-64 years who are employed or seek for a job. It has declined continuously in East Germany since 1991. It amounted to approximately 10.7 million persons initially and decreased to 8.4 million in 2013, i. e. by 21.2%. Meanwhile, the West German labor force increased by 2.5 million people or 5.7%.

The decline in the labor force potential in East Germany is mainly due to three factors. First, the population went down by 9.9%. Both the demographic development, especially the decrease in the number of births, and the high outmigration contributed to this decline. Second, the population at working age has dropped significantly as a consequence of aging. The share of persons at working age (including all persons aged between 15 to 64 years) amounted to 67.4% in 1991, in 2012, it was only 65.6%. The third reason is that, in 2013, the participation rate, indicating the proportion between the potential labor force and the population at working age, is, with 79%, significantly lower than in 1991 (88.1%).

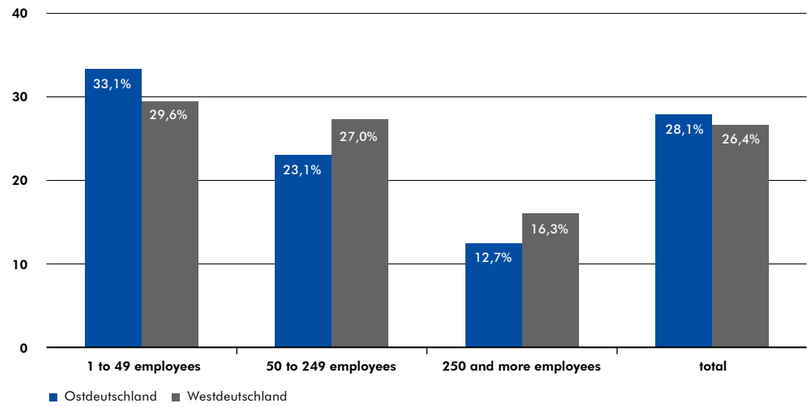
Contact: *Hans-Ulrich Brautzsch*

[A] East Germany including Berlin.

FIGURE 21

VACANCIES OF SKILLED LABOR MAINLY IN SMALL ENTERPRISES IN EAST GERMANY

Share of vacancies in the total number of announced jobs in the first half of 2013 by firm size and region



Source: IAB Establishment Panel, 2013 survey, extrapolated to the basic population; calculations and diagram by IWH.

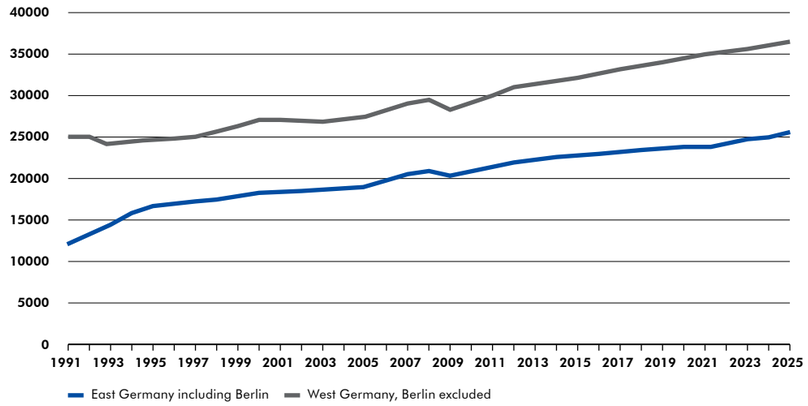
The acquisition of skilled labor is a challenging task for enterprises everywhere in Germany. 28% of all East German and 26% of all West German vacancies with regard to skilled labor could not be filled in the first half of 2013. Though unemployment is higher, East German enterprises face a bit greater difficulties than their western counterparts when it comes to acquisition of skilled personnel. Small enterprises in East Germany have the largest share of open vacancies. As to medium-sized and large enterprises, however, the proportion of vacancies is larger in the western part of Germany.

Contact: *Cornelia Lang*

FIGURE 22

EAST WEST GAP IN TERMS OF GDP PER CAPITA MIGHT BECOME GREATER DUE TO DEMOGRAPHIC CHANGES

IWH growth projection of Gross Domestic Product per capita in East and West Germany



Source: Holtemöller, O.; Irrek, M.; Schultz, B.: A Federal Long-run Projection Model for Germany, Halle (Saale): Institut für Wirtschaftsforschung Halle, 2012, IWH Discussion Papers No. 11/2012.

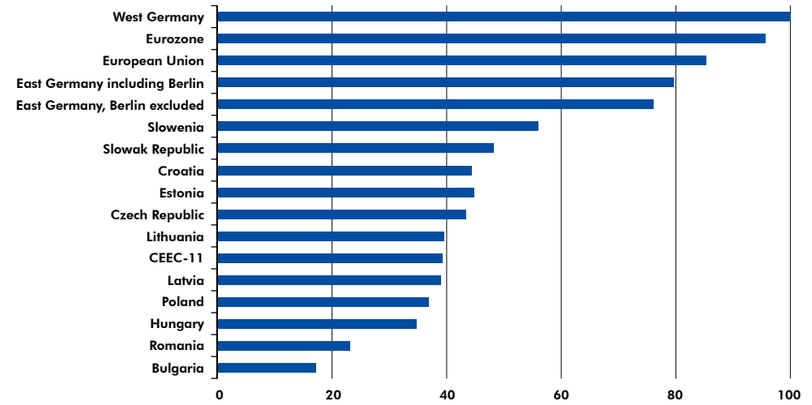
The East German Gross Domestic Product per capita converged quickly towards the West German level during the first years after unification. Since then, however, the gap has not declined noticeably. A growth projection for the years from 2011 on indicates that the gap between East and West Germany could even widen again. The reason for this result is the adverse demographic change in East Germany. A quickly ageing population means that the relation between the volume of labor and the size of the population is probable to develop less favorably compared to West Germany. The further convergence of labor productivity between East and West Germany is, according to our projection, probably not sufficient to compensate for this negative effect.

Contact: *Maike Irrek*

FIGURE 23

PRODUCTIVITY GAP BETWEEN CENTRAL AND EASTERN EUROPEAN MEMBER STATES OF THE EU, EAST GERMANY, AND WEST GERMANY

Gross Domestic Product per worker in East Germany and Central and Eastern European member states of the EU, 2013, relative to GDP in West Germany in %



Source: Arbeitskreis „Volkswirtschaftliche Gesamtrechnungen der Länder“, Statistisches Landesamt Baden-Württemberg, Stuttgart, Eurostat; calculations and diagram by IWH.

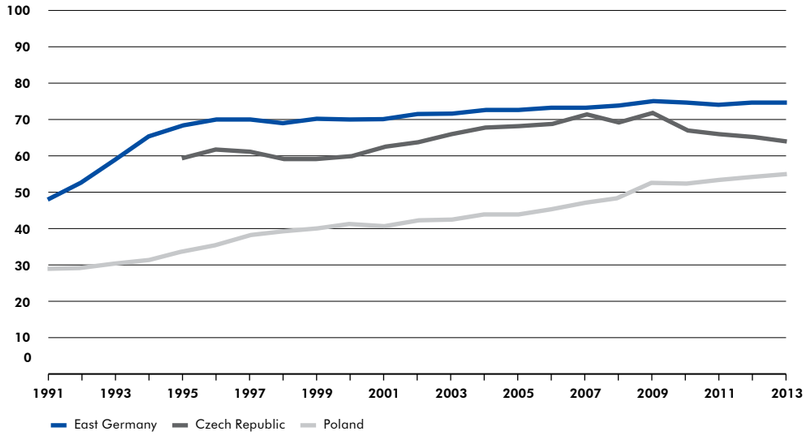
Productivity in Europe is still markedly lower in transition countries than in well established market economies. The figure above shows, as an indicator for this gap, GDP per worker relative to the West German level for Central and Eastern European member states of the EU and for East Germany. The latter economy reaches almost 80% of the West German benchmark, but productivity in other transition economies is much lower. This is partly so because the East German capital stock had been quickly modernized, while the CEEC countries were not capable to bring in the same amount of resources for capital accumulation as it was the case in East Germany.

Contact: *Martina Kämpfe*

FIGURE 24

CONVERGENCE IN EAST GERMANY, THE CZECH REPUBLIC, AND IN POLAND

Gross Domestic Product per capita in purchasing power parities, relative to the German level in %



Source: Statistisches Bundesamt; for purchasing power parities of East Germany: Heinz Vortmann et al (2013): Zur Entwicklung der Preisniveaus in Ost- und Westdeutschland. DIW discussion papers 1269; for Poland up to 1994: IMF; since 1995: Eurostat; for the Czech Republic: Eurostat; calculations and diagram by IWH.

How successful was the German Unification in economic terms? One way to come close to an answer to this question is to compare the East German performance with those of comparable transition economies such as the Czech Republic and Poland. GDP per capita is at present about 70% higher in East Germany than in the Czech Republic and more than twice as high as in Poland. In order to compare living standards, however, the large difference in domestic price levels has to be taken into account, since many domestic products such as housing are cheaper in the two neighbouring countries. This is done by comparing the production levels in the different countries not by exchange rates, but by purchasing power parities that are calculated by the IMF and Eurostat. In addition, some goods in East Germany are cheaper than on average in Germany. The price level is estimated to be at present about 6% lower in the East (Vortmann [2013]). As the figure above shows, taking all this into account, GDP per capita adjusted for different price levels is at present about 16% higher in East Germany than in the Czech Republic.

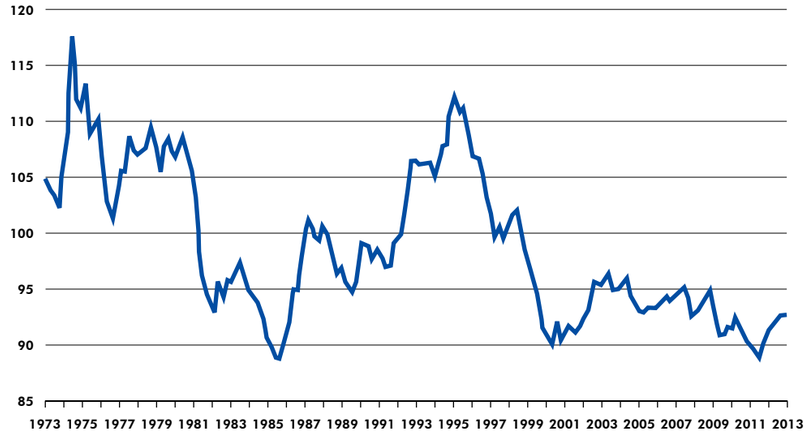
It should be noted, however, that disposable incomes per capita in East Germany are markedly higher than GDP per capita. Wage incomes of people living in East Germany but working in the West and transfers by the social security (in particular pension) system lift real incomes to about 90% of the average level in Germany. All in all, the living standard is markedly higher in East Germany than in the neighbouring countries.

Contact: *Axel Lindner*

FIGURE 25

THE GERMAN ECONOMY REGAINED ITS PRICE COMPETITIVENESS

Indicator of price competitiveness, based on the deflators of total sales against 24 advanced economies, 1st quarter 1999 = 100



Source: Deutsche Bundesbank.

This figure shows a frequently used indicator for the price competitiveness of the German economy. The indicator rises and competitiveness decreases if the domestic price level rises stronger than price levels abroad or if the domestic currency appreciates. The price competitiveness weakened markedly after unification up to the mid 1990s. The main cause for this fact is that unification triggered a demand shock that made prices for domestic products and property, as well as wages, rise quickly. In addition, wages were lifted in East Germany much faster than productivity for political reasons. That said, the loss of competitiveness was not necessarily bad for the unification process: The German export surplus vanished for some years, and more domestic resources were used for producing non-tradable goods such as houses. In the second half of the 1990s, the German Economy regained its price competitiveness: when the D-Mark temporarily depreciated and prices and wages rose very slowly due to sluggish demand and high unemployment.

Contact: *Axel Lindner*

SHORT PROFILE OF IWH

The Halle Institute for Economic Research (IWH) was founded in 1992 and is a member of the Leibniz Association. With its three research departments – Macroeconomics, Financial Markets and Structural Change – the IWH conducts economic research and provides economic policy recommendations which are founded on evidence-based research. The institute studies transition-related economic issues in East Germany as well as in Central and Eastern Europe and the ongoing process of economic integration in Europe. With the IWH's guiding theme "From Transition to European Integration", the institute's research covers economic convergence processes and international economic integration. Research focuses on macroeconomic dynamics and stability, transformation of institutions, microeconomic innovation processes and the role of financial markets for the real economy.

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Fields of research:

- quantitative macroeconomics (network) and business cycles
- applied econometrics and time series analysis
- fiscal and monetary policy
- economic forecasting and simulations
- asset prices and macroeconomic dynamics

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Figures: 6, 12, 13, 14, 15, 20

Fields of research:

- analysis and forecasting of the labor market in Germany and in its Eastern Region
- input-output analysis
- quarterly monitoring of business cycles for the Land Saxony-Anhalt
- macroeconometric model

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Figures: 5, 7, 8, 9, 11, 17, 18

Fields of research:

- regional development policy, cluster policy
- case studies in East German regions
- sectoral analyses at the regional level

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Figures: 1, 2

Fields of research:

- applied microeconomics
- the theory of the firm
- institutional economics
- behavioral economics

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Figures: 3, 4, 22

Fields of research:

- empirical research on economic growth
- medium to long-term growth projections for East Germany

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Figure: 23

Fields of research:

- analyzing current economic situation and forecasting economic developments in the Central and Eastern European countries
- adjustment processes in the Central and Eastern European candidate countries in preparation for EU accession
- reforms of the EU policies (in particular structural funds policy) and the effects on the EU enlargement towards the East
- forecasting of German foreign trade

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Figures: 10, 16, 21

Fields of research:

- business survey for the East German Manufacturing Sector
- determinants of entrepreneurship
- living conditions in East Germany

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Figures: 19, 24, 25

Fields of research:

- monetary economics
- European macroeconomics