THE LUBLIN REGION UNDER AN INTERNATIONAL BENCHMARKING LENS

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Contents

Tables

Charts

1 Introduction

1.1 Objectives and Scope of the Benchmarking Analysis

The World Bank has commissioned the independent economic research institute BAK Basel Economics AG (BAKBASEL) to conduct the economic benchmarking analysis «The Lublin Region under an International Benchmarking Lens». It is a part of the World Bank project «Lubelskie Region: Policy Notes – Support for Regional Development Strategy (RDS)». The World Bank is assisting The Lubelskie Voivodeship in formulating a long term Regional Development Strategy (RDS), which is to provide a comprehensive spatial development policy framework for the Lubelskie region up to 2020 and to help operationalise the regional development policy framework for the voivodeship beyond 2013.

The benchmarking analysis is to provide the World Bank with an overview of economic performance and location factors of the Lubelskie region, systematically comparing Lubelskie to other (and comparable) regions in Poland and Western Europe. Findings of the analysis will serve for the World Bank as a basis and guidelines for assessing the content of the Lubelskie RDS and to propose a policy framework for the purpose of the new strategy formulation.

The period of interest is mostly 2000-2010. 2010 is a reasonable ending year as it represents the global recovery from the recession of 2009 and hence offsets distortions caused by the financial crisis and the recession. When no value for 2010 existed, the latest possible value has been chosen. Sometimes the decade is subdivided into the two periods 2000-2005 and 2005-2010. In some contexts a longer period, namely 1995-2010 is considered.

The benchmarking report focuses on three main parts of economic development. First of all the (historical) economic performance of Lubelskie and the benchmarking regions is addressed in chapter 2 by means of indicators capturing aspects like wealth, availability of jobs and productivity. These hard facts serve as a kind of «as is» analysis and provide the starting point for a regional development strategy.

Subsequently the analysis is carried on to the economic sectors of Lubelskie and the benchmarking regions in chapter 3. The main objective of this part is to identify industries, which are capable of advancing economic growth in Lubelskie. First of all the industry structure of the region is analysed to provide the reader with a picture of how value added is generated today in Lubelskie and the benchmarking regions. Subsequently the historical performance of the most important industries is addressed and their potential for future economic development is assessed.

However, in the modern globalised world the production factors labour and capital have become very mobile. In particular movements of capital are no longer limited by geographical distances whereas (less skilled) labour still exerts some kind of «stickiness». Highly skilled labour – which may also be denoted as human capital – however, is far more mobile than less skilled labour and shares the traits of physical capital. In such a context the global allocation of labour, physical and human capital is a crucial aspect of the differences in economic development.

The allocation of the factors of production depends less on «hard» economic criteria than on «soft» factors, which capture the attractiveness of a region. Entrepreneurs need to launch their products as quickly and cost-efficiently as possible. This is highly supported by good accessibility, low taxation and low regulation. Besides, innovation in production technologies benefits from local «knowledge-clusters». These regional aspects are covered in chapter 4.

Finally, the findings of the benchmarking analysis are consolidated in chapter 5. It assumes the shape of a SWOT[1]-analysis and summarizes the present conditions of the Lubelskie region.

[1] Strengths (S) and Weaknesses (W) / Opportunities (O) and Threats (T)

1.2 Selection of the Benchmarking Regions

As depicted in Tab. 1-1 the benchmarking sample consists of Polish and Western European NUTS 2 regions. The only exception is Danish Mainland, which is an aggregate of Danish NUTS 2 regions and is frequently used by BAKBASEL. Poland and Western Europe serve as general benchmarks as they capture the aspects of many different regions and hence represent a kind of average.

Tab. 1-1 Benchmarking Regions, 2010

Country	Region	NUTS Level	NUTS Code	Core City	Population	Population Density
Polska	Polska	0	PL	Warszawa	38'155'505	122
	Lubelskie	2	PL31	Lublin	2'151'408	86
	Podkarpackie	2	PL32	Rzeszów	2'100'651	118
	Łódzkie	2	PL11	Łódź	2'532'536	139
Deutschland	Thüringen	2	DEG	Erfurt	2'231'401	138
Danmark	Danish Mainland	-	Aggregate of: DK03, DK04, DK05	Arhus	3'033'903	91
Portugal	Portugal Centro	2	PT16	Coimbra	2'424'301	86
España	Galicia	2	ES11	La Coruña	2'736'637	93
	Extremadura	2	ES43	Badajoz	1'083'260	26
France	Picardie	2	FR22	Amiens	1'922'081	99
	Lorraine	2	FR41	Metz	2'341'996	99
Italia	Calabria	2	ITF6	Reggio di Calabria	2'014'494	134
Österreich	Steiermark	2	AT22	Graz	1'209'577	74
United Kingdom	South Yorkshire	2	UKE3	Sheffield	1'324'984	854
-	Western Europe	-	Aggregate of 17 countries	-	399'988'089	111

Population: People
Population density: People per square kilometre
Source: BAKBASEL

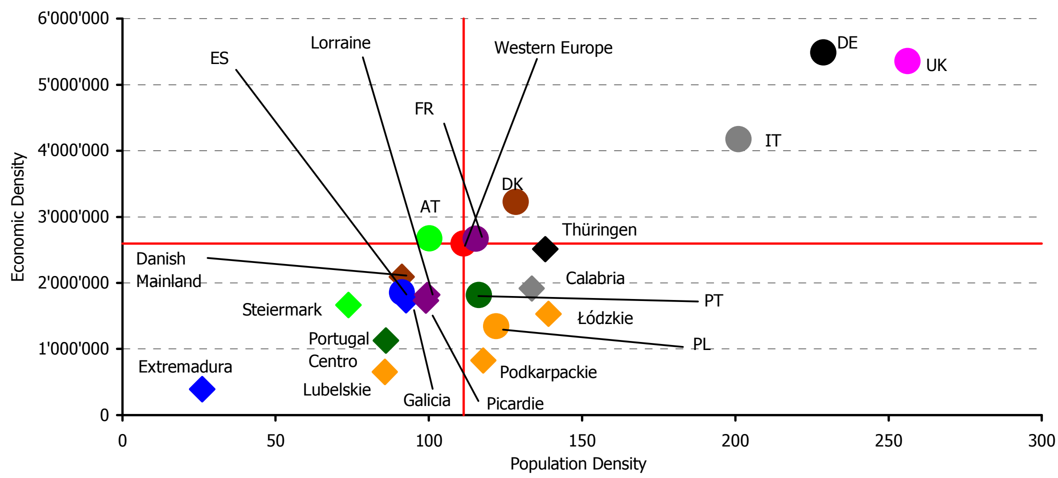
The benchmarking sample was chosen based on considerations regarding the size (measured by population) and industry structure of the regions: Regions of similar size and industry structure were included. Most of the regions exert some kind of geographical peripherality. Hence, they cannot benefit from economies of scale that result from cluster formation in congested areas.

The following short analysis summarises further aspects of the benchmarking regions and displays similarities and differences between the regions compared to Lubelskie. In Fig. 1-1 population and economic density are displayed. Population density is defined as people per square kilometre, economic density as GDP per square kilometre. Both indicators differentiate between urban (more economic activity) and rural (less economic activity) regions. It can be seen that most regions have both a lower population and economic density than the respective country (the country's value is up right in relation to the region's value). However, there are a few exceptions: Łódzkie exhibits higher values than Polska in both dimensions. It has been included in the sample nonetheless as an example for a more urban region of Central Poland. The same applies to South Yorkshire: Its population and economic densities are far above the United Kingdom's. Again, it serves as an example for a more urban area. Finally, Galicia lies very close to the

Spanish average. As can be seen, Lubelskie lies in the bottom left quadrant and hence can be classified as rural.

It can also be seen that most regions feature lower population and economic densities than the Western European average. Only South Yorkshire serves as an example for a slightly more advanced economy, whereas Podkarpackie, Łódzkie, Calabria and Thüringen capture the effects of more populous areas.

Fig. 1-1 Population and economic density, 2010



Population density: People per square kilometre
Economic density: GDP in million EUR (at current prices and exchange rates, PPP corrected) per square kilometre
South Yorkshire has been excluded because it distorts the figure. It has a population density of 854 people/km^2 and economic density of 15.9 Million EUR/km^2.
Source: BAKBASEL, national statistical offices

As a result of their peripheral location, most of the regions cannot actively participate in the promising economic trends and therefore lag both with regard to level of development and economic growth. In Fig. 1-2 GDP per capita and GDP growth are displayed. The former is an indicator for the level of wealth, the latter for the augmentation of wealth. As depicted in Tab. 1-2 the benchmarking regions can be classified according to their GDP per capita and GDP growth values in comparison to the national averages or the Western European average. Thus four possible groups of regions result:

- Leading regions: Above average in both dimensions: Best case, the region is very prosperous, but resulting in further disparities
- Saturated regions: Wealthier than the average, but slower growth: The region looses ground and approaches the average from above
- Convergence regions: Poorer than the average, but higher growth: The region catches up and approaches the average from below
- Lagging regions: Below average in both dimensions: Worst case, the region looses further ground resulting in further disparities

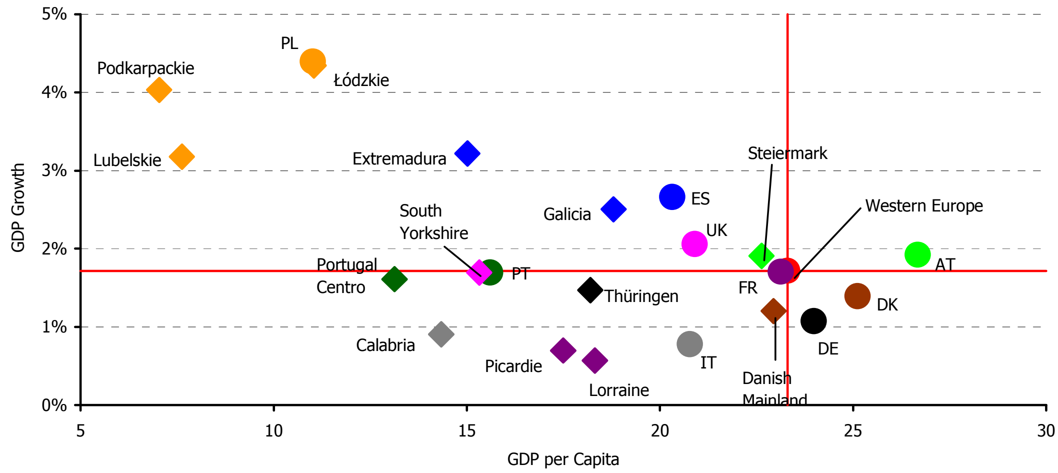
Tab. 1-2 Four possible economic scenarios

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="2">GDP per capita</td></tr>
<tr><td>Below average</td><td>Above average</td></tr>
<tr><td rowspan="2">GDP growth</td><td>Below average</td><td>Lagging regions</td><td>Saturated regions</td></tr>
<tr><td>Above average</td><td>Convergence regions</td><td>Leading regions</td></tr>
</table>

Source: BAKBASEL

As depicted in Fig. 1-2 most regions are lagging regions compared to their respective national averages. Only three regions grow faster than the respective countries, that is Extremadura, Thüringen and Calabria. Hence, they belong to the group of national convergence regions. Besides, Łódzkie has practically the same GDP per capita level as Polska. However, compared to the Western European average some regions that are lagging compared to their national averages belong to the convergence regions. Most notably the Polish benchmarking regions form part of this group.

Fig. 1-2 GDP per capita, 2010, and GDP growth, 1995-2010



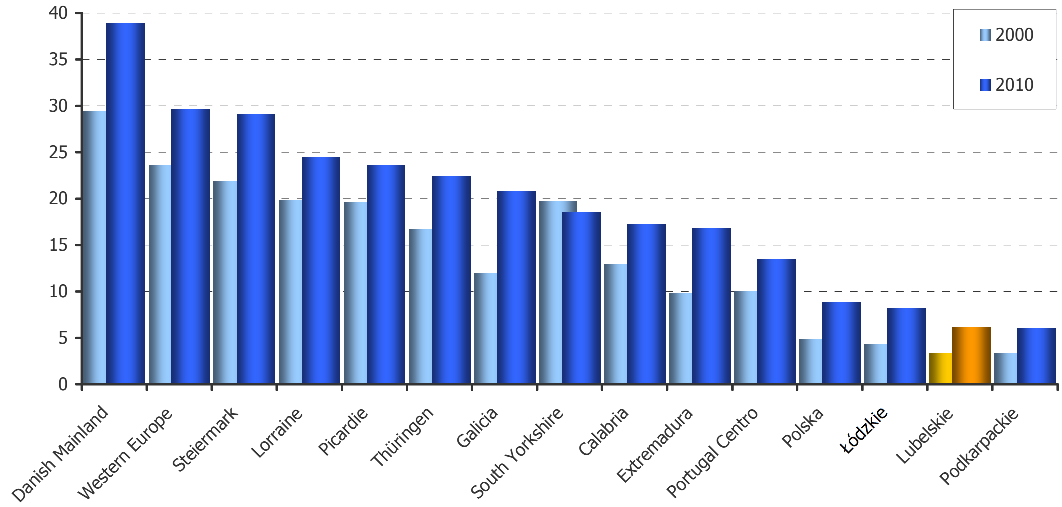
GDP per capita: GDP in million EUR (at current prices and exchange rates, PPP corrected) per person
GDP growth: Annual average growth rate for the period 1995-2010
Source: BAKBASEL, national statistical offices

In summary, regarding criteria like wealth and attractiveness the regions in the sample are not «best in class». They are rather weak both in their respective countries and compared to the Western European average. This was done on purpose so that relevant strategies for the Lubelskie region may be found. According to BAKBASEL, more advanced regions would not be a decent choice. The reason is that they differ too much from the Lubelskie region in terms of their «economic lifecycle» and hence wrong conclusions about Lubelskie's economic situation could be drawn.

2 Performance Benchmarking

The benchmarking report starts off with an assessment of the current economic situation in the Lubelskie region compared to the regions in the benchmarking sample. Economic indicators capturing aspects of wealth, labour market situation and productivity are considered.

Fig. 2-1 GDP per capita, 2000 and 2010



In 1'000 EUR (at current prices and exchange rates)
Source: BAKBASEL, national statistical offices

- The first indicator of interest is GDP per capita, an appropriate measure of wealth. Fig. 2-1 reveals that the Lubelskie region still had a very low level of GDP per capita in 2010, namely the second-lowest value in our benchmarking sample. It is almost five times smaller than the Western European average and only 70 percent the Polish average. This is reflected in values of 6'100 Euro per capita in Lubelskie, 8'800 Euro per capita in Poland and 29'700 Euro per capita in Western Europe.
- With respect to the level of wealth dimension Lubelskie is a poor region compared to both the Polish and the Western European average whereupon the difference to Western Europe is larger than to Poland. Only Podkarpackie performs worse but the difference is very small and they can be considered as equal.
- However, it is pleasant to note that the GDP per capita of the Lubelskie region grew relatively strongly in the period 2000-2010. Nonetheless, it was still much below average in 2010, so Lubelskie was not able to improve its ranking in the previous decade.

Whereas wealth is the result of economic development, economic competitiveness captured by productivity is its origin. Unit labour costs per output unit (the price of labour used in producing a good in a given region) are inverse proportional to (labour) productivity. Hence, the more productive the labour force of a given region the lower the costs of producing a unit of a good in this region (ceteris paribus). As stated in the introduction physical capital is very mobile nowadays, so (labour intensive) industries tend to settle in regions where they can produce cost-efficiently. Therefore, high productivity grants a region a competitive edge.

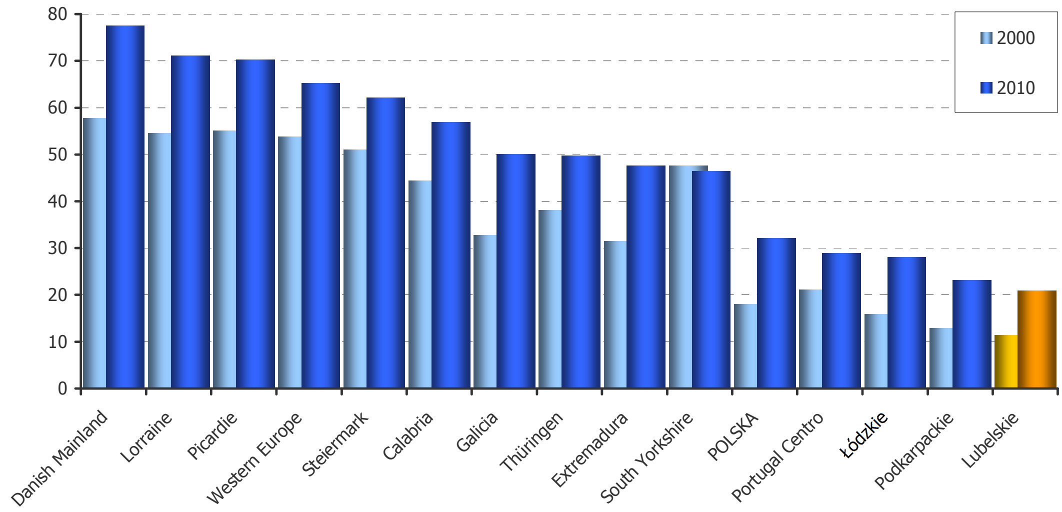
Productivity

Two measures of productivity are usually used in economic analyses: hourly productivity and labour productivity. Hourly productivity is defined as output per hour of labour input in the economy. Labour productivity is the output per employee (including the self-employed). Output is measured as GDP or value added.

Although basically providing the same information, the measures can differ from one another. Reasons for differences are especially found in the usual hours worked and the part-time employment structures. Other issues like overtime, holidays, average sick leave duration and similar issues influence the results as well. The differences can be observed in the levels as well as in the dynamics of the indicators.

Neither of the indicators can be regarded as the superior one. Depending on the question asked, one can be more suited to the analysis than the other. For many economic questions analysing differences in the economic development, hourly productivity is regarded as more precise because it is not influenced by labour market issues like part-time structures. However, data availability is often better for labour productivity. Furthermore, labour productivity does more directly fit into an analysis with figures like GDP per capita or the number of jobs.

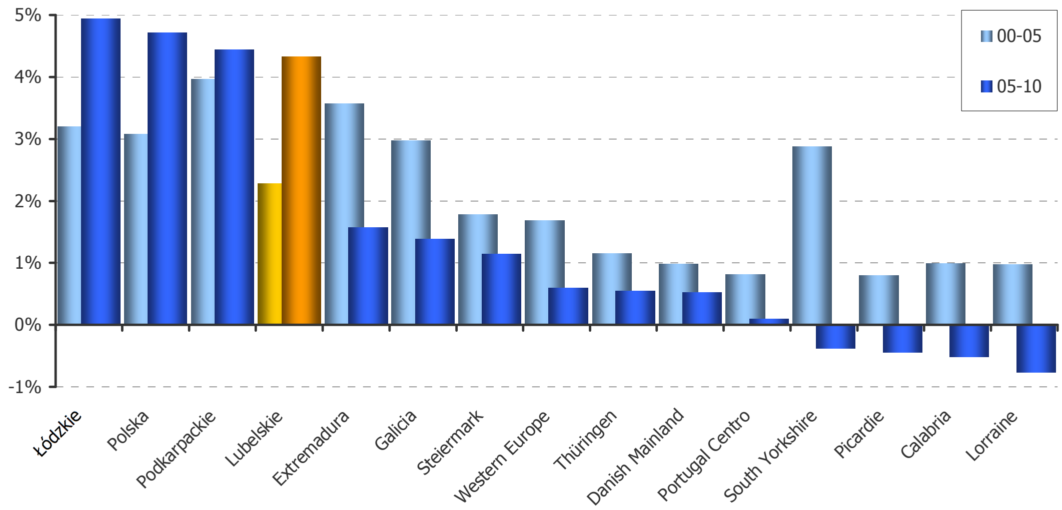
Fig. 2-2 Labour productivity, 2000 and 2010



In 1'000 EUR (at current prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Labour productivity is displayed in Fig. 2-2. Like GDP per capita it was on a very low level in the Lubelskie region in 2010. It is at the rear of the benchmarking sample. Lubelskie even performs worse than Podkarpackie, the other less developed region in Eastern Poland. Labour productivity in Lubelskie is not even one third of the Western European value and 35 percent below the Polish average. This is reflected in values of 21'000 Euro per employee in Lubelskie, 32'100 Euro per employee in Poland and 65'200 Euro per employee in Western Europe.
- However, as in the case of GDP per capita Lubelskie and the other Polish regions show a vast improvement in labour productivity over the period 2000-2010. The values nearly doubled. Nonetheless Lubelskie was not able to improve its ranking in the previous decade.

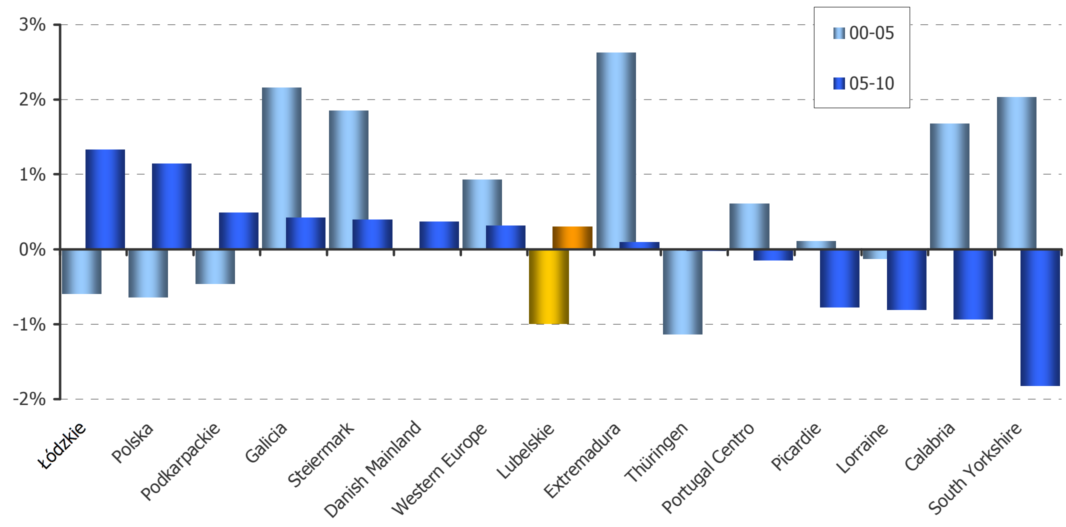
Fig. 2-3 Real GDP growth, 2000-2005 and 2005-2010



In % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- After the level of wealth dimension, the augmentation of wealth dimension needs a more detailed analysis. Fig. 2-3 displays the average annual growth rates of real GDP in the periods 2000-2005 and 2005-2010. In comparison to nominal GDP, real GDP does not capture movements in the prices of goods. It is visible that Lubelskie and the other Polish regions experienced the strongest economic growth in the benchmarking sample in the period 2000-2010. The Lubelskie region grew by 2.3 percent per annum in the period 2000-2005 and 4.3 percent per annum in the period 2005-2010, which is far beyond the Western European averages of 1.7 and 0.6 percent per annum.
- Hence, in relation to the Western European average Lubelskie belongs to the convergence regions. However, compared to the other Polish regions, it was below average in both periods. Thus, the gap between Lubelskie and the Polish average widened. Yet, Lubelskie experienced the strongest growth acceleration. Its growth rate almost doubled between 2000-2005 and 2005-2010. This is a first sign of a change to the better.

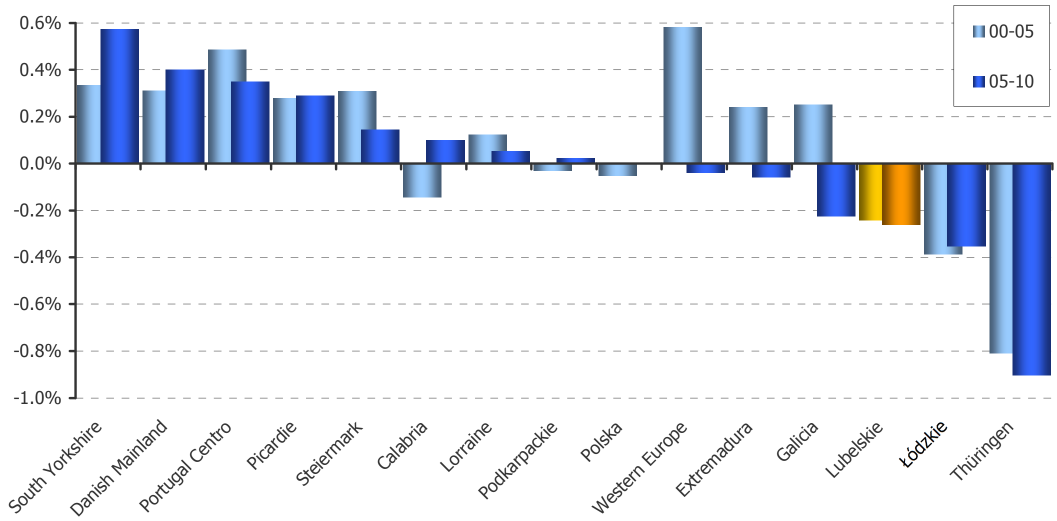
Fig. 2-4 Employment growth, 2000-2005 and 2005-2010



In % p.a.
Source: BAKBASEL, national statistical offices

- According to the previous paragraph real GDP developed rather pleasantly. The other pillar of economic development is the labour market. According to Fig. 2-4 the labour market of the Lubelskie region did not perform equally well in the previous decade. It shrank by 0.34 percent per annum. Only Lorraine (-0.46% p.a.) and Thüringen (-0.57% p.a.) performed worse.
- It strikes the eye that in contrast to GDP growth Lubelskie not only performed worse than the Polish average but also than the Western European average. The other Polish regions also experienced a contraction in the period 2000-2005, but firstly the rates were lower and secondly they experienced higher growth in the period 2005-2010. Whereas the other Polish regions showed the highest growth rates in the period 2005-2010 Lubelskie only performed on average.
- The contraction of the labour market in Lubelskie in the period 2000-2005 may be due to productivity gains: As the production processes grew more productive some jobs became obsolete. An example may be the agricultural sector: Tasks, which have been executed by people and animals in the past, are nowadays carried out by machines (e.g. ploughing). In general, the new ways of producing are less labour intensive but all the more capital intensive. As a consequence, the redundant labour flows into sectors where it is needed (perhaps even in other regions and countries). This is a very painful evolution for the involved sectors and employees, but in the long run it is necessary to ensure, that a region employs its labour force in the most productive way to generate as much value added as possible.
- The development, which was described in the previous section, is reflected in the vast improvement in labour productivity between 2000 and 2010 depicted in Fig. 2-2. This is a necessary step in the process of becoming more competitive. The growth of employment in the period 2005-2010 may be an indicator that the region has become more attractive for firms due to higher productivity and new jobs have been created. This is also reflected in the fact that real labour productivity had an average annual growth rate of 3.3 percent per annum in the period 2000-2005 and even of 4.0 percent per annum in the period 2005-2010.

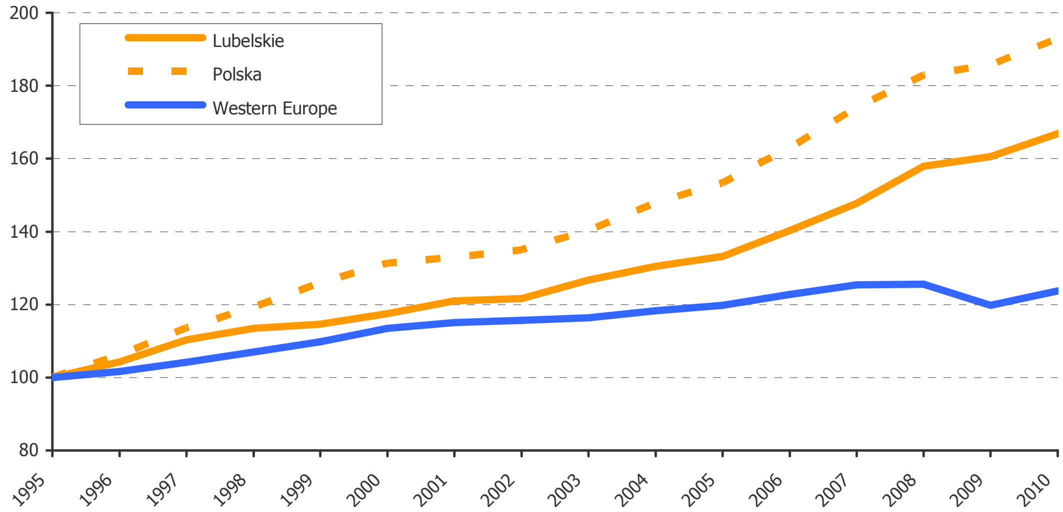
Fig. 2-5 Population growth, 2000-2005, and 2005-2010



In % p.a.
Source: BAKBASEL, national statistical offices

- As in the case of employment growth the Lubelskie region experienced the third-worst population growth over the period 2000-2010. The population shrank by 0.25 percent per annum. Only Łódzkie (-0.37% p.a.) and Thüringen (-0.85% p.a.) experienced higher emigration. The depopulation indicates a lack of attractiveness of the region.
- In contrast to the development of the labour market the depopulation did not stop in the period 2005-2010. Maybe the recovery in the labour market is a leading indicator of the evolution of population migration: As more jobs are created the region becomes more attractive and emigration stops. The plausibility of this guess is reinforced by the fact that the unemployment rate in the Lubelskie region fell from 17.0 percent in 2005 to 12.9 percent in 2009.
- Depopulation is stronger in Lubelskie than in Poland. This suggests that Poland experiences a high degree of internal migration.

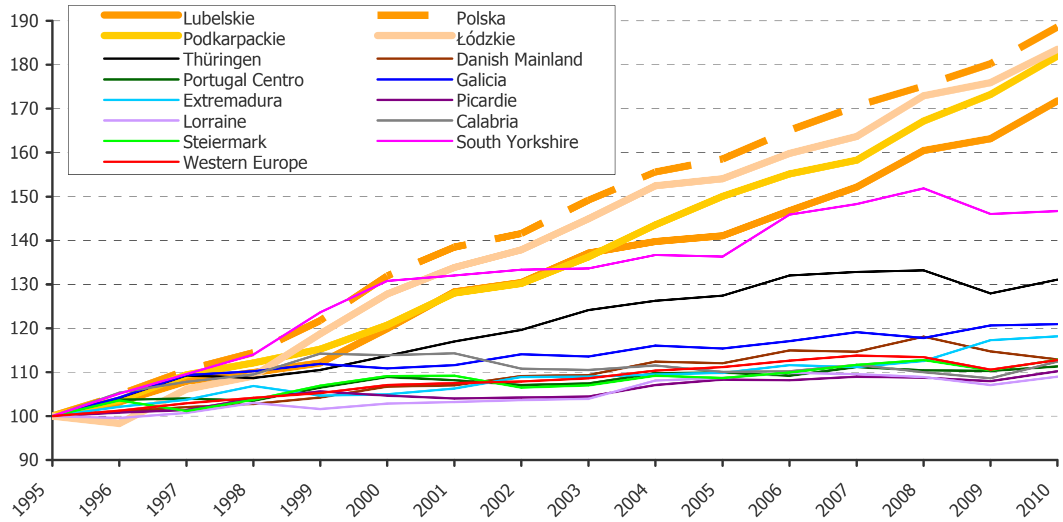
Fig. 2-6 Growth of real GDP per capita, 1995-2010



Index 2000 = 100 (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Lubelskie experienced stronger GDP per capita growth than Western Europe but compared to Poland it performed below average.
- Since 2005 the difference between the yearly growth rates of Poland and Lubelskie shrink (with the exception of 2007) and since 2008 Lubelskie even shows higher annual growth rates than Poland. While real GDP per capita grew by 3.1 percent per annum in Poland in the period 2000-2005, in Lubelskie it grew by only 2.7 percent per annum. In the period 2005-2010 the growth rates were 4.69 percent per annum in Poland and 4.70 percent per annum in Lubelskie. However, it must be noted that the higher growth rates of GDP per capita in Lubelskie compared to Poland are due to the depopulation in Lubelskie. GDP still grows faster in Poland than in Lubelskie (2000-2005: 3.0% p.a. compared to 2.3% p.a., 2005-2010: 4.7% p.a. compared to 4.3% p.a.).
- Poland was the sole country in Europe that did not fall into recession in the year 2009. GDP per capita still grew by 1.5 percent per annum in Poland and 1.7 percent per annum in Lubelskie.

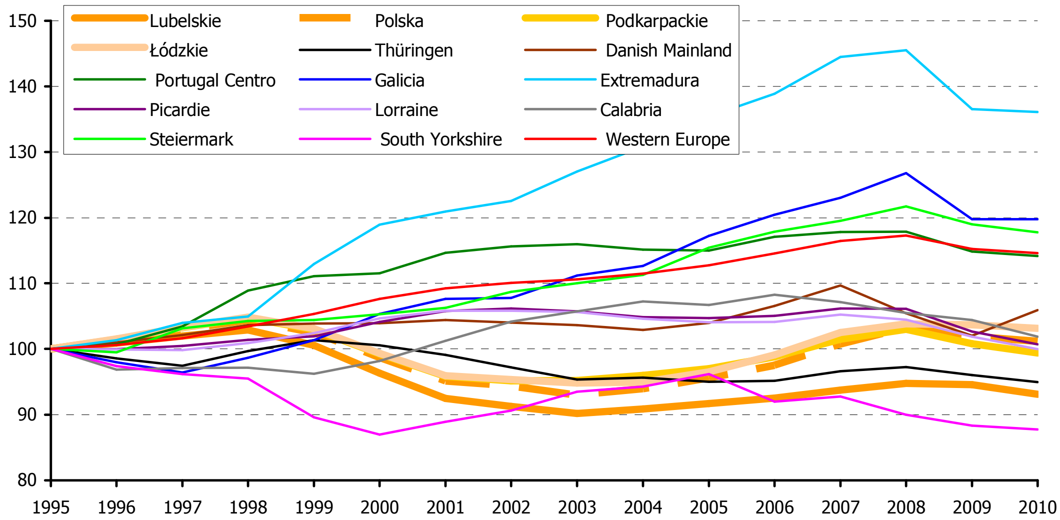
Fig. 2-7 Growth of real labour productivity, 1995-2010



Index 2000 = 100 (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- As in GDP per capita Lubelskie also experienced a much stronger growth in real labour productivity compared to Western Europe. This is mostly due to a «catch-up-effect» as Lubelskie started from far lower levels.
- Compared to Poland the evolution is similar to the development of GDP per capita: From 1995 to 2005 labour productivity mostly grew faster in Poland than in Lubelskie, but since 2005 the difference between the growth rates became smaller (except for 2009). In some years the growth rate in Lubelskie exceeded the one in Poland. In the period 2000-2005 labour productivity grew by 3.7 percent per annum in Poland and 3.3 percent per annum in Lubelskie. In the period 2005-2010 the growth rates were 3.5 percent per annum and 4.0 percent per annum respectively. As in the case of GDP per capita the higher growth rates in Lubelskie are due to a less favourable development of employed people relative to Poland.

Fig. 2-8 Employment growth, 1995-2010



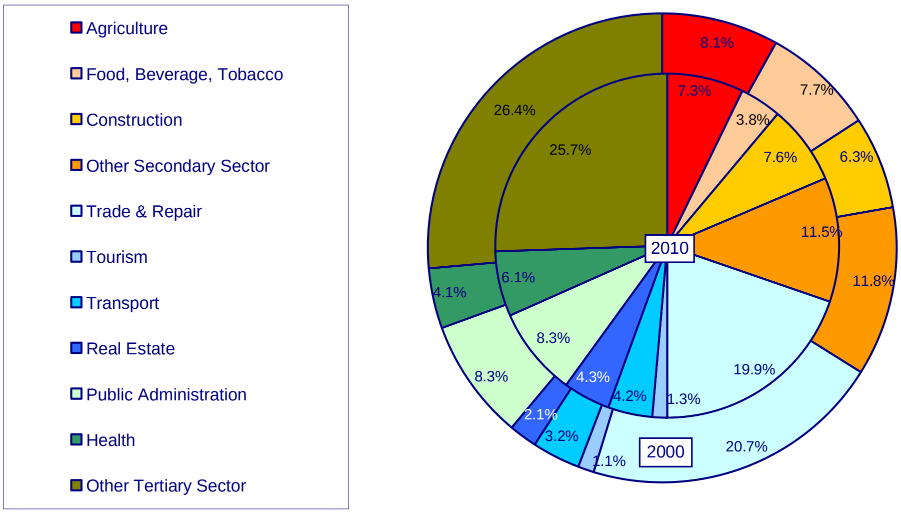
Index 2000 = 100 (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Lubelskie shows a weak development of the labour market in the period 1995-2010. As depicted in Fig. 1-4 Lubelskie had the third-worst average growth rate over the period 2000-2010.
- However, it seems as if the low was reached in 2003 because employment grew by about 1 percent per annum in the period 2004-2008. Only lately, that is to say in the years 2009 and 2010 employment began to shrink once again. Whether this evolution is due to cyclical or structural effects cannot be said at this moment. However, given similar patterns in many other regions, cyclical effects are more likely.

3 Industry Benchmarking

The following chapter focuses on the analysis of the industry structure and the performance of the industries of Lubelskie.

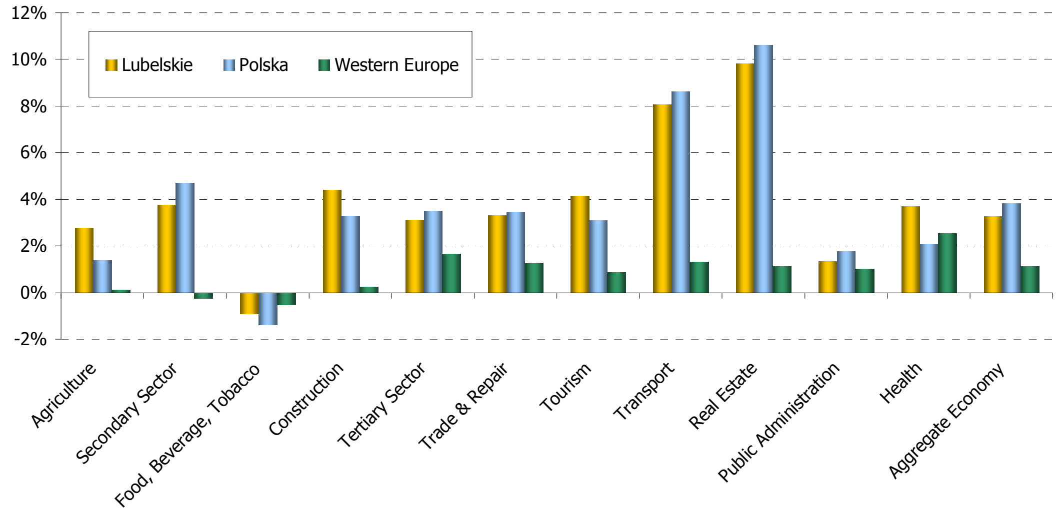
Fig. 3-1 Lubelskie, share of industries in GDP, 2000 and 2010



Source: BAKBASEL, statistical office of Poland

- The two pies show the industry structure of the Lubelskie economy in the years 2000 and 2010 as shares in GDP (using the NACE classification).
- The industry structure is dominated by the service sector which makes up to 70 percent of total economy in 2010. The trade and repair industry is the most important industry in the service sector.
- The primary and the secondary sector contribute 7 and 23 percent to total GDP. Beside agriculture and the food industry there can not be identified any important (export-oriented) industry cluster in the secondary sector.
- The shares of the sectors in GDP of Lubelskie are quite close to those in the Western European average in 2010. Here, the secondary and the tertiary sector contributed 24 and 74 percent to GDP. The only relevant difference concerns the contribution of the primary sector which only makes up to less than 2 percent of GDP in the Western European average.
- Comparing the industry structure in 2010 with the one in 2000, not many shifts can be identified. The only significant difference between 2000 and 2010 is the decline of the importance of the food industry.

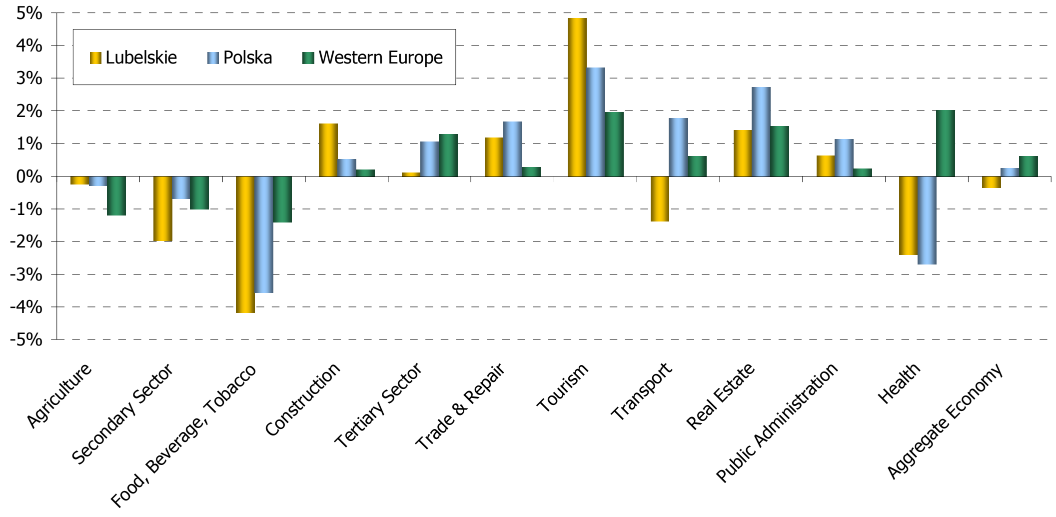
Fig. 3-2 Growth of value added per industry, 2000-2010



In % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- The growth rates of value added per industry show the very dynamic development of Lubelskie and Poland during the last decade.
- Most of the industries grew much stronger in Lubelskie and Poland than in Western Europe on average between 2000 and 2010. This finding can be interpreted as a catch-up effect: Lubelskie and Poland both came from a relatively low level but reached very high growth rates which allowed them to reduce the gap to Western Europe.
- The differences between Lubelskie and Poland are not very significant for most of the industries. With agriculture and construction, two of the key industries of Lubelskie grew faster than in Poland. The same holds true for tourism and health.

Fig. 3-3 Growth of employment per industry, 2000-2010



In % p.a.
Source: BAKBASEL, national statistical offices

- The growth rates of employment per industry show a different picture compared to the analysis of the growth of value added.
- The growth rates of total employment were negative in Lubelskie between 2000 and 2010. While the number of employees was constant in the tertiary sector, it dropped by 2 percent p.a. in the secondary sector.
- A more detailed analysis reveals that the development was not homogenous between the industries. On the one hand, there are industries like food, health and transport with a significant loss of employment during the period under consideration. On the other hand, the number of employees strongly grew in construction, trade, tourism and real estate, whereas tourism can be revealed as a small «job-engine» of Lubelskie.
- Although the growth rates of employment per industry were most of the time weaker in Lubelskie than in Poland (more negative or less positive), they most of the time were in line with the ones in Poland and also with Western Europe. In total the development of employment was weaker in Lubelskie than in Poland and Western Europe where at least a small growth was realized in total.

With the following charts we analyze the contribution of the key industries to GDP growth. The analysis is made with the help of so called «bubble charts» which combine several key informations on the performance and the importance of the industries. The following box explains the mechanism of this analyzing tool:

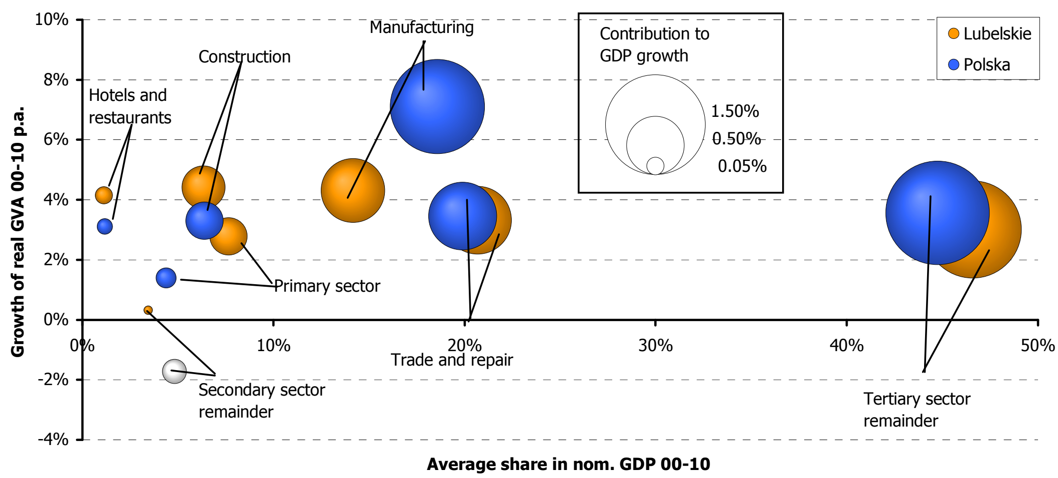
Interpretation example for a growth contribution «bubble chart»:

The contribution of a sector to the growth of an economy depends on its weight within the total (share) and on its growth rates. A large contribution to economic growth can be due to a high share and moderate growth or a smaller share but more dynamic development.

Figures like the ones following do provide all this information. Here, they focus on the contribution of the industries to GDP growth of a region. The x-axis holds information on the share (in percent). The y-axis reflects the average annual growth (in percentage points). Therefore, the growth contribution of an industry increases when moving from the lower left corner towards the right and/or upwards. As the relationship is nonlinear, the growth contribution is also given in the graph: the size of the bubbles reflects the growth contribution. Negative contributions are marked with grey bubbles.

For example, consider the Manufacturing Sector in Lublin. It made up 16.4 percent of the economy on average between 2000 and 2010. During this period, it grew 4.3 percent a year on average. Combining these, the Manufacturing Sector contributed 0.71 percentage points to the average growth of the Lublin economy.

Fig. 3-4 Contribution to GDP growth, Lubelskie and Poland



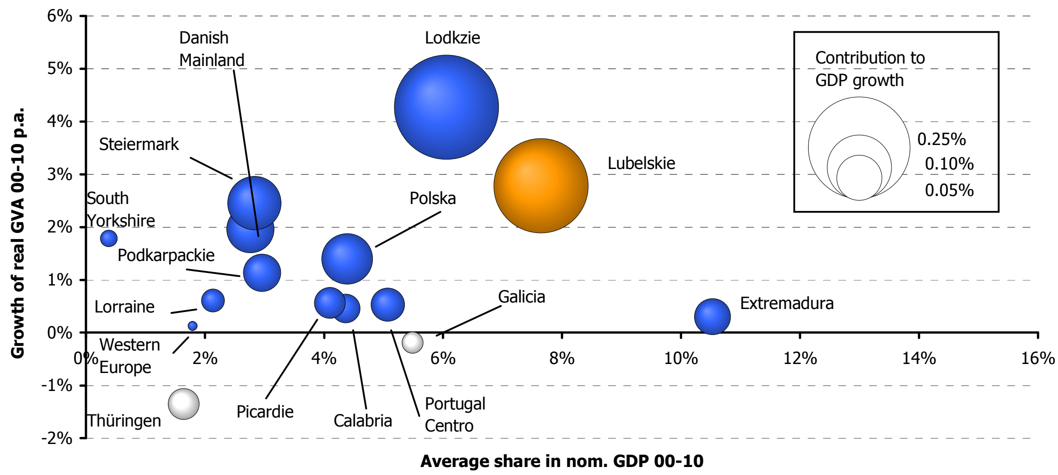
Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, statistical office of Poland

- The comparison between Lubelskie and Poland shows that the industry structure at an aggregate level does not differ significantly. The most significant difference can be seen for the primary sector which is more important in Lubelskie than in Poland and manufacturing which is more important in Poland.

- The analysis of the performance brings out more differences between Lubelskie and Poland. The most important difference concerns the growth of manufacturing which was much more dynamic in Poland than in Lubelskie between 2000 and 2010. As manufacturing is very important for the overall economy, this is one reason for the weaker growth of GDP in Lubelskie.
- For hotels and restaurants (tourism), construction, primary sector and secondary sector remainder, an opposite result can be found – here, Lubelskie slightly outperformed Poland.

In the following figures, we are going more into detail. The analysis will focus on selected key industries and compare Lubelskie to the sample of international regions.

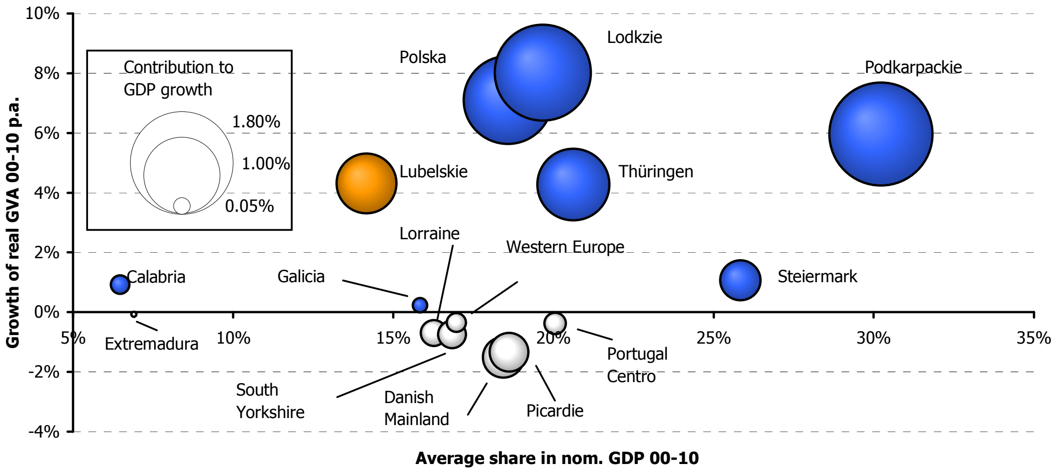
Fig. 3-5 Contribution to GDP growth, Agriculture



Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Agriculture is a very important industry for Lubelskie. The Benchmarking reveals that only in Extremadura agriculture is more important.
- The good news is that agriculture was very dynamic in Lubelskie between 2000 and 2010. The growth rate of value added in agriculture was far above the average of the sample, of Poland and of Western Europe.
- The contribution of agriculture to GDP growth in Lubelskie was 6.4 percent over this period, higher than in any other region of the sample.

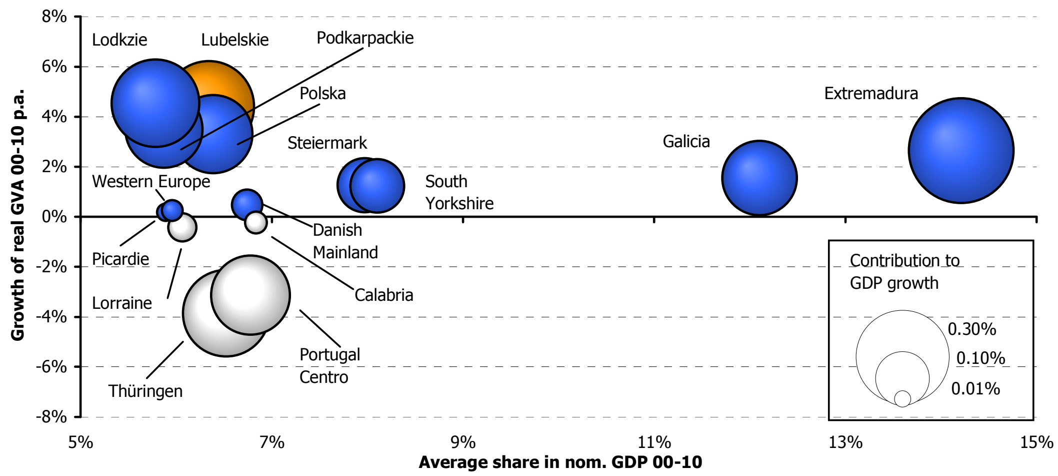
Fig. 3-6 Contribution to GDP growth, Manufacturing



Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Manufacturing is less present in Lubelskie than in most other regions in the sample.
- Manufacturing developed quite dynamically in Lubelskie. The average growth rate between 2000 and 2010 was 4.3 percent which only was outperformed by Poland and the other Polish regions.
- The Benchmarking shows that manufacturing was in decline in a large number of regions. In these regions, manufacturing significantly reduced GDP (as can be seen by the size of the bubbles). There was also a contraction of manufacturing for Western Europe. Thus, the Polish regions were able to increase their market shares.
- The conclusion for Lubelskie differs significantly from Western Europe. Because of the dynamic growth, manufacturing was an important pillar of the GDP expansion: it contributed more than 18.5 percent to total GDP growth from 2000 to 2010.

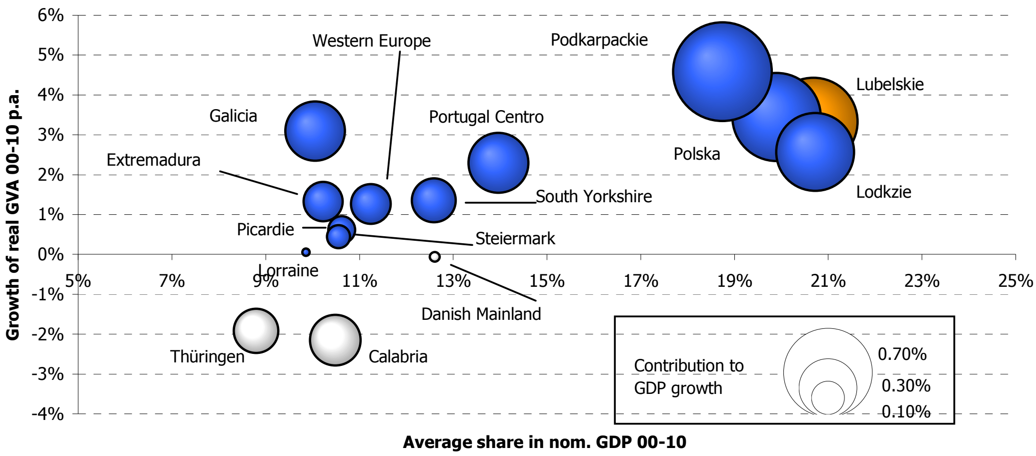
Fig. 3-7 Contribution to GDP growth, Construction



Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Construction is an important industry of the Lubelskie economy. Though, the Benchmarking reveals that construction is less important for Lubelskie than it is for other regions.
- Together with construction in Lodzkie, construction in Lubelskie is «growth-leader». With an average annual growth rate of 4.4 percent, construction in Lubelskie grew very fast during the last decade – faster than in any other of the more closely analysed industries.
- Because of this strong growth the contribution to GDP growth adds up to 8.5 percent. Therefore, construction was slightly more important than the primary sector. Though, it has to be mentioned that construction is not an export-oriented industry and completely dependant of the development of the domestic economy, while the primary sector can be both, an export industry and domestically driven.

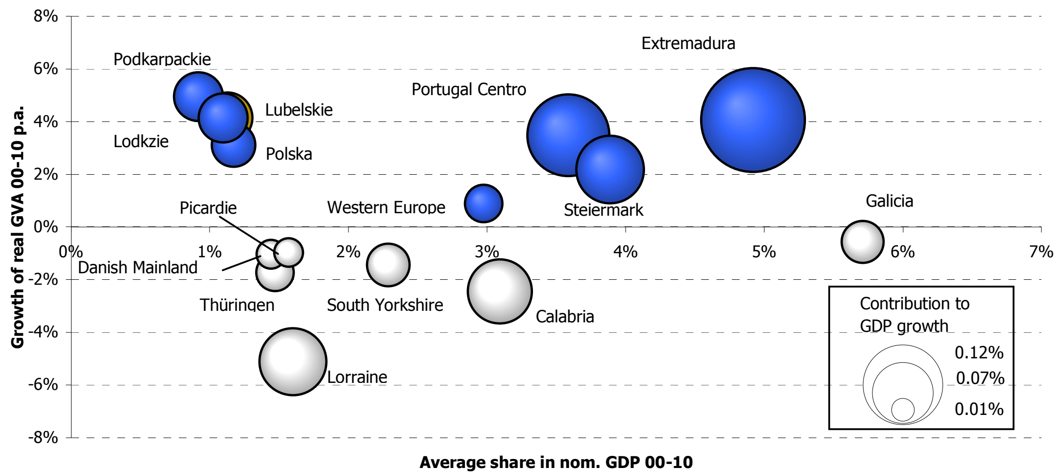
Fig. 3-8 Contribution to GDP growth, Trade and Repair



Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- As for Poland and all the Polish regions, trade and repair is one of the most important industries in Lubelskie. Trade and repair contributes more than 20 percent to total GDP, almost twice the Western European average.
- Trade and repair is not just weighty, it also grew very dynamically during the past decade. In Lubelskie this industry grew by 3.3 percent on average. This is almost as much as in Poland but (much) more than in all the other regions of the sample.
- The relative contribution of trade and repair to GDP growth was more than 20 percent, almost as much as the contribution of manufacturing. There has to be mentioned that manufacturing is containing a large range of industries while trade and repair just contains the three industries retail and wholesale trade as well as car sale and repair.

Fig. 3-9 Contribution to GDP growth, Tourism



Gross value added
Abscissa: in %
Ordinate: in % p.a. (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

- Tourism is not of major importance for all the Polish regions. Tourism in all or most of the regions in the sample is more important than in Lubelskie, above all in the Spanish regions.
- Nevertheless, the strong growth performance during the last years reveals that there is a lot of potential in tourism for Poland and also for Lubelskie – tourism grew with 4.2 percent on average between 2000 and 2010. Beside the potential to create value added, there is also a significant potential for creating new jobs, as seen before.
- Despite the strong growth rates the contribution of tourism to GDP growth was quite small during the past decade and just reached 1.4 percent.

4 Location Factor Benchmarking

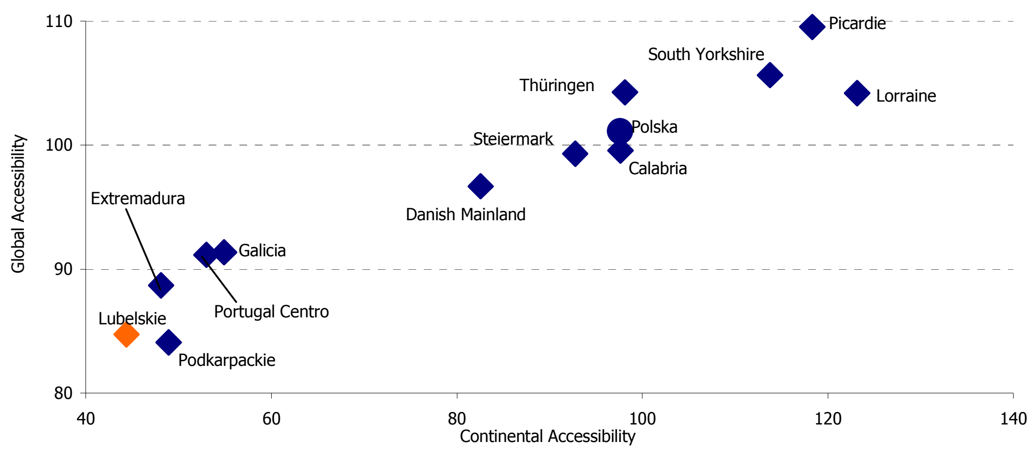
Accessibility

The accessibility of a region is determined by two factors: geography and infrastructure. While the geographic position cannot be changed, improving connectivity is a key policy aim.

Accessibility as a location factor

A region's accessibility is a key factor in a globalised economy. Today, all regions in Europe are accessible, but the degree and efficiency of accessibility vary. Without good accessibility, a region cannot profit from the international division of labour to the same extent as other regions and is less attractive for companies.

Fig. 4-1 Global and continental accessibility, 2008



Index (average accessibility of regions 2002 = 100), no data available for Łódzkie and Western Europe
Source: BAKBASEL, IVT

- The Lubelskie region (which is represented by Lublin in the case of accessibility) is very poorly accessible compared to the other regions in the benchmarking sample.
- The low score in global accessibility is due to the lack of an international airport in the region. However, construction of an airport that will be able to handle large airliners in Świdnik, about 10 km southeast of Lublin, is projected to be finished in 2012 (Wikipedia, 2011). Global accessibility should improve by then accordingly (assuming that there will be regular scheduled flights). Poland performs rather well because of the international airport in Warszawa.
- In terms of continental accessibility (i.e. within Europe) Lubelskie even performs the worst in the benchmarking sample. Compared to the non-Polish regions this is mostly due to the geographical distance to the economic centres in Western Europe. Poland again performs rather well because of the good flight and train connections from Warszawa.

Taxation

Tax competition is an issue often brought up in public discussion. Consequently, taxation and international comparisons of tax levels is highly ranked on the political agenda. Some countries follow a strategy of lowering taxes to support economic growth.

Taxation as a location factor

There are several ways for tax levels to influence regional economic development. Taxation is a key topic for businesses evaluating the attractiveness of a location. A lower tax burden attracts new companies to a location and provides an incentive for existing companies to stay. Even if no location decision is involved, it increases competitiveness in the market by lowering the tax costs for a company which, in turn, supports company survival or growth. Such a connection between taxes and economic growth is obvious for direct company taxation. For personal income taxation, this is less straight forward, but for several reasons such a connection would be expected as well. First, company owners and top management have to pay personal income taxes. Their individual preferences might influence their decisions for the company. Second, employees' decisions are influenced as well. Employees focus on net available income which is different from a firm's costs. If employees have some bargaining power and are mobile between regions, the companies will be forced to bear at least part of the difference in the tax burden between competing regions. Otherwise, mobile employees will move to the regions with lower tax levels since their available income is higher there. Therefore, higher income tax levels can result in higher costs for companies. Highly qualified individuals are especially and increasingly internationally mobile. At the same time, these individuals are becoming more important for a knowledge based economy. Therefore, income taxation, especially the burden on highly qualified employees, can work as a cost factor just as much as company taxation does.

The following box provides an overview of the taxation indicators used in our benchmarking analysis:

Indicators for Taxation

Taxation is a large field of research and many indicators are available. The choice gets much more limited when the data should be internationally comparable, reflect the complete tax system instead of only one particular issue or tax rate, and fit the economic reasoning given above. We have two indicators fulfilling these conditions, one for company taxation and one for the tax burden on highly qualified employees.

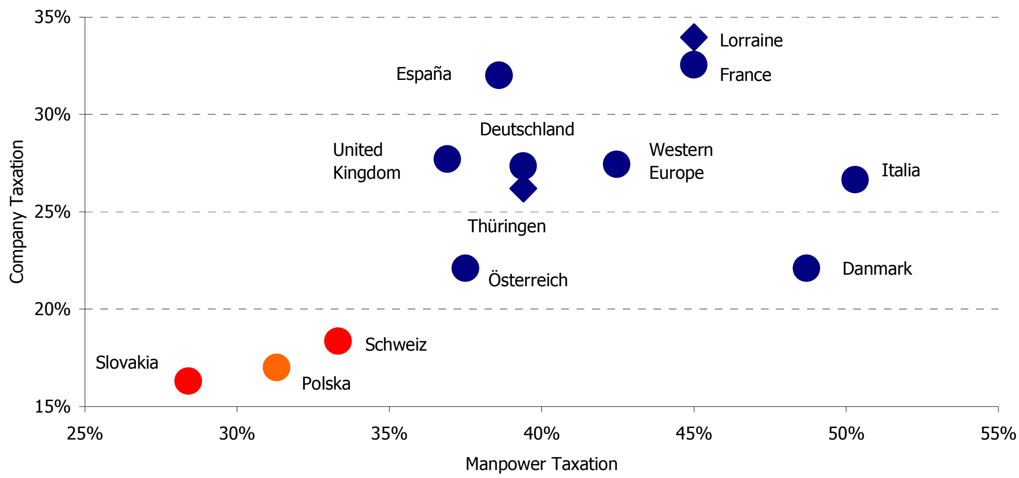
The indicators used in benchmarking are:

- Company tax burden (in percentage-points of profits). It measures the Effective Average Tax Rate including all kinds of direct company taxes for a typical profitable investment.
- Tax burden on highly qualified manpower (in percentage-points of gross income). It measures the Average Tax Rate for a highly qualified employee (available income after taxes: 100'000 EURO; single). Taxes include the expected tax burden on pensions and social security contributions if mandatory and appropriate.

For further information on these indicators, see BAKBASEL (2007) as well as Elschner and Schwager (2003) and Elschner and Overesch (2004).

As in the case of regulation, taxation is to a large extent an issue defined on the national level. But again, it is important to regions' prospects for growth. Therefore, it should be included in an international benchmarking. Furthermore, depending on the national setting, there are possibilities for regions to increase or decrease the tax burden, in many countries at least to some extent, in some countries to a large extent (e.g. Switzerland, USA). The indicators used take regional differences into account if appropriate.

Fig. 4-2 BAK Taxation Index: Taxation of companies and on highly qualified manpower, 2009



Effective average tax rates (EATR) in %
Source: BAKBASEL, ZEW

- Regarding taxation only Poland is depicted in Fig. 4-2 because personal and company income tax are centrally imposed and also centrally administered, thus the income tax does not depend on where a person lives or a company is located. There is the exception of special economic zones (SEZ), that provide tax exception for corporations that are located within their borders, but they are not considered in this analysis.
- In terms of taxation Poland shows a high competitiveness compared to the other regions in the benchmarking sample.
- However, it must be noted that other European countries may compete very well. Slovakia and Switzerland have been added to this sample to show two types of these competing regions: Other Eastern European countries like Slovakia also try to attract foreign capital with very low tax rates. As can be seen Slovakia even performs slightly better than Poland. Then there are a few highly developed Western European regions like Switzerland which are also able to keep up in tax competition. Therefore, Poland should not concentrate too unilaterally on tax competition.

Regulation

The connections between regulation and economic performance are very complex and work through many channels of the economic system. Without going into too much detail, a more liberal system of product markets is expected to lead to a higher level of competition and a more efficient allocation of production resources. This can lead to a higher level of production as well as to dynamic effects on average growth. More flexible labour markets allow cheaper and faster adoption of the labour input when market conditions change; liberal labour markets allow the optimal use of the labour force potential. Again, level effects as well as dynamic effects are expected when labour market regulation moves towards the optimum which, for Europe, would be expected to be below the current level.

Regulation as a location factor

Regulation is a double-edged sword. On the one hand, a certain level of regulation guarantees functioning markets, corrects market failures and compensates for externalities. On the other hand, regulation is costly. Regulations need administration and oversight which consume resources not available elsewhere in the production process. Probably even more serious are the indirect costs. Regulation can lead to unwanted incentives or can hinder additional economic activities. For example, regulating certain product standards can lead to a sheltered market which reduces the incentive for companies to innovate and hinders new competitors from entering the market.

From the above discussion, it is clear that a bell shaped curve would be expected for the overall relationship between the degree of regulation and the economic performance. Economists almost unanimously believe that Europe is on the downward slope of this curve, that is, the general level of regulation in Europe is above the level optimal for economic growth. We therefore expect that, given the sample of regions used in the benchmarking exercise, it is advantageous with respect to economic prospects for a region to have a lower level of regulation.

The following box provides an overview of the regulation indicators used in our benchmarking analysis:

Indicators for Regulation

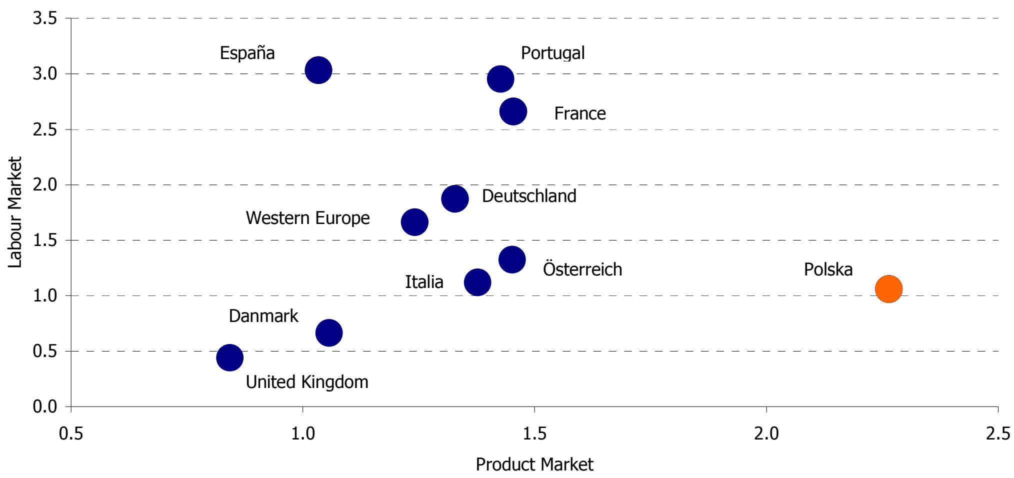
To quantify the level of regulation, the OECD measures several hundred different indicators from all fields of regulation. From these, a meta-analysis yields regulation indices. Other sources following similar approaches are used to complete time series.

The indicators used in benchmarking are:

- Index of product market regulation (0 = very liberal / 6 = very restrictive)
- Index of labour market regulation (0 = very liberal / 6 = very restrictive)

All these regulation indicators are measured on a national level. This makes sense insofar as most major regulation is determined at the national level. Still, they are important in regional benchmarking to understand a region's position and its options. Without regulation an important part of the picture would be missing. Of course, there are also regulations at the regional level. Last but not least, how local officials handle a given national regulation can be very different between regions. Unfortunately, no internationally comparable data on the regional level is available. Still, the available indicators grasp the most important part of regulation and allow an international comparison of the position of different regions.

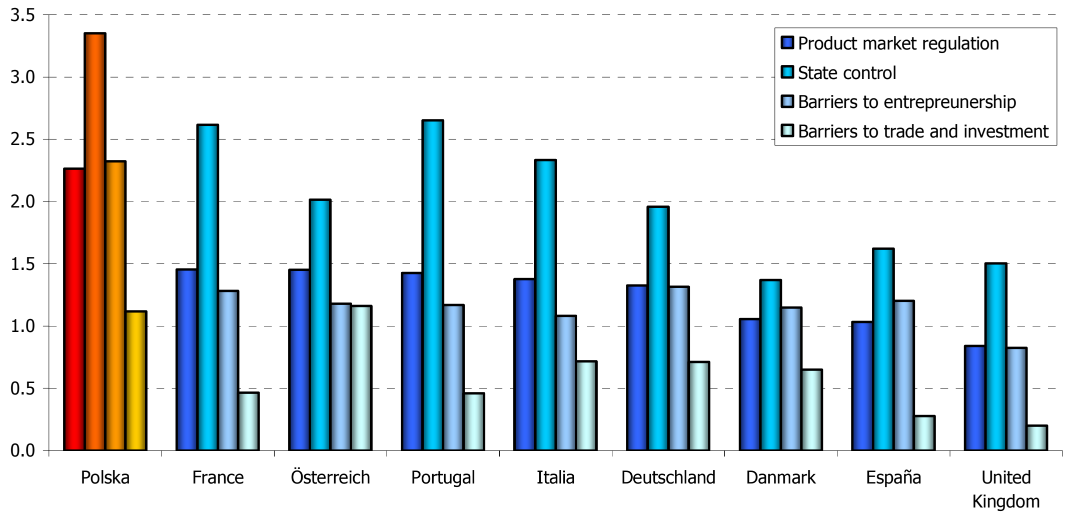
Fig. 4-3 Regulation of product and labour markets, 2008



Index (0 = very liberal / 6 = very restrictive)
Source: BAKBASEL, OECD, Cato Institute

- Like in the case of taxation, regulation is mostly set on a national level, so only country information is depicted in Fig. 4-3.
- In terms of product market regulation Poland performs very badly: It has the highest product market regulation in the benchmarking sample. More details on this are discussed in the next paragraph.
- Regarding labour market regulation Poland has a far better rank in the benchmarking sample. It is only topped by the very liberal English (UK) and Danish regions. The liberal labour market might turn out to be an asset in the catch-up process as a high degree of flexibility and adaptivity is necessary.

Fig. 4-4 Regulation of product markets, 2008



Index (0 = very liberal / 6 = very restrictive)
Source: BAKBASEL, OECD

- Fig. 4-4 takes a detailed look into product market regulation. Regarding this indicator Poland performs particularly bad.
- It can be seen, that Poland shows the highest (which translates into the most restrictive) value in every domain except «Barriers to trade and investment» where it features the second highest value.
- The highest ratio between Poland and the country with the second highest value can be found in the domain «Barriers to entrepreneurship». A detailed look into this domain reveals that it is mostly the sub-domain «Administrative burdens on startups» which leads to the bad performance of Poland. Further divided into low-level indicators (the most basic building blocks of the OECD Indicator of Product Market Regulation, PMR), it can be seen, that Poland performs very bad in all of the indicators the aforementioned sub-domain encompasses. However, the relative spread between Poland (with the highest value) and the country with the second highest value is the largest for the indicator «Administrative burdens for corporation»[2].
- In summary, the exceptionally high value in product market regulation stems to a large part from the high administrative costs a person faces when registering a public limited company. However, the high share of sectors in which the state controls at least one firm and the direct control it still has over business enterprises contribute to the restrictive product market, too. In the latter two indicators Poland has the highest possible value of 6, meaning very restrictive.

[2] For a detailed description of how the OECD Indicator of Product Market Regulation (PMR) is composed, see http://www.oecd.org/dataoecd/32/9/42131723.pdf.

Innovation

The highly developed European economies rely on permanent innovation to keep the competitive advantage in a globalizing world and to justify high earnings levels. This is why the analysis will focus on different indicators measuring the regional innovation level and the regional innovation performance. Basically, there are four indicators under consideration:

Human capital

A highly qualified workforce with a high degree of practical know-how is a key factor for sustained economic growth.

Indicators for human capital available in a region

Human capital cannot be measured directly. Instead, indicators have to be used. The highest level of formal education achieved is both the most straightforward indicator and the one for which the most data is available.

The indicators which are used in benchmarking are:

- Share of the labour force with a tertiary degree (highly qualified)
- Share of the labour force without a secondary degree (not qualified)

Of course, these are incomplete measures since they focus on the formal education usually obtained at the beginning of the working life. They do not reflect non-formal education or the influence of work experience and ability and they ignore life-long learning. Furthermore, differences in the education systems between countries might lead to biased results. Still, these are the best indicators available and are widely accepted in international comparisons.

Shanghai-Index

A further resource used in the innovation process is top quality academic research. Although not usually considered innovation by a strict business definition, academic research is often the first step of a longer innovation process that eventually leads to economically relevant innovations. Therefore, a relevant factor in innovation is the research potential embodied in universities located in a region.

Measurement of University quality

An indicator used to measure the top academic potential of universities is the Shanghai Jiao Tong University's 'Academic Ranking of World Universities' («Shanghai Index»). This ranking comprises the 500 best universities in the world and considers, among others, sub-indices on publications in journals and the number of Nobel Prize winners.

The indicator used in benchmarking is:

- The total number of scores in the Shanghai Index for all universities located in the region

The total number of scores reflects the quantity of top research available in the region. As networking effects and economies of scale play an important role, the total number of scores is important in itself. Furthermore, in order to attract the best researchers and students possible, a region must become known as a prominent centre for learning with a critical mass of top universities. Of course, this number depends on the size of the regions as well.

A limitation of this indicator has to be kept in mind. The focus of research of a university is a factor which strongly affects the ranking. The Shanghai Index puts more weight on the natural sciences. A university with a focus on social sciences consequently ranks lower.

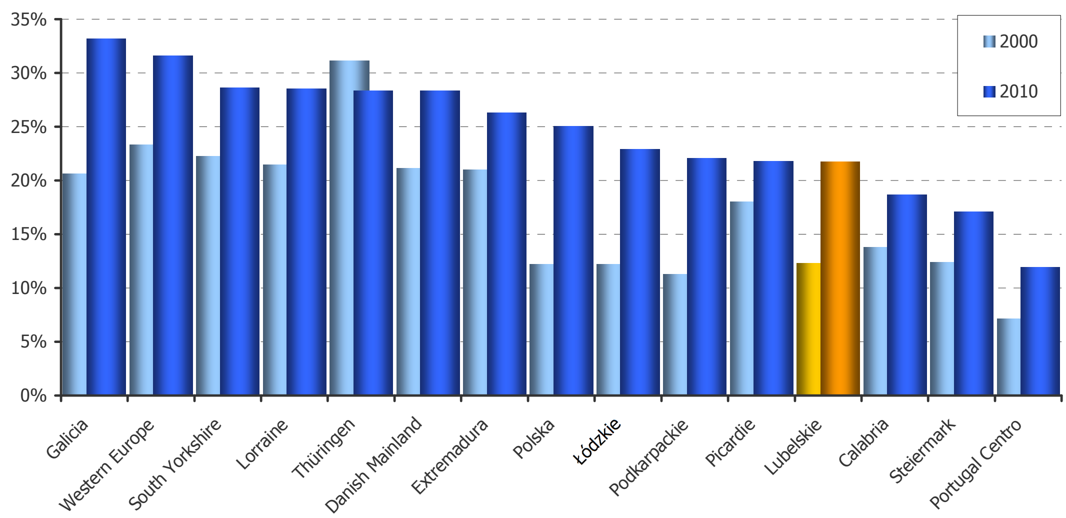
Patents

Patents are a key measure of innovation output, as patent indicators reflect the inventive performance of countries, regions, technologies, firms, etc. They are also used to track the level of diffusion of knowledge across technology areas, countries, sectors, firms, etc., and the level of internationalisation of innovative activities. Patent indicators can serve to measure the output of R&D, its productivity, structure and the development of a specific technology/industry. Among the few available indicators of technology output, patent indicators are probably the most frequently used. The relationship between patents as an intermediate output resulting from R&D inputs has been investigated extensively. Patents are often interpreted as an output indicator; however, they could also be viewed as an input indicator, as patents are used as a source of information by subsequent inventors

Measurement of Patents

EPO fillings, according to the region of the inventor, full count (each filling counts as one in each region with a research involved). To avoid the double counting of the same patent, each patent filling is counted only once when aggregating different regions. This often results in lower values for the aggregated regions (e.g. IT) comparing to the sum of all regions. For all patent datasets, missing values are zero values.

Fig. 4-5 Tertiary education

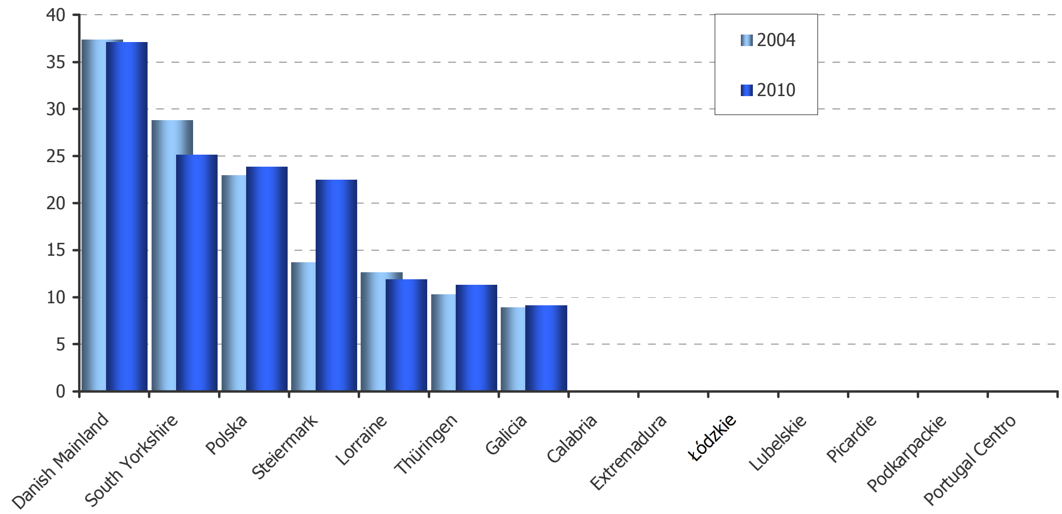


Proportion of employed people with a tertiary education in the total of employed people
Source: BAKBASEL

- Regarding the share of employed people with a tertiary education Lubelskie ranks in the rear of the benchmarking sample compared to both Western Europe and Poland. The Western European share of 32 percent is nearly one and a half times larger than the share of 22 percent in Lubelskie.

- Bear in mind that capital regions traditionally have higher shares of highly educated people than other regions due to the large public sector, including administration and education. Thus Western Europe and Polska have a slight "capital city bias".
- However, all Polish regions experienced the strongest growth of the share of tertiary educated employment in the period 2000-2010. Unfortunately, Lubelskie performed the worst among the Polish benchmarking regions: Tertiary education in Poland grew by 7.5 percent per annum, while Lubelskie «only» showed a growth rate of 5.9 percent per annum.

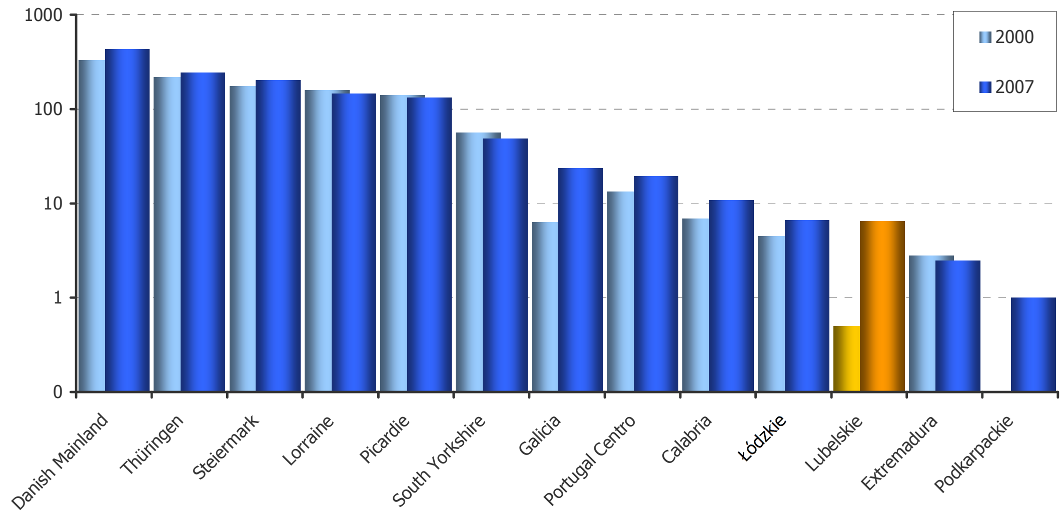
Fig. 4-6 Shanghai-Index, 2004 and 2010



Total scores of all universities in the region in the Shanghai-Index
Source: BAKBASEL, Shanghai Jiao Tong University

- There are no universities in the Lubelskie region which were included in the sample of the top 500 universities published in the Academic Ranking of World Universities (ARWU). Only two Polish universities are among the best 500 universities, namely Jagiellonian University in Krakow and the University of Warsaw (both rank between 400th and 500th). The value of Polska aggregates these two universities.
- Lubelskie is in good company having a university which is not among the world top 500. Most smaller regions in Europe are in the same situation.

Fig. 4-7 Patents, 2000 and 2007



The ordinate has a logarithmic scale.
Fractional count; patents that could not be regionalised were not included. As a consequence, countries with a higher share of not regionalised patents (e.g. Poland) perform worse (bias).
Source: BAKBASEL, OECD REGPAT database, December 2010

- As pictured in Fig. 4-7 Lubelskie is again at the rear of the benchmarking sample. However, more patents have been issued in 2007 than in Extremadura and Podkarpackie and the value is very close to the one of Łódzkie. Moreover, patents that have not been regionalised by the OECD have not been included. As a consequence, countries with a higher share of not regionalised patents (e.g. Poland) perform worse, hence the sample is slightly biased. It may be presumed that the values of the Polish regions are higher in reality.
- It is also visible that the differences in issued patents are very large across the benchmarking sample. Danish Mainland has a value of about 437 patents in 2007, whereas the Lubelskie region issued about 7 patents. This finding is in line with previous findings like the low share of the industrial sector in the aggregate economy and the lower results in tertiary education and the Shanghai Index.
- However, it is very positive to note that Lubelskie exhibits the second-highest growth rate during the period 2000-2007. Indeed, the very low levels of Lubelskie and Podkarpackie in 2000 must be considered. With zero patents in 2007, Podkarpackie features an infinite growth rate (the highest in the sample) while in absolute terms only one patent more has been issued. In Lubelskie the case is similar, with 6.5 patents in 2007 and 0.5 patents in 2005 (which translates into a annual average growth rate of 44% p.a.). Nonetheless, the mere increase in patents is a very positive sign.

5 Conclusions

This final chapter consolidates the information provided in the three preceding chapters. It is a short SWOT-analysis accounting for the strengths and weaknesses as well as the opportunities and threats of the Lubelskie region. Performance benchmarking and location factors are analysed by graphs which display the position of Lubelskie, Polska and Western Europe in the benchmarking sample (of 15 territories) by means of quartiles (25%-, 50%, 75%- and 100%-quantiles). How to interpret them is described in the following text box.

Interpretation example for a «quantile chart»:

A region's value (of some specific indicator) can be displayed relatively to the whole benchmarking sample by indicating whether it is smaller or larger than some quantile. The p-quantile is defined as the value which is greater or equal than a share of p of the sample. For example, the 25%-quantile is the value which is greater or equal than 25% observations in the sample.

In the quartile-charts below, a value falls into the leftmost column if its realisation of the specific indicator is smaller or equal than the 25%-quantile (the first quartile), i.e. it belongs to the 25% share of the smallest values in the benchmarking sample. It falls into the second column, if its value is greater than the 25%-quantile but smaller or equal than the 50%-quantile (the median). The interpretation carries over to the third and fourth column, which are separated by the third quartile.

It is important to note that for some indicators higher values imply less desirable states (such as taxation or regulation). In these cases the indicators have been inverted for their illustration in the graphs below, i.e. the highest 25% of regulation values fall into the leftmost column. Hence the graph can be interpreted by the fact that the «worst performers» fall into the leftmost column and the «top-performers» into the rightmost column.

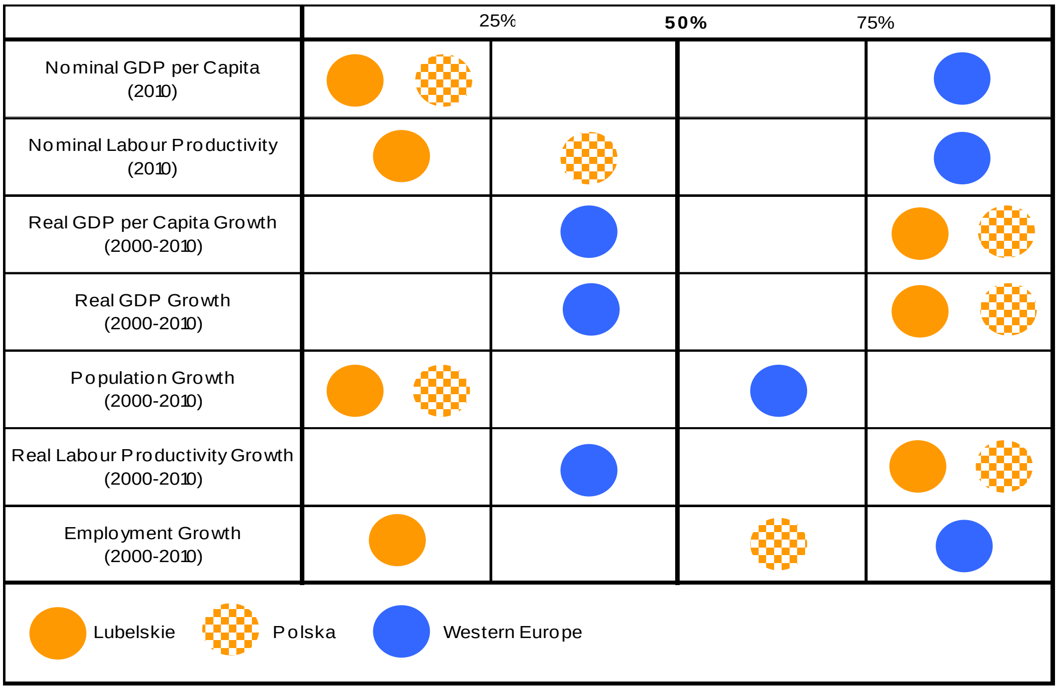
Polska and Western Europe have been included as specific benchmarking examples. However, bear in mind that they do not represent averages of the benchmarking sample. Western Europe includes other regions than the benchmarking sample. As declared in the introduction the average region in the benchmarking sample is less developed than the average Western European region. Hence, Western Europe performs very well in level indicators and suboptimal in growth indicators.

5.1 Performance Benchmarking

Lubelskie's economic performance is best summarised by the following two facts (in comparison to the benchmarking sample):

- Low levels of wealth and productivity
- High growth rates of wealth and productivity

Fig. 5-1 Summary of performance indicators



Quartiles of the sample, the farther to right the better
Source: BAKBASEL

- As displayed in Fig. 5-1 Lubelskie is still an underdeveloped region. The low levels of wealth and productivity led to an emigration of employees and residents. However, this may prove to be the key to economic development in the future: The economy seems to have become more productive in the sense that the same value added can be produced with a smaller labour force. By means of these productivity gains the region gains a competitive edge in the international competition for capital. Entrepreneurs and international companies are attracted by the comparatively lower costs of producing goods and services, which in turn advances economic development. When an inflexion point has been reached, growth of labour productivity will be no longer advanced by contraction of the labour force, but by stronger growth of gross value added. This will also allow the labour market to grow once again, as productivity gains can still be generated if gross value added grows faster than employment. Thereby the competitive edge may be supported.
- It seems as if some regions in Poland have already executed this step in economic development. Poland lies in higher quartiles in regard to nominal labour productivity and employment growth. The U-turn has been executed and after an initial elimination of jobs and successive productivity gains economic development has gained ground and is now sustainable by itself. The development of the labour market in Poland and Lubelskie may be checked in Fig. 2-8. Both seem to

have reached the trough in the labour market in 2003. Population growth on the other hand has not yet picked up even in Poland, but the labour market development is an indicator for expected population growth in the future, presumably caused by immigration from poorer Eastern European countries.

- The advanced stage of development in other Polish regions may be the reason for the below national average growth rates of Lubelskie in real GDP per capita and real labour productivity (see Fig. 2-3 and Fig. 2-7). Once the economic development has gained its footing, productivity gains are no longer generated by reducing the labour force with a constant generation of value added. Rather, the generation of value added grows faster than the labour force and hence labour productivity also grows. This seems to be the case in Poland as both real labour productivity and employment have positive growth rates (see Fig. 5-1).

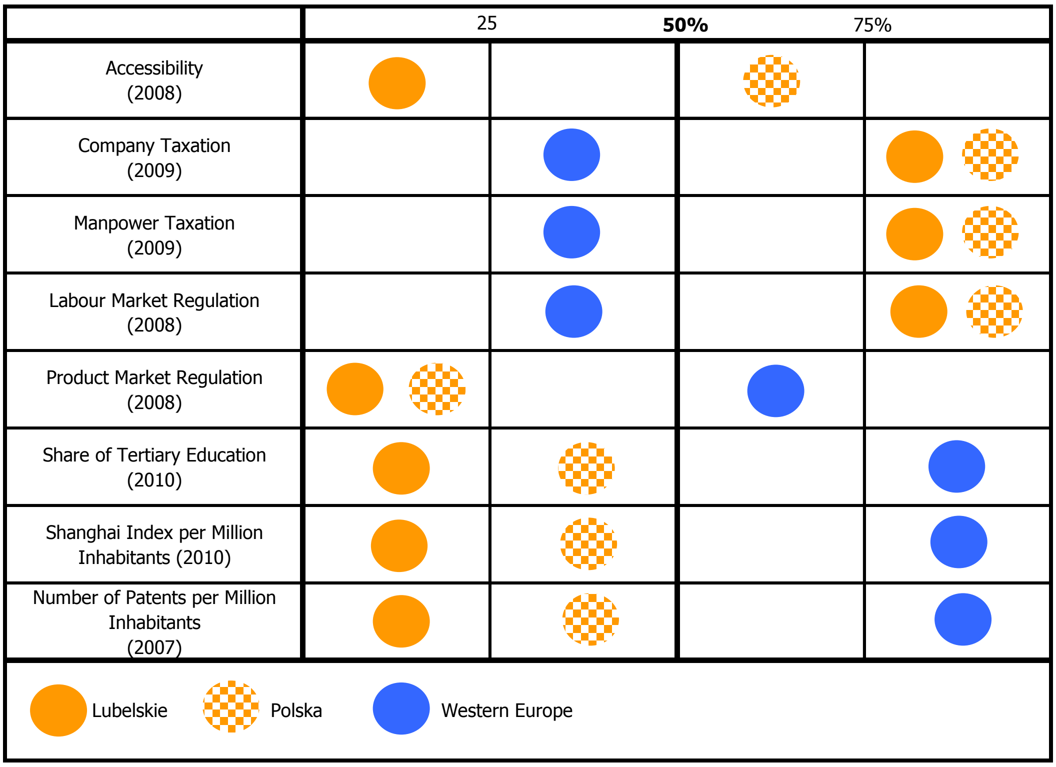
5.2 Industry Benchmarking

- The economic performance of a region is closely linked to the industry structure. As regional economics can not be considered as perpetual motion machines, export oriented industries are the main drivers of economic growth. The export oriented industries are generating economic value added and wealth by serving external demand which then in general boosts domestically generated value added. Normally, highly specialized manufacturing industries (e.g. chemistry, machinery), financial and other knowledge-intense services as well as tourism are considered as export-oriented industries.
- As the benchmarking analyses revealed, there are hardly any export oriented industries in Lubelskie. There are no weighty service industries and the manufacturing sector is highly fragmented. Specialisations at the single industry level can only be identified for the food industry and tourism. However, the food industry can not be considered as a powerful industry cluster as the value added of this industry heavily dropped in Lubelskie during the last decade. And tourism is still underdeveloped and doesn't reach the critical size to provide strong impulses. At least, tourism seems to have a real potential to push the future development of Lubelskie. During the last decade, tourism in Lubelskie grew faster than in Poland and the development of employment was very dynamic, so that tourism can be revealed as a small «job-engine» for Lubelskie.
- Because of the favourable preconditions of Lubelskie, also agriculture could to some extent be identified as an export oriented industry. The benchmarking reveals that agriculture is very important for Lubelskie, much more important than for most of the other benchmarking regions. However, the potential of agriculture for future impulses has to be questioned, because this sector in general is highly regulated and protected by tariffs.
- Otherwise, construction is of high importance to Lubelskie. Value added as well as employment in the construction industry grew faster in Lubelskie than in Poland during the past decade. Although the contribution of construction to GDP growth is very important for Lubelskie, there has to be mentioned that construction mostly is domestically driven. The same holds true for the health industry, another weighty industry in Lubelskie. However, the health industry in Lubelskie had to face a painful reduction of employment during the last decade.

5.3 Location Factor Benchmarking

As in the case of performance indicators, some indicators / location factors lead and others lag. In the context of performance, labour productivity growth precedes GDP growth, which precedes employment growth, which precedes wealth increases (in levels). In the context of location factors, favourable taxation and regulation mostly lead to increases in accessibility and innovation. The theoretical reason is the following: International companies are attracted by low taxes and low regulation. As they operate in interregional / -national markets, they depend on good transportation possibilities (buy and sell goods and services, transport employees and clients). With the presence of these companies the government has an incentive to provide the necessary transport systems. Similarly, the presence of these companies leads to the development of industry-clusters which in turn advance the development of knowledge-clusters and hence innovation location factors.

Fig. 5-2 Summary of location factors



Quartiles of the sample, the farther to the right the better
It is not meaningful to define an accessibility value for Western Europe in this context.
Source: BAKBASEL

- The taxation and regulation location factors are set on a national level and hence are identical on regional and national level. In comparison to Western Europe, Poland performs very well in the «leading» location factors taxation and regulation. Only the value for product market regulation is higher than in the other benchmarking regions.
- In global and continental accessibility Lubelskie performs badly both in comparison to the Polish and the benchmarking sample average. Poland certainly benefits from its capital Warszawa. However, it is to be expected that the accessibility of the Lubelskie region will improve with economic development.

- Lubelskie's values for the innovation location factors (share of tertiary educated employees, Shanghai Index, patents) are very low, too, whereas the Polish average is higher. This is in line with the theory that the innovation indicators are lagging compared to the taxation and regulation indicators and hence to economic development. Some Polish regions seem to be further developed than Lubelskie.

5.4 Summarising SWOT

In this section the most important results of the previous benchmarking analysis are resumed in form of a short SWOT analysis.

Lubelskie is (still) a rural area with both population density and GDP density below the Polish and the Western European average. Relative to Poland it is a lagging region, relative to Western Europe, however, it is a convergence region continuously catching up. Within our sample, the Polish regions are growth leaders, thus reducing the wealth gap to all other regions including the Spanish.

The following table provides an overview of the economic strengths and weaknesses of Lubelskie:

Tab. 5-1 Strengths and Weaknesses

Strengths	Weaknesses
Real GDP Growth	Nominal GDP per Capita
Real GDP per Capita Growth	Nominal Labour Productivity
Real Labour Productivity Growth	Employment Growth
Company Taxation	Population Growth
Manpower Taxation	Absence of strong industry cluster
Labour Market Regulation	Accessibility
	Product Market Regulation
	Human Capital (Share of Tertiary Education)
	Innovation Performance (Shanghai, Patents)

Source: BAKBASEL

A major problem in Lubelskie is the development of the population, which is still shrinking. Promising for the future is the lower turning point in employment in 2003, which shows that GDP growth is not only due to rapidly rising productivity, but is also able to create additional jobs. This may help reducing emigration and eventually add to population growth.

The strengths and weaknesses include some hints for the future. Lubelskie is a low density region located at the Eastern border of the EU and far from the economic gravity centre. Even within Poland, Lubelskie is not at the forefront of economic development. Innovation capacity, e.g., is lower than in the Polish average. It will be difficult to make Lublin and Lubelskie a «spot to be» in Europe.

One of the major drawbacks is accessibility. Given the distance of some 165 kilometres from Warszawa to Lublin, both car and train rides take more than two and a half hours, which is rather long (or slow). Despite the fact that Lublin is located on the E372 from Warszawa to Lviv (and further to Kiev), there is no fast link on either side. And air traffic is even poorer. Compared to, e.g., Rzeszow, the situation is still bad (also given the plans to open a new airfield just outside Lublin). Especially given the fact that Lubelskie is a remote area in Poland and in the EU, accessibility is one of the major challenges for the regional policy-makers.

The following table provides an overview of economic opportunities and threats of Lubelskie:

Tab. 5-2 Opportunities and Threats

Opportunities	Threats
Good accessibility	Bad accessibility
A clear strategy and focus	No strategy and focus
Reinforce agriculture	Demography, emigration of the young
Establish tourism	
Enhance transport and trade	

Source: BAKBASEL

Lubelskie should have a clear vision, strategy, focus. Given the geographical facts, the low accessibility and the low innovation capacity, there are only a few sectors that may serve as focal points. Agriculture is one of the sectors often associated with low income; however, looking towards France or North America may prove successful strategies. Especially with food shortages and rising food prices to come, agriculture will become a good business. The University of Lublin may focus on research in agriculture designed to increase crop productivity as for changing climate conditions in Central Europe. A land reform leading to larger units would support a stronger agricultural sector.

A second focus may be put on tourism, combining great landscapes (e.g. Poleski and Roztoczański national parks) and historic cities (e.g. Lublin and Zamość). Especially the UEFA European Football Championship 2012 may prove a good opportunity to introduce Lublin to a broader (European) audience although no matches will take place in Lublin itself. However, Lublin may profit from its geographical location, connecting the venues in Poland with those in the Ukraine. A third focus may be put on transport and trade, including wholesale trade in agricultural goods and exchange with neighbouring countries in the East. Though, both require good accessibility.

Of course it would be nice to see Lublin as a pharmaceutical or IT centre by the year 2020. However, from the data analysed from a bird's view, it is not possible to identify any industry that may prove to become a sound cluster. If local experts can identify such a nucleus (which can hardly be seen from outside), it is always worth to follow such a path. Particularly the Special Economic Zone (SEZ) «Euro-Park Mielec», in which Lublin shares the third largest area (behind Mielec and Rzeszow), can be seen as a means to attract more «promising» economical sectors. The tax reductions that can be granted in the SEZ in combination with the already low level of taxation in Poland may serve as a competitive edge in the fierce tax competition in Eastern Europe.

6 Appendix

6.1 Data Source

The data used in this report originate from the «International Benchmarking Database» of BAK Basel Economics. For a precise description of the methodology, please refer to BAKBASEL (2010).

Some data have been taken over or derived from other databases:

- Thomson Scientific Ltd. (TS), London, UK; © Copyright Thomson Scientific 2006
- Shanghai Jiao Tong University (SJTU)
- Organisation for Economic Cooperation and Development, Paris (OECD)
- Zentrum für Europäische Wirtschaftsforschung an der Universität Mannheim (ZEW)
- Institut für Verkehrsplanung und Transportsysteme an der ETH Zürich (IVT)
- EUROSTAT and various national statistical offices

6.2 References

BAKBASEL (2010): International Benchmarking Report 2010, Part III: Sources, Basel.

BAKBASEL (2007): BAK Taxation Index 2007 – Effektive Steuerbelastung von Unternehmen und auf den Einsatz hoch qualifizierter Arbeitskräfte, Basel/Mannheim.

Elschner, Christina and Robert Schwager (2003): The Effective Tax Burden on Highly Qualified Employees - An International Comparison, Studie im Auftrag des IBC BAK International Benchmark Club von BAK Basel Economics, Mannheim.

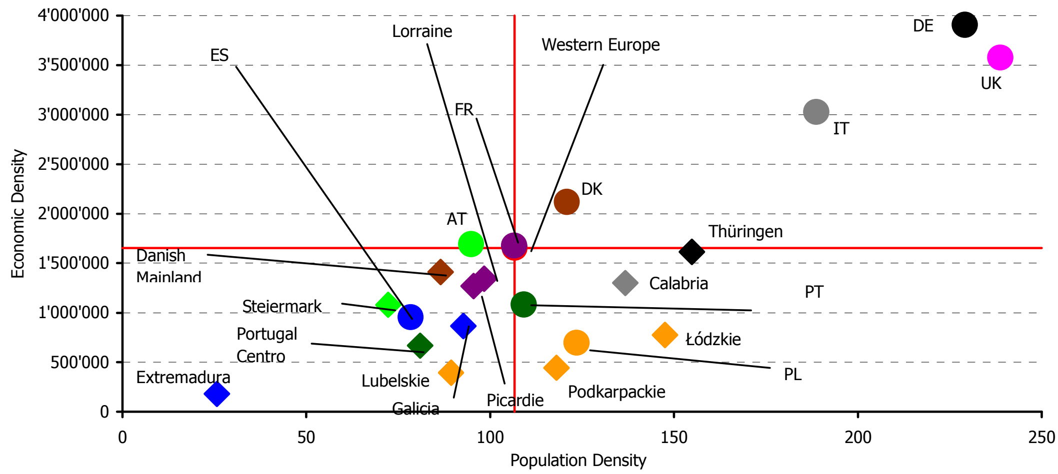
Elschner, Christina and Michael Overesch (2004): Der IBC Taxation Index 2003 - Eine geographische Erweiterung, BAK Basel Economics, Basel.

Wikipedia (2011)
http://en.wikipedia.org/wiki/Lublin#Airport

6.3 Additional Graphs

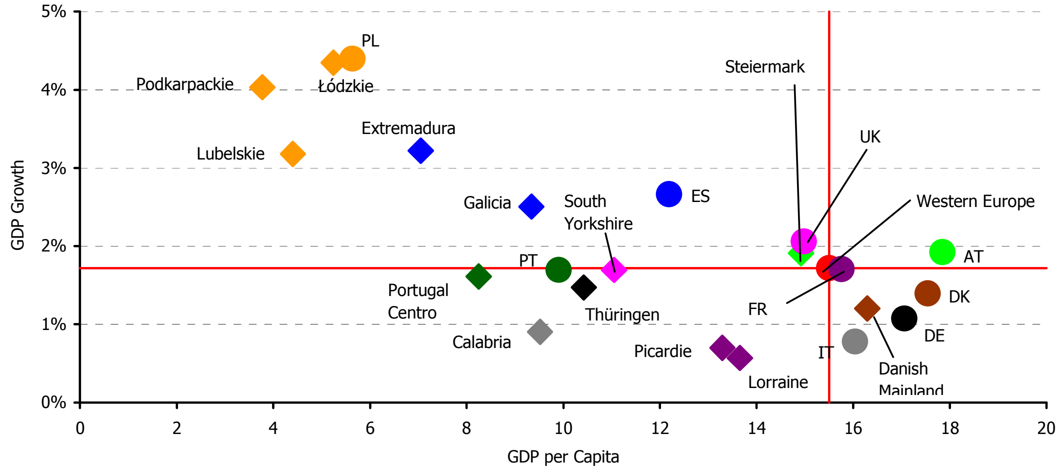
In this section of the annex, Fig. 1-1 (population and economic density) and Fig. 1-2 (GDP per capita and GDP growth) are displayed for different years. The level indicators (population density, economic density, GDP per capita) have been depicted for the starting date of our period of interest (1995), whereas the growth indicator (GDP growth) still encompasses the whole period (1995-2010).

Fig. 6-1 Population and economic density, 1995



Population density: People per square kilometre
Economic density: GDP in million EUR (at current prices and exchange rates, PPP corrected) per square kilometre
South Yorkshire has been excluded because it distorts the figure. It has a population density of 825 people/km^2 and economic density of 9.1 Million EUR/km^2.
Source: BAKBASEL, national statistical offices

Fig. 6-2 GDP per capita, 1995 and GDP growth, 1995-2010



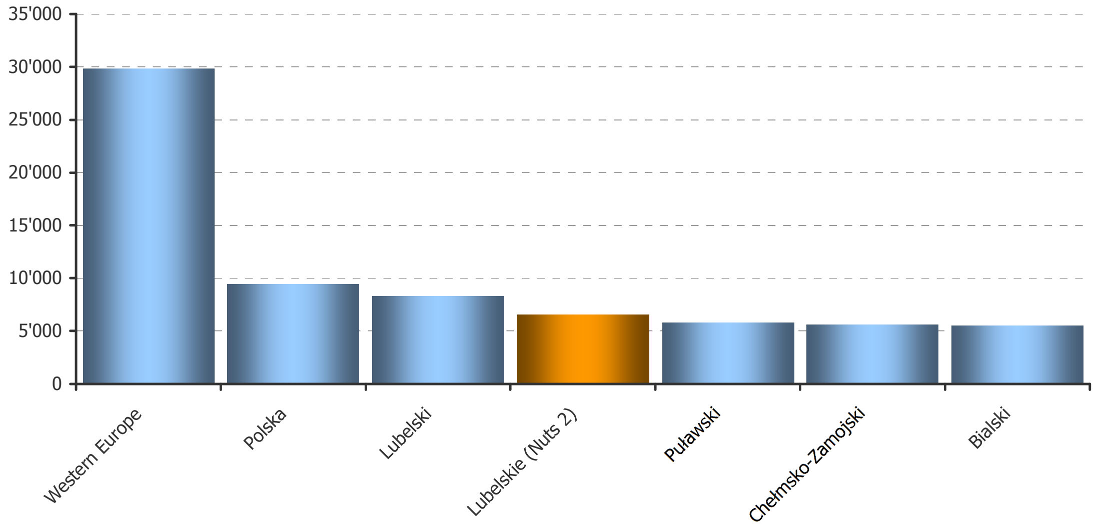
GDP per capita: GDP in million EUR (at current prices and exchange rates, PPP corrected) per person
GDP growth: Annual average growth rate for the period 1995-2010
Source: BAKBASEL, national statistical offices

Compared to Fig. 1-1 and Fig. 1-2, not very much has changed in the relative position of the regions compared to each other, despite the fact that the period is rather long (15 years) and Poland and its regions exhibited high growth rates during the period.

6.4 A Spot on NUTS 3

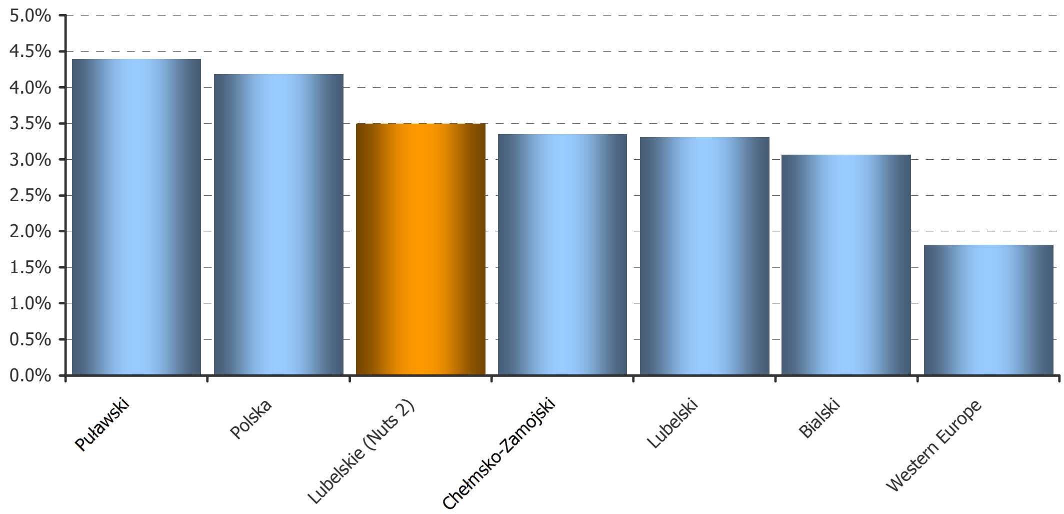
In this annex you will find a few graphs with data on the NUTS 3 level without comments.

Fig. 6-3 GDP per capita on the NUTS 3 level, 2008



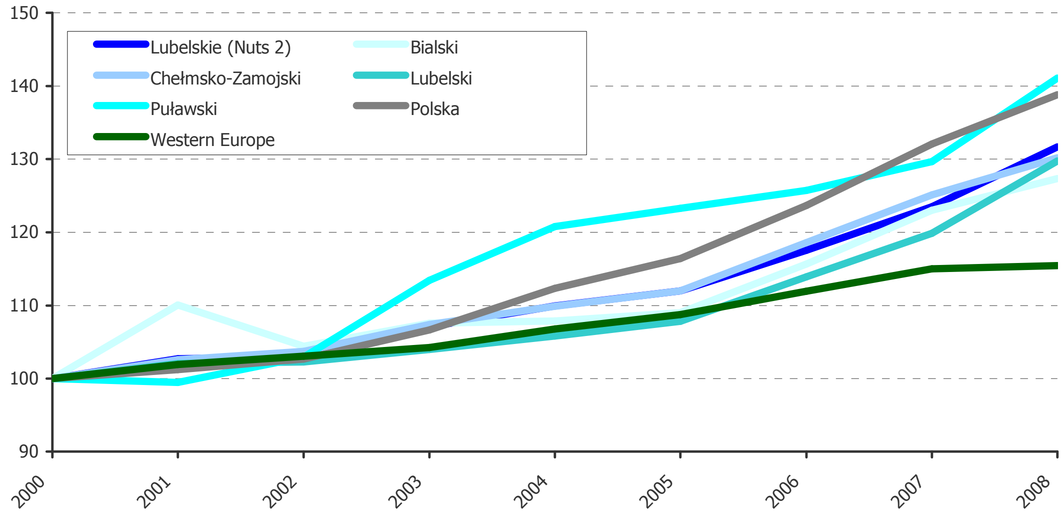
In 1'000 EUR (at current prices and exchange rates)
Source: BAKBASEL, national statistical offices

Fig. 6-4 Growth of real GDP on the NUTS 3 level, 2000-2009



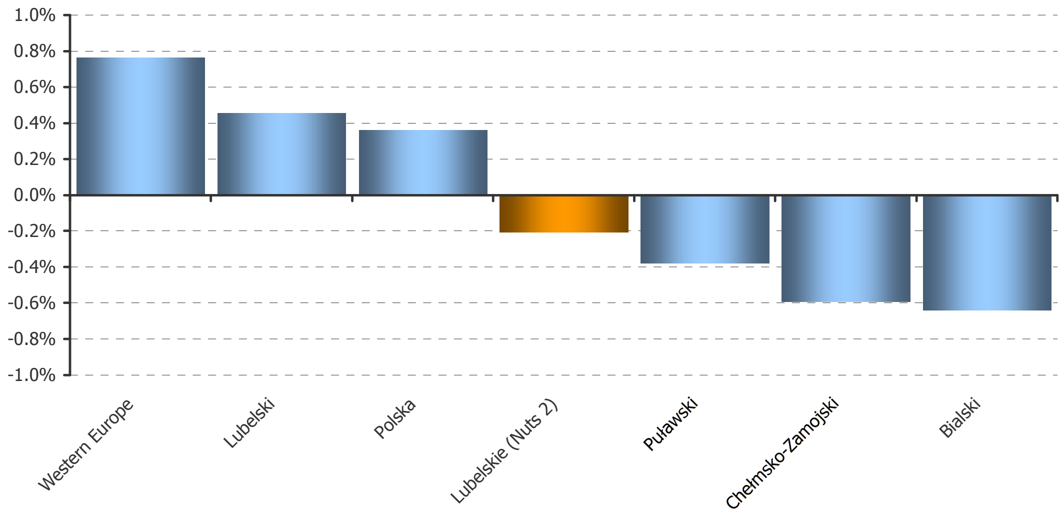
In % p.a.
Source: BAKBASEL, national statistical offices

Fig. 6-5 Growth of real GDP on the NUTS 3 level, 2000-2008



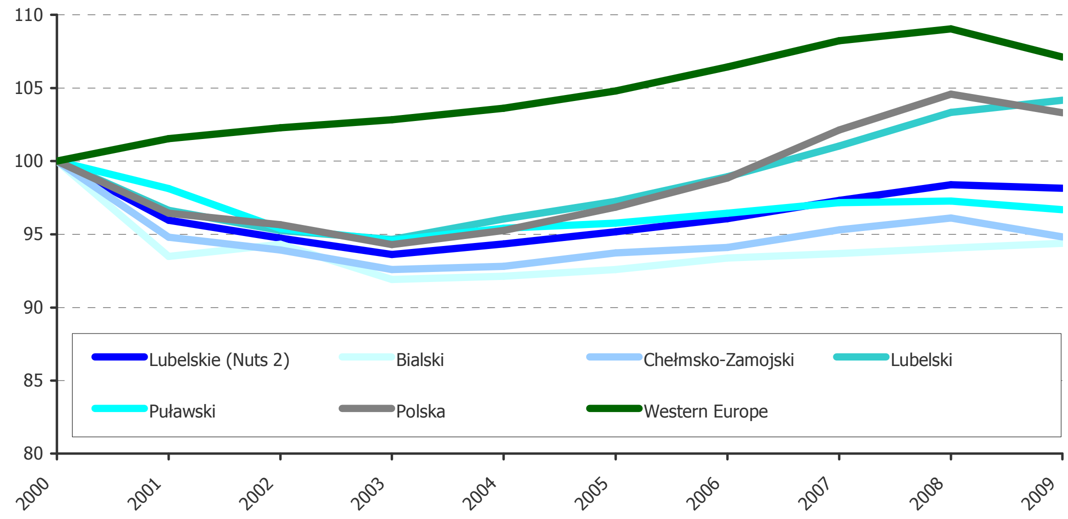
Index 2000 = 100 (at constant prices and exchange rates)
Source: BAKBASEL, national statistical offices

Fig. 6-6 Employment growth on the NUTS 3 level, 2000-2009



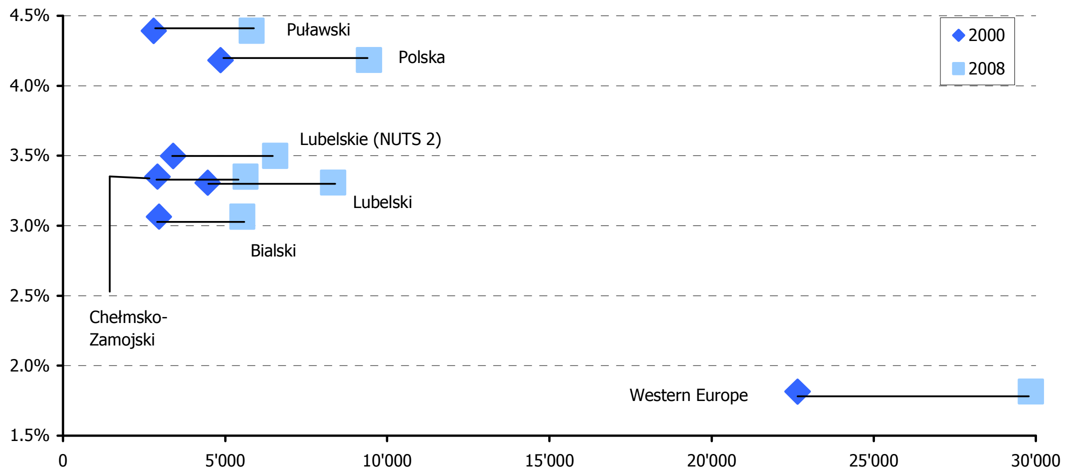
In % p.a.
Source: BAKBASEL, national statistical offices

Fig. 6-7 Employment growth on the NUTS 3 level, 2000-2009



Index 2000 = 100
Source: BAKBASEL, national statistical offices

Fig. 6-8 GDP per capita, 2000/2008, and GDP growth, 2000-2008, on the NUTS 3 level



Abscissa: In 1'000 EUR (at current prices and exchange rates)
Ordinate: In % p.a.
Source: BAKBASEL

Remark: The NUTS 2 region Lubelskie (PL31) has been divided into the comprising NUTS 3 regions Bialski (PL311), Chełmsko-zamojski (PL312), Lubelski (PL314) and Puławski (PL315). One main conclusion can be drawn from the preceding graphs: In terms of the level indicator (GDP per capita) the more urban Lubelski (containing the capital city of Lublin) performs better than the more rural regions Bialski, Chełmsko-zamojski and Puławski, which lie very close together. Regarding growth of real GDP Puławski develops very dynamically, even more than Poland. Looking at employment growth, the order is the same as in GDP per capita (with Lubelski as the most dynamic NUTS 3 region).