

**Strategic Evaluation on Innovation and the Knowledge Based Economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013**

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## Executive Summary

Increasingly interventions in the field of research technology development and innovation (RTDI) have become a key interest of policy-makers at all levels: European, national and regional. This is mainly due to the consensus that RTDI is one of the key drivers of productivity gains, economic growth and employment. Nevertheless, some observers agree that there is a risk of R&D and innovation in fuelling economic growth may be exaggerated, or that RTDI policies are equally important across all regions. The real danger is that lagging behind regions will adopt innovation policies as the sole solution to their economic development and high unemployment. In contrast, this analysis suggests that the Structural Fund interventions promoting the development of innovation and knowledge should be prioritised on the basis of regional RTDI potential. For example, lagging behind rural regions may benefit more from effective strategies adapted to their economic structure, rather than investment in public R&D institutes or projects. Certainly, unlike the infrastructure investments in R&D make sense in the regions with such potential, other type of measures seem to be more relevant in regions where the potential of stimulating the economic growth by innovation-oriented policies is less evident. In other words, strategic decisions cannot be taken without taking into account both current and future innovation potential of regions.

Often, innovation is thought to be relevant just for high-tech industries or radical innovations. However, this report argues the opposite. More accurately, it advocates that especially in regions with a low innovation potential fostering innovation in traditional industries and encouraging incremental innovations can better reinvigorate the economic growth, due to the large economic size of these sectors. It is also important to remember that successful innovative companies do not necessarily need to be big in size. Nonetheless, they need to find their niche markets. Although there is clearly a scope for regional authorities to plan and design appropriate policy-mix for the 2007-2013 programmes, it will be very important to concentrate the Structural Fund RTDI interventions on regions with high innovation potential.

Below, the reader will find short summaries of the main conclusions formulated in this report, with regard to both strategic orientations for the Structural Fund investments in innovation and knowledge, as well as operational guidelines to maximising their effectiveness.

### **Recommendation 1: Take into account different regional innovation potential when planning the 2007-2013 programmes.**

The recent report of the independent expert group on R&D and innovation appointed following the Hampton Court Summit “Creating an Innovative Europe” proposed that Member States should agree to a minimum voluntary commitment of the Structural Fund interventions supporting research and innovation of the order of 20%. The argument put forward was that this would represent a major increase from the present 5.9% of the overall envelope of the European Regional Development Fund and European Social Fund that are at present spent on support towards R&D and innovation. There is a risk, however, that the role of R&D and innovation is fuelling economic growth may be exaggerated or that RTDI policies are equally important to

all regions. Henceforth, it is important to design the best possible policy responses taking into account the regional innovation potential.

**Recommendation 2: Incorporate in the next programming period 2007-2013, innovation-related initiatives which will be able to create the meaningful and durable ‘structural effects’.**

There should be an evolution from infrastructure projects to more innovative approaches, which are likely to bring a greater value-added in stimulating the economic development. More detailed information about innovation policy orientations in the 2007-2013 perspective is presented in Section 6.1.

**Recommendation 3: Extend measures fostering innovation to the traditional sectors often based on non-technological innovation.**

The policy-makers engaged in programming of the Structural Funds, should be aware that one can find very innovative firms not only in the high-tech sectors (pharmaceutical, electronic material and telecom equipment, medical, precision and optical instruments), but also amongst the traditional ones, such as agriculture and farming, food and beverages, plastic products and tourism. For this reason, it is recommended to embed the measures supporting innovation in traditional industries, in the 2007-2013 perspective. This type of support is of particular relevance to regions with lower innovation potential and less advanced regions.

Policy-makers have a broad range of measures to choose from in order to foster innovation in traditional industries. One of them is support to the development of networks in a specific sector. The other possibility is to support traditional sectors by supporting mobility of graduates from technical universities to local companies. Awareness raising initiatives can also bring positive effects. One possibility is to establish an annual competition for innovative company coming from the traditional sector. The winners could be recompensed for their efforts by some sort of financial reward. Moreover, support to competence centres led by private consortium from the traditional sectors can also foster innovation. Finally, direct support for innovative projects in traditional industries is another possibility.

**Recommendation 4: Introduce two phases of the application process, streamline the administrative requirements and ensure that potential beneficiaries are well informed and prepared for the programming period 2007-2013.**

The first phase should consist of preliminary assessment of applications, and second one should be based on detailed analysis of administrative and technical offers. The ideal of course would be to have first technical assessment and then verification of the administrative documentation. Also, the number of required documents should be reduced to the strict minimum. On the one hand, it is very important to establish comprehensive and “light” administrative procedures, and on the other, to ensure that the potential beneficiaries are well prepared for the application process.

**Recommendation 5: Make availability of the Structural Fund interventions conditional upon involvement of enterprises**

Making availability of financing for infrastructure projects at research and knowledge organisations should be made conditional upon involvement of the business sector. Such approach is expected to help more effectively in stimulating co-operation between the R&D and business sector.

**Recommendation 6: Establish an effective system of monitoring and evaluation.**

The existing software should be adapted to the new financial perspective 2007-2013. At present, it is too late to foresee the design of a new tool, and such action is likely to be counter-productive. Finally, it is necessary to ensure that independent evaluations are carried out regularly.

# 1 Introduction

In March 2000, the EU Heads of State and government launched an ambitious political initiative for the European Union to become “the most competitive, dynamic, knowledge-based economy by year 2010”. The agenda, which has become known as the ‘Lisbon Strategy’, has included a broad range of policies and regulatory measures to achieve this goal.

At the 2005 Spring Council of European Union, Heads of State and government concluded that all appropriate national and Community resources, including those of Cohesion Policy, should be mobilised in order to renew the basis of Europe’s competitiveness, increase its growth potential and its productivity and strengthen social cohesion, placing the main emphasis on knowledge, innovation and the optimisation of human capital. In short, the Council recognised that while some progress has been made since 2000 in moving towards the goals enshrined in the Lisbon Strategy there remains a need to create “a new partnership for growth and jobs”<sup>1</sup>

In launching the discussion on the priorities for the new generation of cohesion policy programmes, the Commission published on 6 July 2005 draft Community Strategic Guidelines entitled “Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013”. One of the specific guideline is to improve the knowledge and innovation for growth. More specific areas of interventions, which are proposed by the Commission, include: improve and increase investment in RTD, facilitate innovation and promote entrepreneurship, promote the information society for all, and improve access to finance.<sup>2</sup>

Innovation is an important factor in releasing the potential of the Lisbon agenda. The knowledge captured in new technologies and processes can drive growth and competitiveness and create new jobs. But knowledge must be treated as part of a wider framework in which business grow and operate. Developing knowledge-based economy requires adequate levels of investment in R&D, education, and ICT as well as creating a favourable environment for innovation.

Less developed areas of the Union are also confronted with this new competitiveness challenge. Increasing cohesion leads to improvements in living standards and the reduction of economic and social disparities, which depend to an important extent on increases in productivity. Increasing competitiveness implies economic change through the introduction of new technologies and new methods of production as well as the development of new skills. Innovation is at the heart of this process. Technological and organisational change and new demands generated by rising income levels and factors which create new economic opportunities and therefore, contribute to the growth potential of these countries.

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<sup>1</sup> Communication to the Spring European Council (2005) “Working together for growth and jobs: A new start for the Lisbon Strategy”, COM(2005) 141. Available at: [http://www.europa.eu.int/growthandjobs/key/index\\_en.htm](http://www.europa.eu.int/growthandjobs/key/index_en.htm).

<sup>2</sup> Communication from the Commission (2005) “Cohesion Policy in Support of Growth and Jobs: Community Strategic Guidelines, 2007-2013”, COM(2005) 0299. Available at: [http://www.europa.eu.int/comm/regional\\_policy/sources/docoffic/2007/osc/index\\_en.htm](http://www.europa.eu.int/comm/regional_policy/sources/docoffic/2007/osc/index_en.htm).

Structural Funds are the main Community instruments to promote economic and social cohesion. In the past and current programmes, they have contributed to enhance the research potential and innovation in businesses and to develop the information society, particularly in the less developed areas. Cohesion policy has also promoted the development of regional innovation strategies and other similar initiatives in the field of the information society.

The overall objective of the strategic evaluation study, as set out in the terms of reference, is that the study should provide conclusions and recommendations for the future of Structural Fund and Cohesion policy. In particular, the Strategic Evaluation will be used to prepare the negotiations with the Member States for 2007-13, to prepare the next operational programmes and to provide input into the 4th Economic and Social Cohesion Report.

In line with the tender specifications, this country report addresses the following issues:

- An analysis of the current situation in the field of innovation and the knowledge-based economy at national and regional level. For the national level, performance is compared to the average performance for the EU25 Member States plus Romania and Bulgaria; and at regional level, where possible given available statistics, compared to a typology of EU regions;
- Lessons from the past and current experience of implementing innovation and knowledge economy measures in the Structural Funds, both in terms of priorities and strategic approaches; as well as in terms of operational implementation;
- Main needs and potential for innovation in the eligible regions drawing on available studies, strategy development and future and foresight studies; and
- Recommendations on main investment priorities for Structural Funds over the programming period 2007-2013 and their implications for regional development.



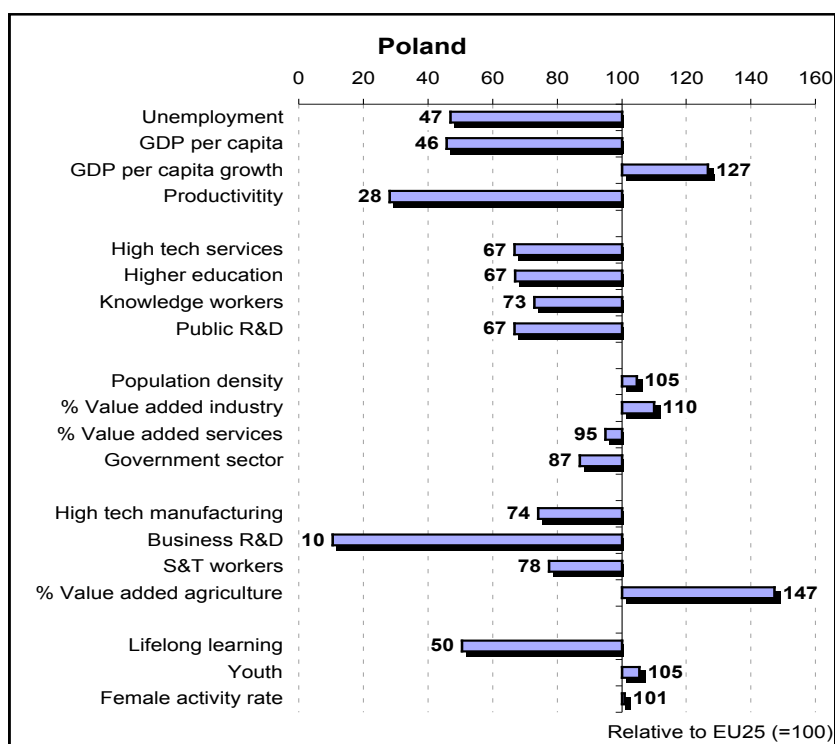
## 2 Investing in innovation and knowledge: a comparative overview of regional performance

This section provides a synthetic overview of the relative performance of the country, and where relevant main regions, with respect to the EU-25 average for a number of selected key structural indicators of innovation and knowledge. The analysis aims to identify main disparities and needs at national, and wherever possible, regional level with a view to supporting the definition of priorities for future Structural Funds interventions (see sections 5 and 6 of this report).

### 2.1 Country overview: innovation and the knowledge economy

Exhibit 1 below provides a snapshot picture of the relative position of Poland compared to the EU-25 average for a series of key knowledge economy indicators.

**Exhibit 1: Relative country performance for key knowledge economy indicators**



Source: Calculations of MERIT based on available Eurostat and national data from 2002-2003 depending on indicator. Detailed definitions and data for each indicator are provided in Appendix B.

It reveals that Poland is lagging behind the EU-25 average on a majority of key knowledge economy indicators. Such results were also confirmed by the 2005 European Innovation Scoreboard (EIS)<sup>3</sup> data, as well as the Trend Chart report on Poland covering the period 2004-2005.<sup>4</sup> In total, there are only six indicators in

<sup>3</sup> Available at: <http://trendchart.cordis.lu/scoreboards/scoreboard2005/index.cfm>.

<sup>4</sup> Available at: [http://trendchart.cordis.lu/tc\\_country\\_list.cfm?ID=27](http://trendchart.cordis.lu/tc_country_list.cfm?ID=27).

which Poland performed above the EU-25 average, namely GDP growth, population density, industry value-added, agriculture value-added, youth and female activity rate.

In 2004, the real GDP growth rate reached the level of 5.4%, however, recently the pace of Polish growth has been falling behind in comparison with other countries from the region of Central Eastern European Countries (CEECs). The real GDP growth rate in 2005 was only 3.2%, but has been recently picking up again to 5% in the 1<sup>st</sup> quarter of 2006. It is noticeable that the economic growth is mainly export-driven. In comparison with 2004, exports in 2005 increased by 6.1% and import by 0.2%. Expressed in Euro the performance is much more positive as exports and imports increased respectively by 19.6% and 13%. What is even more astonishing is the fact that two-thirds of exports come from companies with foreign equity or from Polish affiliates of European and non-European multinationals. There are also additional reasons explaining the growth. Local demand in 2005 in comparison with 2004 increased by 1.9% and the level of investments for the same period increased by 6.2%. At the end of January 2006, the rate of unemployment remained at the level of 18%, which is estimated at approximately 2.8 million of active labour force. A more worrying fact is that structural unemployment (more than one year) represents more than 50% of the total unemployed.<sup>5</sup> On the positive side, Poland showed a spectacular acceleration in labour productivity growth in 2005. The labour productivity growth rate increased from 4.1 to 7.7%. This improvement is a result of a complex web of determinants and interactions, such as labour quality and skill mix of human resources, technological progress and know-how accelerated by the increasing inflow of foreign direct investments (FDI) as well as sectoral reallocation effects.

The most cited drawback with regard to innovation is a low level of R&D expenditures. In 2004, the value of gross expenditures on R&D (GERD) was estimated at 5,155.4 million PLN (1,223.9 MEUR), which represented an increase of 13.1% in comparison with 2003. In 2004, the GERD/GDP ratio was estimated at 0.58%, and per capita it represented 135 PLN (32 EUR). The level of R&D activity in 2003 in the business sector was estimated at 1,249.7 million PLN (268.1 MEUR) and represents 0.15% of GDP. In 2004, business expenditures on R&D (BERD) increased to the level of 1,478.7 million PLN (351 MEUR), which represents a growth of 18.3% in comparison with 2003. In percentage, BERD in 2004 accounted for 0.17% of GDP.<sup>6</sup>

The problem in Poland is actually three-fold i.e. low level of GERD (below 1% of GDP), insufficient industry R&D investments, and high concentration of R&D expenditures in few regions. Also, a low level of enterprise innovativeness, high costs of development and implementation of innovative projects, and limited access to finance are considered as the major weaknesses. According to the publication "Science and technology in 2003", out of 3.3 bln EUR of total innovation expenditures incurred by industry only 11% was spent on R&D. In 2004, the innovation expenditures were estimated at 3.7 bln EUR, but the share of R&D expenditures represented only 7.5%.<sup>7</sup> One could only expect, that future trends will

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<sup>5</sup> Available at: [http://www.stat.gov.pl/dane\\_spol-gosp/praca\\_ludnosc/index.htm](http://www.stat.gov.pl/dane_spol-gosp/praca_ludnosc/index.htm).

<sup>6</sup> Central Statistical Office (2004) "Nauka i technika w 2003", Central Statistical Office (2005) "Nauka i technika w 2004".

<sup>7</sup> Loc. Cit.

be positive. This opinion is based taking into account the recently adopted legislation i.e. Act on supporting innovation activities (29 July 2005), introducing fiscal incentives as well as important Structural Fund investments.

In the academic year 2004/2005, there were 384,000 graduates from higher education institutions of which 5.7% graduated from engineering and technology faculties. In comparison with the academic year 1990/1991, the decline is significant when 17% of students graduated in this field. Most recent statistics show that the most popular specialisation is economics and administration, which accounted for 34.4% of students.<sup>8</sup> The share of the population with a tertiary education is currently 71% of the EU-25 average in 2004, which represents approximately 15.6% of Poland's population. At the end of 2005, the level of unemployed by education level was the following: tertiary (5.5%), vocational secondary (21.9%), general secondary (7.6%), basic vocational (32.6%), and lower secondary, primary and incomplete primary (32.4%).<sup>9</sup> Therefore, the challenge in Poland is to continue investing in knowledge, ensuring that higher education institutions prepare highly qualified personnel for the actual needs of the private sector.

It is also clear that Poland's economy is not based on high-tech companies. For example, in 2004 the share of high-technology products in export was estimated at 2.3% and in imports at 9.2%. The following products had the highest shares of exports in the group of high-tech products i.e. electronics and telecommunication equipment (27.7%), scientific equipment (23%), and aviation equipment (14.7%), whereas the pharmaceutical share was estimated at 4.6%. As a result, it implies that increasing innovativeness of more traditional companies is at least as important as granting the support for the high-tech companies. In 2004, the structure of sold production in the manufacturing section by levels of technology was as follows: high-technology (4.5%), medium-high-technology (25.6), medium-low technology (31.3%) and low technology (38.6%).<sup>10</sup> Increasing innovativeness across traditional industries is very important because intensification of innovation efforts in traditional sectors may generate or sustain employment and wealth. It can also lead to emergence of entirely new industries. Yet traditional industry in long run will be able to compete only by becoming more knowledge intensive.

In addition to this, Poland needs to improve co-operation between the R&D sector and industry. The R&D expenditures in the higher education sector financed by business sector fell from 9.7% in 1998 to 6% in 2003.<sup>11</sup> In 2004, the contribution of private companies in R&D expenditures in the higher education accounted only for 5%, whereas 82% was allocated from the public budget.<sup>12</sup> The recent report on Innovation potential of Polish SMEs reveals that 91.1% of surveyed SMEs do not co-operates with the State Research Institutes (JBRs), universities, and centres of technology transfers.<sup>13</sup> Experts attribute this situation mainly to the mismatch between the offer of research institutions and low RTDI potential of business sector.

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<sup>8</sup> Central Statistical Office (2004) "Szkolnictwo wyższe i ich finanse w 2004".

<sup>9</sup> Available at: [http://www.stat.gov.pl/dane\\_spol-gosp/praca\\_ludnosc/index.htm](http://www.stat.gov.pl/dane_spol-gosp/praca_ludnosc/index.htm).

<sup>10</sup> Central Statistical Office (2005) "Rocznik statystyczny przemysłu".

<sup>11</sup> Available at: <http://trendchart.cordis.lu/scoreboards/scoreboard2005/Poland.cfm>.

<sup>12</sup> Central Statistical Office (2005) "Nauka i technika w 2004".

<sup>13</sup> Polish Agency for Enterprises Development (2005) "Potencjał innowacyjny polskich małych i średniej wielkości przedsiębiorstw".

Nonetheless, this lack of co-operation is also due to a low level of awareness among entrepreneurs about available offers, and little experience in communicating R&D results from research organisations to enterprises.

## 2.2 Regional disparities and recent trends

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables into a small number of factors by means of factor analysis. These factors are:

- **Public Knowledge (F1).** Human resources in science and technology combined with public R&D expenditures and employment in knowledge intensive services is the most important or common variables in this factor. Regions with large universities will rank high on this factor.
- **Urban Services (F2).** The most important variables for this factor are value-added share of services, employment in government administrations and population density. A key observation is that academic centres do not necessary co-locate with administration centres.
- **Private Technology (F3).** This factor is most strongly influenced by business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries.
- **Learning Families (F4).** The most important variable in this factor is the share of the population below the age of 10. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a ‘knowledge-society-life-style’ based on behavioural norms and values that are beneficial to a knowledge economy.

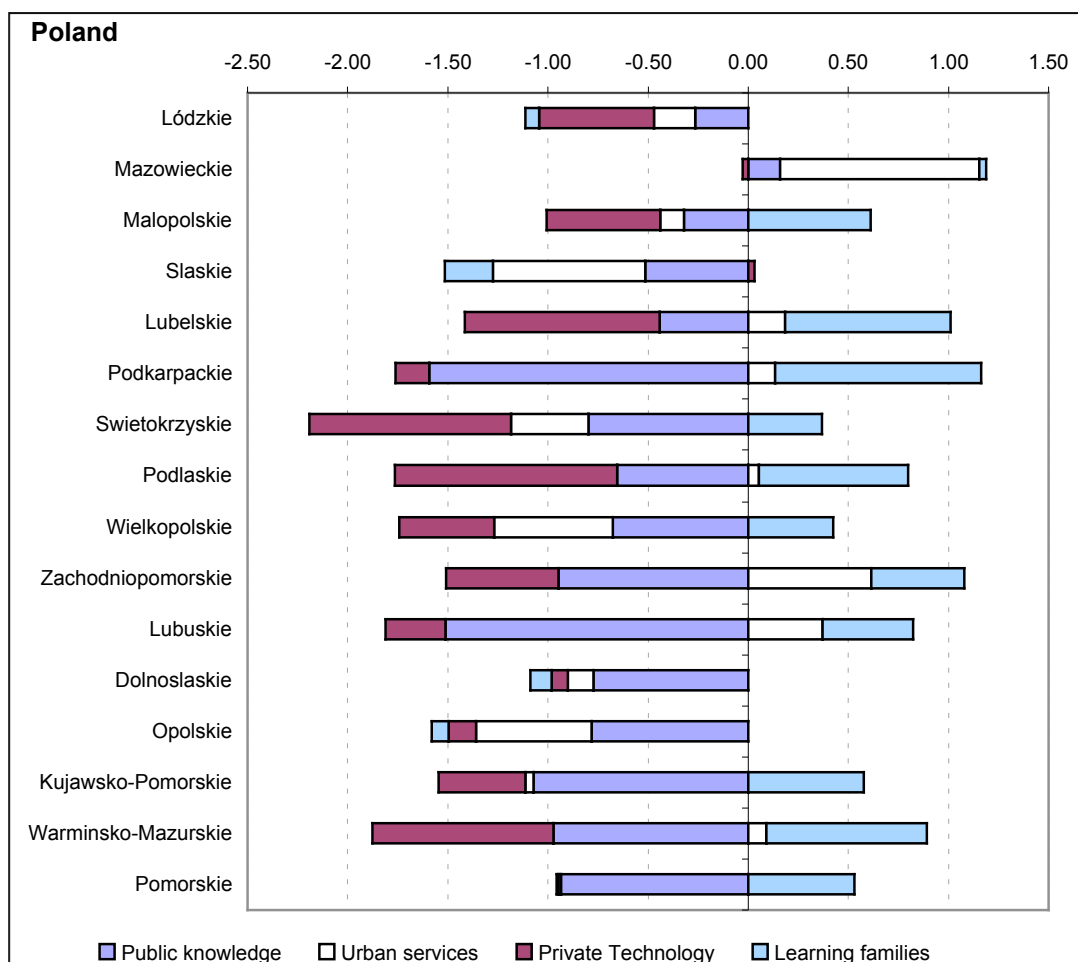
In a second step, the 200 plus EU-27 regions were grouped into 11 types of regions (see appendix A) displaying similar characteristics by means of a cluster analysis. In the case of Poland the regions are grouped as follows:

**Mazowieckie (Warsaw region)** stands out from the other Polish regions as a member of the cluster “**Local sciences & services**”. This cluster groups regions with diverse nationality consisting mainly of capital cities, such as Madrid, Warsaw, Lisbon, Budapest and Athens. These urban areas serve as national centres for business services, government administration, public research institutes and universities. Urban Services and Public knowledge are therefore the strongest factors for this type of region. GDP per capita is on average slightly below the EU-25 average, but growing. The low score on life-long-learning is a weakness in most Local Science & Services regions, especially compared to the more wealthy and advanced Science & Service Centres.

The other 15 Polish regions are classified as “**Eastern (or manufacturing) cohesion**”: Manufacturing industries is the dominant sector, whereas services and agriculture are rather small sectors. This type of region is mostly located in Poland, Czech Republic, Hungary and Slovak Republic. Two Portuguese regions are also included. The Public Knowledge factor is the main weakness of this type of regions.

However, the score on the “Private Technology” factor is close to average, which means that it is much stronger in this respect than the Southern (or services) Cohesion regions. Unemployment is high, even compared to Rural Industries and Services Cohesion regions.

**Exhibit 2: Regional factor scores per region**



Source: MERIT. The bars are stapled factor-scores showing the deviation (1=standard deviation) per factor from the average of 215 EU regions (0.00). The longer the bar, the bigger is deviation. Detailed regional scorecards can be found in Appendix B.

The 2004 World Bank report entitled: “Poland: Directions in regional policy” explained that the main geographical distinction within the country were a rural/urban divide, a metropolitan divide, and an East/West divide. The richest regions were metropolitan regions, and the poorest ones were those situated in the Eastern part of Poland characterised by lack of strong urban centres.<sup>14</sup> MERIT in its cluster analysis distinguished two categories of Polish regions, namely Mazowieckie as a capital region and other 15 regions as “Eastern cohesion”. Obviously, it is true that the majority of regions qualify as cohesion regions, however, capturing further nuances is very important for further analysis. The above-mentioned Exhibit 2 is extremely helpful as it reveals some interesting regional distinctions, especially in terms of regional disparities and needs. In order to provide a better picture on types of Polish

<sup>14</sup> World Bank Report (2004) “Poland: Directions in regional policy”.

regions, it is necessary to divide them into **four separate groups**: (i) Mazowieckie as a leading capital region; (ii) secondary growth poles (Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie); (iii) regions with lower innovation potential (Kujawsko-Pomorskie, Zachodniopomorskie, Lubuskie and Opolskie); and (iv) less advanced regions (Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Świętokrzyskie, and Podlaskie).

**Map 1: Regions, voivodships and sub-regions by nomenclature of territorial units**



Source: Central Statistical Office (GUS).

One of the biggest differences of **Mazowieckie** in comparison with other Polish regions is the fact that it is the “Leading capital region”. It is also the richest and fastest growing economy in Poland. The most recent data confirms that Mazowieckie outperforms the rest of regions on the key macroeconomic indicators. Its contribution to the overall country gross domestic product (GDP) was estimated at 20.6% in 2003, and in the same year its GDP per capita was 53.2% higher than country average. The economic structure of the region is primarily based on services, which increased from the level of 48.1% in 1995 to 61% in 2003. According to the 2003 data, the industry value-added to GDP was approximately 18.8%, whereas agriculture share was only 2.5%.<sup>15</sup> It is also noteworthy to point out that 26.7% of foreign direct investments were located in Mazowieckie in 2004 (834 out of 3,128 such investments). At the end of January 2006, the level of unemployment was estimated at 14.1%. Moreover, Mazowieckie is the biggest academic centre in Poland. During the academic year

<sup>15</sup> Central Statistical Office (2005) "Rocznik statystyczny województw".

2004/2005, there were 77 higher schools in Warsaw alone with more than 300,000 students, which represent 16.3% of all students. The number of students in the whole region is estimated at 368,403, which represents 19.2% of all students in Poland.<sup>16</sup> In 2004, there were 297 R&D entities located in Mazowieckie out of 957 in total. Also, the region shows high concentration of GERD (43.9%), BERD (48.4%) and innovation expenditures in the industry sector (27.3%).<sup>17</sup> Naturally, the concentration of R&D investments, higher education and FDI can be explained to a large extent by a capital city effect.

Following Mazowieckie, the group of regions including Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie are the most developed regions in Poland. In short, those regions can be considered as **“Secondary growth poles”**. In 2003, their contribution to GDP was estimated at 49.9% and three regions had GDP per capita above country average, notably Śląskie, Wielkopolskie and Dolnośląskie. The average value-added of services in 2003 was estimated at 48.2%, which is below Poland’s average (50.5%), and in terms of agriculture value-added to GDP only Wielkopolskie had higher contribution (4.8%), well above Poland’s average (2.9%), whereas the average contribution of industry to GDP (27%) was above country average (24.5%) with Śląskie taking the lead (32.5%).<sup>18</sup> In particular, approximately 50% of foreign direct investments in 2004 were located in this group of regions (1,581 out of 3,128 such investments). Although the level of unemployment is on average lower than in the other parts of Poland, three regions including Dolnośląskie, Pomorskie and Łódzkie have the unemployment rates above country average, which was estimated in January 2006 at 18%. In total, there are 192 higher schools and the number of enrolled students in the academic year 2004/2005 was estimated at 938,800 students, which represent 49% of all students in Poland.<sup>19</sup> In 2004, there were 457 R&D entities located in this group of regions representing 47.8% of all such institutions. Moreover, those six regions concentrate 43.8% of all GERD, 43.7 of BERD and 47.6% of innovation expenditures in the industry sector.<sup>20</sup>

Kujawsko-Pomorskie, Zachodniopomorskie, Lubuskie and Opolskie can be viewed as **“Regions with lower innovation capacity”**. The contribution to GDP of those regions was estimated in 2003 at 13.6%, which is even lower than the contribution of “Less advanced regions” with the value-added of 16%. In terms of GDP per capita, the group of these regions score on average much better than “Less advanced regions”, respectively 88% and 75% of Poland’s average. The contribution to GDP from agriculture in the same year was about 3.45% on average, which is the highest after the most agricultural areas located in the East of Poland. The contribution to GDP from industry is estimated at 23.8% and is below Poland’s average of 24.5%.<sup>21</sup> Approximately, 13.1% of foreign direct investments in 2004 were located in this group of regions (410 out of 3,128 such investments). More than this, the average rate of unemployment at the end of January 2006 was estimated at 23%. Furthermore, in 2004 there were 51 higher schools located in this group of regions

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<sup>16</sup> Central Statistical Office (2004) “Szkolnictwo wyższe i ich finanse w 2004”.

<sup>17</sup> Central Statistical Office (2005) “Nauka i technika w 2004”.

<sup>18</sup> Central Statistical Office (2005) “Rocznik statystyczny województw”.

<sup>19</sup> Central Statistical Office (2004) “Szkolnictwo wyższe i ich finanse w 2004”.

<sup>20</sup> Central Statistical Office (2005) “Nauka i technika w 2004”.

<sup>21</sup> Central Statistical Office (2005) “Rocznik statystyczny województw”.



with the total number of 247,133 students and it represents 12.9% of all students.<sup>22</sup> In the year there were 81 R&D entities representing only 8.5% of all such institutions in Poland. Furthermore, the concentration of GERD, BERD and innovation expenditures in the industry sector is respectively 4.6%, 4.2%, and 13.3%.<sup>23</sup>

**“Less advanced regions”**, including Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Świętokrzyskie, and Podlaskie belong to the group of the poorest regions in Poland. In those regions the contribution to GDP was estimated at 16%, which is less than in Mazowieckie alone. Also, “Less advanced regions” had the lowest GDP per capita and it represented just 75% of Poland’s average. The major difference in comparison with other regions is the structure of economy. The value added to GDP from agriculture was 4.8% and was the highest in Poland with the exception of Podkarpackie, which is clearly more industrial oriented region.<sup>24</sup>

The average unemployment rate is above Poland’s average (18%). In particular, Warmińsko-Mazurskie recorded the highest unemployment rate (28%) at the end of January 2006. Due to the peripheral location, under-developed transport and production infrastructure as well as limited access to skilled workforce, “Less advanced regions” face serious difficulties in attracting foreign investors. This is reflected in low figures, which indicate that in 2004 only 9.7% of all foreign direct investments were located in those regions (303 out of 3,128 such investments). In 2004, there were in total 77 higher schools less than Mazowieckie. This group of regions also concentrated 18.2% of the total number of students during the 2004/2005 academic year.<sup>25</sup> In terms of the number of research organisations, its share is just 13%. More specifically speaking, 125 R&D entities out of 957 were located in this group of regions, and mostly in Podkarpackie and Lubelskie. Furthermore, the concentration of GERD, BERD and innovation expenditures in the industry sector is respectively 7.7%, 3.7%, and 11.9%.<sup>26</sup>

As regards the recent trends (see Exhibit 3), the following observations should be highlighted. First, all regions experienced the increase of unemployment rate as well as higher GDP growth. Second, only one region Lubuskie increased slightly the share of industry value-added. Third, all regions recorded lower share of agriculture value-added and the majority had more population with higher education in 2002 than in 1999. Yet all regions show negative trend in total R&D expenditures as percentage of GDP, which is extraordinary even in the Polish context. As commonly known, the negative change in total R&D expenditures as percentage of GDP can be attributed to the fact that GDP has been increasing more rapidly than the expenditures on R&D. To illustrate this in 1995 GERD was estimated at 0.65% of GDP and in 2004 at 0.58%, however, at the same time the R&D expenditures per person grew from 55 PLN (17 EUR) to 135 PLN (32 EUR).

Other data shows that innovation expenditures in industry during the period 2002-2004, increased mainly in eight regions (the expenditures in Mazowieckie increased by 52.6%), remained constant in Łódzkie, and fell in seven regions (Świętokrzyskie

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<sup>22</sup> Central Statistical Office (2004) “Szkolnictwo wyższe i ich finanse w 2004”.

<sup>23</sup> Central Statistical Office (2005) “Nauka i technika w 2004”.

<sup>24</sup> Central Statistical Office (2005) “Rocznik statystyczny województw”.

<sup>25</sup> Central Statistical Office (2004) “Szkolnictwo wyższe i ich finanse w 2004”.

<sup>26</sup> Central Statistical Office (2005) “Nauka i technika w 2004”.



recorded the sharpest decline of 144.5%).<sup>27</sup> The decline of innovation expenditures in seven regions (i.e. Świętokrzyskie, Lubelskie, Dolnośląskie, Śląskie, Warmińsko-Mazurskie, Wielkopolskie, and Kujawsko-Pomorskie) can be attributed to either negative economic situation, or the fact that the first phase of technology upgrading – mainly through the acquisition of new machinery – has been exhausted. Yet it is most likely that innovation expenditures will resume the upward path in the nearest future with the assistance of the Structural Funds.

### Exhibit 3: Recent trends per region in key indicators

		Unemploy ment	Per capita GDP	Industry share	Agriculture share	Population density	Tertiary education	R&D intensity
		1996-2003	1996-2002	1996-2002	1996-2002	1996-2002	1999-2002	1996-2002
		%-pnt ch.	% growth	%-pnt ch.	%-pnt ch.	%-pnt ch.	%-pnt ch.	%-pnt ch.
EU25		--	--	--	--	--	--	--
Poland		8.70	6.04	-5.65	-3.37	-0.97	0.92	-0.08
Lódzkie	PL11	9.20	6.79	-5.18	-2.84	-2.65	2.97	-0.08
Mazowieckie	PL12	8.50	8.11	-4.85	-2.88	1.34	1.63	-0.17
Malopolskie	PL21	10.40	5.54	-7.59	-1.92	1.23	-0.50	-0.12
Ślaskie	PL22	13.30	4.80	-9.69	-0.74	-3.33	0.34	-0.04
Lubelskie	PL31	5.50	4.64	-4.87	-7.62	-1.90	2.62	-0.06
Podkarpackie	PL32	4.10	4.89	-5.36	-4.28	-0.17	-0.88	-0.05
Świetokrzyskie	PL33	5.80	6.24	-4.89	-3.13	-2.46	0.69	-0.01
Podlaskie	PL34	6.10	5.88	-1.53	-5.45	-0.99	1.71	-0.03
Wielkopolskie	PL41	9.20	6.68	-4.65	-4.50	0.54	0.08	-0.06
Zachodniopomorski	PL42	12.60	5.28	-5.51	-4.76	-1.33	3.08	-0.04
Lubuskie	PL43	12.80	4.95	0.62	-4.08	-0.55	2.92	-0.02
Dolnoslaskie	PL51	14.60	5.94	-5.47	-3.61	-2.74	0.27	-0.06
Opolskie	PL52	9.10	3.88	-4.92	-5.35	-2.58	2.40	-0.02
Kujawsko-Pomorsk	PL61	8.50	5.45	-4.74	-3.31	-1.12	-0.47	-0.04
Warmińsko-Mazurski	PL62	6.00	4.89	-2.69	-7.37	-1.83	1.33	-0.04
Pomorskie	PL63	9.90	6.06	-1.83	-3.11	0.51	0.36	-0.07

Source: MERIT based on Eurostat data for period indicated

<sup>27</sup> Loc. Cit.

## 2.3 Conclusions: innovation and knowledge performance

**Exhibit 4: Summary of key disparities and needs per region**

Region / group of regions	Key factors explaining disparity of performance (weaknesses)	Key needs in terms of innovation and the knowledge economy
<p><b>“Leading capital region”</b> (Mazowieckie)</p>	<ul style="list-style-type: none"> <li>▪ Dominance of public R&amp;D funding (62.2%) and low level of funding by private companies (17.7%)</li>   <li>▪ Relatively low number of S&amp;E graduates and dominance of private higher schools over public institutions</li>   <li>▪ Weak co-operation between science and industry</li>   <li>▪ Limited linkages between the capital and sub-regions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continue the efforts in increasing the low levels of innovation and business R&amp;D expenditures</li>   <li>▪ Encourage foreign companies to continue expanding their existing R&amp;D units and establishing the new ones</li>   <li>▪ Efforts aimed at promotion of entrepreneurship and start-ups among young persons should be connected with initiatives to encourage young people to pursue scientific careers</li>   <li>▪ Establish effective cooperation between higher education, scientific research centres and enterprises</li>   <li>▪ Building stronger links between the capital and other sub-regions through joint innovative projects</li> </ul>
<p><b>“Secondary growth poles”</b> (Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie)</p>	<ul style="list-style-type: none"> <li>▪ The regional innovation system concentrated around capital cities. The key factors explaining disparity of performance are very similar as in the case of Mazowieckie.</li> </ul>	<ul style="list-style-type: none"> <li>▪ As above</li> </ul>
<p><b>“Regions with lower innovation capacity”</b> (Kujawsko-Pomorskie, Zachodniopomorskie, Lubuskie and Opolskie)</p>	<ul style="list-style-type: none"> <li>▪ Limited research capacity and its high concentration in one region, namely Kujawsko-Pomorskie</li>   <li>▪ Traditional sector structure with relatively high contribution of agriculture to GDP (exception Lubuskie)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improve the qualifications of human resources matching with the industry needs</li>   <li>▪ Increase innovativeness of more traditional companies</li> </ul>
<p><b>“Less advanced regions”</b> (Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Świętokrzyskie, and Podlaskie)</p>	<ul style="list-style-type: none"> <li>▪ Peripheral location and difficult access to the majority of these regions</li>   <li>▪ High contribution of agriculture to GDP in the majority of the regions with the exception of Podkarpackie which is known for the “Aviation Valley”</li>   <li>▪ Concentration of R&amp;D base in two regions, namely Lubelskie and Podkarpackie</li> </ul>	<ul style="list-style-type: none"> <li>▪ Develop infrastructure guaranteeing good connectivity and create conditions to attract FDI</li>   <li>▪ Promote innovation in sectors which will guarantee development of local economies</li>   <li>▪ Improve in those regions interactions between higher education, research institutes and enterprises. Other regions require more efforts aimed at improving the qualifications of human resources.</li> </ul>

### **3 Innovation and knowledge: institutional context and policy mix at national and regional levels**

Structural Fund support for innovation and knowledge is contingent on and seeks to generate and strengthen the existing national (and/or regional) innovation system<sup>28</sup> in each Member State. In particular, institutional, legal and financial factors in the innovation system can limit the potential for certain types of intervention. Moreover, within the framework of the EU “Lisbon objectives”, Structural Fund interventions are expected to complement and provide added value to national (or regional) policy framework. In some Member States, Structural Fund interventions in favour of innovation and knowledge are marginal with respect to the national investment and policy effort, in others Structural Funds provide a main source of funding for such interventions. In both cases, there is a need to identify relevant national and EU policies, which can have an impact on decisions on funding priorities.

#### **3.1 Institutional and legal framework for innovation and the knowledge economy**

This section of the report appraises two broad factors that condition the potential for coordinated intervention of EU and national (regional) policies in favour of innovation and knowledge:

- The first concerns the organisational structures of public and semi-public bodies responsible for the design, implementation and monitoring of innovation and knowledge economy policies. In particular, the analysis considers the responsibilities for funding or managing specific types of measures liable to be considered for support under the Structural Funds;
- The second concerns the institutional, legal and financial frameworks, which condition the linkage of national (regional) financing with EU financing.

In Poland, the institutional framework for innovation and knowledge is fragmented with often overlapping responsibilities. Also, the co-ordination relating to innovation matters is vertical, while the horizontal co-ordination between three Ministries that deal with innovation and knowledge matters is weak. Before the 2005 parliamentary elections, the Ministry of Scientific Research and Information Technology was responsible for the supply side of innovation (R&D), the Ministry of Economic Affairs and Labour for the demand side (market perspective), and the Ministry of Education and Sport for education (human capital).

Shortly after the 2005 parliamentary elections, important changes have been introduced into the institutional framework. As a result, the new Ministry of Regional Development (MoRD) was created on 31 October 2005 from the former Ministry of Economic Affairs and Labour (renamed into the Ministry of Economic Affairs) with the view to increase the absorption capacity of the Structural Fund interventions,

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<sup>28</sup> The network of organisations, individuals and institutions, located within or active within national or regional boundaries, that determine and shape the generation, diffusion and use of technology and other knowledge, which, in turn, explain the pattern, pace and rate of innovation and the economic success of innovation.

which at that time was estimated at an alarming low level of 4.35%.<sup>29</sup> The other change was the consolidation of Ministry of National Education and the Ministry of Scientific Research and Information Technology into the Ministry of Education and Science (MoES). An additional important fact to be explained is that the department dealing with e-government and information society projects - previously located at the Ministry of Scientific Research and Information Technology - was shifted to the Ministry of Internal Affairs (MoIA). What is particularly surprising is that the newly created MoES on 31 October 2005 has been recently divided again into two separate ministries, notably the Ministry of National Education (MoNE) and Ministry of Science and Higher Education (MoSHE). Regretfully, the overall assessment of changes described above is negative because the existing institutional framework could have already been established just after the elections. It appears that decisions have been made too hastily, following the 2005 parliamentary elections, without serious reflection on the design of institutional framework, which undoubtedly will have the bearing on the quality of decision-making process in the future.

At the regional level, the key organisation overseeing promotion and development innovation is the Marshal Office, and its main tasks among others include: preparation of regional economic development strategies, multi-annual regional programmes and implementation of the Regional Innovation Strategies (RIS). In practice, the Marshal Offices lack a capacity to design and implement innovation-oriented policies. The only active organisations at regional level are: science and technology parks, regional development agencies and agencies responsible for enterprises development. On the one hand, there is a lack of innovation support organisations active in some regions, and on another, there is a lack of co-ordination between the existing ones, especially in the most developed regions.

#### Exhibit 5: Main organisations per policy area

	Type of organisation	
Policy objectives	National (&/or regional) public authorities and agencies	Key private or non-profit organisations
<b>Improving governance of innovation and knowledge policies</b>	<ul style="list-style-type: none"> <li>▪ Ministry of Economic Affairs (national)</li> <li>▪ Marshal offices (regional)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Polish Lisbon Strategy Forum, consultants and academic experts</li> </ul>
<b>Innovation friendly environment</b>	<ul style="list-style-type: none"> <li>▪ Ministry of Economic Affairs (national) → (innovation financing)</li> <li>▪ Ministry of Interior and Administration (national) → (e-gov)</li> <li>▪ Marshal and city offices, (regional) → (e-gov)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Polish Confederation of Private Employers Lewiatan → (regulatory improvements)</li> </ul>
<b>Knowledge transfer and technology diffusion to enterprises</b>	<ul style="list-style-type: none"> <li>▪ Agency of Industrial Development (national/regional)</li> <li>▪ Polish Agency for Enterprises Development (national)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Science and technology parks, innovation centres, university liaison and transfer offices</li> </ul>
<b>Innovation poles and clusters</b>	<ul style="list-style-type: none"> <li>▪ Polish Agency for Enterprises Development (national)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Local initiatives</li> </ul>

<sup>29</sup> Available at: <http://www.funduszestrukturalne.gov.pl/PODSTAWY+WSPARCIA+WSPOLNOTY/Stan+realizacji+PWW/>

	Type of organisation	
Policy objectives	National (&/or regional) public authorities and agencies	Key private or non-profit organisations
Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Polish Agency for Enterprises Development (national)</li> <li>▪ Agency of Industrial Development (national/regional)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technology incubators and National Innovation Network (KSI)</li> <li>▪ FIRE Foundation</li> </ul>
Boosting applied research and product development	<ul style="list-style-type: none"> <li>▪ The Ministry of Education and Science (national)</li> </ul>	<ul style="list-style-type: none"> <li>▪ State Scientific Research Institutes (JBRs), Centres of Excellence (CD) and Centres of Advanced Technology (CZT)</li> </ul>

Source: Study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.. See appendix C for a detailed definition of the policy categories.

Until now, there are no evaluations on RIS in Poland, however, the PAED decided on 20 June 2006 to launch a call for tenders relating to preparation of an evaluation of 15 RIS. Despite this, and for the purpose of this report it is already suffice to explain some major drawbacks. According to the 2005 TrendChart report on Poland, the results of the RIS differ across regions and three major weaknesses should be highlighted. Firstly, each RIS project was prepared independently using not only different experts but also relying on different methodologies. When elaborating the RIS, there was no co-ordination mechanism between the regional and national level. Secondly, the regional authorities considered that introducing support mechanisms in all areas of innovation would be an appropriate response to the weaknesses of the RIS. This led to the de-fragmentation of the support system with too many small measures. Thirdly, the types of partnership that have been created within the framework of the RIS varied across regions. The process of raising awareness of innovation at the regional level was difficult due little experience of regional authorities in developing regional innovation policies but also because of the limited interest from the private sector.<sup>30</sup> Given the fact that during the financial perspective 2004-2006 there was a single IROP, and the role of managing authority was placed at national level (MoRD), it can be concluded that the Marshal Offices acted as deconcentrated authorities in this respect. During the 2007-2013 perspective, the Marshal Offices will be acting as decentralised authorities. This results from the fact that each region will have its own Regional Operational Programmes. At present, the regional authorities are already responsible for their design. In the future, they will be also responsible for their implementation.

Setting the right framework conditions is crucial for the expected impacts on the Structural Fund interventions to materialise. The actual problem is that the impact assessments of project legislations are still of insufficient quality. In result, it creates two fundamental problems. First, provisions of national legislations are sometimes more stringent than the EU rules. For example, this was the case with the Act on Public procurement that had to be modified because it caused delays in the implementation of projects, and thereby had negative impact on the absorption capacity of the Structural Fund interventions. The new Act on Public procurement (7 April 2006) which entered into force on 25 May 2006 introduced new simplified procurement procedures i.e. for procurements in the range of 6,000 EUR to 60,000 EUR it is now sufficient to publish the call for tenders at the portal of Public

<sup>30</sup> Jacek Walendowski (2005) "Poland's annual innovation policy trends and appraisal report (2004-2005)". Available at: [http://trendchart.cordis.lu/tc\\_country\\_list.cfm?ID=27](http://trendchart.cordis.lu/tc_country_list.cfm?ID=27).

Procurement Office, procuring institution or in its offices, whereas for procurements above 60,000 EUR an institution launching a call for tenders is able to shorten the period for submission of proposals to 7 days. Second, other national provisions relating to measure 1.2.3 Supporting the emergence of seed capital funds (SOP-ICE), were not well prepared. Four obstacles hampered the use of this instrument. The first was that from the beginning there was no clear concept of implementation as well as there were frequent changes relating to the choice of implementing authority. Second, there was a lack of selection criteria necessary when evaluating project proposals. Next, there were no necessary executive acts. Moreover, supporting the development of seed capital funds constitutes the State aid, and therefore such types of instruments require a notification and acceptance of the European Commission, or otherwise, the support cannot be granted. Finally, the project of support programme was notified to the Commission on 15 November 2005, however, the whole procedure can last up to 20 months, which would mean that there would be 12 months for realisation of this measure. On the top of this, even the Act on National Equity Fund (4 March 2005) is not operational yet, due to the lack of ministerial decree that is currently amid the process of inter-department consultations. All this shows that on the one hand Poland is active in introducing measures aimed at improving access to innovation financing but still lacks a forward looking planning when designing new instruments.

## **3.2 Policy mix assessment**

This section provides a summary overview and analysis of the national and regional policy mix in favour of innovation and knowledge in which the Structural Fund interventions take place. The analysis is conducted with respect to seven broad categories of objectives of innovation and knowledge policies (see appendix C for an explanation of each category).

Measures identified per category of the policy objectives are then further sub-divided in terms of the direct beneficiaries of funding (or legislative) action. To simplify, the report adopts three broad types of organisation as targets of policy intervention:

- Policies supporting academic and non-profit knowledge creating institutions;
- Policies supporting intermediary/bridging organisations involved in innovation support, technology transfer, innovation finance, etc.;
- Policies supporting directly innovation activities in private sector.

The matrix below summarises the current policy mix in at national level. A simplified coding system is used with intensity of support (financial or political priority) for different policy areas and targets indicated by a colour coding system.

## Exhibit 6: Policy mix for innovation and knowledge

Policy objectives	Target of policy action		
	Academic /non-profit knowledge institutions	Intermediaries/bridging organisations	Private enterprises
<b>Improving governance of innovation and knowledge policies</b>	<ul style="list-style-type: none"> <li>▪ National Innovation Strategy “Increasing innovativeness of the Polish economy until 2006”</li> <li>▪ Draft of new National Innovation Strategy “Directions for increasing economy innovativeness 2007-2013” (28 April 2006)</li> <li>▪ Act on supporting innovation activities (29 July 2005)</li> <li>▪ Measure 2.6 Regional innovation strategies and transfer and knowledge (IROP)</li> </ul>		
<b>Innovation friendly environment</b>	<ul style="list-style-type: none"> <li>▪ Measure 2.3 Development of staff for modern economy (OP-DHR)</li> <li>▪ Measure 2.6 Regional innovation strategies and transfer of knowledge (IROP)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measure 1.1 Strengthening of institutions supporting operations of enterprises (OP-ICE)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Act on supporting innovation activities (29 July 2005)</li> <li>▪ Measure 1.2 Improvement of accessibility to external financing of enterprises investments (OP-ICE)</li> <li>▪ Measure 1.5 Development of a system of entrepreneurs access to information and public services on-line (OP-ICE)</li> <li>▪ Measure 1.5 Information society infrastructure (IROP)</li> </ul>
<b>Knowledge transfer and technology diffusion to enterprises</b>	<ul style="list-style-type: none"> <li>▪ Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE)</li> <li>▪ Measure 2.3 Development of staff for modern economy (OP-DHR)</li> </ul>		
<b>Innovation poles and clusters</b>	<ul style="list-style-type: none"> <li>▪ Measure 2.6 Regional innovation strategies and transfer of knowledge (IROP)</li> <li>▪ Pilot clustering projects (planned by Polish Agency for Enterprises Development)</li> </ul>		
<b>Support to creation and growth of innovative enterprises</b>	<ul style="list-style-type: none"> <li>▪ Pilot Technostarters project (planned by Polish Agency for Enterprises Development)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE)</li> <li>▪ FIRE Foundation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE)</li> <li>▪ Measure 2.2 Support to product and technological competitiveness of enterprises (OP-ICE)</li> <li>▪ Measure 2.3 Improvement of competitiveness of SMEs through investments (OP-</li> </ul>

			<ul style="list-style-type: none"> <li>▪ ICE)</li> <li>▪ Measure 3.4 Micro-enterprises (IROP)</li> <li>▪ Measure 2.5 Entrepreneurship promotion (IROP)</li> <li>▪ Sub-measure 1.3.1 Regional educational infrastructure (IROP)</li> </ul>
<b>Boosting applied research and product development</b>	<ul style="list-style-type: none"> <li>▪ Measure 1.4 Strengthening co-operation between R&amp;D sphere and the economy (OP-ICE)</li> </ul>	<ul style="list-style-type: none"> <li>▪ FIRE Foundation</li> <li>▪ Support programme of projects in the area of IPR (planned by Polish Agency for Enterprises Development)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Act on supporting innovation activities (29 July 2005)</li> <li>▪ Support programme of projects in the area of IPR (planned by Polish Agency for Enterprises Development)</li> </ul>
<b>Legend</b>			
<b>Top policy priority</b>			
<b>Secondary priority</b>			
<b>Low priority</b>			

Source: calculations of study team based on national/regional policy documents, TrendChart reports, OECD reports, etc.

**Improving governance of innovation and knowledge policies**, which is in practice about technical assistance type funding used by public authorities at national and regional level, is given a secondary priority. Before the system of policy peer reviews had been conducted to a large extent with the support of international stakeholders, while now increasingly national public authorities and agencies start playing such role. Despite these efforts, there is no sound strategy on innovation and knowledge. The existing strategy “Increasing innovativeness of the Polish economy until 2006” (11 July 2000) has not been updated since July 2000. Only recently, the MoEA has presented a preliminary draft version of new revamped strategy “Directions for increasing economy innovativeness 2007-2013” (28 April 2006).

Also, the recently adopted legislation i.e. Act on supporting innovation activities (29 July 2005) which entered into force on 20 October 2005 enlarges the responsibilities of the Polish Agency for Enterprises Development (PAED) to supporting the national and regional administration in collecting and analysing information concerning the needs of economy with respect to innovation. Most recently prepared reports by PAED include: “Innovation potential of Polish SMEs”; “Innovativeness of Polish micro enterprises”; “Presentation of potential of science and technology parks and technological incubators in Poland”; and “Regional Innovation Strategies in Poland”. All the publications are available from newly created innovation portal (<http://www.pi.gov.pl/>).



The major instrument in this area supported by the Structural Funds is Measure 2.6 Regional innovation strategies and transfer and knowledge (IROP), which supports development and implementation of RIS strategies.

**Establishing friendly environment conducive to innovation** is undoubtedly one of important priorities. The major goal of the recent Act on Supporting innovation activities is to increase competitiveness and innovativeness of the Polish economy through increasing business expenditures on R&D (BERD), and improving management of public resources allocated for R&D. There are three types of instruments: (i) technology credits; (ii) status of R&D centres<sup>31</sup>; and (iii) physical incentives. Also, the Structural Funds contribute to the creation of innovation friendly environment. In conclusion, companies are the main target group in this policy area. The major Structural Fund interventions include: Measure 1.2 Improvement of accessibility to external financing of enterprises' investments (OP-ICE), Measure 1.5 Development of a system of entrepreneurs' access to information and public services on-line (OP-ICE), Measure 1.5 Information society infrastructure (IROP), and Measure 1.1 Strengthening of institutions supporting operations of enterprises (OP-ICE).

**Knowledge transfer and technology diffusion to enterprises** is achieved through the development of science and technology parks. Since 2002, the development of regional industrial, science and technology parks has remained one of the policy objectives. In August 2002, the Industrial Development Agency issued the document "Strategy of the development of regional industrial parks" and following to this an agreement with the Polish Agency of Enterprise Development was reached concerning a collaboration of the development of such parks.<sup>32</sup> At present, the implementation of investment projects relating to the establishment and development of industrial parks, science and technology parks and technology incubators (including academic incubators) is financed through Measure 1.3 Creation of favourable conditions for enterprises development (Operational Programme Increasing Competitiveness of Enterprises, hereinafter referred to as OP-ICE), whereas transfer of knowledge from academic institutions to enterprises is supported via Measure 2.3 Development of staff for modern economy (OP-DHR).

In general, there is a lack of policy measures promoting the development of **innovation poles and clusters**. The only existing one is Measure 2.6 Regional Innovation Strategies and transfer of knowledge (IROP) which supports some pilot cluster projects. Only recently, PAED has announced to launch cluster pilot projects. The danger is undoubtedly that the development of science and technology parks will become the key objective of every region in Poland. According to the 2005 report on Innovation centres in Poland, in the mid of 2005 there were 27 park initiatives, of which only eight could be considered as entities realising fully their statutory activities. Other eight initiatives were viewed as capable to carry out the activities in relatively short periods and eleven initiatives are in the process of planning.<sup>33</sup> Up to

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<sup>31</sup> The main conditions for a private entity to become an R&D centre are as follows: to be a legal entity, annual net earning should be at least 800,000 EUR, and 50% of net earnings should come from R&D activities.

<sup>32</sup> Jacek Walendowski (2005) "Poland's annual innovation policy trends and appraisal report (2004-2005)". Available at: [http://trendchart.cordis.lu/tc\\_country\\_list.cfm?ID=27](http://trendchart.cordis.lu/tc_country_list.cfm?ID=27).

<sup>33</sup> Polish Agency for Enterprise Development (2005) "Ośrodki innowacji w Polsce".

date, only three regions have not started such initiatives, notably Warmińsko-Mazurskie, Świętokrzyskie, and Lubuskie. The potential threat is that the supply of these parks will not be developing in line with the demands of industry, especially because the Polish economy is mainly based on traditional industries. To ensure that these investments contribute to the development of an innovative Polish economy, it will be necessary to link such efforts with innovative clustering initiatives.

**Support to creation and growth of innovative enterprises** is given clearly a high priority. The key instruments which are aimed at meeting this objective, include: Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE); Measure 2.2 Support to product and technological competitiveness of enterprises (OP-ICE); and Measure 2.3 Improvement of competitiveness of SMEs through investments (OP-ICE). Increasing R&D and innovation investments especially in the private sector and improving the co-operation between science and industry is identified in the NRP 2005-2008 as one of the key challenges.

**Boosting applied research and product development** is clearly one of the priorities of the Government. Specially, the recent Act on Supporting innovation activities which had been mentioned earlier aims to reverse the negative trends i.e. low industry R&D expenditures, low level of company innovativeness and lack of incentives available for the private sector for innovative activities. For example, private entities can gain a possibility to apply for the status of R&D Centres. More accurately, an entrepreneur who receives such status will be exempted from various taxes i.e. agricultural tax, forestry tax, property tax and duties of perpetual lease. This instrument is targeted at the private research centres and not at companies implementing innovation. The R&D Centres can also establish the Innovation Fund to finance the R&D activities. The amount allocated for the Fund decrease the taxable income. In monthly perspective, the reduction of the taxable income cannot exceed 20% of R&D Centre's income. The only existing instrument supported by the Structural Funds is Measure 1.4 Strengthening co-operation between R&D sphere and the economy (OP-ICE), but it proves to be unsuccessful. More detailed explanation on this will be presented in section 4.

Overall, the policy mix covers almost of all existing challenges across various policy areas, however, with some exceptions. One of them is the development of innovative clusters. Also, there are no explicit measures aimed at supporting innovation in traditional and service sectors. While the policy is very much oriented on stimulating innovation through R&D fiscal incentives and technology credits, instruments promoting innovation in traditional and service sectors are missing. Finally, what is rather disappointing and is often the case, are frequent changes to the newly adopted legislations which are designed to stimulate the innovativeness of the Polish economy.

### 3.3 Conclusions: the national innovation system and policy mix

**Exhibit 7: Key opportunities and constraints for investment by the Structural Funds**

<b>Policy objectives</b>	<b>Opportunities for Community funding (national priorities)</b>	<b>Constraints or bottlenecks (factors limiting Community funding)</b>
<b>Improving governance of innovation and knowledge policies</b>	<ul style="list-style-type: none"> <li>▪ Technical assistance and evaluations which are relatively a new concept in policy-making in Poland.</li> </ul>	<ul style="list-style-type: none"> <li>▪ No constraints</li> </ul>
<b>Innovation friendly environment</b>	<ul style="list-style-type: none"> <li>▪ Innovation financing</li> <li>▪ e-Government</li> <li>▪ Developing human capital for the knowledge-economy (e.g. training researchers in enterprises)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Complex process of setting up National Equity Funds and Regional Seed Funds</li> <li>▪ Short experience in developing e-Government services → it requires strong leadership at political level, digital convergence, organisational changes into the public administration and good marketing strategy</li> <li>▪ Lack of awareness within companies</li> </ul>
<b>Knowledge transfer and technology diffusion to enterprises</b>	<ul style="list-style-type: none"> <li>▪ Supporting centres of excellence led by private consortium</li> </ul>	<ul style="list-style-type: none"> <li>▪ Difficult process when establishing a joint legal entity which is complicated by issues relating to intellectual property rights</li> </ul>
<b>Innovation poles and clusters</b>	<ul style="list-style-type: none"> <li>▪ Measures aimed at development of innovative clusters</li> </ul>	<ul style="list-style-type: none"> <li>▪ Difficult to implement → Critical factors for successful cluster development are: participation of the business sector, bottom-up approach, innovation and R&amp;D capacity</li> </ul>
<b>Support to creation and growth of innovative enterprises</b>	<ul style="list-style-type: none"> <li>▪ Direct support to innovative SMEs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Potential competition between the designed measures (advisory services versus direct investment grants)</li> <li>▪ Low demand can be expected if measures are designed only to support innovation in high-tech sectors and not in traditional industries</li> </ul>
<b>Boosting applied research and product development</b>	<ul style="list-style-type: none"> <li>▪ Support aimed at improvement of industry science co-operation</li> <li>▪ Research infrastructures</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very difficult in practice → national requirements may impede companies to prepare the proposals of projects</li> </ul>

## **4 Structural Funds interventions to boost innovation and create a knowledge economy: 2000-2006**

This section of the reports provides an analysis the patterns of Structural Fund expenditures in the fields of innovation and knowledge-based economy during the current programming period (2000-2006 for EU-15 or 2004-2006 for the new Member States). It examines the patterns from both a strategic point of view (the policy mix pursued by the Structural Funds programmes) and at an operational level (consumption of funds, management of innovation measures, indications of relative effectiveness of measures, case studies of 'good' practice).

### **4.1 Strategic framework for Structural Fund support to innovation and knowledge**

#### **4.1.1 Strategic approach to innovation & knowledge in Structural Fund programmes**

The strategic goal of OP-ICE is defined in the Programme Complement as improvement of the competitive position of enterprises established in Poland, operating in the European Single Market. The adopted strategy for attaining the OP objective envisages a need for developing a strong institutional framework supporting operations of enterprises and transforming the economy into the one based on innovative enterprises, holding a strong competitive position on the Single European Market. To this end, the following two priorities were established: (i) enhancement of knowledge-based economy business environment and (ii) direct support to enterprises.

The goal for the Integrated Regional Operational Programme (IROP) is to establish conditions for enhanced competitiveness of regions and counteract exclusion of certain specified areas in such was as to work towards the country's long-term economic development, its economic, social and territorial cohesion, and integration with the European Union. The first priority is defined as development and modernisation of the infrastructure to enhance the competitiveness of regions. The second priority concerns strengthening human resources development in regions, whereas the third priority relates largely to local development.

The main objective of the Operational Programme Human Resources Development (OP-HRD) is the development of an open, knowledge-based society through provision of conditions facilitating human resources development by gaining education, undergoing training and performing work.

In July 2000, the Ministry of Economic Affairs and Labour adopted a government programme "Increasing innovativeness of the Polish economy until 2006". Since the document was too general, OP-ICE became consequently the key support programme for Polish companies during the period 2004-2006. Prior to launching the Structural Funds, the national budget did not include significant financial support. Therefore, the Structural Funds in Poland constitute the main sources of innovation financing.

The budget allocations for the period from 2004 to 2006 of the first priority of OP-ICE “Enhancement of knowledge-based economy business environment” are 813.4 MEUR, whereas for the second priority “Direct support to enterprises” represent 2.019 bln EUR. During the course of implementation there were some concerns that a lot of money was allocated to Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE), however, total allocations for this measure represent only 2.3% of total allocations of OP-ICE.

The calculations presented below in the two exhibits below are based on the allocation of Structural Fund budgets based on the intervention code classification. For practical purposes, the calculation of financial resources allocated to innovation and knowledge has been limited to the RTDI codes:

- 181 Research projects based in universities and research institutes
- 182 Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes
- 183 RTDI Infrastructure
- 184 Training for researchers

Additional calculations based on broader definitions of innovation are presented in Appendix D.

**Exhibit 8: Overall allocation of resources at an objective 1 and 2 level (planned figures in Euro)**

Objectives	Total cost	Structural funds			National funds	
		Total	ERDF	ESF	Public	Private
<b>RTDI INTERVENTIONS</b>						
Objective 1	351,618,218	217,825,776	217,825,776	-	76,392,442	57,400,000
<b>TOTAL COHESION POLICY</b>						
Objective 1	12,669,693,024	8,275,812,636	4,972,788,583	1,908,502,751	3,136,143,143	1,257,737,245

*Source: Programming documents and financial data provided by DG REGIO*

The total of EU allocations for RTDI is estimated at 217.8 MEUR, which represents 2.6% of the 8.2 bln EUR Structural Funds interventions allocated to Poland for the period 2004-2006. In per capita, the allocations for RTDI are approximately about 5.71 EUR. The two programmes, which include RTDI measures (181-184): are OP-ICE and OP-IROP.

Taking into account that the GERD in 2004 which was estimated at 5,155.4 million PLN (1,223.9 MEUR)<sup>34</sup>, the contribution of the Structural Funds to RTDI interventions is not negligible. The ERDF envelope equivalent to 217,825,776 EUR represents 17.8% of the 2004 GERD.

<sup>34</sup> Exchange rate on 31/12/2004 1EUR=4.2122 PLN

## Exhibit 9: Regional allocation of resources (Euro)

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
Improvement of the Competitiveness of Enterprises for Years 2004-2006	100,848,447.00	100,848,447.00	-	1,251,098,419.00	1,251,098,419.00	-
Integrated Regional Development OP	116,977,329.00	116,977,329.00	-	2,968,470,769.00	2,530,001,234.00	438,469,535.00
Poland - FIG Objective 1	-	-	-	201,832,064.00	-	-
Sectoral Operational Programme Human Resource Development 2004-2006	-	-	-	1,470,033,216.00	-	1,470,033,216.00
SOP Restructuring and Modernisation of the Food Sector and Rural Development	-	-	-	1,192,689,238.00	-	-
Transport-Maritime Economy for 2004-2006	-	-	-	1,163,384,465.00	1,163,384,465.00	-
Technical Assistance	-	-	-	28,304,465.00	28,304,465.00	-
<b>Obj. 1 - Total MultiRegional Ops</b>	<b>217,825,776.00</b>	<b>217,825,776.00</b>	<b>0.00</b>	<b>8,275,812,636.00</b>	<b>4,972,788,583.00</b>	<b>1,908,502,751.00</b>

Source: Programming documents and financial data provided by DG REGIO

### 4.1.2 Specific measures in favour of innovation and knowledge

#### Exhibit 10: Key innovation & knowledge measures

Policy area	Number of identified measures (all programmes)	Approximate share of total funding for innovation & knowledge measures	Types of measures funded (possibly indicating importance)
Improving governance of innovation and knowledge policies	1	1.92%	Regional innovation strategies
Innovation friendly environment	4	18.54%	Strengthening of institutions supporting operations of enterprises; Improvement of accessibility to external financing of enterprises' investments; e-Government

<b>Policy area</b>	<b>Number of identified measures (all programmes)</b>	<b>Approximate share of total funding for innovation &amp; knowledge measures</b>	<b>Types of measures funded (possibly indicating importance)</b>
<b>Knowledge transfer and technology diffusion to enterprises</b>	2	13.92%	Industrial parks, science and technology parks and incubators of technology (including academic incubators); post-graduate courses for company staff
<b>Innovation poles and clusters</b>	0	0%	n/a
<b>Support to creation and growth of innovative enterprises</b>	6	59.28%	Direct support to companies (investment & advisory services); socio-educational infrastructure; entrepreneurship, support to micro-enterprises.
<b>Boosting applied research and product development</b>	1	6.33%	Short text description e.g. reimbursable loans for SMEs.

*Nb: This table is a summary of the table in appendix D. The total of the percentage share per policy area may sum to more than 100 since certain measures fall into several categories.*

In the ongoing programming period 2004-2006, there is one measure, which aims to some extent at improving governance capacities for innovation and knowledge policies. More specifically, it is the measure 2.6 (IROP) which supports the development of Regional Innovation Strategies. All the Polish regions have developed or are in the process of the implementation of their RIS, however, the types of partnership that have been created so within the framework of the RIS differ across regions. Specially, the process of raising awareness of innovation at the regional level was difficult due little experience of regional authorities in developing regional innovation policies but also because of the limited interest from the private sector.

Creating an environment conducive to innovation is very important and often is viewed as the laying foundation for the rapid and sustainable economic growth. In comparison with the past, Poland has made a visible progress in this respect. One of the major recent achievements was the adoption of the Act on Freedom of economic activities (2 July 2004), which aims at the development of private sector by cutting the red tape. In this specific area, it appears that efforts are being stepped up. More recent milestone is a report including analysis of existing barriers for entrepreneurs which was prepared in consultation with representatives of the private sector and published by the MoEA on 23 March 2006. In short, the report proposed 156 specific recommendations which are currently under review of special inter-ministerial team responsible for regulatory issues, and once the opinion is prepared, the Minister of Economy will present information to the Council concerning the progress of implementation of proposed simplifications.

Yet business friendly environment is not only about the legislation in place. Also, there is a wide range of instruments which have been supported during the current financial perspective with the assistance of the Structural Funds e.g. strengthening and developing the network of institutions supporting the development of SMEs (Measure 1.1, OP-ICE), innovation financing (Measure 1.2, OP-ICE), and e-Government (Measure 1.5, OP-ICE).

The key instruments which are used to improve the knowledge transfer and technology diffusion to enterprises are: implementation of investment projects relating to the establishment and development of industrial parks, science and technology parks and incubators of technology (including academic incubators) and counselling services for institutions managing industrial parks, science and technology parks and incubators of technology (including academic incubators). These are of course very recent initiatives and many of them have been financed through the Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE). According to the recent PAED report on Potential of science and technology parks and technology incubators, the sector of technology parks and incubators is very diversified and there are four major categories i.e. “cheap office space”, those providing specialised infrastructure, specialised services, and other services. Besides, the major weaknesses are: a lack of systematic approach to support of innovative companies, no selection procedures of innovative companies, and weak co-operation with the R&D sector.<sup>35</sup>

As mentioned earlier, there is no a specific measure which would target the development of innovative clusters. The technology and science parks could play a role in such initiatives in the nearest future. In contrast, direct support to entrepreneurs undertaking investments related to major changes in production, products or manufacture process has been in financial terms the most significant. Boosting applied research and product development was going to be mainly achieved through the implementation of Measure 1.4 Strengthening co-operation between R&D sphere and the economy (OP-ICE). The concept of such a scheme is very good, however, practice showed once again that it is difficult to strengthen co-operation between the science and industry sector.

## **4.2 Learning from experience: the Structural Funds and innovation since 2004**

### **4.2.1 Management and coordination of innovation & knowledge measures**

This section reviews the overall management of Structural Fund interventions in favour of innovation and knowledge during the current period. It examines the coherence the role of key organisations or partnerships in implementing Structural Funds measures for innovation and knowledge, the linkages between Structural Fund interventions and other Community policies (e.g. the RTD Framework Programme) and the financial absorption and additionality of the funds allocated to innovation and knowledge.

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<sup>35</sup> Polish Agency for Enterprises Development (2005) “Prezentacja potencjału parków naukowo-technologicznych i inkubatorów technologicznych w Polsce”.



In October 2005, the MoRD was created from the Ministry of Economic Affairs and Labour. The major new responsibility of the new Ministry is to ensure effective co-ordination of tasks relating to the preparation of the National Strategic Reference Framework (National Cohesion Strategy). It also ensures the responsibility for the management of all OPs in the programming period 2004-2006, with the exception of agriculture and fisheries. In order to increase the absorption capacity during the current financial perspective 2004-2006, the Council approved a special programme on 6 December 2005.

Concerning innovation and knowledge-based measures, there are practically no requirements concerning co-operation between public and private stakeholders. Although the new legislation on Public-Private Partnerships entered into force on 7 October 2005, until now there are no regulations determining the requirements necessary for establishing public-private partnership contracts. Representatives of the business sector are rather negative about the project of regulation which was prepared by the Ministry of Finance. The main weakness relates mainly to complicated and costly procedures during the selection of private partner but also it is often stated that there is no distinction between big and small projects. This might lead to the situation when the local authorities will only use the framework of public-private partnership in implementation of large investments.

Ensuring that maximum synergies are obtained from EU funding was to a large extent ‘top-down’ effort of course in consultation with the representatives of regions and other stakeholders. Since Poland had no Regional Operation Programmes in the financial perspective 2004-2006, it is justified to claim that the influence of ‘bottom-up’ was very limited. Although no specific initiative was taken during the current programming period to increase the synergies between Structural Fund interventions and other Community funding, the existence of the National Contact Point helps to create them. Often, one of the cited examples is the “Aviation Valley”, which used both sources of funding.

#### **Exhibit 11: Absorption capacity of RTDI interventions**

<b>CODES</b>	<b>ALLOCATED</b>	<b>DISBURSED</b>	<b>EXPENDITURE CAPACITY</b>
<b>OBJECTIVE 1</b>			
181 - Research projects based in universities and research institutes	33,279,987.51	0.00	0.0%
182 - Innovation and technology transfers, establishment of networks and partnerships between businesses and/or research institutes	33,279,987.51	0.00	0.0%
183 - RTDI infrastructure	151,265,800.98	12,184,499.52	8.1%
<b>TOTAL OBJ. 1</b>	<b>217,825,776.00</b>	<b>12,184,499.52</b>	<b>5.6%</b>

*Source: Provided by ISMERI.*

Exhibit 11 shows that out of the total 217.8 MEUR allocated from the Structural Funds in favour of RTDI, only 12.2 MEUR has been actually disbursed, which means

that the actual expenditure capacity of RTDI interventions was only 5.6%.<sup>36</sup> At the end of January 2006, the overall value of contracts was estimated at 62.6%, whereas the value of actually made payments was estimated just at 8.22% of total allocations for the period 2004-2006. At the end of February, those figures increased respectively to 65.7% and 9.01%, and at the end of March they further increased to 68.3% and 11.65%.<sup>37</sup> The value of signed contracts at the end of March under IROP differs across the regions, ranging from 91.42% in Pomorskie to 61.81% in Lubelskie. According to the official sources, at present there is no threat of de-commitment.

The main bottlenecks can be summarised as follows:

- Smallest changes in OPs require either ministerial decree or act;
- Restrictive procedure of the Act on public procurement (the requirements of Polish legislation are much more strict than the EU legislation);
- Lack of reliable system of information, management and monitoring;
- Complex administrative requirements; and
- High costs involved in the preparation of applications.

More specifically, some measures were over-subscribed, whereas others were clearly much less popular. According to the data available at the end of February 2006, most of applications under OP-ICE were made for Measure 2.3 Improvement of competitiveness of SMEs through investments (21,898) and Sub-measure 2.2.2 Support to internationalisation of enterprises (4,476), however, many entrepreneurs have paid much less attention to Measure 2.1 Improvement of competitiveness of SMEs through advice (2,914), whereas sub-measure 1.2.3 Seed capital funds has not been launched.

On 18 January 2006, the Council adopted the information concerning the rules for reallocation of financial resources presented by the MoRD. The changes concern the reallocation of financial resources between measures OP-ICE. The main reason for changes is a low level of signed contracts in some measures. With regard to RTDI interventions the planned reallocations concern the following measures. The resources from Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE) will be shifted to Measure 2.3 Improvement of competitiveness of SMEs through investments (OP-ICE). The resources of Sub-measure 2.2.2 Support to internationalisation of enterprises will be directed to Sub-measure 2.2.1 Support to entrepreneurs undertaking initial investments. Nonetheless, the main shortcoming of this sub-measure is that the majority of beneficiaries are large companies and not SMEs. The resources from Measure 1.4 Strengthening co-operation between R&D sphere and the economy (OP-ICE) will be reallocated to Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE). In two first cases, the main reasons for reallocations were, notably a low demand and overestimated budgets. In the case of the latter, the major reasons for reallocation were a low demand from entrepreneurs and the fact that the application process was too cumbersome.

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<sup>36</sup> Until 31 December 2005.

<sup>37</sup> Available at: <http://www.funduszezstrukturalne.gov.pl/Stan+realizacji/>.

#### **4.2.2 Effects and added value of Structural Fund support for innovation and knowledge**

This section of the report analyses the effects and added value of the Structural Fund interventions in favour of innovation and knowledge during the current programming period. The analysis is based on two main sources, namely: a) available evaluation reports or studies concerning Structural Fund interventions; b) interviews and additional research carried out for this study. Accordingly, this section does not pretend to provide an exhaustive overview of the effects or added value of Structural Fund interventions but rather is based on the examination of a limited number of cases of good practice. These good practice cases can concern the influence of the Structural Funds on innovation and knowledge economy policies (introduction of new approaches, influence on policy development, etc.), integration of Structural Funds with national policy priorities, promoting innovative approaches to delivery (partnerships), or measures which have had a particularly important impact in terms of boosting innovation potential, jobs and growth.

In earlier sections, it had been explained that the overall policy mix responds to a great extent to the existing challenges, however, there are some specific weaknesses which were revealed during the implementation of the Structural Funds. Not surprisingly, measures of direct investment to enterprises were the most popular and relatively easy to implement. On the contrary, measures which were not so successful are actually interventions more complex and requiring special legal framework. These are measures aimed at providing support to the creation of Seed Capital Fund for instance, and improving the co-operation between the science sector and private companies under OP-ICE.

Measuring the effects and assessing value-added of policy interventions is a difficult and challenging task in itself but it is even more complicated when preparing forward-looking studies at the stage of on-going implementation. Although it is still difficult to speak about the fulfilled objectives and impacts, some points of reflection are presented below.

As far as objectives are concerned, the target of the creation of 5 capital funds has not been fulfilled and subsequently this might have a negative effect on the emergence of innovative companies. According to the programming document of OP-ICE, the target of companies, which should receive the support through the seed capital funds, was established at 100.

Until March 2006, 11 contracts have been signed under sub-measure 1.4.1 Research projects and development activities: industry and pre-competitive research conducted by enterprises or groups of enterprises and/or in co-operation with scientific-research institutions. The majority of funding supports only modernisation and physical investments in laboratories. This means that establishing closer co-operation between the R&D sphere and enterprises will definitely take longer than planned.

The value of submitted applications for measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE) was estimated at the end of February 2006 at 47.8% of total allocations for the period 2004-2006. This reveals a true paradox i.e. Polish SMEs lack managerial skills and at the same time are not attracted by this type

of support instrument. This is reflected in the number of applications which were rejected in Measure 2.3 Improvement of SMEs through investments (OP-ICE). At the end of February, the failure rate at the pre-selection stage was approximately 45% (9,782 applications were rejected out of 21,898). Polish SMEs are not interested in advisory services because direct grants for physical investments are more appealing due to higher financial support.

In contrast, Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE) is very successful and popular. As a result, one could expect that the objective of creating favourable conditions for developing business activity will be met. Yet it is not certain whether the investments in the creation of science and technology parks will be sustained in the future. In the future, we might well question the pertinence of such investments if they fail to provide the actual value added to the industry. One of recent evaluations of SOP-ICE confirmed that it was unlikely to that Measure 1.3 supporting the development of science and technology parks (OP-ICE) would have significant impact on innovation.<sup>38</sup>

On the contrary, the measures which are likely to create the greatest effects and important value-added in favour of innovation and knowledge-based economy are instruments including pro-innovative approaches. In spite of the short period of implementation, one of them, which can be viewed as the best practice in Poland, is Measure 2.6 Regional Innovation Strategies and transfer of knowledge (IROP).

#### ***Regional Innovation Strategies and transfer of knowledge***

*The process of development of RIS started in Poland in 2002. The first five projects in the regions of Opolskie, Śląskie, Warmińsko-Mazurskie, Wielkopolskie and Zachodniopomorskie were initiated within the framework of the EU 5th Framework Programme. Subsequently, this was followed up in 2003 by the action of the Polish government that provided national grants via the former State Committee of Scientific Research (KBN) to regions in order to prepare their RIS.*

*Consequently, the Structural Funds created an opportunity to continue the efforts in increasing the capacities of the regions in the area of innovation. In total, there are five types of projects which can be financed in the scope of Measure 2.6 Regional Innovation Strategies and transfer of knowledge (IROP), notably creation or development of RIS, creation of the networks, development of the system of communication and information exchange, internships for higher education institutions graduates and for employees of the R&D sector, and scholarships for the best higher education graduates continuing the PhD courses in the strategic areas pre-defined by the RIS.*

*The reason why this initiative is considered a best practice is mainly because of its pro-innovative approach, which goes beyond direct grants for physical infrastructure projects. More detailed information about the implementation of this measure which are prepared on the basis of experience of Wielkopolskie and Śląskie can be found in Appendix E.*

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<sup>38</sup> Sienna (2005) "Funkcjonowanie systemu wdrażania SPO Wzrost konkurencyjności przedsiębiorstw, 2004-2006: identyfikacja barier i problemów organizacyjnych".

### **4.3 Conclusions: Structural Funds interventions in favour of innovation and knowledge**

In summary, there are at least six lessons to be learnt from the implementation of Structural Fund interventions during the period 2004-2006. First, devoting more attention to measures aimed at improving industry and science co-operation will be needed in the light of the design of the 2007-2013 programmes. For instance, making the investments for equipment and modernisation of laboratories conditional upon establishing co-operation with the private sector. Second, future measures should have an integrated offer from which an entrepreneur could use advisory services and obtain direct support for physical investments. Another area that requires greater attention in the future is transfer of knowledge from the R&D sector to enterprises through mobility of researchers. Moreover, measures aimed at establishing poles of competitiveness based on regional strengths as well as establishing inter-regional co-operation should be better reflected in the 2007-2013 programmes. In addition to this, it will be necessary to encourage incremental innovation as well as innovation in traditional sectors, and this could be done via the design of specific measures e.g. support in the creation of cluster initiatives, mobility of researchers from R&D institutions to local enterprises, centres of competences, competitions to select the most innovative company in traditional sector and direct support to the commercialisation of results. Finally, all ministerial acts should be adopted before the launch of the 2007-2013 financial perspective. The current experience in establishing the seed capital funds shows that it is a must.

## Exhibit 12: Main outcomes of innovation and knowledge measures

Programme or measure	Capability <sup>39</sup>	Added value
Measure 1.1 Strengthening of institutions supporting operations of enterprises (OP-ICE)	Good absorption capacity (104.3%)	Reinforcement of national priority i.e. improve entrepreneurs' access to quality services provided by business support institutions.
Measure 1.2 Improvement of accessibility to external financing of enterprises' investments (OP-ICE)	Good absorption capacity (85.3%) Problems in launching a sub-measure 1.2.3 Support to the creation of Seed Capital Funds.	Entrepreneurs should gains easier access to external sources of investment financing.
Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE)	Good absorption capacity (99.4%)	Improving infrastructure and services of technology parks.
Measure 1.4 Strengthening co-operation between R&D sphere and the economy (OP-ICE)	Low absorption capacity (36.1%)	Improving the co-operation between science and industry.
Measure 1.5 Development of a system of entrepreneurs' access to information and public services on-line (OP-ICE)	Good absorption capacity (103%)	Innovative approach to create business friendly environment.
Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE)	Low absorption capacity (22.8%)	Potentially interesting measure, however, the network of consulting services is already widely developed.
Measure 2.2 Support to product and technological competitiveness of enterprises (OP-ICE)	Overall good absorption capacity (47%), however, low absorption capacity of sub-measure 2.2.2 Support to internationalisation of enterprises. The main shortcoming of sub-measure 2.2.1 is that the majority of beneficiaries are not SMEs, but large companies.	Direct support for new investments i.e. buildings, machinery, equipment, costs related to licences and patents.
Measure 2.3 Improvement of competitiveness of SMEs through investments (OP-ICE)	Good absorption capacity (62.3%)	Direct support for modernisation of product and technology processes.
Sub-measure 1.3.1 Regional educational infrastructure (IROP)	Good absorption capacity (102.1%)	Basic socio-education infrastructure.
Measure 1.5 Information society infrastructure (IROP)	Good absorption capacity (65.7%)	Reinforcement of national priority to provide access to public services on-line.
Measure 2.5 Entrepreneurship promotion (IROP)	Good absorption capacity (60.6%)	Reinforcement of national priority.
Measure 2.6 Regional innovation strategies and transfer and knowledge (IROP)	Good absorption capacity (59.7%)	Improving the governance of innovation at regional level (RIS).
Measure 3.4 Micro-enterprises (IROP)	Good absorption capacity (62.8%)	Support to micro-enterprises.
Measure 2.3 Development of staff for modern economy (OP-DHR)	Good absorption capacity (82.1%)	Training of company staff.

Effectiveness → significant results achieved; good absorption and management performance, etc.

Added value of measures → reinforcement of national priorities, innovative approaches and solutions, institution building, etc.

<sup>39</sup> The value of signed contracts as percentage of total allocations for 2004-2006, at the end of March 2006. Available at: <http://www.fundusze-strukturalne.gov.pl/Stan+realizacji/>.

## **5 Regional potential for innovation: a prospective analysis**

This section of the report seeks to summarise and draw conclusions from the analysis of the preceding sections, available studies and interviews and focus groups carried out for this study in order to provide an analysis of the regional innovation potential. In doing so, the aim is to provide a framework for orientations in terms of future Structural Fund investments in innovation and knowledge.

### **5.1 Factors influencing regional innovation potential**

One of the most important factors which influences regional innovation potential is the sectorial structure. The major industrial centres in Poland are mainly regions called “Secondary growth poles” as well as Mazowieckie. In 2004, sold production of industry by those two types of regions was respectively 55.3% and 19.8%. In the latter, the employment rate in industry is estimated at 11.9%, and in the former the average employment in this sector is estimated at 9.5%. Yet the employment in this sector varies from 16.4% in Śląskie to 2.1% in Podlaskie.<sup>40</sup> As a matter of fact, those results actually reveal a degree of industrial intensity, which should be taken into account during the programming of future instruments.

The regional centres of automotive industry are concentrated around three regions, namely Dolnośląskie, Śląskie and Wielkopolskie. From all the Polish regions, Podkarpackie has the longest tradition in the aviation sector, and has been proving recently rather well that it is possible to attract well-known foreign investors. The regions which have the highest potential in the high-tech sector include mainly Dolnośląskie, Śląskie, Małopolskie, Kujawsko-Pomorskie and Pomorskie. When analysing the business process off-shoring sector (BPO), it appears that it attracts a growing attention of foreign investors. The biggest service centres are located in the following cities: Gdańsk, Elbląg, Olsztyn, Warszawa, Łódź, Kraków, Częstochowa, Bielsko-Biała, Wrocław, Zielona Góra, Poznań and Bydgoszcz. Regions with enormous possibilities for tourism development, or eco-friendly industries include: Pomorskie, Warmińsko-Mazurskie, Podlaskie, Lubelskie, Świętokrzyskie, Małopolskie, and Śląskie. The food sector industries are mainly concentrated in Warmińsko-Mazurskie, Podlaskie, Lubelskie, Opolskie, Wielkopolskie, Lubuskie, Zachodniopomorskie, and Kujawsko-Pomorskie. The main centres of logistics can be located in Zachodniopomorskie, Wielkopolskie, Łódzkie, and Lubelskie. The wood sector is concentrated in three regions i.e. Zachodniopomorskie, Lubuskie, and Warmińsko-Mazurskie. Three other regions i.e. Kujawsko-Pomorskie, Opolskie and Małopolskie play a leading role in the chemical sector. The machinery sector is concentrated in Podlaskie and Lubelskie, whereas electro-machinery sector in Kujawsko-Pomorskie and Dolnośląskie. The pharmaceutical sector is mainly concentrated in Mazowieckie, Łódzkie, Wielkopolskie, Podkarpackie, and Lubelskie.

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<sup>40</sup> Central Statistical Office (2005) “Rocznik statystyczny przemysłu”.

The concentration of R&D also influences significantly the innovation potential of regions. It is clear that regions where such concentration is high are more likely to emerge as innovative economies. Mazowieckie accounts alone for 43.9% of total R&D expenditures in Poland, and the regions labelled as “Secondary growth poles” (Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie) account for additional 43.8%. That actually indicates a large gap of the remaining regions. Moreover, the concentration of BERD is the highest in Mazowieckie (48.4%), Śląskie (11.7%), Małopolskie (9.8%), Wielkopolskie (7.9%), Dolnośląskie (6.9%) and Łódzkie (5.5%).

As it had been demonstrated in the Section 2, Mazowieckie, had the largest number of R&D entities in 2004 (297 out of 957), as well as the biggest share of researchers per 1,000 working population estimated at 8. In the “Secondary growth poles”, there were 457 R&D entities with the average of 3.7 researchers. In “Regions with lower innovation capacity” there were 81 research organisations, whereas the average of researchers estimated at 2.1. In the group of regions labelled as “Less advanced regions”, there were 125 research organisations and only 1.6 researchers per 1,000 working population. Besides, investment attractiveness of regions depends amongst many other indicators on the transport accessibility, and the former has clearly major impact on economic development. According to the recent study conducted by Instytut Badań nad Gospodarką Rynkową<sup>41</sup>, the regions with the most difficult transport accessibility are “Less advanced regions”, especially Podkarpackie, Lubelskie and Podlaskie).

A summary of factors influencing innovation potential by type of region is presented next.

### Exhibit 13: Factors influencing innovation potential by type of region

Region / type of region	Main factors influencing future innovation potential
“Leading capital region” (Mazowieckie)	<ul style="list-style-type: none"> <li>▪ Large contribution to GDP from the service sector</li> <li>▪ Large human capital base</li> <li>▪ Relatively high level of GERD, BERD, and innovation expenditures</li> <li>▪ Unbalanced structure of GERD relying on support from public funding</li> <li>▪ Diversification and high concentration of R&amp;D institutions</li> </ul>
“Secondary growth poles” (Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie)	<ul style="list-style-type: none"> <li>▪ Large contribution to GDP from the industry sector</li> <li>▪ Capacity to identify sectors which stand out as particularly important for the future</li> <li>▪ Good academic and research base</li> <li>▪ Relatively high level of innovation expenditures in the industry sector</li> <li>▪ Ability to transfer skills/knowledge from foreign affiliates</li> </ul>
“Regions with lower innovation capacity” (Kujawsko-Pomorskie, Zachodniopomorskie, Lubuskie and Opolskie)	<ul style="list-style-type: none"> <li>▪ Relatively high contribution to GDP from agriculture</li> <li>▪ Low concentration of GERD, BERD and innovation expenditures</li> <li>▪ Low level of attractiveness for FDI</li> <li>▪ Human capital concentrated only in one region</li> <li>▪ Ability to innovate in more traditional low-tech sectors</li> </ul>

<sup>41</sup> Instytut Badań nad Gospodarką Rynkową (2005) “Atrakcyjność inwestycyjna województw i podregionów Polski”.



Region / type of region	Main factors influencing future innovation potential
<b>“Less advanced regions”</b> (Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Świętokrzyskie, and Podlaskie)	<ul style="list-style-type: none"> <li>▪ Peripheral location and underdeveloped transport infrastructure</li> <li>▪ High contribution of agriculture to GDP (except Podkarpackie)</li> <li>▪ Low level of attractiveness for FDI</li> <li>▪ Small R&amp;D base relying mainly on public support</li> <li>▪ Ability to innovate in more traditional low-tech sectors</li> </ul>

## 5.2 A prospective SWOT appraisal of regional innovation potential

Mazowieckie is evidently on the pole position in terms of high concentration of RDTI expenditures. Besides the highest concentration of GERD, BERD, and innovation expenditures in the industry sector (respectively, 43.9%, 48.4%, and 27.3%), Mazowieckie has a huge potential to become an innovative hot spot in Central and Eastern Europe due to large and highly qualified human capital. More specifically speaking, there are approximately 370,000 students each year pursuing higher education studies, which are an equivalent to about 20% of all students in Poland. Moreover, Mazowieckie with the total number of researchers estimated at 34,702 in 2004, which represents 27.2% of the total number of persons working in the R&D sector in Poland, has significant advantage over the remaining regions. Looking at the sectorial specialisation, the emerging conclusion is that there are enormous opportunities for promoting innovation in the service sector because its high contribution to GDP. In 2003, it was estimated at 61%. Unfortunately, the strengths might also turn quickly into possible threats. For instance, having a large number of R&D entities is an advantage, however, if they are too diversified there is a risk that they will be disconnected with the demand from the private sector. Furthermore, extensive network of business/innovation intermediaries is one of the important strengths, but if their offers are not suited to the demand of the business sector it can become also a threat. On the other spectrum, there is a good potential, however, with structural change to improve the mobility of researchers between their research organisations and industry, increase the level of BERD and support the creation of new and innovative companies.

The “Secondary growth poles” already show relatively high concentration of GERD, BERD, and innovation expenditures in the industry sector (respectively 43.8%, 43.7% and 47.6%) and it is likely that those investments will be increasing in the future. In addition to this, human resources represent one of the strengths of these regions. Each year there are on average nearly 1 million students enrolled in the higher education institutions and this number represents about 50% of all students in Poland, and in 2004 there were about 65,849 researchers, which is equivalent of 52% of all researchers in Poland. Otherwise, the fact of growing number of investment in R&D infrastructure can be regarded as both strength but also a possible threat, in case those investments will not be coupled with the demand in the coming years. The major weaknesses, but which may be overcome with the structural change are mainly weak science-industry co-operation and still a low level of BERD. Until today, there is no genuine strategic policy planning and for this reason those regions (attracting a lot of FDI) risk of becoming cheaper assembly lines of multinational companies. The challenge is clear-cut, notably to create conditions that those companies invest more in the area of research and innovation in co-operation with local SMEs. The “Regions with lower innovation potential” and “Less advanced regions” have many common characteristics, which translate into similar SWOT tables, however, the

significant difference is particularly underdeveloped transport infrastructure and peripheral localisation of the latter.

#### Exhibit 14: Innovation and Knowledge SWOT

Leading capital region	Opportunities	Threats
<b>Strengths</b>	<ul style="list-style-type: none"> <li>▪ High concentration of RTDI expenditures</li> <li>▪ High scientific and technological potential</li> <li>▪ Enormous possibilities of promoting innovation in the service sector</li> </ul>	<ul style="list-style-type: none"> <li>▪ Large diversification of R&amp;D entities</li> <li>▪ Extensive network of business/innovation intermediaries</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>▪ Insufficient science-industry mobility</li> <li>▪ Low level of BERD</li> <li>▪ Creation of new innovative companies (start-ups and spin-offs)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Incapability of establishing better linkages between Warsaw and other sub-regions</li> </ul>

Secondary growth poles	Opportunities	Threats
<b>Strengths</b>	<ul style="list-style-type: none"> <li>▪ Increasing the investments in the area of research and innovation</li> <li>▪ High scientific and technological potential</li> </ul>	<ul style="list-style-type: none"> <li>▪ Growing number of investment in R&amp;D infrastructure</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>▪ Weak co-operation between R&amp;D and business sector</li> <li>▪ Low level of BERD</li> </ul>	<ul style="list-style-type: none"> <li>▪ Incapability of establishing better linkages between FDI bases and local companies</li> </ul>

Regions with lower innovation potential	Opportunities	Threats
<b>Strengths</b>	<ul style="list-style-type: none"> <li>▪ High potential of introducing innovation in more traditional sectors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Incapacity to select the areas of strategic importance, guaranteeing sustainable regional development</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>▪ Low interest from foreign direct investments</li> <li>▪ Mismatch between the industry needs and qualifications of graduates</li> </ul>	<ul style="list-style-type: none"> <li>▪ Concentrating the investments solely in research infrastructure</li> </ul>

Less advanced regions	Opportunities	Threats
<b>Strengths</b>	<ul style="list-style-type: none"> <li>▪ High potential of introducing innovation in more traditional sectors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Incapacity to select the areas of strategic importance, guaranteeing sustainable regional development</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>▪ Underdeveloped transport infrastructure and peripheral localisation</li> <li>▪ Limited visibility for potential foreign investors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Concentrating the investments solely in research infrastructure</li> </ul>

### **5.3 Conclusions: regional innovation potential**

#### **Policy headline 1: Secondary growth poles have a potential of becoming more innovative on the global markets**

- The regions with high RTDI potential are the regions where encouraging innovation appears to be the most appropriate strategy. In other words, these regions have necessary elements to make innovation happen. The main strengths, which are worthwhile to be mentioned include: good academic and research base, high concentration of R&D (public and private) and innovation expenditures, and high attractiveness for foreign investors, etc. Therefore, reinvigorating the economic growth through innovation strategies could serve as leverage for becoming more vibrant economies at national level, and even more innovative on the global markets. It is particularly important to build the vision on the existing strengths and connect the foreign investors with local companies. To conclude, the Structural Funds can play a substantial role in turning the regions with high RTDI potential into the so-called innovation ‘hot spots’.
- The sectors with high innovation potential are: (i) automotive (Dolnośląskie, Śląskie and Wielkopolskie), (ii) ICT (Dolnośląskie, Śląskie, Małopolskie, and Pomorskie), (iii) tourism and eco-friendly industries (Pomorskie, Małopolskie, and Śląskie), (iv) food (Wielkopolskie), (v) logistics (Wielkopolskie and Łódzkie), (vi) electro-machinery (Dolnośląskie), (vii) pharmaceutical (Łódzkie and Wielkopolskie), and (viii) chemical (Małopolskie).

#### **Policy headline 2: Mazowieckie has a potential of becoming internationally recognised centre of excellence in research and innovation**

- One of the strengths of Mazowieckie is the highest concentration of GERD, BERD, and innovation expenditures in the industry sector. It is also the biggest educational centre in Poland with the largest scientific base, expressed in the number of researchers and research organisations. Yet the region is booming mainly because of Warsaw, however, other sub-regions are disconnected with the capital, and often their performance is comparable with the lagging behind regions. Hence, the challenge is to establish effective co-operation at all regional levels. Taking into account that in 2003, the contribution of services to GDP was 61%, it is necessary to support innovation in this sector, however, it requires a vision beyond technological innovation.
- The sectors with high innovation potential are: (i) services, (ii) pharmaceutical, (iii) ICT and (iv) logistics.

#### **Policy headline 3: Regions with lower innovation potential and less advanced regions have a potential of introducing innovation in traditional sectors**

- It is very important to take into account of the current and potential comparative advantage of regions when deciding on regional strategies for economic development. The experience of other European regions shows that innovation is not only about making significant investments in the R&D sector. Although there will be increasing political pressure in this direction, it is essential to work towards establishing strategies based on regional comparative advantages with the aim to lay the foundation for sustainable economic growth with more and better jobs. In particular, supporting innovation in low-tech sectors should be

recognised as a priority. There should be no illusion about the role of infrastructure investments, which will not solve all the problems. That is why it is recommended to include especially measures supporting the development of innovation in traditional sectors, which might have more structural effects.

- The sectors with high innovation potential are: (i) tourism and eco-friendly industries (Warmińsko-Mazurskie, Podlaskie, Lubelskie, and Świętokrzyskie), (ii) food (Warmińsko-Mazurskie, Podlaskie, Lubelskie, Opolskie, Lubuskie, Zachodniopomorskie, and Kujawsko-Pomorskie), (iii) logistics (Zachodniopomorskie and Lubelskie), (iv) wood (Zachodniopomorskie, Lubuskie, and Warmińsko-Mazurskie), (v) chemical (Kujawsko-Pomorskie and Opolskie), (vi) machinery (Podlaskie and Lubelskie), (vii) electro-machinery (Kujawsko-Pomorskie), (viii) aviation (Podkarpackie), and (ix) pharmaceutical (Podkarpackie and Lubelskie).

## **6 Future priorities for Structural Fund support for innovation and knowledge: options for intervention**

The key challenges identified in the National Reform Programme (2005-2008) are appropriate as they correspond to the main weaknesses of the Polish economy with regard to innovation. In addition to this, there are different measures which have the objective to create business friendly environment conducive to innovation. However, there is a risk that Poland will focus too much on technological innovation and neglect other forms of innovation which can also spur economic growth, and contribute to the creation of employment. The potential danger is to pursue just R&D and technology innovation, while it is commonly recognised that there is no effective co-operation between the R&D sector and industry. Above all, the regional potential must be taken into account when designing future support instruments. In other words, not all regions will be able to become the world acclaimed centres of innovation and research, even with the significant support from the Structural Funds.

According to the preliminary draft National Strategic Reference Framework (recently renamed as National Cohesion Strategy) adopted by the Council of Ministers on 14 February 2006, the total allocation for the programming period 2007-2013 is estimated at 85.6 bln EUR, which includes 59 bln EUR of Community funding. The planned division between the programmes is as follows: 33% Cohesion Fund, 15% ESF and 52% ERDF (of which 26.8% of the total Community funding will be devoted to 16 Regional Operational Programmes, 13.7% for OP Human capital, 11.7% for OP Competitive economy, and 3.6% for OP Development of Eastern Poland). The most controversial programme is OP Development of Eastern Poland which aims to help the five “Less advanced regions” to reduce their regional disparities. The allocations for the period 2007-2013 are estimated a 2.2 bln EUR. Nevertheless, the choice of instruments is the fundamental problem e.g. investment in the conference centres or science and technology parks, are unlikely to create structural and durable changes in those regions.

### **6.1 Strategic orientations for Structural Fund investments in innovation and knowledge**

**Key conclusion 1: Poland is clearly lagging behind the majority of the EU Member States in key innovation and knowledge-based economy indicators. Despite this, it should be remembered that there are also significant regional disparities, and thus different innovation potential.**

This finding is confirmed by other studies on innovation performance, for instance, the 2005 EIS, according to which Poland is ranked on the 27th position out of 33 countries on the Summary Innovation Index, and 21st out of the 25 EU Member States (it only outperforms Slovakia, Greece, Latvia and Malta). This is however one side of the coin. The other is concerning the trends which present a little bit more favourable picture. More precisely, the level of investment on innovation in the manufacturing sector increased from 12,234.7 million PLN (3.1 bln EUR) in 2000 to 15,417.00 million PLN (3.7 bln EUR) in 2004, which represents a growth of 26%.

Despite the efforts, Poland will face tremendous difficulties in reaching the Lisbon objectives. The current level of GERD is estimated at 0.58% of GDP and BERD at 0.17%. In nominal terms, GERD is 1.22 bln EUR and BERD 351 MEUR, according to the 2004 data. Those results are extremely low comparing to other countries or even big multinational companies. For instance, GlaxoSmithKline (Great Britain) reported alone 5 bln USD R&D spending in the financial year 2004-2005. Moreover, there are many regional disparities in innovation and research potential. To illustrate this, in 2004 Mazowieckie had 297 R&D entities with the base of researchers estimated at 34,702, whereas the region of Świętokrzyskie had only 10 such institutions, and 1,124 researchers. The examples of disparities between the regions are numerous, and it is sufficient to imagine that the concentration of RTDI expenditures (GERD, BERD and innovative expenditures in the industry sector) in Mazowieckie was estimated in 2004, respectively at 43.9%, 48.4%, and 27.3%.

**Recommendation 1: Take into account different regional innovation potential when planning the 2007-2013 programmes.**

The recent report of the independent expert group on R&D and innovation appointed following the Hampton Court Summit “Creating an Innovative Europe” proposed that Member States should agree to a minimum voluntary commitment of Structural Fund interventions supporting research and innovation of the order of 20%. The argument put forward was that this would represent a major increase from the present 5.9% of the overall envelope of the European Regional Development Fund and European Social Fund that are at present spent on support towards R&D and innovation. There is a risk, however, that the role of R&D and innovation is fuelling economic growth may be exaggerated or that RTDI policies are equally important to all regions. Henceforth, it is important to design the best possible policy responses taking into account the regional innovation potential.

**Key conclusion 2: Recognising that innovation and knowledge are the driving forces behind prosperity and well-being, it is necessary that all the necessary efforts are made, in order to ensure that the financial allocations for the next programming period 2007-2013 are planned with the objective to establish solid foundations for sustainable economic growth and more jobs.**

The total of EU allocation of the Structural Funds for the programming period 2007-2013 is estimated at 59.5 bln EUR.<sup>42</sup> This represents an important increase of 49.4 bln EUR, in comparison with the allocations for the current financial perspective 2004-2006, which amount to the total of approximately 10.1 bln EUR. In other words, the annual allocations of the Structural Funds for the financial perspective 2007-2013 will increase by 5.1 bln EUR or 151.6%, in comparison with the programming period 2004-2006<sup>43</sup>. This opportunity must be well used because it is unlikely that Poland will receive the same support in the programming period 2014-2020. The Structural Funds have been mainly used so far to support four types of projects: (i) Infrastructures e.g. innovation centres, incubators or centres of research and technology parks; (ii) Networks e.g. development of clusters, competence networks and technology transfers; (iii) Innovative Projects (IP) e.g. efficient

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<sup>42</sup> European Regional Development Fund, European Social Fund and Cohesion Fund.

<sup>43</sup> SF (2004-2006): 3.4 bln EUR per year, SF (2007-2013): 8.5 bln EUR per year.

utilisation of ICT, transfer of new technology to business, spin-offs (universities starting new business) or start-ups and applied research projects; and (iv) Environment for innovation concerning projects such as innovation in SME in the fields of management, marketing, financing and human resources, strategies, advisory services, financial engineering and human capital. The next financial perspective requires a new generation of instruments, which will help in laying foundations for long-term partnerships between all actors of the National Innovation System.

**Recommendation 2: Incorporate in the next programming period 2007-2013 innovation-related initiatives, which will be able to create the meaningful and durable ‘structural effects’.**

One of the priorities in the 2007-2013 programmes should be to support **measures, which will lead to the improvement of governance capacities at regional level** with respect to innovation and knowledge policies. Such ‘soft’ type of measures should be reflected in the next programming of the Structural Funds because the Marshal Offices lack necessary capacities to design and implement innovation-oriented policies. In particular, regions with lower innovation potential and less advanced regions are urged to prioritise this type of initiatives in their future Regional Operational Programmes. The major benefit of this sort of funding is that policy-makers will be more likely to react appropriately when taking strategic decisions that will be determining regional economic development and welfare of citizens. This could be done fairly easily with the support from technical assistance projects either in the form of trainings or direct advisory services.

Next, it is necessary to support more prospective projects such as **foresight initiatives** because they are important tools in understanding innovation processes at regional level. More accurately, they can help in identifying the main characteristics and factors that promote innovation activities, developing specific sectors, designing relevant policy-mix and building regional partnerships. Taking into account that foresight initiatives require a strong political leadership and commitment of regional authorities, it is suggested to support such initiatives in regions with high RTDI potential, and once the project RIS Mazovia is completed also in the capital region, namely Mazowieckie.

It is also necessary to support **innovative projects** with the aim to assist the development of future policy and programmes by exploring new approaches to innovation. The major benefit for this type of support is experimentation of new ideas in a precisely defined period of time. Recognising the fact that exploration and testing of new approaches is rather complicated process which requires sound experience of regional authorities in innovation policy it appears to be more realistic to introduce such measures in regions with high RTDI potential as well as in Mazowieckie. To conclude, there should be an evolution from infrastructure projects to more innovative approaches which are likely to bring a greater value-added in stimulating the economic development.

Often, strengthening the co-operation between the R&D sector and industry is viewed as a cumbersome process but building partnerships between those two sectors relies to a great extent on financing joint research projects. Although joint research projects

should be continued in regions with higher RTDI potential, there is an increasing need to link R&D efforts with the actual needs of the private sector. There are at least two alternatives to the above-mentioned approach. The first one is to **support competence centres led by private consortia**. The reason why the competence centres have gained such importance in many countries<sup>44</sup> is because they help in establishing long partnerships between the R&D and business sector. According to the 2002 Feasibility study of competence centres in Estonia, a first minimum requirement for R&D competence centres is that they must be based on a strategic plan i.e. a mid-term research plan or programme, collaboratively developed with the involvement of industrial partners.<sup>45</sup> Hence, this solution is more applicable to regions with solid R&D base, notably regions with high RTDI potential including the region of Mazowieckie.

The second is to **encourage mobility of researchers to the private sector and vice versa** because it can be very useful in establishing better co-operation between the research organisations and enterprises. This type of initiatives can be supported across all regions, including regions with lower RTDI potential as well as less advanced regions. More specifically, it is recommended to foresee initiatives similar to the existing measure 2.6 Regional innovation strategies and transfer of knowledge, which is supported in the framework of IROP, and proves to be an example of good practice case in the Polish context.

Moreover, **grating support to the development of joint technology training centres**<sup>46</sup> led by consortium of enterprises will be of particular importance in regions with lower RTDI potential and less advanced regions, due to high level of unemployment and mismatches between the industry needs and qualifications of human resources.

In addition to this, the development of science and technology parks which have been so popular in recent years must go hand in hand with the **creation of innovative clusters**. However, it is very unlikely that all regions will be able to manage clustering initiatives effectively. More accurately, and following the French model “Pôles de Compétitivité” launched in December 2004, clusters could be divided into four types i.e. international clusters, clusters with an international vocation, interregional clusters, and regional clusters.<sup>47</sup> In the Polish context, the development of all types of clusters could be prioritised in regions with high RTDI potential and Mazowieckie, whereas the regions with lower innovation potential and less advanced regions could try to implement pilot initiatives with the aim to develop regional clusters. Distilled from the international experience, the minimum requirements for cluster development are that clusters should specialised in scientific/technological fields with the involvement of research/knowledge institutions, enterprises and policy-makers.

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<sup>44</sup> K plus Centres of Competence in Austria, Competence Centre Programme in Sweden, Technology Competence Centres Program in Estonia, and KKK programme in Hungary, etc. More detailed information available at: <http://trendchart.cordis.lu/>.

<sup>45</sup> Dick de Jager et. al. (2002) “Competence centre programme Estonia: Feasibility study”.

<sup>46</sup> Human networks of research and technology training in Greece. More detailed information available at: <http://trendchart.cordis.lu/>.

<sup>47</sup> More detailed information available at: <http://www.competitivite.gouv.fr/index.php?&lang=en>.



Finally, there has been an increasing recognition of the importance of innovation in the service sector and the service sector's contribution to economic growth. In particular, there are emerging enormous possibilities to encourage **innovation in the services sector** in Mazowieckie, which accounts for the highest contribution of services to GDP, estimated in 2003 at 61%. Yet it is important to remember that innovation in services can often be more incremental in nature and less technological intensive which creates a possibility to develop this type of innovation also in other regions.

**Key conclusion 3: Government policy to be effective in fostering innovation must focus on the sectors which are promising to strengthen local economies.**

Poland's economy is evidently not based on high-tech companies. In 2004, the share of high-technology products in export was estimated at 2.3% and in imports at 9.2%. Consequently, it implies that increasing innovativeness of more traditional companies is at least as important as granting the support for the high-tech companies.

**Recommendation 3: Extend measures fostering innovation to the traditional sectors often based on non-technological innovation.**

The policy-makers engaged in programming of the Structural Funds, should be aware that one can find very innovative firms not only in the high-tech sectors (pharmaceutical, electronic material and telecom equipment, medical, precision and optical instruments), but also amongst the traditional ones, such as agriculture and farming, food and beverages, plastic products and tourism. For this reason, it is recommended to embed the measures supporting innovation in traditional industries, in the 2007-2013 perspective. This type of support is of particular relevance to regions with lower innovation potential and less advanced regions.

Policy-makers have a broad range of measures to choose from in order to foster innovation in traditional industries. One of them is support to the development of networks in a specific sector. The other possibility is to support traditional sectors by supporting mobility of graduates from technical universities to local companies. Awareness raising initiatives can also bring positive effects. One possibility is to establish an annual competition for innovative company coming from the traditional sector. The winners could be recompensed for their efforts by some sort of financial reward. Moreover, support to competence centres led by private consortium from the traditional sectors can also foster innovation. Finally, direct support for innovative projects in traditional industries is another possibility.

## **6.2 Operational guidelines to maximising effectiveness of Structural Fund interventions for innovation and knowledge**

**Key conclusion 4: The system of implementation of the Structural Funds proved to be ineffective because of inadapted legislation, excessive bureaucratic procedures and lack of experience in preparing high-level quality proposals, especially amongst the SMEs.**

The application process for funding from the Structural Funds proved to be cumbersome. At the end of March 2006, the value of signed contracts expressed as percentage of obligations for the programming period 2004-2006 of all OPs was estimated at 68.3%, whereas calculated as the value of made payments the absorption capacity is only 11.65%. In particular, smaller companies encountered enormous difficulties in preparing good project proposals. To illustrate this, 9,782 applications (approximately 45% of applications), submitted in the scope of Measure 2.3 Improvement of competitiveness of SMEs through investments (SOP-ICE), were rejected during the selection phase, according to the February 2006 data.

**Recommendation 4: Introduce two phases of the application process, streamline the administrative requirements and ensure that potential beneficiaries are well informed and prepared for the programming period 2007-2013.**

The first phase should consist of preliminary assessment of applications, and second one should be based on detailed analysis of administrative and technical offers. The ideal of course would be to have first technical assessment and then verification of the administrative documentation. Also, the number of required documents should be reduced to the strict minimum. On the one hand, it is very important to establish comprehensive and “light” administrative procedures, and on the other, to ensure that the potential beneficiaries are well prepared for the application process.

**Key conclusion 5: Establishing closer co-operation between the R&D and business sector requires more than just modernisation of laboratories or acquisition of new equipment.**

The current experience in the implementation of measure 1.4 Strengthening co-operation between R&D sphere and economy (OP-ICE) shows that it is rather easy to finance modernisation of research organisations but much more difficult to involve the representatives from the business sector.

**Recommendation 5: Make availability of Structural Fund interventions conditional upon involvement of enterprises**

Making availability of financing for infrastructure projects at research and knowledge organisations should be made conditional upon involvement of the business sector. Such approach is expected to help more effectively in stimulating co-operation between the R&D and business sector.

**Key conclusion 6: The system of monitoring should help the civil servants to manage, monitor and assess the progress of the implementation of the OPs, however, in practice, the so-called SIMIK system (electronic system of monitoring and financial control) does not function in the majority of the OPs.**

**Recommendation 6: Establish an effective system of monitoring and evaluation.**

The existing software should be adapted to the new financial perspective 2007-2013. At present, it is too late to foresee the design of a new tool, and such action is likely to be counter-productive. Finally, it is necessary to ensure that independent evaluations are carried out regularly.

**Exhibit 15: Summary of recommendations on investment priorities**

Region or group of regions	Strategic focus	Priority measures	Indicative financial resources
Leading capital region (Mazowieckie)	<ul style="list-style-type: none"> <li>▪ Supporting the development and creation of new innovative companies</li> <li>▪ Investing in human capital for innovation</li> <li>▪ Boosting co-operation between the R&amp;D sector and industry</li> <li>▪ Support in innovation policy-planning</li> <li>▪ As above</li> </ul>	<ul style="list-style-type: none"> <li>▪ Promotion of innovation in the service sector</li> <li>▪ International and interregional clusters</li> <li>▪ Support to the mobility of higher education graduates and researchers between their research institutions and the business sector</li> <li>▪ Support to scientific research institutions which should be made conditional upon involvement of enterprises</li> <li>▪ Development and support of centres of excellences led by private consortia</li> <li>▪ Foresight initiative, and innovative pilot actions.</li> </ul>	<p>RTDI expenditures<sup>48</sup> as % of regional allocations from IROP (2004-2006): 16.46% (16.45 MEUR per year)</p> <p>RTDI expenditures 2007-2013: max. 15% of ROP</p>
Secondary growth poles (Śląskie, Wielkopolskie, Dolnośląskie, Małopolskie, Łódzkie and Pomorskie)	<ul style="list-style-type: none"> <li>▪ As above</li> </ul>	<ul style="list-style-type: none"> <li>▪ Promotion of innovation in sectors of strategic importance</li> <li>▪ International and interregional clusters</li> <li>▪ Support to the mobility of higher education graduates and researchers between their research institutions and the business sector</li> </ul>	<p>RTDI expenditures as % of regional allocations from IROP (2004-2006): Śląskie 17.09% (15.94 MEUR per year)</p> <p>Wielkopolskie 16.73% (10.93 MEUR per year)</p> <p>Dolnośląskie 13.07% (9.74 MEUR per year)</p>

<sup>48</sup> IROP (2004-2006): Measures 1.3 Regional social infrastructure, 1.5 Information society infrastructure, 2.5 Entrepreneurship promotion, 2.6 Regional innovation strategies and transfer of knowledge, and 3.4 Micro-enterprises.

Region or group of regions	Strategic focus	Priority measures	Indicative financial resources
		<ul style="list-style-type: none"> <li>▪ Support to scientific research institutions which should be made conditional upon involvement of enterprises</li> <li>▪ Development and support of centres of excellences led by private consortia</li> <li>▪ Foresight initiative, and innovative pilot actions.</li> </ul>	<p>Matopolskie 21.77% (13.44 MEUR per year)  Łódzkie 17.01% (8.9 MEUR per year)  Pomorskie 14.73% (7.83 MEUR per year)</p> <p>RTDI expenditures 2007-2013: max. 17% of ROP, as in IROP (2004-2006).</p>
Regions with lower innovation potential (Kujawsko-Pomorskie, Lubuskie and Zachodniopomorskie, Lubuskie and Opolskie)	<ul style="list-style-type: none"> <li>▪ Improving governance capacities for innovation and knowledge-based policies</li> <li>▪ Introducing innovation in more traditional sectors</li> <li>▪ Investing in human resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical assistance type funding</li> <li>▪ Support to local companies in becoming more innovative</li> <li>▪ Support the development of joint technology training centres led by consortium of enterprises</li> </ul>	<p>RTDI expenditures as % of regional allocations from IROP (2004-2006):  Kujawsko-Pomorskie 21.92% (10.37 MEUR per year)  Zachodniopomorskie 17.16% (8 MEUR per year)  Lubuskie 19.59% (5.39 MEUR per year)  Opolskie 18% (4.6 MEUR per year)</p> <p>RTDI expenditures 2007-2013: max. 10% of ROP</p>
Less advanced regions (Lubelskie, Podkarpackie, Warmińsko-Mazurskie, Świętokrzyskie, and Podlaskie)	<ul style="list-style-type: none"> <li>▪ Overcoming the peripheral localisation</li> <li>▪ Improving governance capacities for innovation and knowledge-based policies</li> <li>▪ Introducing innovation in more traditional sectors</li> <li>▪ Investing in human resources</li> </ul>	<ul style="list-style-type: none"> <li>▪ Investment in ICT to ensure connectivity for all (citizens and enterprises)</li> <li>▪ Technical assistance type funding</li> <li>▪ Support innovation in the tourism sector (Innovationsprogrammet in Sweden)</li> <li>▪ Support the development of joint technology training centres led by consortium of enterprises</li> </ul>	<p>RTDI expenditures as % of regional allocations from IROP (2004-2006):  Lubelskie 18.68% (12.51 MEUR per year)  Podkarpackie 17.17% (10.99 MEUR per year)  Warmińsko-Mazurskie 14.44% (8.75 MEUR per year)  Świętokrzyskie 15.58% (6.91 MEUR per year)  Podlaskie 19.44% (7.12 MEUR per year)</p> <p>RTDI expenditures 2007-2013: between 6-8% of ROP</p>

## Appendix A Methodological annex

### A.1 Quantitative analysis of key knowledge economy indicators

#### A 1.1 Factor analysis

In order to analyse and describe the knowledge economies at regional level in the EU, the approach adopted was to reduce and condense all relevant statistical information available for a majority of regions. The approach involved firstly reducing the information from a list of selected variables (Table 1) into a small number of factors by means of factor analysis.

*Table 1. Reduction of the dataset (215 EU-25 regions) into four factors by means of factor analysis*

	The 4 factors			
	F1 'Public Knowledge'	F2 'Urban Services'	F3 'Private Technology'	F4 'Learning Families'
Higher education (HRSTE), 2003	<b>.839</b>	.151	.190	.184
Knowledge workers (HRSTC, core), 2003	<b>.831</b>	.164	.267	.327
High-tech services employment, 2003	<b>.575</b>	.367	.428	.323
Public R&D expenditures (HERD+GOVERD), 2002	<b>.543</b>	.431	.275	-.195
Value-added share services, 2002	.323	<b>.869</b>	.002	.121
Value-added share industry, 2002	-.265	<b>-.814</b>	.386	-.061
Employment government administration, 2003	-.217	<b>.745</b>	.124	-.175
Population density, 2002	.380	<b>.402</b>	.043	.038
High and Medium/high-tech manufacturing employment, 2003	-.073	-.331	<b>.873</b>	-.089
Value-added share agriculture, 2002	-.222	-.350	<b>-.672</b>	-.198
Business R&D expenditures, 2002	.335	-.050	<b>.664</b>	.267
S&T workers (HRSTO, occupation), 2003	.560	.178	<b>.589</b>	.382
Population share under 10 years of age, 2001	-.237	.060	-.015	<b>.868</b>
Life-long learning, 2003	.472	-.009	.165	<b>.703</b>
Activity rate females, 2003	.418	-.227	.281	<b>.620</b>

Note: Principal Component Analysis. Rotation Method: Equamax with Kaiser Normalization, a Rotation converged in 9 iterations. Main factor loadings are highlighted in bold. Source: MERIT, based on Eurostat data, mostly referring to 2002 or 2003

Based on the variable with the highest factor loadings we can characterise and interpret the four factors and give them a short symbolic name:

#### Public Knowledge (F1)

Human resources in Science and Technology (education as well as core) combined with public R&D expenditures and employment in knowledge intensive services is the most important or common factor hidden in the dataset. The most important variables in Public Knowledge are the education and human resource variables (HR S&T education and core). Cities with large universities will rank high on this factor.

One interesting conclusion is that public and private knowledge are two different factors (F1 and F3 respectively), which for instance has implications for policy issues regarding Science-Industry linkages. Public R&D and higher education seems especially related to high-tech services, whereas Business R&D especially serves high- and medium-high-tech manufacturing.

#### Urban Services (F2)

This second factor contains information on the structure of the economy. It is well known that industrial economies are quite different from services based economies. It is not a matter of development per se, because in the European regions the variety of economic structure is very large and for a large part based on endowments and path dependent developments like the extent to which government administration is located in a region or not. This factor takes into account the differences between an industrial area and a service-based area including the public administration services of the government. Another observation is that there are two different 'urban' factors, indicating that academic centres not necessary co-locate with administration centres. What may not be surprising is that the Urban Services factor is not associated with R&D, since R&D is more relevant for innovation in manufacturing than for service industries.

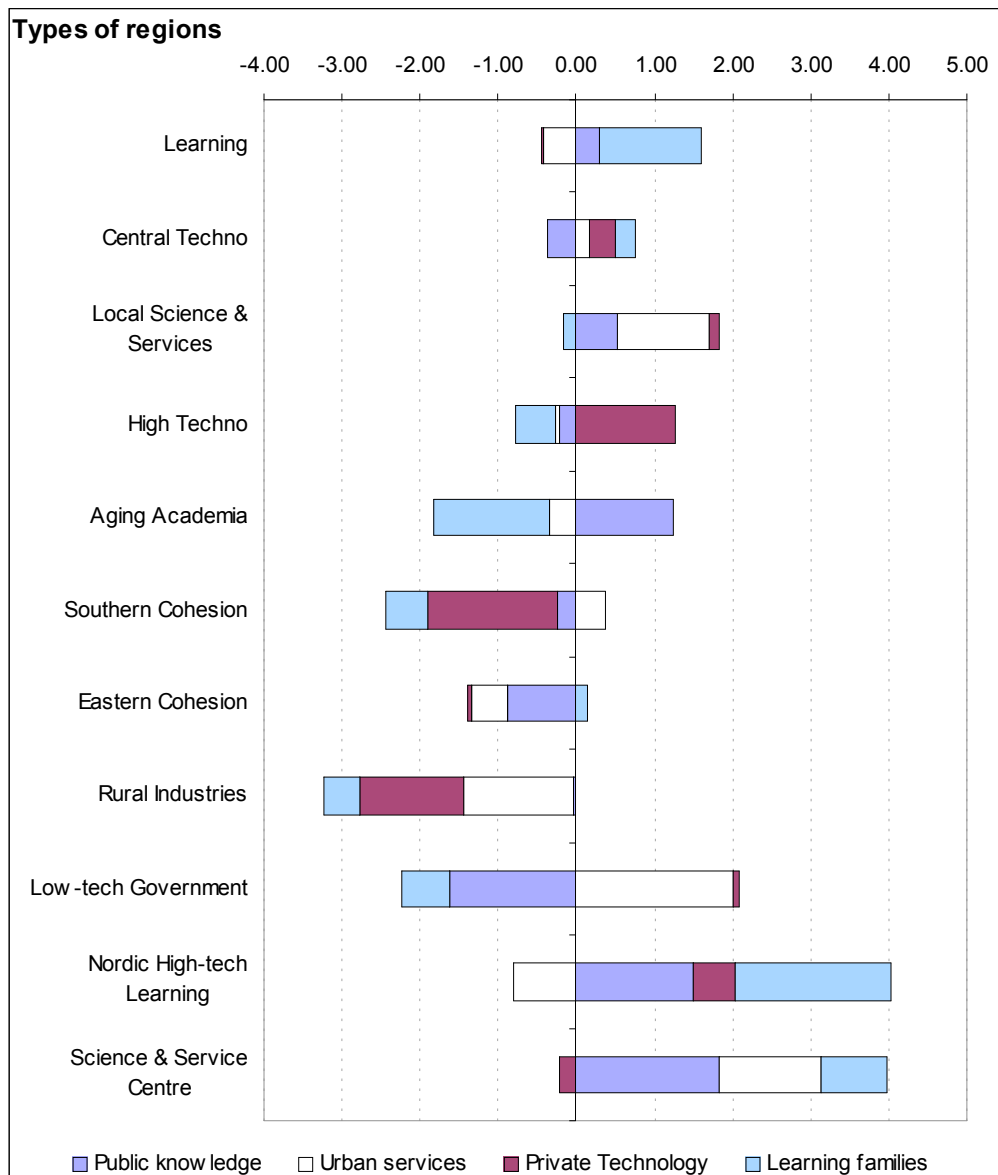
#### Private Technology (F3)

This factor contains business R&D, occupation in S&T activities, and employment in high- and medium-high-tech manufacturing industries. A countervailing power is the existence of agriculture in the region. One interpretation could be that agricultural land-use goes at the cost of possibilities of production sites. Another interpretation is that agriculture is not an R&D intensive sector.

#### Learning Families (F4)

The most important variable in this factor is the share of the population below the age of 10. Locations with relatively large shares of children are places that are attractive to start a family. Possibilities for Life Long Learning in a region seems associated with the lively labour participation of the mothers of these youngsters. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-lifestyle' based on behavioural norms and values that are beneficial to a knowledge economy.

## A 1.2 Description of the 11 types of EU regions



### 1 Learning

The Learning regions are first of all characterised by the high score on the factor 'Learning Families', and the three main components of this factor: life-long-learning, youth and female activity rate. On the other factors the regions are close to the regional average. Unemployment is on average the lowest compared to the other EU regions. Employment in the government sector is limited. GDP per capita is rather high. The regions are located in Austria, Ireland, the Netherlands, Sweden and the UK. There are many similarities with the Nordic High-tech Learning regions, but the business sector in the Nordic version invest more in R&D.

### 2 Central Techno

This is a rather large group of regions located mostly in Germany and France with close to average characteristic, but the share of High-tech manufacturing is rather



high. The factor-scores as well as GDP-per head is slightly above the regional average, except for the Public Knowledge factor which is slightly lower.

### 3 Local Science & Services

This group of regions with diverse nationality consist mainly of capital cities, such as Madrid, Warsaw, Lisbon, Budapest and Athens. These urban areas serve as national centres for business services, government administration, public research institutes and universities. Urban Services and Public knowledge are therefore the strongest factors for this type of region. GDP per capita is on average slightly below the EU25 average, but growing. The low score on life-long-learning is a weakness in most Local Science & Services regions, especially compared to the more wealthy and advanced Science & Service Centres.

### 4 High Techno

The High Techno regions host many high-tech manufacturing industries. They are mostly located in Germany (e.g. Bayern and Baden-Wurtemberg), some in Italy (e.g. Lombardia and Veneto) and two French regions. This type is very strong in Private Technology and has a high level of GDP per capita. The factors Public Knowledge and especially the Learning Family factor shows a relative weakness, e.g. in life-long-learning. Growth in terms of GDP per capita has been low and unemployment didn't improve much in the previous years.

### 5 Aging Academia

This group of regions is mostly located in east-Germany and Spain and also includes the capital regions of Bulgaria and Romania. The strength in the Public Knowledge factor is mostly based on the high share of people with tertiary education. The low score on the Learning Family factor is due to little life-long-learning and hosting relatively few children. The unemployment situation has improved, but is still very high.

### 6 Services Cohesion

Services cohesion regions are located in Southern Europe, consisting of many Greek, some Spanish and two Portuguese regions. The low score on the Private Technology factor is striking. There is hardly any high-tech manufacturing nor business R&D. Services is the most important sector, but also agriculture is still a rather large sector. The share of manufacturing industry in value added is very limited. Population density is low, but on average it has been increasing.

### 7 Manufacturing Cohesion

Manufacturing industries is the dominant sector, whereas services and agriculture are rather small sectors. This type of region is mostly located in Poland, Czech Republic, Hungary and Slovak Republic. Two Portuguese regions are also included. The Public Knowledge factor is the main weakness of this type of regions. However, the score on the Private Technology factor is close to average, which means that it is much stronger in this respect than the Services Cohesion regions. Unemployment is high, even compared to Rural Industries and Services Cohesion regions.

### 8 Rural Industries

Besides a low per capita GDP, Rural Industries regions have in common a low score on both the factors Urban Services and Private Technology. Population density is

very low. The service sector is often very small. Especially agriculture but also manufacturing industries are relatively large sectors. Besides regions in Bulgaria and Romania

#### 9 Low-tech Government

This type of region, mostly located in southern Italy is characterised by a very low score on Public Knowledge combined with a high share of employment in the Government sector. Unemployment is severe, on average comparable to Manufacturing cohesion regions. GDP per capita is however close to the regional average.

#### 10 Nordic High-tech Learning

The Nordic version of the learning regions are typically strong in the Learning Family factor, but this type also has by far the highest business R&D intensity. In contrast with the popular characterisation of Nordic societies, the size of the government administration is the lowest of all the types. The low score on Urban Services is also due to the low population density. A rather unique feature of this type of regional knowledge economy is the combined strength in both the Public Knowledge and the Private Technology factor.

#### 11 Science & Service Centre

The main characteristics of this urban group of regions are the high scores on the Public Knowledge and Urban Services factors. Population density is very high. This type also has the highest GDP per capita and productivity. The variables that are captured by the factor Learning Families also show a score above the regional average, but disappointing is the relatively low presence of high and medium-high-tech manufacturing and the business R&D intensity.

## A.2 Qualitative analysis and preparation of country reports

In summary, the country reports were prepared in the following stages:

A first country document was prepared by the core study team in the form of a **template country report**. It contained overall guidance to the country experts and included a number of pre-filled tables, graphs and analysis sections based on information available at EU level.

Next, the core team members and the national experts who were involved in the pilot phase of the project commented completed elements of the templates. Drafted elements and templates were completed and compiled into **first country briefings (draft pilot reports)** by the national experts involved in the pilot phase of the project. These pilot country reports were prepared by experts for Belgium, Greece, Italy, France, and Poland.

Once the five first country briefings were completed, a **final set of guidelines** was prepared by the core team. These guidelines were agreed with the Commission services responsible for this evaluation. Prior to this, all first country briefings were reviewed during the January 2006 and presented to a first meeting of the scientific committee.

The work during the **country analysis phase** included:

- Undertaking a series of key interviews (KI) with policy decision makers;
- Organising a focus group (FG) with key national or regional RDTI stakeholders;
- Collecting additional information and finalising short case studies; and
- Preparing the synthesis notes of these various activities.

The above-mentioned work served as qualitative data and allowed the national experts to compile the draft **country reports**. All reports were subsequently reviewed, checked and finalised by the core team and the consortium members. Once this first check was completed, the core team organised a final peer reading of the document to verify its overall consistency and to ensure a final English language editing of the document. The core team then completed the final editing and layout of the document with a view to publication.

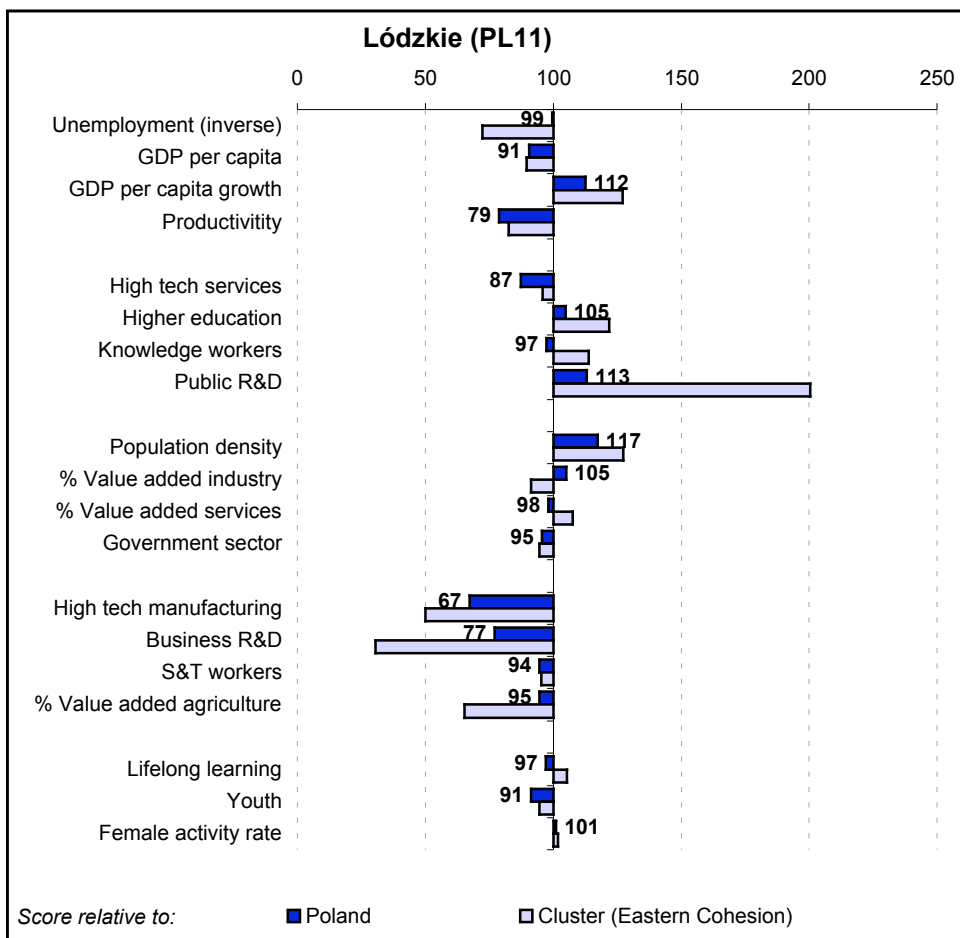
An overall synthesis report of all has been prepared and will be published by the European Commission providing an overview of the issues addressed in each of the 27 country reports produced by the evaluation team.

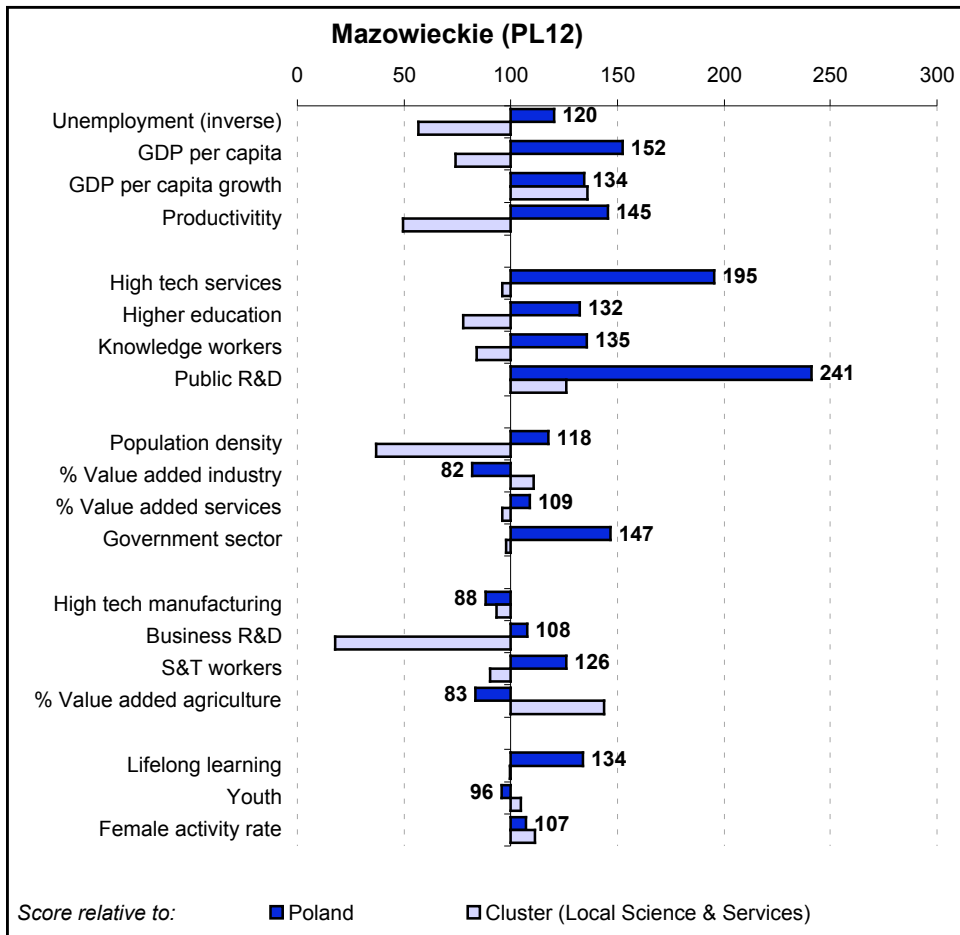
## Appendix B Statistical tables and regional scorecards

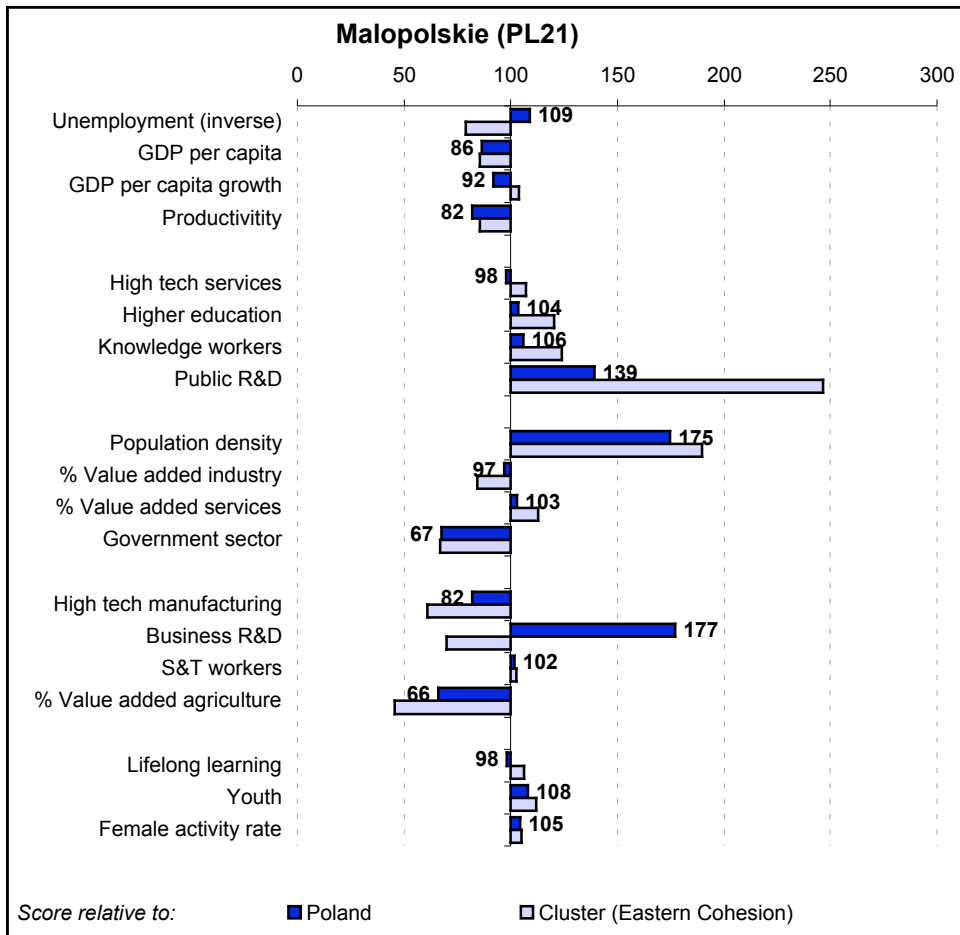
### B.1 Overall quantitative analysis per region

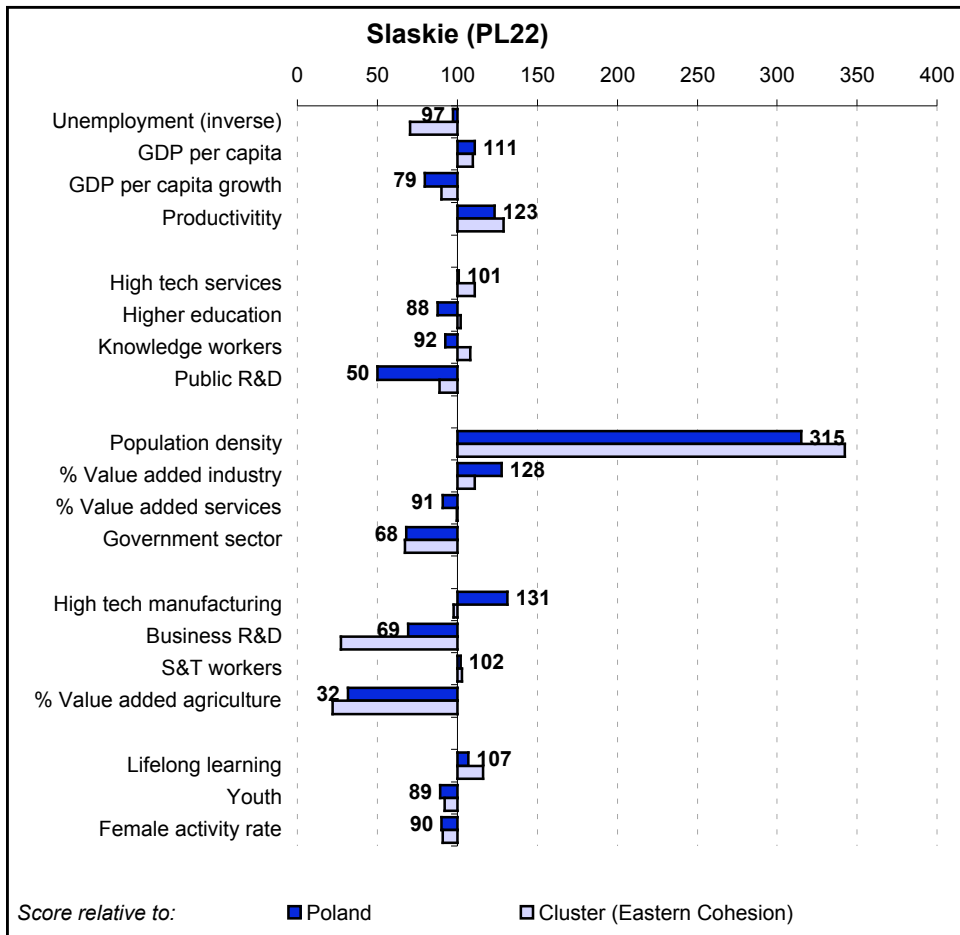
	Cluster	Economic performance				Public knowledge				Urban services <sup>10</sup>				Private technology				Learning families			
		Unempl oyment	GDP per capita	GDP per capita growth 1996- 2002	Product ivity	High tech service	Higher educati ons	Knowle dge on workers	Public R&D	Populat ion density	Value added service	% service	Govern ment sector	High tech manufa cturing	Busines s R&D	S&T workers	Value added agricult ure	Lifelong learning	Youth	Female activity rate	
																					2003
EU25		9.2	21170	4.8	4556	3.2	20.7	11.6	0.69	117	27.0	70.9	6.6	1.24	20.7	2.1	8.7	10.8	48.3		
Regional average		9.4	18882	4.8	3914	2.8	18.9	10.7	0.49	294	28.9	66.6	6.5	0.80	19.5	4.3	7.1	10.5	47.2		
Poland	PL	19.6	9664	6.0	1284	2.1	13.9	8.5	0.46	122	29.7	67.2	4.9	0.13	16.1	3.1	4.4	11.4	48.7		
Relative to EU25		47	46	127	28	67	67	73	67	105	110	95	74	10	78	147	50	105	101		
Lódzkie	PL11	19.7	8747	6.8	1013	1.9	14.5	8.3	0.52	143	31.2	66.9	3.3	0.10	15.2	2.9	4.3	10.4	49.2		
Mazowieckie	PL12	16.3	14718	8.1	1867	4.2	18.3	11.5	1.11	144	24.4	73.1	4.3	0.14	20.3	2.6	5.9	10.9	52.2		
Malopolskie	PL21	18.0	8353	5.5	1051	2.1	14.4	9.0	0.64	214	28.8	69.2	4.4	0.23	16.3	2.0	4.3	12.3	50.9		
Slaskie	PL22	20.2	10703	4.8	1584	2.2	12.2	7.8	0.23	386	37.9	61.1	4.4	0.09	16.4	1.0	4.7	10.1	43.9		
Lubelskie	PL31	16.0	6764	4.6	769	2.0	14.8	9.3	0.32	88	23.6	71.4	3.1	0.12	16.6	5.0	4.3	12.1	52.5		
Podkarpackie	PL32	17.7	6891	4.9	920	1.3	12.1	7.2	0.06	117	31.9	65.5	5.0	0.33	14.9	2.6	3.2	12.9	51.1		
Swietokrzyskie	PL33	19.1	7557	6.2	959	1.0	14.1	6.8	0.04	111	30.3	64.6	5.5	0.03	13.9	5.1	3.2	11.5	45.5		
Podlaskie	PL34	17.8	7435	5.9	959	0.8	14.6	9.3	0.19	60	24.8	69.2	6.8	0.01	16.2	6.0	4.1	12.1	50.3		
Wielkopolskie	PL41	17.1	9967	6.7	1271	1.6	12.5	8.2	0.38	112	32.6	62.2	5.0	0.08	16.0	5.2	3.9	12.1	48.5		
Zachodniopomorskie	PL42	25.5	9553	5.3	1399	2.1	13.7	8.4	0.14	74	23.8	72.4	4.2	0.12	16.2	3.8	3.8	11.4	46.7		
Lubuskie	PL43	24.5	8443	5.0	1150	1.1	12.3	6.6	0.12	72	29.3	67.5	5.3	0.02	12.9	3.2	3.8	11.7	47.3		
Dolnoslaskie	PL51	26.0	10025	5.9	1521	1.7	12.7	7.7	0.35	146	32.3	65.1	6.1	0.10	14.8	2.6	4.9	10.3	48.0		
Opolskie	PL52	18.3	7917	3.9	1178	2.4	11.6	7.0	0.15	113	32.7	62.5	5.4	0.02	14.4	4.7	3.6	10.5	46.3		
Kujawsko-Pomorskie	PL61	21.8	8814	5.5	1103	1.7	12.8	8.0	0.14	115	29.9	65.2	7.3	0.15	14.6	5.0	4.8	11.9	47.7		
Warmińsko-Mazurskie	PL62	23.9	7217	4.9	1118	1.6	12.4	7.5	0.19	59	26.9	68.7	2.9	0.07	15.2	4.3	3.1	12.5	47.4		
Pomorskie	PL63	20.5	9624	6.1	1414	2.5	14.1	8.2	0.29	119	30.3	67.4	7.4	0.22	15.0	2.3	4.5	12.1	47.7		

## B.2 Regional Scorecards

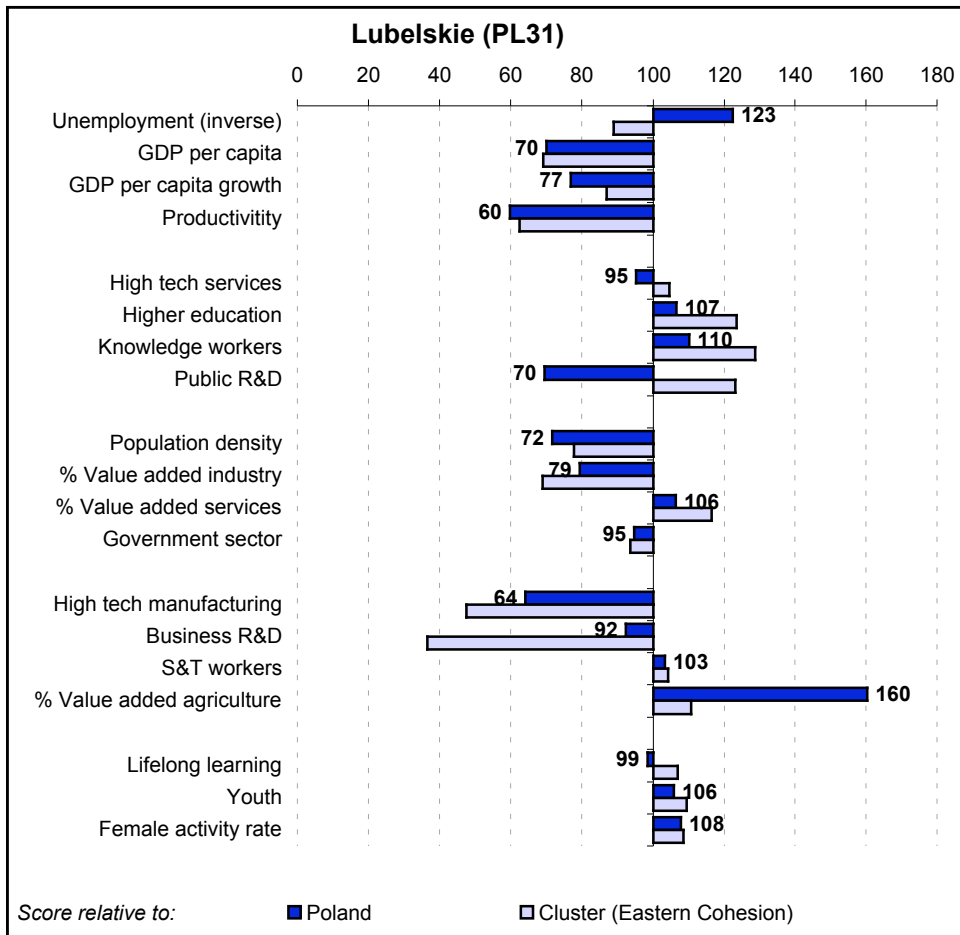


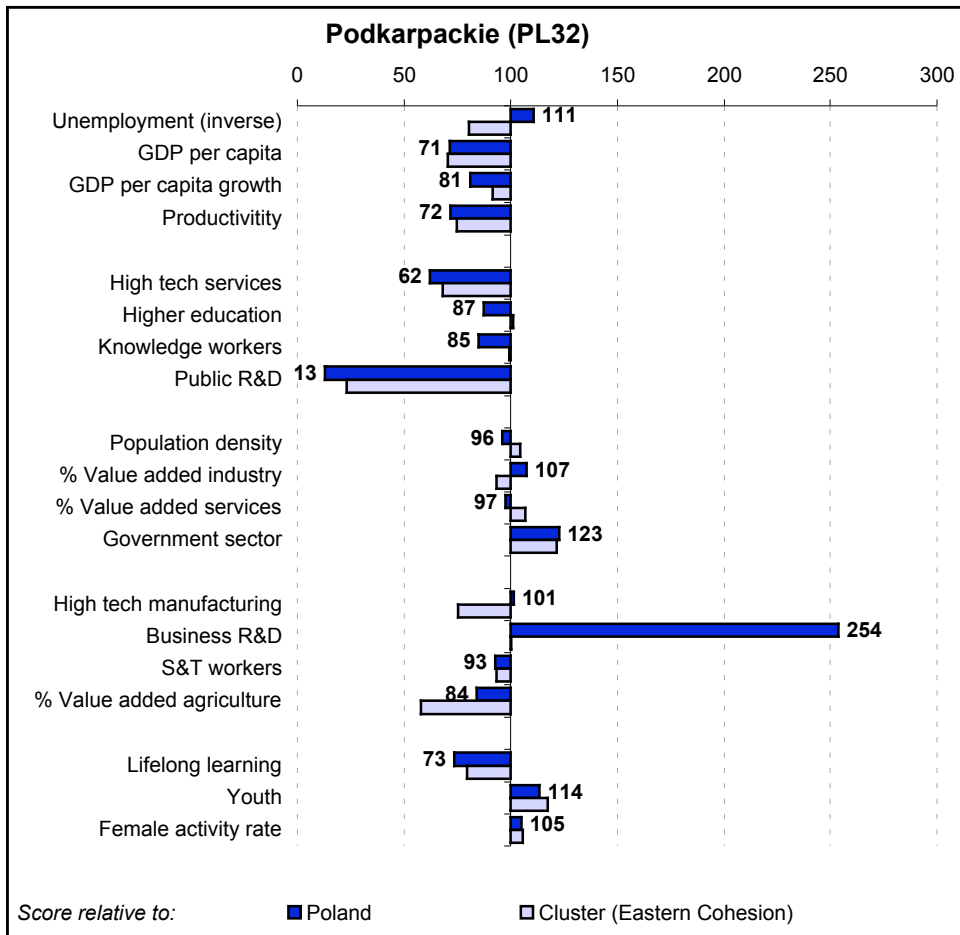


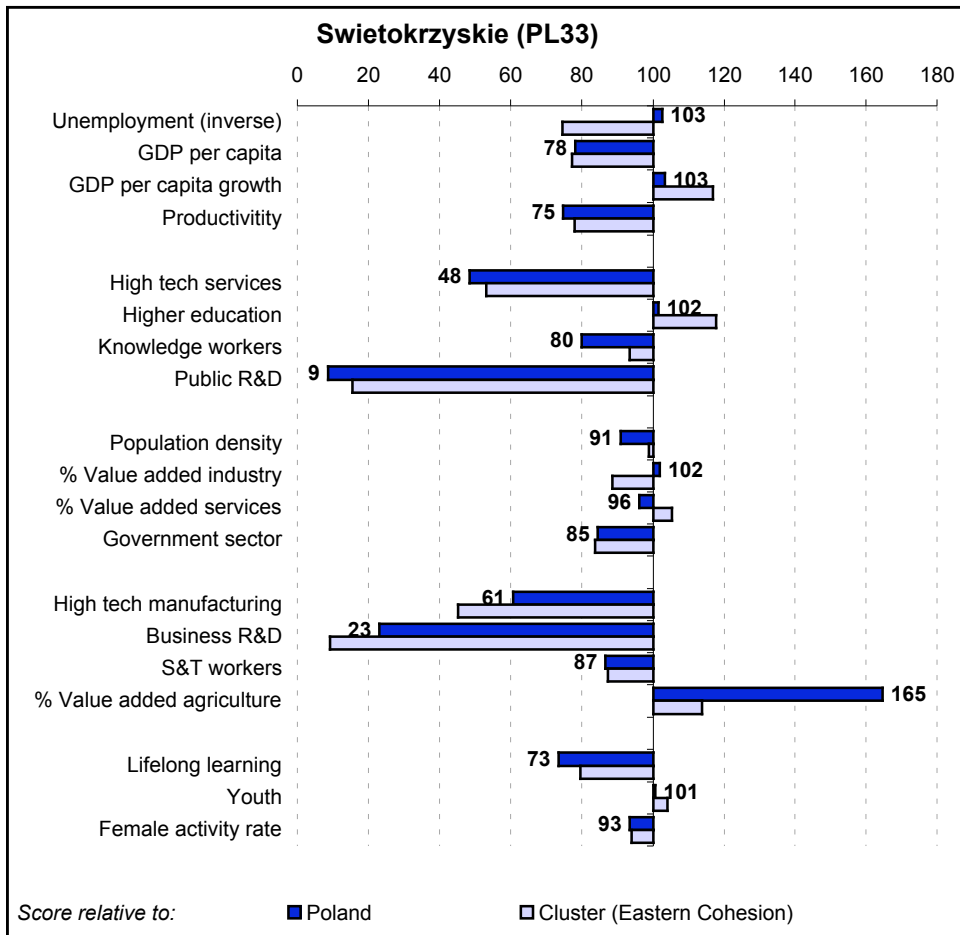


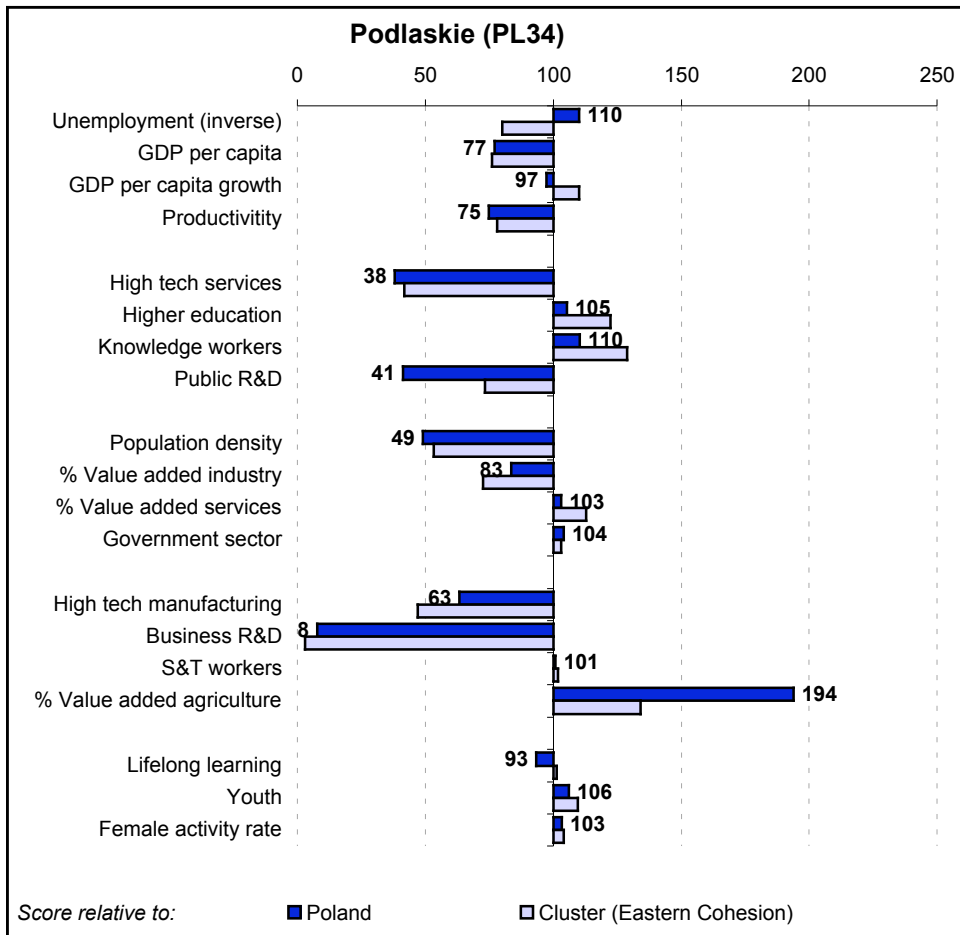


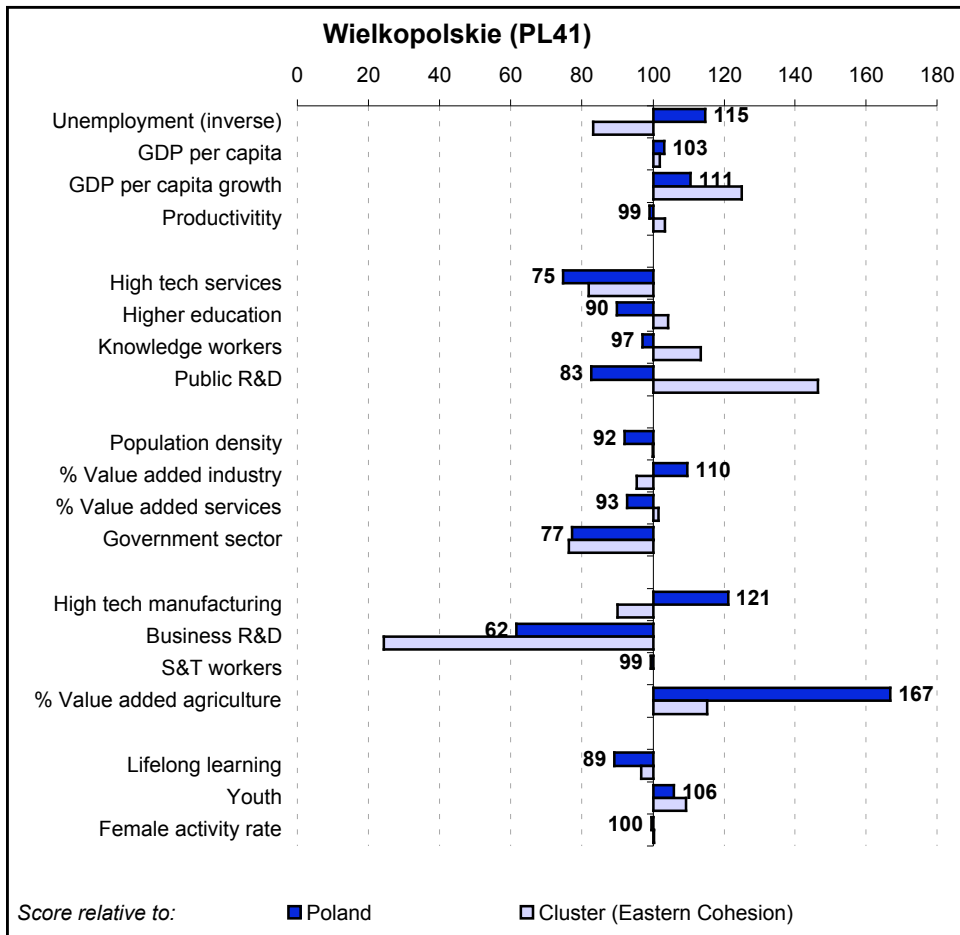


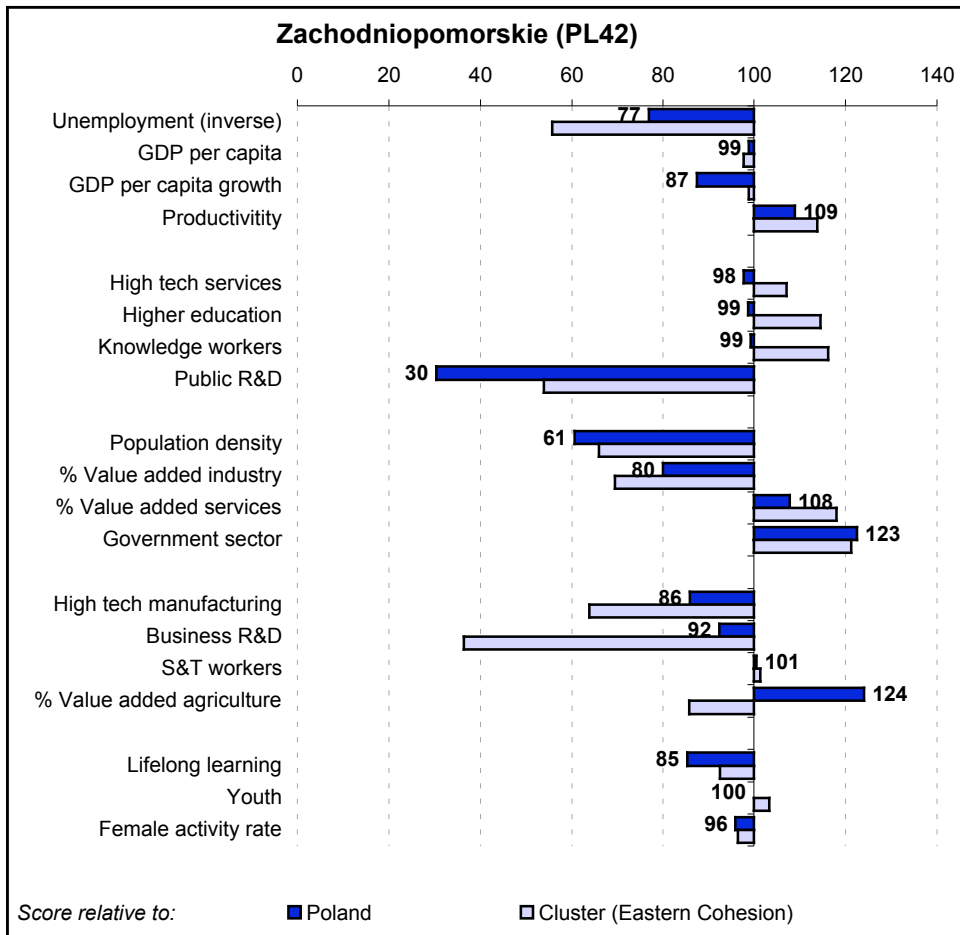


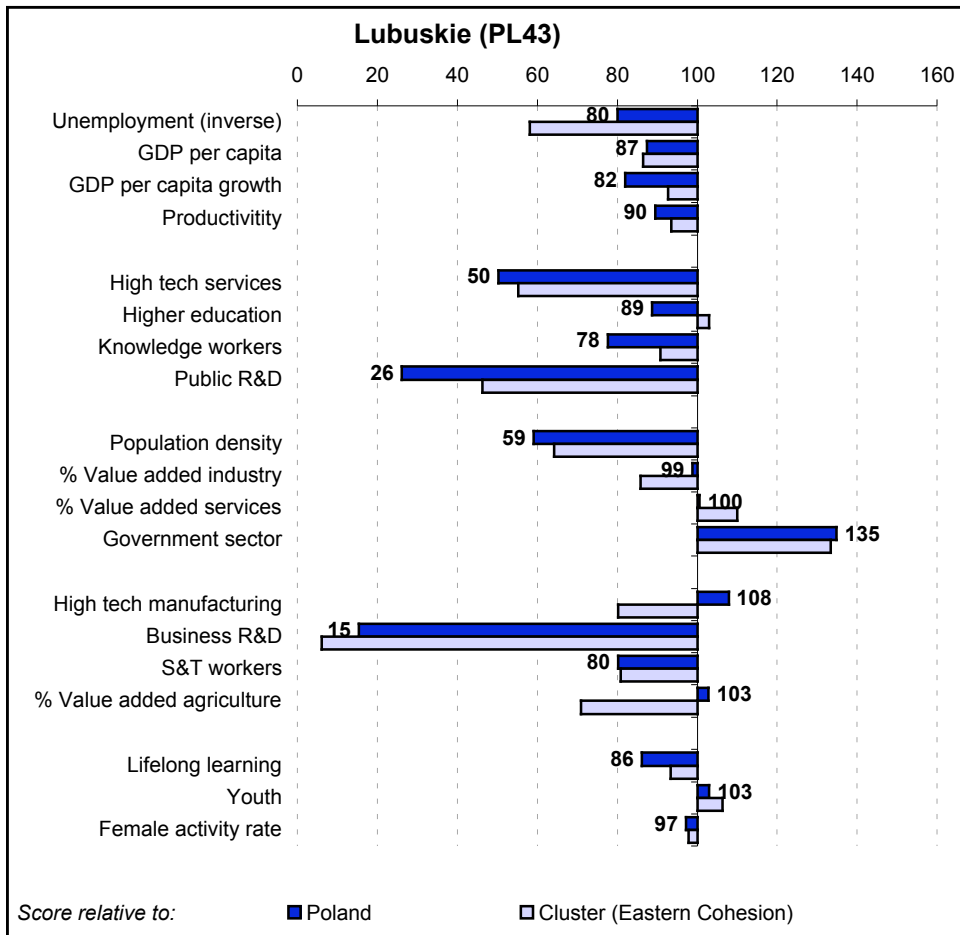


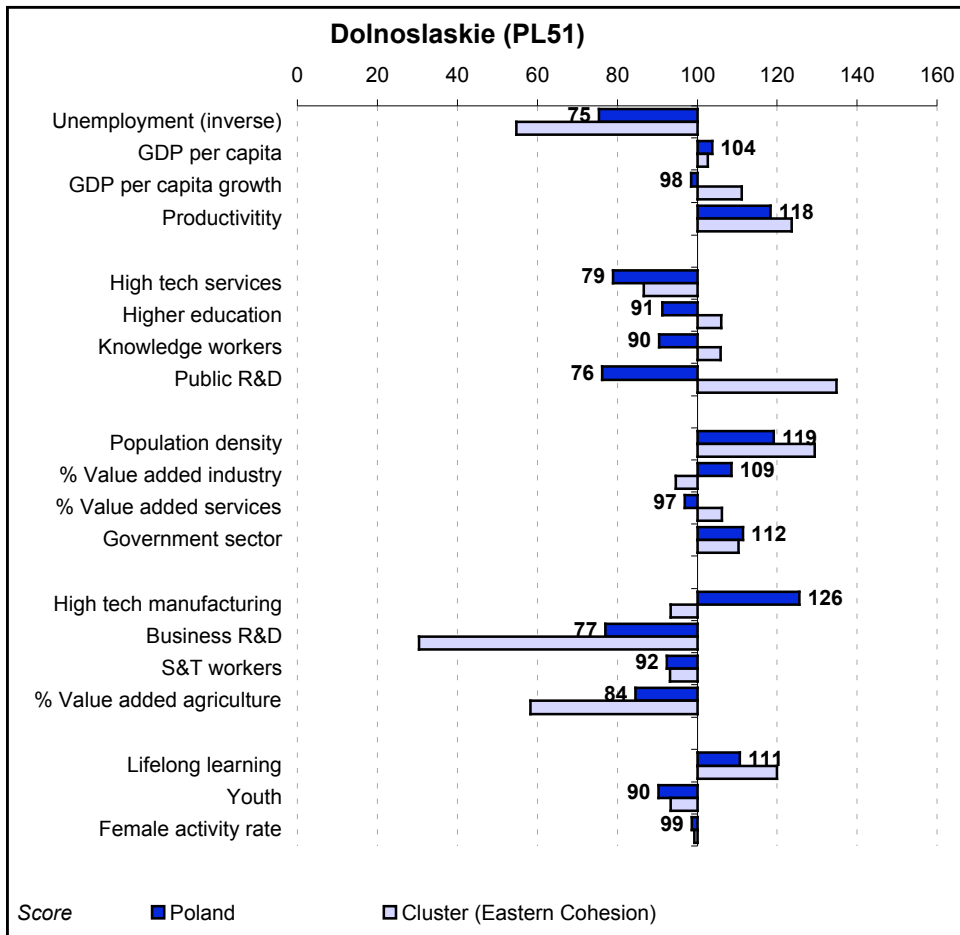




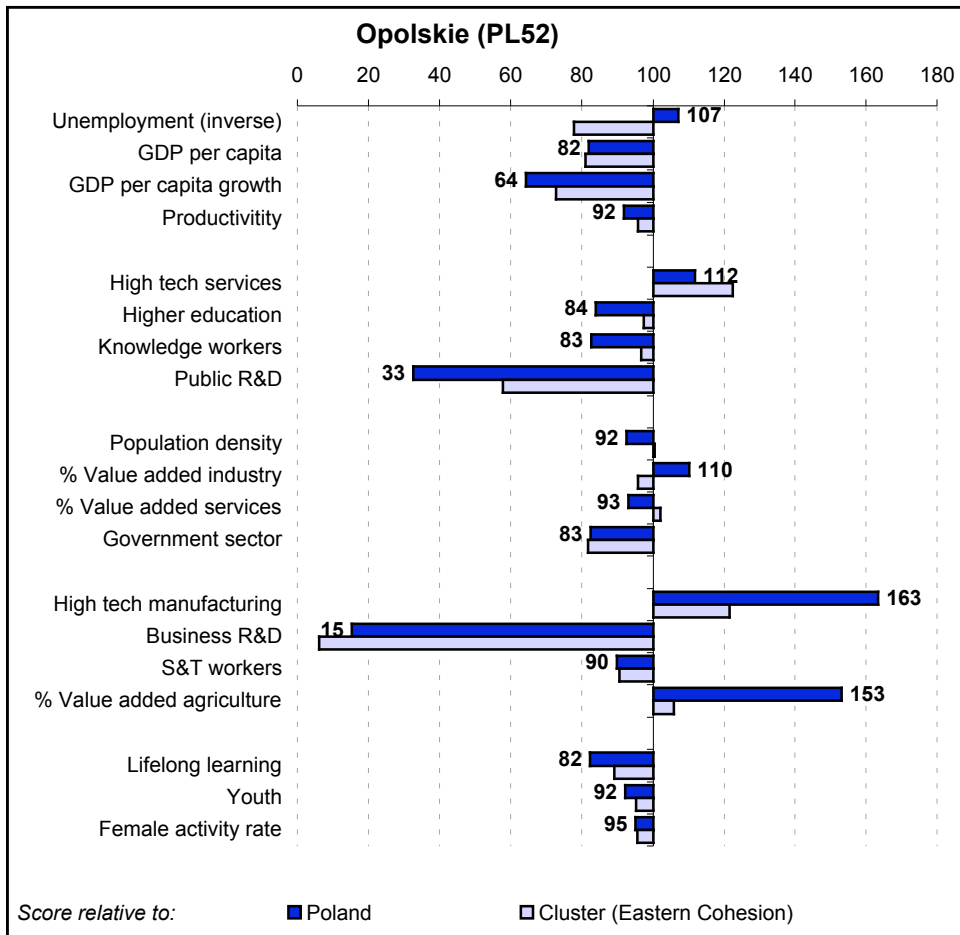


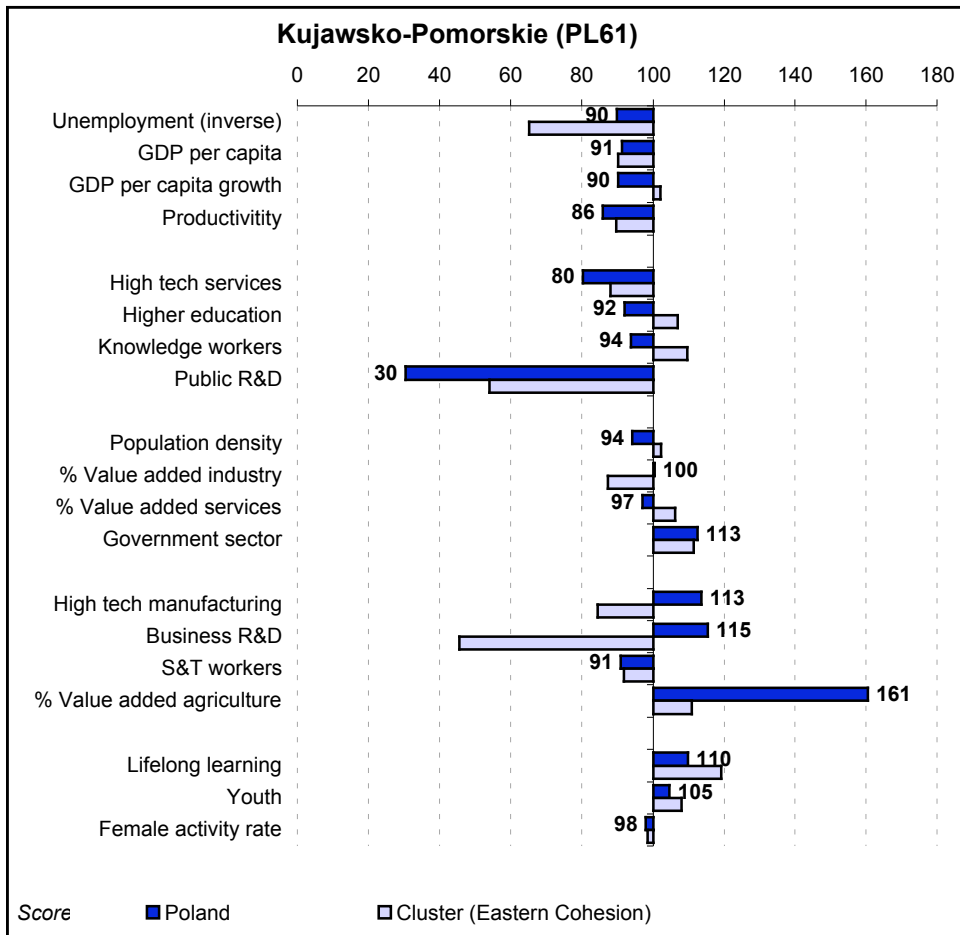


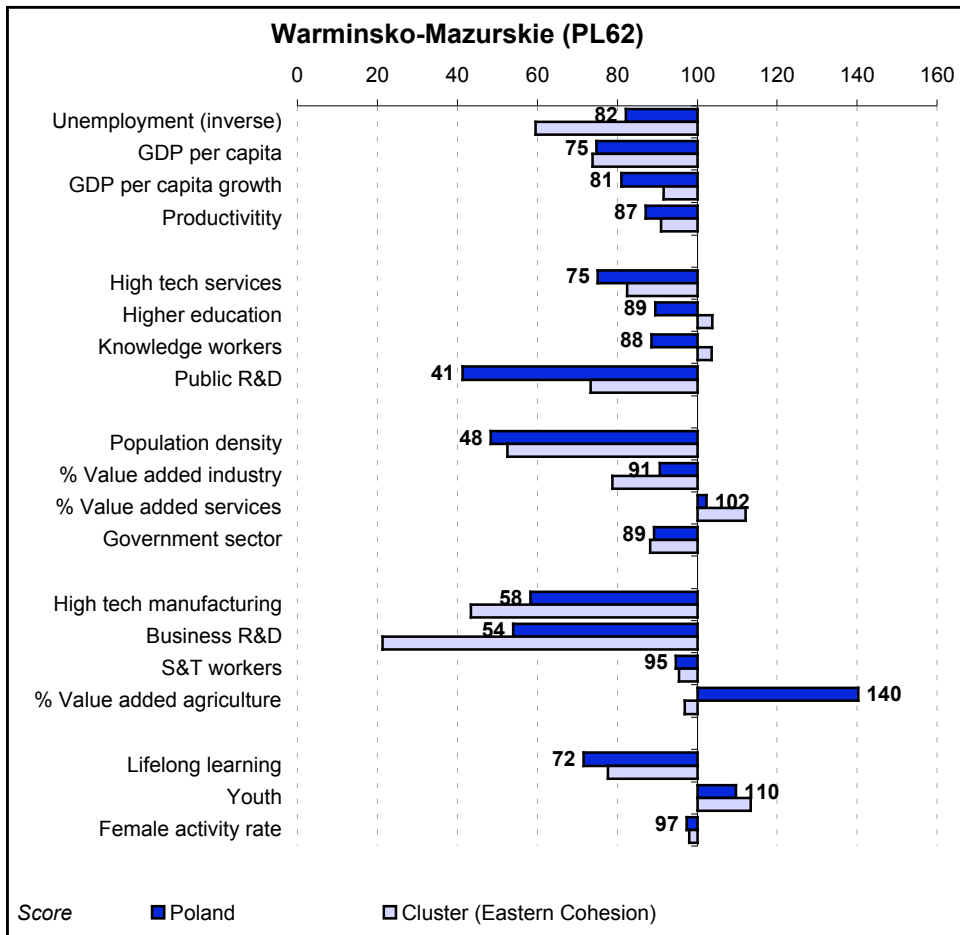


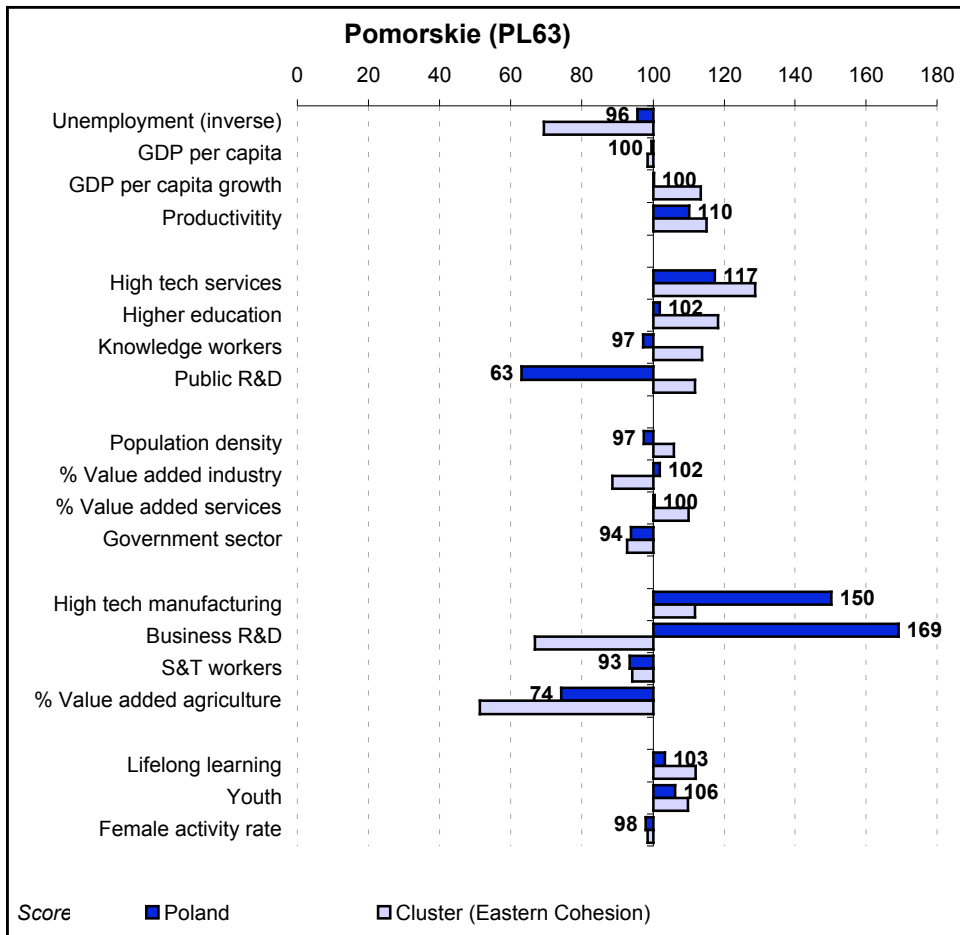












## Appendix C Categories used for policy-mix analysis

### C.1 Classification of policy areas

Policy area	Short description
<b>Improving governance capacities for innovation and knowledge policies</b>	Technical assistance type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of innovation and knowledge. This could include past ERDF innovative action programmes as well as support for instance for regional foresight, etc.
<b>Innovation friendly environment;</b>	This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups: <ul style="list-style-type: none"> <li>innovation financing (in terms of establishing financial engineering schemes, etc.);</li> <li>regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services to enterprises);</li> <li>Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres<sup>49</sup>;</li> </ul>
<b>Knowledge transfer and technology diffusion to enterprises</b>	Direct or indirect support for knowledge and technology transfer: <ul style="list-style-type: none"> <li>direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC;</li> <li>indirect support: delivered through funding of infrastructure and services of technology parks, innovation centres, university liaison and transfer offices, etc.</li> </ul>
<b>Innovation poles and clusters</b>	Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies <ul style="list-style-type: none"> <li>direct support: funding for enterprise level cluster activities, etc.</li> <li>indirect support through funding for regrouping R&amp;D infrastructure in poles, infrastructure for clusters, etc.</li> </ul>
<b>Support to creation and growth of innovative enterprises</b>	Direct or indirect support for creation and growth of innovative firms: <ul style="list-style-type: none"> <li>direct support: specific financial schemes for spin-offs and innovative start-ups, grants to SMEs related to improving innovation management, marketing, industrial design, etc.;</li> <li>indirect support through funding of incubators, training related to entrepreneurship, etc.</li> </ul>
<b>Boosting applied research and product development</b>	Funding of “Pre-competitive development” and “Industrial research” projects and related infrastructure. Policy instruments include: <ul style="list-style-type: none"> <li>aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation);</li> <li>research infrastructures for non-profit/public organisations and higher education sector directly related to universities.</li> </ul>

<sup>49</sup> This is part of the wider area of in-house training, but in the present study only the interventions targeted to researchers or research functions will be analysed.

## C.2 Classification of Beneficiaries:

<b>Beneficiaries</b>	<b>Short description</b>
<i>Public sectors</i>	Universities National research institutions and other national and local public bodies (innovation agencies, BIC, Chambers of Commerce, etc..) Public companies
<i>Private sectors</i>	Enterprises Private research centres
<i>Networks</i>	cooperation between research, universities and businesses cooperation between businesses ( <i>clusters of SMEs</i> ) other forms of cooperation among different actors

## C.3 Classification of instruments:

<b>Instruments</b>	<b>Short description</b>
<i>Infrastructures and facilities</i>	Building and equipment for laboratories or facilities for university or research centres, Telecommunication infrastructures, Building and equipment for incubators and parks for innovative enterprises
<i>Aid schemes</i>	Grants and loans for RTDI projects Innovative finance (venture capital, equity finance, special bonds, etc.) for innovative enterprises
<i>Education and training</i>	Graduate and post-graduate University courses Training of researchers

## Appendix D Financial and policy measure tables

### D.1 Additional financial tables

#### D 1.1 RTDI plus business (innovation technology) support

Objectives	Total cost	Structural funds			National funds	
		Total	ERDF	ESF	Public	Private
<b>RTDI INTERVENTIONS</b>						
Objective 1	1,598,519,122.73	777,502,378.78	777,502,378.78	-	259,084,960.95	561,931,783.00
<b>TOTAL COHESION POLICY</b>						
Objective 1	12,669,693,024.00	8,275,812,636.00	4,972,788,583.00	1,908,502,751.00	3,136,143,143.00	1,257,737,245.00

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
Improvement of the Competitiveness of Enterprises for Years 2004-2006	595,700,590.48	595,700,590.48	-	1,251,098,419.00	1,251,098,419.00	-
Integrated Regional Development OP	181,801,788.30	181,801,788.30	-	2,968,470,769.00	2,530,001,234.00	438,469,535.00
Poland - FIFG Objective 1	-	-	-	201,832,064.00	-	-
Sectoral Operational Programme Human Resource Development 2004-2006	-	-	-	1,470,033,216.00	-	1,470,033,216.00
SOP Restructuring and Modernisation of the Food Sector and Rural Development	-	-	-	1,192,689,238.00	-	-
Transport-Maritime Economy for 2004-2006	-	-	-	1,163,384,465.00	1,163,384,465.00	-
Technical Assistance Obj. 1 - Total	-	-	-	28,304,465.00	28,304,465.00	-
<b>MultiRegional Ops</b>	<b>777,502,378.78</b>	<b>777,502,378.78</b>	<b>0.00</b>	<b>8,275,812,636.00</b>	<b>4,972,788,583.00</b>	<b>1,908,502,751.00</b>

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
Objective 1	777,502,378.78	16,382,555.23	2.1%

Categories 181 to 184 plus:

- 152 Environment-friendly technologies, clean and economical energy technologies
- 153 Business organisation advisory service (including internationalisation, exporting and environmental management, purchase of technology)
- 155 Financial engineering
- 162 Environment-friendly technologies, clean and economical energy technologies

163 Enterprise advisory service (information, business planning, consultancy services, marketing, management, design, internationalisation, exporting, environmental management, purchase of technology)

164 Shared business services (business estates, incubator units, stimulation, promotional services, networking, conferences, trade fairs)

165 Financial engineering

## D 1.2 Broad innovation and knowledge economy funding

Objectives	Total cost	Structural funds			National funds	
		Total	ERDF	ESF	Public	Private
<b>RTDI INTERVENTIONS</b>						
Objective 1	2,331,512,529.86	1,102,538,858.73	1,102,538,858.73	-	388,365,888.12	840,607,783.00
<b>TOTAL COHESION POLICY</b>						
Objective 1	12,669,693,024.00	8,275,812,636.00	4,972,788,583.00	1,908,502,751.00	3,136,143,143.00	1,257,737,245.00

Programs	RTDI INTERVENTIONS			TOTAL		
	Total SF	ERDF	ESF	Total SF	ERDF	ESF
Improvement of the Competitiveness of Enterprises for Years 2004-2006	889,675,290.92	889,675,290.92	-	1,251,098,419.00	1,251,098,419.00	-
Integrated Regional Development OP Poland - FIG	212,863,567.81	212,863,567.81	-	2,968,470,769.00	2,530,001,234.00	438,469,535.00
Objective 1	-	-	-	201,832,064.00	-	-
Sectoral Operational Programme Human Resource Development 2004-2006	-	-	-	1,470,033,216.00	-	1,470,033,216.00
SOP Restructuring and Modernisation of the Food Sector and Rural Development	-	-	-	1,192,689,238.00	-	-
Transport-Maritime Economy for 2004-2006	-	-	-	1,163,384,465.00	1,163,384,465.00	-
Technical Assistance	-	-	-	28,304,465.00	28,304,465.00	-
<b>Obj. 1 - Total MultiRegional Ops</b>	<b>1,102,538,858.73</b>	<b>1,102,538,858.73</b>	<b>0.00</b>	<b>8,275,812,636.00</b>	<b>4,972,788,583.00</b>	<b>1,908,502,751.00</b>

OBJECTIVES	ALLOCATED	DISBURSED TOTAL SF	EXPENDITURE CAPACITY
<b>Objective 1</b>	1,102,538,858.73	18,962,548.21	1.7%

This third calculation adds RTDI plus business (innovation & technology) support plus information society. As D.1.1 plus:

322 Information and Communication Technology (including security and safe transmission measures)

324 Services and applications for SMEs (electronic commerce and transactions, education and training, networking)



## 3.2 Summary of key policy measures per programme

### D 2.1 Main measures in favour of innovation and knowledge

Identified RTDI measure or major project	Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
Measure 1.1 Strengthening of institutions supporting operations of enterprises (OP-ICE)	Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ Projects supporting business support institutions – National Innovation Network (KSI) network and National SME Services Network (KSU)</li> <li>▪ Projects supporting business support institutions and their networks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public and private sectors</li> </ul>
Measure 1.2 Improvement of accessibility to external financing of enterprises' investments (OP-ICE)	Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ Financial resources supporting the loan funds, the guarantee funds and seed capital funds</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>
Measure 1.3 Creation of favourable conditions for enterprises development (OP-ICE)	Knowledge transfer and technology diffusion to enterprises/ Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Implementation of investment projects relating to the establishment and development of industrial parks, science and technology parks and incubators of technology (including academic incubators)</li> <li>▪ Counselling services for institutions managing industrial parks, science and technology parks and incubators of technology (including academic incubators)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>
Measure 1.4 Strengthening co-operation between R&D sphere and the economy (OP-ICE)	Boosting applied research and product development	<ul style="list-style-type: none"> <li>▪ Research projects and development activities: industry and pre-competition research conducted by enterprises or groups of enterprises and/or in co-operation with scientific-research institutions</li> <li>▪ Investment projects relating to building up, modernisation and equipment of specialised laboratories rendering specialised services to enterprises</li> </ul>	<ul style="list-style-type: none"> <li>▪ R&amp;D institutions and organisations (networks, consortia) of R&amp;D sphere, and private sector</li> </ul>

Identified RTDI measure or major project	Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
		<ul style="list-style-type: none"> <li>▪ Investment projects relating to building up, modernisation and equipment of specialised laboratories of Advanced Technologies Centres and Centres of Excellence operating in priority areas from the perspective of development of Poland's economy</li> <li>▪ Projects performed by Centres of Advanced Technologies</li> <li>▪ Research projects in the area of monitoring and forecasting development of technology – foresight</li> </ul>	
Measure 1.5 Development of a system of entrepreneurs' access to information and public services on-line (OP-ICE)	Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ Establishment of an electronic platform enabling access of enterprises and the general public to cheap, fast and quality services and public information</li> <li>▪ Increase of the number of on-line public services</li> <li>▪ Integration of registers of companies and people and their safety assurance</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public sector</li> </ul>
Measure 2.1 Improvement of competitiveness of SMEs through advice (OP-ICE)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Advisory on running business on the Single European Market</li> <li>▪ Advisory relating to quality, in particular projects in the area of design, implementation and improvement of the systems of quality management, environment management and work safety and hygiene, as well as obtaining certificates of conformity for products, services, raw materials, machines, equipment, control-measurement apparatus and personnel qualifications</li> <li>▪ Advisory related to innovation and new technologies, including in particular advisory projects</li> <li>▪ Implementing business development strategies based on new technologies and innovative solutions</li> <li>▪ Advanced technology start-ups or start-ups planning to introduce new or significantly better products or services in the Polish market or significantly modernised comparing to those already existing on the market</li> <li>▪ Application and use of ICT in enterprises</li> <li>▪ Advisory services on export, including in particular counselling projects on launching and developing exports</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>

Identified RTDI measure or major project	Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
		<ul style="list-style-type: none"> <li>▪ Advisory services on setting up co-operation networks of enterprises</li> <li>▪ Advisory services on mergers of enterprises, covering counselling projects relating to mergers of a small or medium-sized enterprise with another small or medium-sized enterprise</li> </ul>	
Measure 2.2 Support to product and technological competitiveness of enterprises (OP-ICE)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Support to entrepreneurs undertaking investments i.e. establishment or extension of an enterprise, both in the manufacture and service sphere, commencing enterprise's activity related to major changes in production, products or manufacture process as well as support to new jobs creation connected with initial investments</li> <li>▪ Support to internalisation of enterprises through financing a part of costs of entrepreneurs' participation in international fairs and exhibitions, and economic missions connected with fairs and exhibitions abroad.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>
Measure 2.3 Improvement of competitiveness of SMEs through investments (OP-ICE)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Implementation of modernisation projects in SMEs</li> <li>▪ Implementation of joint investment projects undertaken by enterprises</li> <li>▪ Purchase of R&amp;D results and/or industrial property rights by enterprises</li> <li>▪ Implementation and commercialisation of innovative technologies and products</li> <li>▪ Application and use of the e-economy technologies in enterprises</li> <li>▪ Application and use of ICT in enterprise management processes</li> <li>▪ Adaptation of technologies and products to the requirements of the EU</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>
Sub-measure 1.3.1 Regional educational infrastructure (IROP)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Construction of new or expansion, reconstruction of existing teaching facilities, libraries, socio-educational infrastructure in campuses and facilities for teaching activities or scientific and research activities related to teaching at higher education level.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public sector</li> </ul>

Identified RTDI measure or major project	Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
		<ul style="list-style-type: none"> <li>▪ Research and development facilities at universities</li> <li>▪ Construction, expansion or modernisation of play grounds at universities or campuses</li> <li>▪ Equipment</li> <li>▪ Construction, development or modernisation of technical and sanitary infrastructure of universities</li> </ul>	
Measure 1.5 Information society infrastructure (IROP)	Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ Construction and/or development of local and/or regional broadband networks</li> <li>▪ Investment in application related projects (e-Government)</li> <li>▪ Establishment of Public Internet Access Point</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public sector</li> </ul>
Measure 2.5 Entrepreneurship promotion (IROP)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ The provision of advisory services and training services in support of the establishment and running of a business activity</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>
Measure 2.6 Regional innovation strategies and transfer and knowledge (IROP)	Improving of governance of innovation and knowledge policies/ Innovation poles and clusters/Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ The creation and/or development of RIS</li> <li>▪ The creation of network of cooperation for transfer of innovations between the R&amp;D sector, enterprises and other entities serving the transfer of know-how and technology</li> <li>▪ Development of the system of communication and information exchange</li> <li>▪ Internships for higher education institutions graduates not registered as unemployed and for employees of the research and development sector</li> <li>▪ Scholarships for the best higher education institutions graduates continuing to study at doctorate level in mathematical sciences, engineering and technology and other scientific domains</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public and private sectors</li> </ul>
Measure 3.4 Micro-enterprises (IROP)	Support to creation and growth of innovative enterprises	<ul style="list-style-type: none"> <li>▪ Specialised consulting services for micro-enterprises</li> <li>▪ Investment grants for micro-enterprises</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private sector</li> </ul>

Identified RTDI measure or major project	Focus of intervention (Policy areas classification)*	Main Instruments**	Main beneficiaries***
Measure 2.3 Development of staff for modern economy (OP-DHR)	Knowledge transfer and technology diffusion to enterprises/ Innovation friendly environment	<ul style="list-style-type: none"> <li>▪ Training and consulting services for employees relating to technology changes, foreign languages and application of ICT</li> <li>▪ Post-graduate courses</li> <li>▪ Traineeships at research institutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Private and public sectors</li> </ul>

\* Classification of RTDI interventions: Improving governance capacities for innovation and knowledge policies; Innovation friendly environment; Knowledge transfer and technology diffusion enterprises; Innovation poles and clusters; Support to creation and growth of innovative enterprises; Boosting applied research and product development (see appendix).

\*\*Classification of instruments: Infrastructures and facilities; Aid schemes; Education and training.

\*\*\*Classification of Beneficiaries: Public sectors; Private sectors; Networks

Main source: OPs, evaluation reports, annual implementation reports, etc.

## Appendix E Case study

<b>Regional Innovation Strategies and transfer of knowledge</b>
<p><b>Description:</b> The general objective of this measure is to increase the capacities of the regions in the sphere of innovation, by reinforcing the co-operation between the R&amp;D sector and the economy, and therefore to the increase of competitiveness of the companies operating on the regional and local markets. It is expected that the development of regional innovation systems based on the Regional Innovation Strategies (RIS) will lay down the solid foundations for the support of innovation at the regional level.</p> <p><b>Zone:</b> Objective 1</p> <p><b>Policy framework:</b> Integrated Regional Operational Programme (2004-2006)</p>
<b>Brief history and main features</b>
<p>The process of development of RIS started in Poland in 2002. The first five projects in the regions of Opolskie, Śląskie, Warmińsko-Mazurskie, Wielkopolskie and Zachodniopomorskie were initiated within the framework of the EU 5th Framework Programme. Subsequently, this was followed up in 2003 by the action of the Polish government that provided national grants via the former State Committee of Scientific Research (KBN) to regions in order to prepare their RIS).</p> <p>There are five types of projects which can be financed in the scope of this measure:</p> <ol style="list-style-type: none"><li>1. Creation or development of Regional Innovation Strategies.<ul style="list-style-type: none"><li>▪ the conduct of analysis and research needed to develop the RIS;</li><li>▪ monitoring and analysis of progress in the implementation of RIS;</li><li>▪ the conduct of research, analysis, and other activities serving to prepare projects supporting the development of the regional innovation system; and</li><li>▪ promotion of RIS.</li></ul></li><li>2. Creation of the network of co-operation for transfer of innovations between the R&amp;D sector, entrepreneurs and public administration from the regional and local levels.<ul style="list-style-type: none"><li>▪ the creation of structures supporting the co-operation network;</li><li>▪ the organisation of meetings, seminars, workshops, promotion campaigns, training, knowledge fairs, etc.</li></ul></li><li>3. Development of the system of communication and information exchange, including the collection of data and creation of databases i.e. covering the scope of educational activities and other undertakings in support of the development of innovation.<ul style="list-style-type: none"><li>▪ the organisation of events promoting innovations and initiatives serving the purposes of the exchange of innovations in such forms as: information days, open door days, days of consultations and co-operation with foreign representatives;</li><li>▪ activities aimed at the analysis and identification of key instruments necessary for the implementation of the RIS;</li><li>▪ activities serving to increase the level of knowledge and skills of the partners developing and implementing the RIS within the scope of strategic planning and building up partnership.</li></ul></li></ol>

- the creation and providing access for a comprehensive information base to the network members, partners developing RIS and other interested parties, including data collection related to the innovative activities.

4. Internships for higher education institutions graduates not registered as unemployed and for employees of the R&D sector, serving the purposes of the transfer of knowledge and innovation between the R&D sector and the business enterprises.

5. Scholarships for the best higher education graduates continuing the PhD courses in mathematical sciences, engineering, technology, and other scientific areas which are determined by the RIS or the Voivodeship Development Strategies.

The final beneficiaries are local self-government units or organisation acting on their behalf, SMEs, higher education institutions, scientific research units and other institutions supporting innovative development of the regions, students at PhD programmes, and employees of the R&D sector and higher institutions graduates not registered as unemployed who take part in the internship at the enterprise.

The measure 2.6 is in the majority of cases implemented by the Marshal Offices and Regional Financing Institutions. Only in the case of Wielkopolska, self-government of Voivodeship vested an external organisation (notably, Poznań Science and Technology Park) with such responsibilities. In brief, they consist of a series of activities, starting from informing about the application procedures, support in the preparation of applications, collection and evaluation of applications, signing the contracts with the beneficiaries, requests for payments, monitoring and projects' control.

On the basis of the above-presented types of eligible projects, it can be concluded that this initiative belong to two types of policy objectives, notably improving governance capacities and developing human capital for the knowledge-based economy. Since it incorporates different approaches in the development of innovation, it can be viewed as an interesting case study.

### **Main results**

Due to the lack of existing IROP evaluations and the fact that projects are still being implemented (at the end of February 2006, the value of signed contracts as percentage of total allocations for the period 2004-2006 is estimated at 51.7%), it is still too early to present firm conclusions with regard to the degree of fulfilled objectives. Despite this, some interesting information are already available. Those are being prepared on the basis of experience in Wielkopolskie, and Śląskie.

In the former, the value of signed contracts after three rounds of competitions is estimated at 62%. Amongst the five type of projects, the second type i.e. creation of the network of co-operation has the highest share. The projects which are being financed in the framework of Measure 2.6 include creation of centres of innovation and technology transfer, clusters of enterprises and scientific-research entities (furniture, boilers, and chemical clusters), organisation of seminars and workshops promoting innovation as well as creation of innovation networks, including Innovation Network of Wielkopolska). Moreover, other two projects targeted at higher education institutions graduates and for employees of the R&D sector. One aims to organise internships in the business enterprises. The second one covers the



costs of scholarships for the best higher education graduates continuing the PhD courses in the strategic areas determined by the RIS. In addition, there are two database projects and one aimed at updating of the existing RIS. During the period 2004-2005, 40 applications have been submitted of which 18 received financing.<sup>50</sup> At the moment of writing this report, the results from the fourth and final call for tenders were not available.

In Śląskie, the total number of applications was estimated at 59, of which 23 received positive decision for realisation. Although the total allocations for the period 2004-2006 are not negligible (allocations for Śląskie estimated at 4,519,368 EUR), there are still about 10 to 15 projects which could be financed, however, for which there is no available financial resources. This is one of the indications of a great interest and demand for this type of action. As in the case of Wielkopolskie, the authorities of Śląskie has focused their efforts on the second type project, notably the creation of the network of co-operation. The on-going projects which are being financed in the framework of Measure 2.6 include the creation of networks i.e. between the major stakeholders dealing with commercialisation of technology, the designers and local companies, the R&D sector (Silesian Centre of Advanced Technology and entrepreneurs as well as the creation of sectorial networks in Śląskie (rail transport, medical products and tourism). There are also other types projects which are being supported, including actions and covering all types of eligible projects.

#### **Reasons of success and conditions for repeatability**

This initiative been considered a best practice, mainly because of its pro-innovative approach which goes beyond direct grants for physical infrastructure projects. It deserves also to be considered as a best practice, since it covers five different but interconnected policy objectives such as policy strategic planning, exchange of information, creation of networks, and preparing the human resources for the needs of the knowledge-based economy via internships for higher education institutions graduates and for employees of the R&D sector as well as scholarships for the best higher education graduates continuing the PhD courses in the strategic areas pre-defined by the RIS.

Although there are no constraints to transferability, such initiatives require a strong leadership at the regional level, in order to succeed in the implementation of pro-innovation actions. The lesson to be drawn for the future perspective is to eliminate the administrative barriers which hinder the implementation of innovative projects. It is very important to take the necessary actions in the forthcoming programming period of the Structural Funds because such initiatives are likely to have significant structural effects on the development of local economies.

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<sup>50</sup> Katarzyna Gaweł, Tomasz Jarusa (2006) "Regionalna Strategia Innowacji dla Wielkopolski oraz Plan Działań na lata 2004-2006 - ocena wstępnego etapu realizacji działań", Chapter 5.



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**List of useful websites:**

Structural Funds in Poland, <http://www.fundusze-strukturalne.gov.pl/>

Polish Agency for Enterprise Development, <http://www.parp.gov.pl/>.

Innovation portal, <http://www.pi.gov.pl/>.

Ministry of Economic Affairs, <http://www.mgip.gov.pl/>.

Ministry of Regional Development, <http://www.mrr.gov.pl/>.

Ministry of Science and Education, <http://www.mnii.gov.pl/>.

## Appendix G Stakeholders consulted

Name	Position	Organisation
Krzysztof Gulda	Director	Ministry of Economic Affairs, Department of Economic Development
Michał Górczyński	Expert	CASE, Centrum Analiz Społeczno-Ekonomicznych
Prof. Jacek Guliński	Vice-Director	Poznań Science and Technology Park
Agnieszka Haber	Head of Unit	Polish Agency for Enterprises Development, Evaluation Unit
Dr Marek Kozak	Expert	Euroreg, University of Warsaw
Luk Palmen	Manager	RIS Silesia Management Unit
Irma Pęciak	Director	Polish Agency for Enterprises Development, Department of Innovation and Technology
Przemysław Pierz	Expert	Ministry of Regional Development, Department of Co-ordination of Infrastructure Programmes
Andrzej Poszewiecki	Expert	Marshal Office (Pomorskie)
Dr Stanisław Łobjko	Lecturer	Warsaw School of Economics, Department of Innovation Management
Aneta Wilmańska	Expert	Ministry of Economic Affairs, Department of Economic Development
Aleksander Żołnierski	Expert	Polish Agency for Enterprises Development, Department of Innovation and Technology