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MAIN INNOVATION INDICATORS IN POLAND AND GERMANY

GŁÓWNE WSKAŹNIKI INNOWACJI W POLSCE I W NIEMCZECH

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Abstract. Author presents main innovation indicators in selected agglomerations and regions in Poland and Germany. These figures describe gap between regions and the state of knowledge-based economy. At present, less than 2% of Europe's wealth (GDP) is devoted to research, which compares poorly with 2.5% in the USA and more than 3% in Japan. Our goal is to approach 3% of GDP for research. This is an important part of the so-called "Lisbon strategy", which consists of a Partnership between the European Union and Member States to transform Europe in a vibrant knowledge economy, in order to boost economic growth, create more and better jobs and ensure lasting prosperity in Europe.

Key words: agglomeration, European Union, innovation index, innovation indicator, region.

Słowa kluczowe: aglomeracja, indeks innowacji, region, Unia Europejska, wskaźnik innowacji.

INTRODUCTION

European Commission introduced EIS – The European Innovation Scoreboard (Fig. 1). EIS covers the 27 EU Member States, Croatia and Turkey, the associate countries Iceland, Norway and Switzerland, as well as Australia, Canada, Israel, Japan and the US. The indicators of the EIS summarize the main elements of innovation performance. The EIS 2007 fully implements the list of indicators from the EIS 2006. The innovation indicators are assigned to five dimensions and grouped in two main themes: inputs and outputs. Table 1 shows the 5 main categories, the 25 indicators, and the primary data sources for each indicator. Innovation inputs cover three innovation dimensions: *Innovation drivers* measure the structural conditions required for innovation potential; *Knowledge creation* measures the investments in R&D activities, considered as key elements for a successful knowledge-based economy; and *Innovation & entrepreneurship* measures the efforts towards innovation at firm level. Innovation outputs cover two innovation dimensions: *Applications* measures the performance, expressed in terms of labour and business activities, and their value added in innovative sectors; and *Intellectual property* measures the achieved results in terms of successful know-how.

MATERIAL AND METHODS

The EIS country pages provide for selected European countries covered by the EIS 2007 a performance chart showing performance by indicator relative to the EU mean (Fig. 2), a radar graph showing the innovation performance for each of the innovation dimensions relative to the country's SII performance (Fig. 3) and the data tables showing, where available, time series data for the SII, the dimensions and each of the indicators (Tab. 2, Tab. 3).

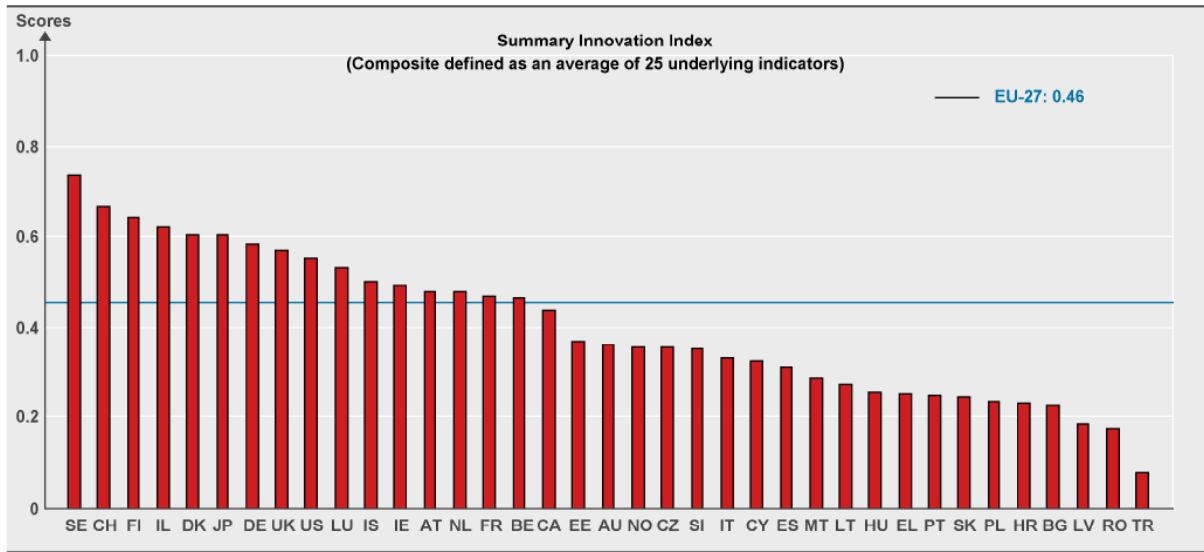


Fig. 1. The European Innovation Scoreboard. EIS 2007
Source: European innovation... (2008).

Table 1. The Structure of EIS 2007. Input and Output Dimensions and Data Sources

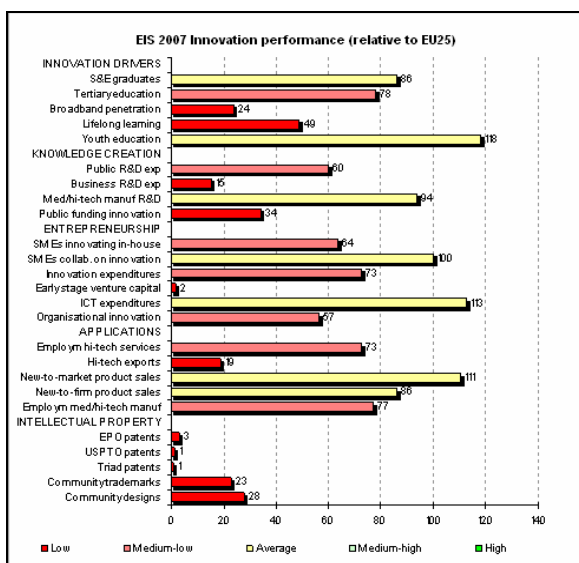
INNOVATION DRIVERS (INPUT DIMENSION)		
1.1	S&E graduates per 1000 population aged 20–29	Eurostat
1.2	Population with tertiary education per 100 population aged 25–64	Eurostat, OECD
1.3	Broadband penetration rate (number of broadband lines per 100 population)	Eurostat, OECD
1.4	Participation in life-long learning per 100 population aged 25–64	Eurostat
1.5	Youth education attainment level (% of population aged 20–24 having completed at least upper secondary education)	Eurostat
KNOWLEDGE CREATION (INPUT DIMENSION)		
2.1	Public R&D expenditures (% of GDP)	Eurostat, OECD
2.2	Business R&D expenditures (% of GDP)	Eurostat, OECD
2.3	Share of medium-high-tech and high-tech R&D (% of manufacturing R&D expenditures)	Eurostat, OECD
2.4	Share of enterprises receiving public funding for innovation	Eurostat (CIS4)
INNOVATION & ENTREPRENEURSHIP (INPUT DIMENSION)		
3.1	SMEs innovating in-house (% of all SMEs)	Eurostat (CIS4)
3.2	Innovative SMEs co-operating with others (% of all SMEs)	Eurostat (CIS4)
3.3	Innovation expenditures (% of total turnover)	Eurostat (CIS4)
3.4	Early-stage venture capital (% of GDP)	Eurostat
3.5	ICT expenditures (% of GDP)	Eurostat, World Bank
3.6	SMEs using organisational innovation (% of all SMEs)	Eurostat (CIS4)
APPLICATIONS (OUTPUT DIMENSION)		
4.1	Employment in high-tech services (% of total workforce)	Eurostat
4.2	Exports of high technology products as a share of total exports	Eurostat
4.3	Sales of new-to-market products (% of total turnover)	Eurostat (CIS4)
4.4	Sales of new-to-firm products (% of total turnover)	Eurostat (CIS4)
4.5	Employment in medium-high and high-tech manufacturing (% of total workforce)	Eurostat, OECD
INTELLECTUAL PROPERTY (OUTPUT DIMENSION)		
5.1	EPO patents per million population	Eurostat, OECD
5.2	USPTO patents per million population	Eurostat, OECD
5.3	Triad patents per million population	Eurostat, OECD
5.4	New community trademarks per million population	OHIM, Eurostat, OECD
5.5	New community designs per million population	OHIM, Eurostat, OECD

Source: European innovation... (2008).

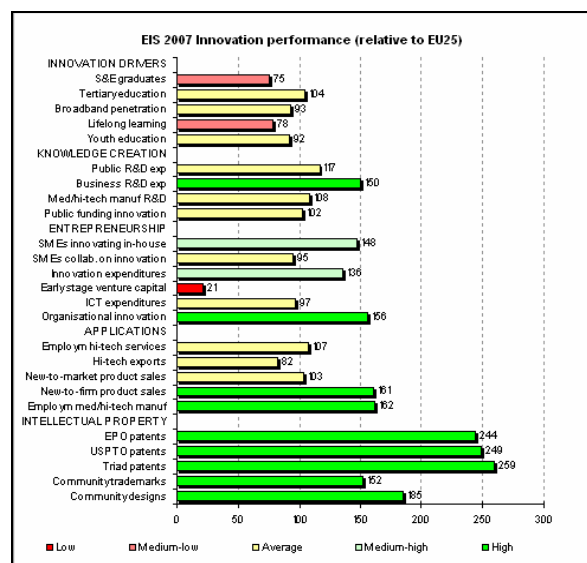
Stuttgart and Berlin regions are “Knowledge and learning regions”. In 2006 in the EU27, 12 million workers were employed in medium high-tech manufacturing⁴ and 2.3 million in high-tech manufacturing⁴, the equivalent of 5.5% and 1.1% respectively of total employment.

The leading region in the EU27 and EFTA in terms of employment in high- and medium high-tech manufacturing was Lombardia in Italy with 448 000 people employed in 2006, followed by Stuttgart in Germany (377 000) and Cataluña in Spain (286 000). Germany dominated the top 20 list with eleven regions, followed by Italy (5) and France (2).

Stuttgart had the highest relative employment in high- and medium high-tech manufacturing with 19.9% of total employment, followed by Karlsruhe (17.2%) also in Germany. In the top 20 list, Germany had eleven regions, including the eight highest positions, followed by the Czech Republic (4), France and Hungary (2 each).



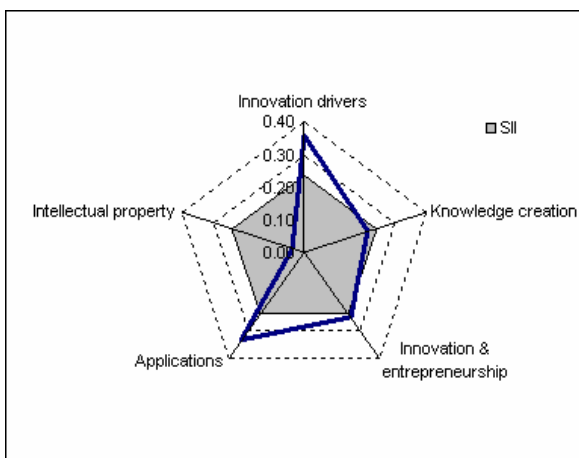
Poland



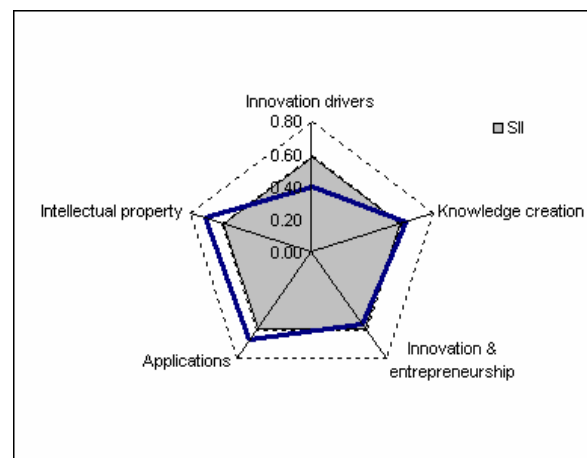
Germany

Fig. 2. EIS 2007 Innovation performance (relative to EU 25)

Source: European innovation... (2008).



Poland



Germany

Fig. 3. Performance chart by innovation dimension

Source: European innovation... (2008).

Table 2. Poland – Summary Innovation Index – The Breakdown

Poland	1999	2000	2001	2002	2003	2004	2005	2006	Rel. to EU	Ref. year
Summary Innovation Index				0.21	0.21	0.22	0.23	0.24		
<i>rank</i>				32	33	33	32	32		
INPUT – Innovation drivers				0.30	0.31	0.32	0.34	0.36		
S&E graduates	5.7	6.6	7.6	8.3	9.0	9.4	11.1	–	86	2005
<i>relative to EU</i>	61	65	70	73	74	76	86	–		
Population with tertiary education	11.3	11.4	11.7	12.2	13.9	15.3	16.8	17.9	78	2006
<i>relative to EU</i>	–	59	59	61	67	71	75	78		
Broadband penetration rate	–	–	–	–	–	0.5	1.9	3.9	24	2006
<i>relative to EU</i>	–	–	–	–	–	7	16	24		
Participation in life-long learning	–	–	–	–	–	5.0	4.9	4.7	49	2006
<i>relative to EU</i>	–	–	–	–	–	54	51	49		
Youth education attainment level	–	88.8	89.7	89.2	90.3	90.9	91.1	91.7	118	2006
<i>relative to EU</i>	–	116	117	116	117	118	118	118		
INPUT – Knowledge creation				0.21	0.19	0.21	0.21	0.21		
Public R&D expenditures	0.40	0.41	0.39	0.44	0.39	0.40	0.39	–	60	2005
<i>relative to EU</i>	63	63	60	67	59	63	60	–		
Business R&D expenditures	0.28	0.23	0.22	0.11	0.15	0.16	0.18	–	15	2005
<i>relative to EU</i>	24	19	18	9	13	14	15	–		
Share of med-high/high-tech R&D	82.3	79.0	77.4	81.5	79.9	80.0	–	–	94	2004
<i>relative to EU</i>	96	93	91	95	94	94	–	–		
Enterprises receiving public funding						3.1			34	2004
<i>relative to EU</i>						34				
INPUT – Innovation & entrepreneurship				0.22	0.22	0.22	0.23	0.24		
SMEs innovating in-house						13.8			64	2004
<i>relative to EU</i>						64				
Innovative SMEs co-operating with others						9.1			100	2004
<i>relative to EU</i>						100				
Innovation expenditures						1.56			73	2004
<i>relative to EU</i>						73				
Early-stage venture capital	0.012	0.023	0.012	0.005	0.001	0.000	0.000	0.001	2	2006
<i>relative to EU</i>	32	31	27	18	5	0	0	2		
ICT expenditures	–	–	–	–	6.4	6.8	7.2	–	113	2005
<i>relative to EU</i>	–	–	–	–	100	106	113	–		
Organisational innovation						19.3			57	2004
<i>relative to EU</i>						57				
OUTPUT – Applications				0.31	0.31	0.31	0.32	0.33		
Employment in high-tech services	–	–	–	–	–	2.1	2.2	2.4	73	2006
<i>relative to EU</i>	–	–	–	–	–	66	66	73		
Exports of high technology products	2.3	2.8	2.7	2.5	2.7	2.7	3.2	3.1	19	2006
<i>relative to EU</i>	11	13	13	13	15	15	17	19		
Sales new-to-market products						8.1			111	2004
<i>relative to EU</i>						111				
Sales new-to-firm products						5.4			86	2004
<i>relative to EU</i>						86				
Med-hi/high-tech manufacturing employment	–	–	–	–	–	4.9	5.1	5.1	77	2006
<i>relative to EU</i>	–	–	–	–	–	72	77	77		
OUTPUT – Intellectual property				0.00	0.01	0.02	0.04	0.04		
EPO patent	2.1	3.1	3.1	4.7	4.2	–	–	–	3	2003
<i>relative to EU</i>	2	2	2	4	3	–	–	–		
USPTO patents	0.6	0.5	0.5	0.6	0.6	–	–	–	1	2003
<i>relative to EU</i>	1	1	1	1	1	–	–	–		
Triad patents	0.2	0.2	0.1	0.2	0.2	0.2	0.2	–	1	2005
<i>relative to EU</i>	1	1	1	1	1	1	1	–		
Community trademarks	–	0.4	0.2	0.4	4.7	14.3	19.7	24.7	23	2006
<i>relative to EU</i>	–	0	0	1	6	18	24	23		
Community designs	–	–	–	–	2.0	6.6	21.0	30.2	28	2006
<i>relative to EU</i>	–	–	–	–	3	8	21	28		

Source: European innovation... (2008).

Table 3. Germany – Summary Innovation Index – The Breakdown

	Germany	1999	2000	2001	2002	2003	2004	2005	2006	Rel. to EU	Ref. year
	Summary Innovation Index				0.59	0.59	0.59	0.59	0.59		
	<i>rank</i>				8	8	7	7	7		
	INPUT – Innovation drivers				0.45	0.43	0.42	0.41	0.41		
1.1	S&E graduates	8.6	8.2	8.0	8.1	8.4	9.0	9.7	–	75	2005
	<i>relative to EU</i>	92	80	74	72	69	73	75	–		
1.2	Population with tertiary education	23.0	23.8	23.5	22.3	24.0	24.9	24.6	23.8	104	2006
	<i>relative to EU</i>	–	123	120	112	115	115	110	104		
1.3	Broadband penetration rate	–	–	–	3.2	4.8	6.7	10.2	15.3	93	2006
	<i>relative to EU</i>	–	–	–	139	107	88	85	93		
1.4	Participation in life-long learning	5.5	5.2	5.2	5.8	6.0	7.4	7.7	7.5	78	2006
	<i>relative to EU</i>	–	–	–	–	71	80	79	78		
1.5	Youth education attainment level	–	–	–	–	–	–	71.5	71.6	92	2006
	<i>relative to EU</i>	–	–	–	–	–	–	92	92		
	INPUT – Knowledge creation				0.61	0.61	0.61	0.62	0.62		
2.1	Public R&D expenditures	0.72	0.73	0.74	0.76	0.77	0.75	0.76	–	117	2005
	<i>relative to EU</i>	113	112	114	115	117	117	117	–		
2.2	Business R&D expenditures	1.67	1.73	1.72	1.72	1.76	1.75	1.76	–	150	2005
	<i>relative to EU</i>	140	143	142	142	148	150	150	–		
2.3	Share of med-high/high-tech R&D	91.8	91.8	91.9	92.4	92.3	92.3	–	–	108	2004
	<i>relative to EU</i>	107	108	108	108	108	108	–	–		
2.4	Enterprises receiving public funding						9.2			102	2004
	<i>relative to EU</i>						102				
	INPUT – Innovation & entrepreneurship				0.57	0.56	0.57	0.57	0.55		
3.1	SMEs innovating in-house						32.0			148	2004
	<i>relative to EU</i>						148				
3.2	Innovative SMEs co-operating with others						8.6			95	2004
	<i>relative to EU</i>						95				
3.3	Innovation expenditures						2.93			136	2004
	<i>relative to EU</i>						136				
3.4	Early-stage venture capital	0.050	0.080	0.055	0.026	0.014	0.016	0.014	0.011	21	2006
	<i>relative to EU</i>	135	108	125	93	67	70	64	21		
3.5	ICT expenditures	–	–	–	6.1	6.1	6.2	6.2	–	97	2005
	<i>relative to EU</i>	–	–	–	92	95	97	97	–		
3.6	Organisational innovation						53.2			156	2004
	<i>relative to EU</i>						156				
	OUTPUT – Applications				0.65	0.65	0.66	0.65	0.67		
4.1	Employment in high-tech services	–	–	–	–	–	–	3.4	3.5	107	2006
	<i>relative to EU</i>	–	–	–	–	–	–	103	107		
4.2	Exports of high technology products	14.2	16.1	15.8	15.2	14.8	15.4	14.8	13.6	82	2006
	<i>relative to EU</i>	70	75	74	80	80	83	79	82		
4.3	Sales new-to-market products						7.5			103	2004
	<i>relative to EU</i>						103				
4.4	Sales new-to-firm products						10.0			161	2004
	<i>relative to EU</i>						161				
4.5	Med-hi/high-tech manufacturing employment	–	–	–	–	–	–	10.4	10.8	162	2006
	<i>relative to EU</i>	–	–	–	–	–	–	159	162		
	OUTPUT – Intellectual property				0.69	0.69	0.69	0.69	0.71		
5.1	EPO patent	288.5	307.0	304.1	300.0	311.7	–	–	–	244	2003
	<i>relative to EU</i>	243	242	239	241	244	–	–	–		
5.2	USPTO patents	142.7	127.9	127.8	130.2	129.8	–	–	–	249	2003
	<i>relative to EU</i>	232	244	244	247	249	–	–	–		
5.3	Triad patents	65.3	53.8	53.6	52.5	53.0	54.0	53.8	–	259	2005
	<i>relative to EU</i>	246	258	255	255	257	259	259	–		
5.4	Community trademarks	–	120.8	100.6	86.2	113.5	116.7	120.5	164.6	152	2006
	<i>relative to EU</i>	–	161	159	142	143	143	146	152		
5.5	Community designs	–	–	–	–	118.6	162.1	180.5	202.7	185	2006
	<i>relative to EU</i>	–	–	–	–	187	188	177	185		

Source: European innovation... (2008).

RESULTS AND DISCUSSION

Author selects following regions: Germany, Baden-Württemberg, Stuttgart, Berlin, Mecklenburg-Vorpommern, Euro area, European Union 15, European Union 27, Poland, Mazowieckie, Wielkopolskie, Zachodniopomorskie and investigates following indicators:

1. Total intramural R&D expenditure (GERD) by sectors of performance and region – Percentage of GDP (Tab. 4).

2. Total intramural R&D expenditure (GERD) by sectors of performance and region – Total (Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998)) (Tab. 5).

3. Total intramural R&D expenditure (GERD) by sectors of performance and region – Business enterprise sector, Percentage of GDP (Tab. 6).

4. Total intramural R&D expenditure (GERD) by sectors of performance and region – Business enterprise sector, Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998) (Tab. 7).

5. Total intramural R&D expenditure (GERD) by sectors of performance and region – Higher education sector, Percentage of GDP (Tab. 8).

6. Total intramural R&D expenditure (GERD) by sectors of performance and region – Higher education sector, Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998) (Tab. 9).

CONCLUSIONS

On the basis of author's research projects (International research...2008) author describes below comparison between Poland and Germany.

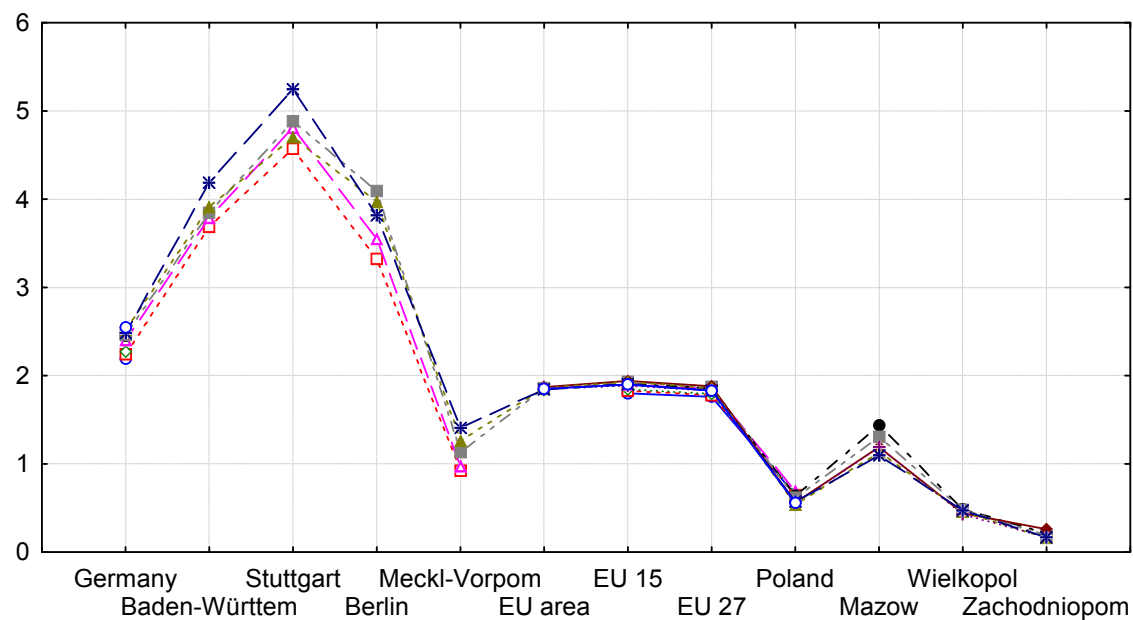
Poland's innovation performance has increased relative to the EU average trend over the past five years. If current trends continue it would reach the EU average level of performance within twenty years. Over the past five years, the trend in Germany's overall performance has been about the same as the EU average trend.

Poland has a level of innovation performance that places it in the group of "catching up countries". Other EU countries in this group with similar overall levels of performance are Malta, Lithuania, Hungary, Greece, Slovakia, Portugal, Bulgaria, Latvia and Romania. Germany's overall innovation performance places it among the group of "innovation leaders". Other EU countries in this group are Sweden, which shows the highest level of innovation performance, and Finland, Denmark and the UK.

Poland has a relatively even level of performance across the five dimensions of innovation. It shows relative strengths in the indicators of Youth education attainment level, ICT expenditures, and Sales of new-to-market products. It is well below the EU average on the indicators of Business R&D expenditures, Early-stage venture capital, and patenting activities. Germany shows relative strengths in the Applications and Intellectual Property dimensions of innovation performance, where it has a particularly strong performance on the indicators of Sales of new to market products, Medium-high/high-tech manufacturing employment as well as a high level on the indicators of patenting. However, it is below the EU average in the Innovation drivers dimension, where it is behind the EU average on indicators of S&E graduates, participation in life-long learning and youth education attainment level.

Table 4. Total intramural R&D expenditure (GERD) by sectors of performance and region – Percentage of GDP

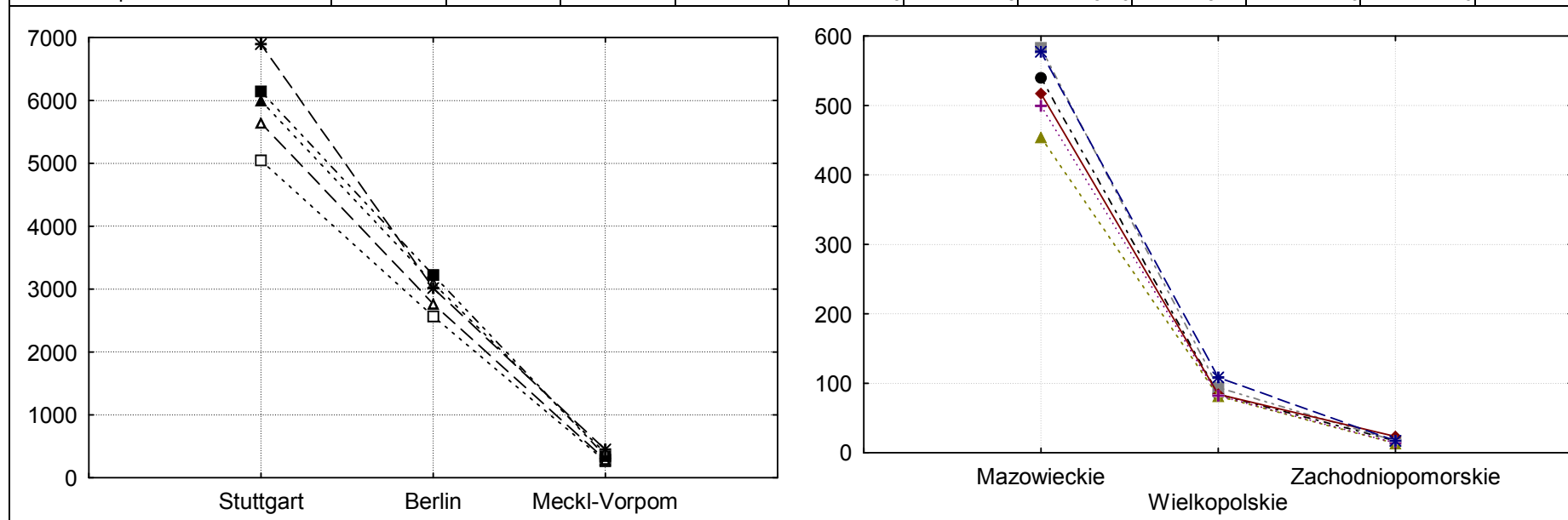
Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Germany	2.19	2.24	2.27	2.40	2.45	2.46	2.49	2.52	2.49	2.48	2.55
Baden-Württemberg		3.69		3.79		3.85		3.91		4.19	
Stuttgart		4.57		4.81		4.88		4.70		5.25	
Berlin		3.32		3.55		4.09		3.97		3.82	
Mecklenburg-Vorpommern		0.92		0.97		1.13		1.26		1.41	
Euro area					1.84	1.86	1.87	1.86	1.85	1.84	1.85
European Union 15	1.80	1.83	1.84	1.90	1.91	1.93	1.94	1.93	1.89	1.90	1.90
European Union 27	1.76	1.78	1.79	1.84	1.86	1.87	1.88	1.86	1.83	1.83	1.83
Poland	0.65	0.65	0.67	0.69	0.64	0.62	0.56	0.54	0.56	0.57	0.56
Mazowieckie					1.44	1.31	1.19	1.13	1.19	1.10	
Wielkopolskie					0.49	0.48	0.44	0.46	0.43	0.47	
Zachodniopomorskie					0.21	0.19	0.26	0.16	0.17	0.17	



Source: Miklewska (2010).

Table 5. Total intramural R&D expenditure (GERD) by sectors of performance and region – Total (Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998))

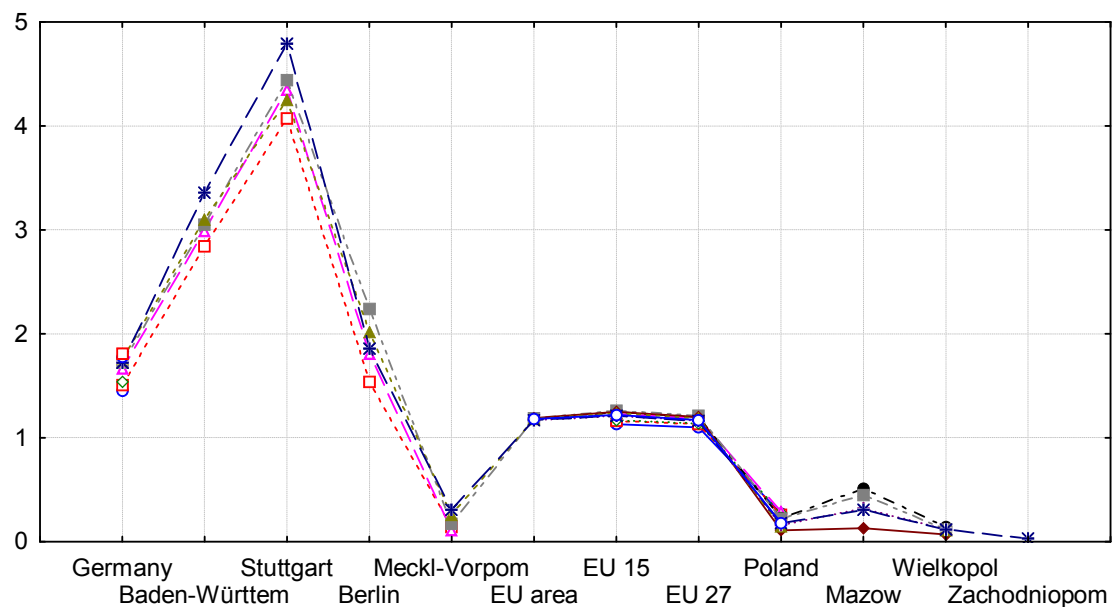
Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Germany	42 167.83	42 671.15	44 347.76	48 190.74	50 619.00	52 002.00	53 363.75	54 538.50	54 966.90	55 739.04	42 167.83
Baden-Württemberg		9 983.55		10 978.00		11 919.00		12 301.15		13 680.99	
Stuttgart		5 045.20		5 643.00		6 146.00		5 996.40		6 896.20	
Berlin		2 565.76		2 765.00		3 222.00		3 096.15		3 017.87	
Mecklenburg-Vorpommern		265.48		290.00		346.00		392.78		447.40	
Euro area					124 360.00	131 078.99	136 586.14	140 130.02	144 330.20	149 309.88	
European Union 15	127 269.42	136 215.69	143 144.95	155 063.35	167 314.07	174 891.39	182 018.50	184 002.65	189 254.53	196 922.20	127 269.42
European Union 27	129 457.74	138 693.29	145 864.95	157 833.18	170 503.46	178 549.05	185 872.09	187 800.30	193 439.93	202 017.52	129 457.74
Poland	806.88	904.59	1 022.62	1 085.89	1 196.57	1 322.95	1 172.29	1 036.05	1 138.84	1 385.66	806.88
Mazowieckie					539.87	583.15	517.01	454.02	499.62	577.38	
Wielkopolskie					84.15	94.03	84.15	81.42	82.31	108.25	
Zachodniopomorskie					17.29	17.43	23.49	13.12	14.16	17.40	



Source: Miklewska (2010).

Table 6. Total intramural R&D expenditure (GERD) by sectors of performance and region – Business enterprise sector, Percentage of GDP

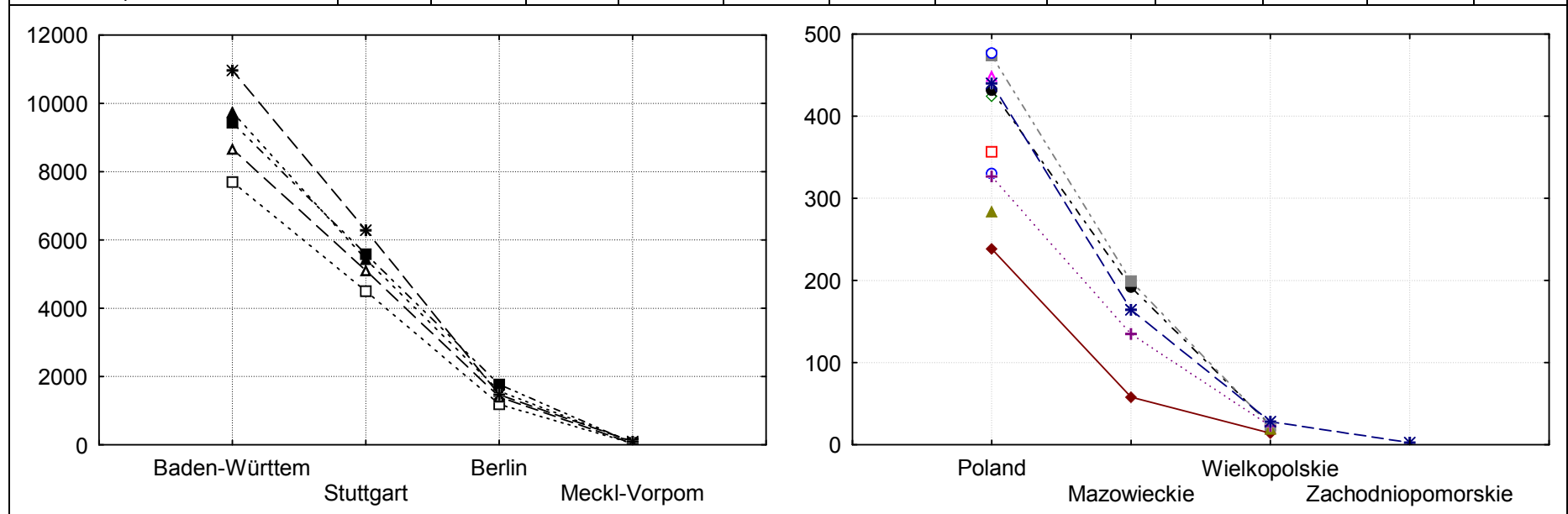
Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Germany	1.45	1.51	1.54	1.67	1.73	1.72	1.72	1.76	1.73	1.72	1.78	1.81
Baden-Württemberg		2.84		2.99		3.05		3.10		3.36		
Stuttgart		4.07		4.35		4.44		4.25		4.79		
Berlin		1.54		1.81		2.24		2.02		1.86		
Mecklenburg-Vorpommern		0.14		0.11		0.17		0.26		0.31		
Euro area					1.18	1.19	1.19	1.18	1.17	1.17	1.18	
European Union 15	1.13	1.16	1.17	1.23	1.25	1.26	1.25	1.24	1.21	1.21	1.22	
European Union 27	1.10	1.13	1.14	1.19	1.20	1.21	1.20	1.19	1.16	1.16	1.17	
Poland	0.27	0.26	0.28	0.29	0.23	0.22	0.11	0.15	0.16	0.18	0.18	
Mazowieckie					0.51	0.45	0.13		0.32	0.31		
Wielkopolskie					0.14	0.12	0.07	0.11	0.12	0.12		
Zachodniopomorskie										0.03		



Source: Miklewska (2010).

Table 7. Total intramural R&D expenditure (GERD) by sectors of performance and region – Business enterprise sector, Millions of euro (from 1.1.1999)/ Millions of ECU (up to 31.12.1998)

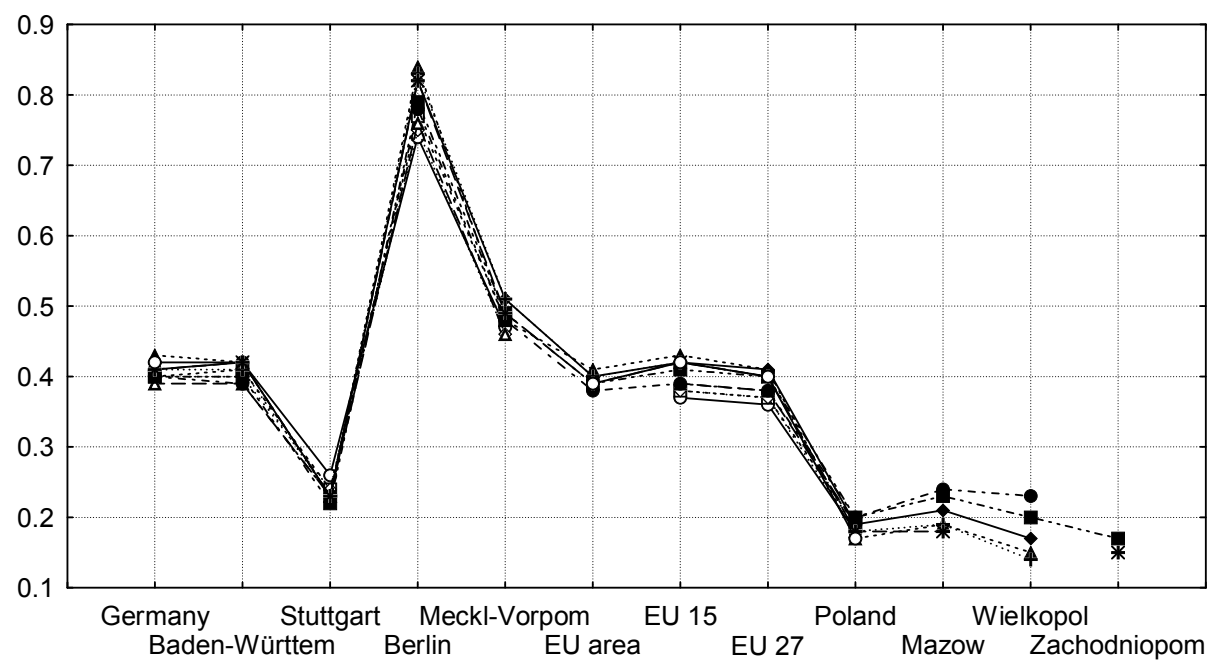
Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Germany	27 871.56	28 783.15	30 129.56	33 622.55	35 600.00	36 331.90	36 950.00	38 029.00	38 363.00	38 651.04	41 148.00	42 840.00
Baden-Württemberg		7 699.92		8 663.00		9 434.00		9 750.23		10 966.00		
Stuttgart		4 498.70		5 104.00		5 586.00		5 431.66		6 286.00		
Berlin		1 188.07		1 410.00		1 766.00		1 575.26		1 473.00		
Mecklenburg-Vorpommern		40.21		33.00		53.00		81.61		97.00		
Euro area		40.21		33.00		53.00		81.61		97.00		
European Union 15					79 879.00	83 872.32	86 675.64	88 787.97	91 628.66	94 564.83	100 017.55	
European Union 27	81 023.38	87 666.20	92 435.77	101 926.41	110 557.38	115 689.42	119 127.24	119 815.32	123 177.84	128 068.15	135 716.18	
Poland	330.22	356.64	424.13	448.81	431.79	474.03	238.48	284.05	326.63	440.00	476.99	
Mazowieckie					192.06	199.45	57.97		135.00	164.26		
Wielkopolskie					23.93	22.85	14.05	19.36	23.02	28.01		
Zachodniopomorskie										2.56		



Source: Miklewska (2010).

Table 8. Total intramural R&D expenditure (GERD) by sectors of performance and region – Higher education sector, Percentage of GDP

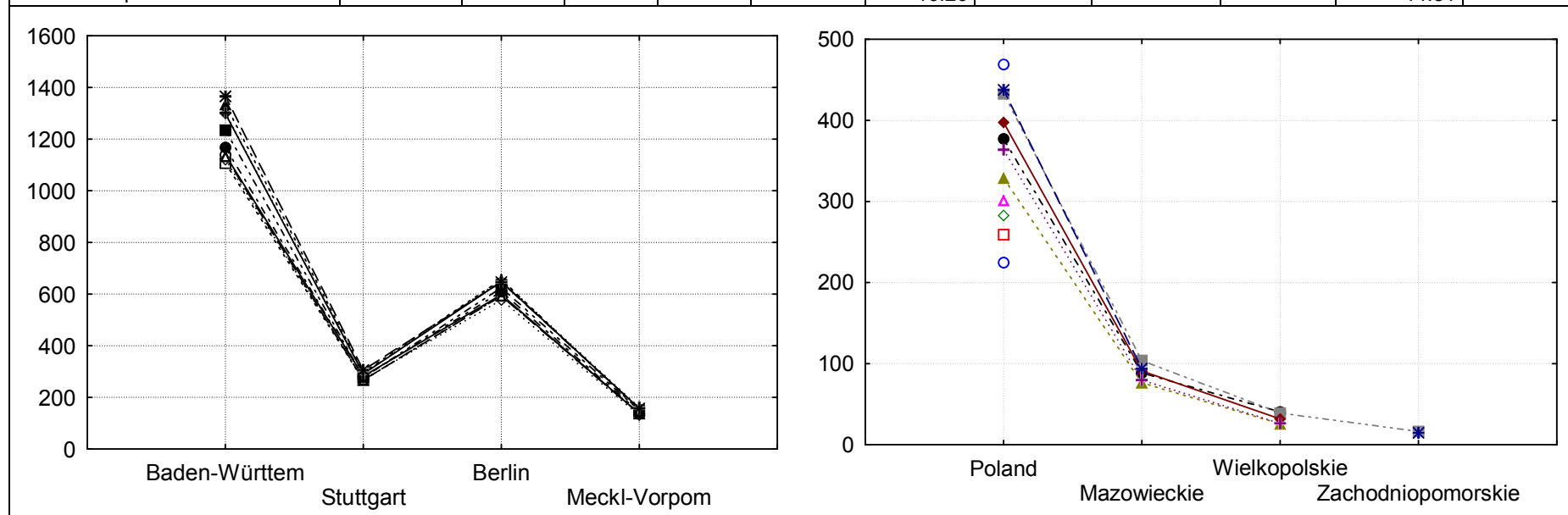
Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Germany	0.41	0.40	0.40	0.39	0.40	0.40	0.42	0.43	0.41	0.41	0.42
Baden-Württemberg	0.42	0.41	0.40	0.39	0.39	0.40	0.42	0.42	0.41	0.42	
Stuttgart	0.26	0.24	0.24	0.23	0.23	0.22	0.23	0.23	0.23	0.23	
Berlin	0.74	0.77	0.75	0.76	0.78	0.79	0.82	0.84	0.83	0.82	
Mecklenburg-Vorpommern	0.47	0.48	0.46	0.46	0.48	0.49	0.51	0.48	0.51	0.49	
Euro area					0.38	0.39	0.40	0.41	0.40	0.39	0.39
European Union 15	0.37	0.38	0.38	0.39	0.39	0.41	0.42	0.43	0.42	0.42	0.42
European Union 27	0.36	0.37	0.37	0.38	0.38	0.40	0.41	0.41	0.40	0.40	0.40
Poland	0.18	0.19	0.18	0.19	0.20	0.20	0.19	0.17	0.18	0.18	0.17
Mazowieckie					0.24	0.23	0.21	0.19	0.19	0.18	
Wielkopolskie					0.23	0.20	0.17	0.15	0.14		
Zachodniopomorskie						0.17				0.15	



Source: Miklewska (2010).

Table 9. Total intramural R&D expenditure (GERD) by sectors of performance and region – Higher education sector, Millions of euro (from 1.1.1999)/ Millions of ECU (up to 31.12.1998)

Geo/Time	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Germany	7 838.06	7 643.16	7 715.59	7 936.63	8 146.10	8 524.20	9 080.36	9 202.10	9 089.46	9 221.10	9 600.00
Baden-Württemberg	1 139.58	1 106.88	1 120.29	1 133.00	1 168.00	1 235.00	1 299.00	1 333.80	1 302.33	1 365.00	
Stuttgart	281.76	266.06	269.15	267.00	278.00	278.00	291.00	296.69	292.09	306.00	
Berlin	597.54	594.26	576.91	593.00	610.00	624.00	648.00	656.59	653.95	646.00	
Mecklenburg-Vorpommern	137.21	137.95	131.02	138.00	143.00	150.00	157.00	150.25	161.05	157.00	
Euro area					25 599.15	27 522.71	29 327.81	30 529.12	30 905.01	31 661.58	32 945.09
European Union 15	26 349.96	28 576.78	29 800.77	31 556.09	34 414.57	37 019.54	39 886.86	40 849.47	41 792.80	43 295.22	45 249.95
European Union 27	26 763.75	29 058.34	30 342.29	32 136.72	35 160.00	37 914.00	40 838.11	41 746.97	42 773.18	44 534.51	46 665.81
Poland	224.56	258.89	282.57	301.44	377.33	432.97	397.57	328.64	363.90	437.56	468.93
Mazowieckie					88.47	103.70	90.94	76.26	79.75	93.69	
Wielkopolskie					40.37	39.19	31.84	25.87	26.44		
Zachodniopomorskie						16.26				14.81	



Source: Miklewska (2010).

The analysis indicates that Poland is below average in its efficiency of transforming innovation inputs into outputs. Germany shows one of the highest efficiencies in the EU in terms of transforming innovation inputs into outputs.

Sweden, Finland, Denmark, Germany and UK are the most innovative EU countries and ahead of the US. Based on their innovation performance, the countries included in the EIS 2007 fall into the following country groups:

1. The innovation leaders include Denmark, Finland, Germany, Israel, Japan, Sweden, Switzerland, the UK and the US. Sweden is the most innovative country, largely due to strong innovation inputs although it is less efficient than some other countries in transforming these into innovation outputs.

2. The innovation followers include Austria, Belgium, Canada, France, Iceland, Ireland, Luxembourg and the Netherlands.

3. The moderate innovators include Australia, Cyprus, Czech Republic, Estonia, Italy, Norway, Slovenia and Spain.

4. The catching-up countries include Bulgaria, Croatia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania and Slovakia. Turkey currently performs below the other countries.

These country groups appear to have been relatively stable over the last five years. Within these groups, countries have changed their relative ranking but it is rare for a country to have moved between groups. Only Luxembourg seems to be on the verge of entering the group of innovation leaders. Czech Republic, Estonia and Lithuania are on track to reach the EU average within a decade.

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Streszczenie. W artykule przedstawiono główne wskaźniki innowacyjności dla wybranych aglomeracji i regionów Polski i Niemiec. Tabele i rysunki ukazują istniejącą lukę między badanymi regionami oraz stan tzw. ekonomii opartej na wiedzy (GOW). Obecnie w Europie na badania przeznaczona jest mniej niż 2% PKB. Prezentuje się to bardzo skromnie w porównaniu z kwotami, które przeznaczają się w USA (2,5%) i w Japonii (3%). Naszym celem jest zbliżenie się do poziomu 3%. Jest to ważna część tzw. Strategii lizbońskiej, która zakłada partnerstwo między Unią Europejską i krajami członkowskimi, mające doprowadzić do szybkiego rozwoju GOW w celu połączenia ekonomicznego wzrostu, tworzenia większej liczby lepszych miejsc pracy oraz podtrzymania dobrobytu w Europie.

