POLAND
COMPETITIVENESS REPORT 2016
THE ROLE OF ECONOMIC POLICY AND INSTITUTIONS

Edited by
Marzenna Anna Weresa

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Preface

This book is the 2016 edition of a long-standing series of comparative studies on key development trends in the Polish economy conducted by the World Economy Research Institute at the Warsaw School of Economics since the late 1980s in association with a number of other international research centers. The aim of this year's research is to assess changes in the competitiveness of the Polish economy from 2010 to 2015, with a focus on the role of institutions and economic policy in shaping Poland's competitive advantages.

Competitiveness is a concept that refers to sustainable economic growth, but also means the ability to improve the quality of life, strengthen a country's position on foreign markets and increase its attractiveness to foreign investment. Such a broad definition of competitiveness has been adopted for the analyses conducted in this book. Poland's competitive position is evaluated in comparison with other European Union countries, including those that, like Poland, underwent a transition from central planning to a market economy in the 1990s and then became part of the bloc as a result of three rounds of its enlargement in 2004, 2007 and 2013. Some aspects of Poland's competitiveness are also analyzed in comparison with other emerging market economies outside Europe.

The book consists of three parts, each of which is further divided into chapters. Part I (Chapters 1–5) examines the latest trends in the development of the Polish economy. The country's key economic indicators are compared with those reported by other EU countries. In particular, this comparative analysis covers the rate of economic growth, changes in real GDP per capita, convergence trends in relation to other EU countries, and the scale of income inequality and poverty. This is followed by an analysis of changes in the competitive position of the Polish economy on international markets and in Poland's investment attractiveness.

Part II of the book (Chapters 6–9) seeks to identify factors determining the competitiveness of the Polish economy. The framework of this analysis goes beyond a simple economic growth accounting exercise. Human and financial resources are analyzed in depth, both quantitatively and qualitatively, as key drivers of the competitive position of the Polish economy. Also examined are legal and regulatory changes with an influence on the development of these resources. In addition, changes in total factor productivity are presented in order to capture the role of technological and organizational factors in shaping the competitiveness of the Polish economy in 2015.

Part III of this book (Chapters 10–15) focuses on institutional factors and economic policies pursued in Poland, including elements of regional, innovation and cluster policies. A detailed analysis of this issue is preceded by an outline of the Polish model of capitalism. Then the main elements of economic policy from 2007 to 2015 – a period when the centrist Civic Platform (PO) party governed the country in coalition with the rural-based Polish People's Party (PSL) – are examined, with particular emphasis on policy interventions during the last five years. Against this background, the most important challenges facing the Polish economy in the short and long term are identified.

This analysis is followed by an assessment of the key aspects of regional policies related to the implementation of a so-called smart specialization strategy. This strategy includes efforts at both the national and regional levels designed to stimulate innovation in Polish enterprises. The innovation challenge is further discussed in the last three chapters of this book, which show the results of financial support for innovating businesses and highlight barriers to innovation in Poland. This section of the book also identifies obstacles to the implementation of cluster policy, which is designed to improve Poland's performance in terms of innovation.

The final section of this report on Poland's competitiveness concludes with a tentative assessment of the current competitive position of the Polish economy. It also identifies factors that led to changes in this position in 2015. Some policy implications are also offered, in particular steps that Poland needs to take to effectively embrace the European Union's flagship "Europe 2020" jobs and growth strategy.

Marzenna Anna Weresa

Part I

Poland's Competitiveness in 2010–2015

Chapter 1

Comparative Economic Performance: Poland and the European Union

Zbigniew Matkowski, Ryszard Rapacki, Mariusz Próchniak

The aim of this chapter is to assess changes in the competitiveness of the Polish economy from 2010 to 2015. The analysis covers the basic indicators of economic development, such as GDP growth, inflation, unemployment, balance of public finances, and current account balance. Poland's economic indicators are compared with those reported by other European Union member states.

The international context

Before embarking on a comparative analysis of Poland's economic performance in 2015, we will first outline its global context, sketching a picture of the prevailing patterns of growth that occurred in the world economy during this period.

As can be seen from the preliminary data shown in Table 1.1, the global Gross Domestic Product grew 2.4% in 2015, which implies stabilization compared with 2013 and 2014. In the medium-term perspective, this growth dynamic is above the trend line for 2008–2011, which includes the effects of the deepest global recession since World War II (–2.4% in 2009). Yet it remains well below global economic growth in the pre-crisis period (3.9%).

Similar to the prevailing trends throughout the studied period, the continuing recovery of the global economy in 2015 was mostly due to relatively fast economic growth in developing economies; their GDP growth rate was 3.7%. The most remarkable growth indices were recorded in Southeastern Asia (5.7%), especially in India (7.2%) and China (6.8%). On the other hand, the relatively slow growth in the global economy was due to developed countries (with their 1.9% GDP growth) doing worse economically than in the pre-crisis period (though better than in the 2007–2014 period). Contributing factors included the continued fiscal crisis in the eurozone and economic stagnation in some of its member countries.

Table 1.1. World economic growth in 2007–2015 (rates of growth in %)

Year	2007–2012 (annual averages)	2013	2014	2015[a]
World	1.9[b]	2.3	2.6	2.4
Developed countries	1.0	1.0	1.7	1.9
Eurozone	0.4	–0.3	0.9	1.6
USA	1.3	1.5	2.4	2.4
Japan	0.4	1.6	–0.1	0.5
Transition countries	2.3	2.1	0.9	–2.8
Russia	1.8	1.3	0.6	–3.8
Developing countries, of which: least developed countries	5.3 5.7	4.6 5.1	4.4 5.6	3.7 4.5
Africa	4.1	3.3	3.4	3.7
Southeast Asia	7.0	6.1	6.2	5.7
China	9.2	7.7	7.3	6.8
India	7.3	6.5	7.2	7.2
Latin America	2.8	2.8	1.0	–0.5

[a] Preliminary data. [b] 2008–2011.
The economic growth rates of country groups are calculated as a weighted average of individual country GDP growth rates. The weights are based on 2010 prices and exchange rates (for the growth rates from 2007) or on 2005 prices and exchange rates.

Source: United Nations (2009, 2015, 2016).

Size of the economy

We begin our analysis of the performance of the Polish economy in 2015 and of its international competitive position with a brief assessment of Poland's economic potential and its place in the world economy as well as in the European Union.

The basic measure of the size of the economy is the value of the gross domestic product (GDP) produced in a country in a given year. In spite of all its shortcomings, this is still the most comprehensive measure of economic activity and is widely used in macroeconomic analyses. For inter-country comparisons, the values of GDP expressed in local currencies are converted into a single international currency (e.g. USD or EUR), using current exchange rates (CER) or purchasing power parities (PPP) as conversion factors.[1] The GDP calculated at PPP is believed to better represent the value of output produced in a given country, considering different price levels in the

[1] Purchasing power parity (PPP) is a conversion factor that shows how many currency units of a given country would be needed to buy the same basket of goods and services that could be purchased for $1 in the United States. The value of GDP at PPP is expressed in calculative units called "international dollars" that

local markets for goods and services; it is also less susceptible to the fluctuation in current exchange rates. For these reasons it is more widely used in broad international comparisons. On the other hand, the PPP conversion factors are often imprecise and tend to overestimate the value of GDP for less developed countries against the value of GDP in more developed countries. The same reservation applies to the comparison of per capita GDP). In our assessments of total and per capita GDP, we apply both conversion systems, CER and PPP, to provide readers with a more comprehensive comparison.

According to IMF estimates for 2015 (IMF, 2016), Poland's GDP was equal to $481 billion if calculated at CER, but its real value estimated at PPP was $1 trillion ($1,003 billion). Among the world's largest economies arranged according to their total GDP, Poland ranked 25th in terms of the GDP value calculated at CER (between Sweden and Belgium), and 22nd in terms of the GDP value estimated at PPP (between Nigeria and Egypt). Compared with the previous year, Poland's position in the world economy deteriorated by two places in both assessments of the GDP value. This was due to more rapid growth in some developing economies and a depreciation of the Polish currency against the U.S. dollar. The share of Poland in global output did not change: it was 0.7% at CER and 0.9% at PPP. This share, reflecting Poland's position in the world economy, has remained stable for the last 10 years, although the country's place in the worldwide GDP ranking changes from year to year because of cyclical fluctuations in output, changing inflation and exchange rates, and some revisions in GDP data and conversion factors.

Let us now look at the position of Poland's economy in the European Union (EU28). Table 1.2 presents data on the value of total GDP in individual EU member countries in 2015, calculated in euros at current exchange rates (CER) and according to the purchasing power standard (PPS).[2] All the GDP data for 2015 are preliminary estimates published by the European Commission (European Commission, 2015a), which may be subject to further revisions. The ranking given in the table is arranged according to the value of GDP calculated at CER; the alternative ranks, based on the PPS GDP values, are given in parentheses.

represent the purchasing power of $1 in the U.S. market. The estimated PPP value of the GDP of a given country corresponds to its value calculated at U.S. prices.

2 The purchasing power standard (PPS) for EU member states, calculated by Eurostat, is based on the average price level in the EU28. The value of GDP at PPS is measured in calculative units (called PPS), which express the purchasing power of the euro in the given country.

Table 1.2. GDP of EU member countries in 2015 (€ billion)

Rank	Country	GDP at CER		GDP at PPS	
		billions of €	%	billions of €	%
1(1)	Germany	3,022.0	20.7	2,924.0	20.0
2(2)	United Kingdom	2,583.0	17.7	2,041.0	14.0
3(3)	France	2,175.0	14.9	2,017.0	13.8
4(4)	Italy	1,635.0	11.2	1,666.0	11.4
5(5)	Spain	1,079.0	7.4	1,233.0	8.4
6(7)	Netherlands	682.2	4.7	636.1	4.4
7(9)	Sweden	439.9	3.0	350.0	2.4
8(6)	**Poland**	**425.6**	**2.9**	**755.4**	**5.2**
9(8)	Belgium	410.0	2.9	375.6	2.6
10(11)	Austria	336.3	2.3	307.9	2.1
11(15)	Denmark	265.3	1.8	199.6	1.4
12(18)	Finland	208.6	1.4	170.1	1.2
13(17)	Ireland	204.5	1.4	185.1	1.3
14(13)	Portugal	178.8	1.2	233.1	1.6
15(14)	Greece	173.2	1.2	217.0	1.5
16(12)	Czech Republic	163.9	1.1	258.6	1.8
17(10)	Romania	157.7	1.1	310.3	2.1
18(16)	Hungary	108.8	0.7	194.7	1.3
19(19)	Slovakia	78.1	0.5	120.2	0.8
20(24)	Luxembourg	50.3	0.3	43.4	0.3
21(20)	Bulgaria	43.9	0.3	94.8	0.6
22(21)	Croatia	43.8	0.3	70.6	0.5
23(23)	Slovenia	38.5	0.3	49.2	0.3
24(22)	Lithuania	36.9	0.3	61.8	0.4
25(25)	Latvia	24.6	0.2	36.4	0.2
26(26)	Estonia	20.5	0.1	28.0	0.2
27(27)	Cyprus	17.4	0.1	20.6	0.1
28(28)	Malta	8.5	0.1	10.6	0.1
	EU28	14,611.0	100.0	14,611.0	100.0

Note: All GDP data for 2015 are preliminary European Commission estimates. The positions given in the first column refer to GDP calculated at CER and PPS (the latter in parenthesis). The percentage shares in the EU28 total were calculated by the author.

Source: European Commission (2015a).

The European Union now comprises 28 member states of very different sizes and different economic potential. The five biggest countries in terms of population num-

bers and production volume – Germany, France, the United Kingdom, Italy, and Spain – represent 63% of the EU28's total population and 72% of its combined GDP calculated at CER or 68% if calculated at PPS. The 15 Western European countries that belonged to the EU before its major enlargement (EU15) represent 79% of the total population and produce 92% of the combined GDP calculated at CER, or 86% of the combined GDP calculated at PPS. The 13 new member states that joined the EU in 2004, 2007 or later – 11 CEE countries plus Cyprus and Malta – represent 21% of the total population, but produce 8% or 14% of the total GDP respectively. This asymmetry between the "old core" and the new entrants (or, more broadly, between Western Europe and Central and Eastern Europe) should be borne in mind when evaluating the position of Poland in the European Union.

Poland is the largest country among the new EU member states in terms of area, population and GDP. Poland ranks sixth in the enlarged European Union in terms of area and population (7.1% and 7.5% respectively). In terms of GDP value calculated at PPS, it also ranks sixth (5.2%), but it is eighth (2.9%) if GDP is converted using CER. As we can see, Poland's share in the EU28's economic potential is much lower than what is indicated by the size of its territory or population, but, in light of historical experience, this should come as no surprise; a similar disproportion is in evidence for all other CEE countries.

Poland has significantly improved its position in the European economy since it joined the EU. Its share in the combined output of all the current EU member countries (EU28), calculated at CER, rose from 1.9% in 2004 to 2.4% in 2007, 2.8% in 2010, and 2.9% in 2015. Likewise, Poland's share in the total output of the EU28 calculated at PPS rose from 3.6% in 2004 to 4.1% in 2007, 4.7% in 2010, and 5.2% in 2015. Compared with the previous year, Poland's position in this ranking did not change in 2015.

Socioeconomic development and standard of living

The basic measure of socioeconomic development and standard of living is national income or product per inhabitant. Figure 1.1 shows the value of per capita GDP measured at PPS in EU member countries in 2004 and 2015.[3] The figure enables us to compare the value of GDP per capita and to evaluate the growth of real income in individual countries in the period after the EU's major enlargement. The GDP per capita data for 2015 are preliminary estimates. Both the total and per capita GDP data for CEE

[3] To simplify the information, the per capita GDP data originally expressed in PPS are labeled here € (standardized euro). The same applies to the total GDP data shown in Table 1.2.

countries calculated at PPS are much higher than the corresponding values calculated at CER. As already pointed out, the GDP data for CEE countries calculated at PPS are imprecise and may be overestimated.

According to our calculations based on preliminary data by the European Commission (European Commission, 2015a), the average per capita GDP in the enlarged EU (EU28), calculated at PPS, was €28,600 in 2015. In the current euro area (EA19) it was €32,300, and in the "old" EU countries (EU15) it was €31,000.

The income levels recorded in individual EU countries vary greatly. Luxembourg leads the EU with a GDP per capita at PPS of €76,200 in 2015.[4] A high per capita GDP (between €30,000 and €40,000) is also recorded in Ireland, the Netherlands, Austria, Sweden, Germany, Denmark, Belgium, Finland, the United Kingdom, and France. Italy and Spain have lower per capita GDPs (at about €27,000). The less advanced Western European countries, Greece, Portugal, Cyprus, and Malta, have much lower per capita incomes (between €23,000 and €25,000). In CEE countries, per capita GDP ranges from about €13,000 in Bulgaria to more than €24,000 in the Czech Republic and Slovenia.

Against this background, Poland's position in the per capita GDP rankings in the EU is unimpressive. With a per capita GDP at PPS of €19,600 in 2015, Poland is in the lower part of the list in the enlarged EU. Only four other EU countries (Latvia, Croatia, Romania, and Bulgaria) have lower income per inhabitant. Poland's per capita GDP at PPS is comparable to that of Hungary, though Hungary had a slightly better result in 2015.

Comparing the GDP per capita data for 2004 and 2015, shown in Figure 1.1, we can see that since joining the EU, Poland has made significant progress in reducing its income gap with more advanced countries in Western Europe. During the last 10 years, Poland's per capita GDP measured at PPS has increased by almost 80%, while the EU15's per capita GDP at PPS has risen by 22%. As a result, the index showing the relative per capita PPS GDP level in Poland (taking the EU15 as 100) increased from 43 in 2004 to 63 in 2015, implying further progress in closing the income gap toward Western Europe.

Of course, GDP per capita is a crude and tentative measure of the standard of living in a country. The living standards of inhabitants are also dependent on income distribution and possessed wealth. Unfortunately, international statistics do not offer much data on the financial and real assets of households. Information on income

[4] The unusually high value of GDP per capita in Luxembourg is largely due to high incomes generated and earned by international banks, financial institutions, and headquarters of big international corporations located in the country. This does not adequately reflect the average living standard of inhabitants compared with other Western European countries.

inequality, particularly poverty, is also incomplete and often outdated. The latest estimates of poverty rates made by the World Bank (2016a), using the international poverty lines of $1.90 or $3.10, show that the incidence of absolute poverty in all EU countries is small. However, in most CEE countries a considerable part of the population lives below the income and consumption level recognized as a poverty line using national standards. According to a recent OECD report on income distribution and poverty (OECD, 2013), based on 2010 data, the relative poverty rate in Poland (the percentage of the population living at less than half of the national median income) was about 11%, an indicator roughly equal to the OECD average, but almost twice as high as in the Czech Republic and Denmark.

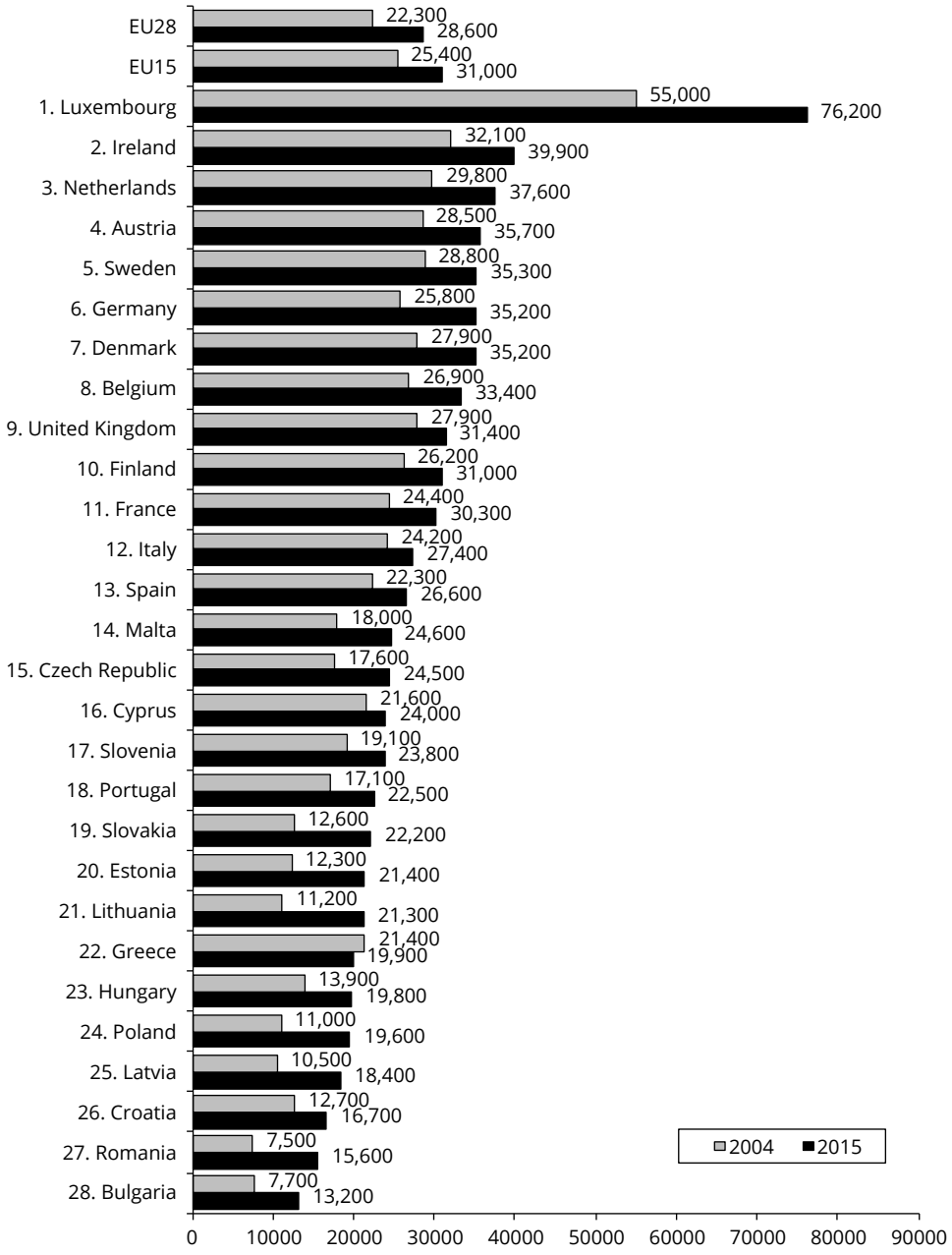
The common view in Poland is that the country's solid track record in economic growth, measured by an increase in real GDP, has not translated well into the well-being of the average citizen. If this opinion is true, one important factor contributing to this feeling is a high dispersion of income and wealth distribution.

A conventional gauge of income inequality is the Gini coefficient, which measures the overall concentration of household income. Poland is among EU countries with relatively high income inequalities. The Gini coefficient of disposable income for Poland, at 30.8 in 2014, was slightly lower than the EU28 average. Among the new EU member states, more egalitarian patterns of income distribution are reported by the Czech Republic, Slovakia, Slovenia, Croatia, and Hungary. Among Western European countries, more equality can be seen in Austria, Belgium, Denmark, the Netherlands, Sweden, Finland, and Germany, countries that strongly promote the welfare state idea. Poland is showing a gradual decrease in the Gini coefficient, which is a positive trend.

Another indicator of income inequality is the income gap between the poorest and the richest people in a country. According to Eurostat data (Eurostat, 2016), the ratio of income earned by the wealthiest 20% and the poorest 20% of families in Poland in 2014 was almost 5:1, roughly equal to the EU average. But in most EU countries this ratio was lower, and a significantly larger income gap between the rich and the poor was only noted in Italy, Spain, Portugal, and Greece, as well as in Romania, Bulgaria, and Latvia. In the quintile distribution of household incomes observed in Poland, the wealthiest 20% of families accrued almost 40% of total household income, and the richest 10% gained almost 25% of total disposable income.[5]

[5] More information on income inequality and poverty in Poland and other EU countries can be found in chapter 3 of this report.

Figure 1.1. EU28 member countries by GDP per capita in PPS (€)



Note: Ranking based on preliminary PPS GDP estimates for 2015; reference data for 2004 illustrating change after EU enlargement; GDP per capita calculated by dividing total GDP by total population.

Source: European Commission (2015a).

A concise measure of social development and the standard of living is the Human Development Index (HDI), compiled by the United Nations Development Programme (UNDP). It is the geometric mean of three component indices reflecting gross national income (GNI) per capita, life expectancy at birth, and education level, which are assumed to represent three basic dimensions of human development: a long and healthy life, thorough knowledge, and a decent standard of living. The index values range from 0 to 1; higher values imply a higher development level.

According to the latest *Human Development Report* (UNDP, 2015), based on 2014 data, Norway, Australia, Switzerland, Denmark, the Netherlands, and Germany lead the way in the global HDI classification. Slovenia (ranked 25th) was the best performer among CEE countries, followed by the Czech Republic, Estonia, Slovakia, Poland, Lithuania, Hungary, Latvia, Croatia, Romania, and Bulgaria (59th). Poland, with an HDI of 0.843, is close to the CEE average, but behind most other EU28 countries and ahead of only Lithuania, Portugal, Hungary, Latvia, Croatia, Romania, and Bulgaria. Poland is currently No. 36 among 185 countries in the worldwide HDI rankings.

Poland's HDI has increased consistently, which testifies to the sustainability of the country's socioeconomic development. Since 2008, Poland has advanced in the HDI classification by three places, with most of the progress made in the last three years, and Poland's HDI has increased significantly. However, Poland's position in the worldwide HDI rankings is still remote. Nor does Poland rank high in the HDI league table in terms of the three components of the index: income, health, and education.

The same source also gives estimates of the so-called inequality-adjusted HDI (IHDI). This index aims to capture the living standard and development level of the average person in a country, which is less than the aggregate HDI when there is inequality in the distribution of income, education, and health. Poland's IHDI is lower than the value of the original HDI, but this does not change significantly the country's position in the global HDI rankings.

The OECD compiles for its member countries a composite well-being index called "Better Life Index" (BLI), which tries to capture various components of the quality of life and various dimensions of social well-being, such as: (1) income and wealth, (2) housing, (3) job opportunities, (4) work-life balance, (5) education, (6) health, (7) environment, (8) community links, (9) freedom and governance, (10) personal safety, and (11) life satisfaction. The index is based on a large set of quantitative and qualitative data and employs an advanced computation methodology that allows the user to calculate their own aggregate well-being index for each country, using own weights attributed to the various dimensions of social well-being, but the data and results are only available for 36 OECD member and candidate states, including only a few CEE countries. The composite index takes values ranging from 0 to 10 (higher

values mean a better performance). According to the latest BLI ranking (OECD, 2016), Poland, with an unweighted BLI value of about 5.5, is close to the OECD average. Among several dimensions of social well-being captured by the BLI, Poland has relatively high marks in areas such as personal security, education, and social links, but relatively low marks for material living conditions, health, and life satisfaction.

A similar quality-of-life index (QLI), recently called the "where-to-be-born index," is compiled by the Economist Intelligence Unit (EIU), which is linked to *The Economist* magazine. The index is published on an irregular basis. The latest, 2013 QLI ranking (EIU, 2013) covered 80 countries and was topped by highly developed countries: Switzerland, Australia, Norway, Sweden, and Denmark. Of 11 CEE countries included in the classification, the highest ranks were given to the Czech Republic and Slovenia, and the lowest ones to Lithuania, Romania, and Bulgaria. Poland was ranked 33rd, in the upper middle of both the whole pack and the CEE subgroup.

One important aspect of social wealth is the availability of jobs and employment opportunities. This factor directly influences income and wealth as well as the extent to which education and knowledge can be transformed into higher living standards. High unemployment is in sharp conflict with people's sense of well-being and wealth. Meanwhile, high unemployment has become one of the main economic problems in Europe and elsewhere. The problem has become more acute in the last several years due to the global crisis and turbulence in the eurozone. Unemployment levels in most EU countries are still quite high, even as the recession has phased out. This is because a large portion of the jobless are affected by long-term structural unemployment and short-term frictional unemployment (both are rather unrelated to the current level of business activity), and because changes in employment and unemployment lag behind changes in output and are usually less significant.

In 2015, the average unemployment rate in the EU28, as recorded in labor force surveys, was 9.5% according to preliminary estimates (European Commission, 2016). In Western Europe, the highest unemployment was seen in Greece (25%), Spain (22%), Portugal (13%), and Cyprus (16%). Among CEE countries, Croatia (16%), Slovakia (12%), and Bulgaria (10%) were the most affected.[6] Poland, with an unemployment rate of 7.5% reported in labor market surveys, was below the EU average, but registered unemployment was much higher: 10.5% yearly on average (GUS, 2016a). A special problem is high unemployment among the young. On average in the EU, unemployment among young people is at least twice the rate among adults. In Poland, the unemployment rate among those aged under 24 exceeded 20% in 2015.

[6] All the figures are the average unemployment rates recorded in the harmonized labor force surveys (LFS). Registered unemployment was usually higher.

Comparative assessment of macroeconomic performance

Our assessment of the current condition of the Polish economy is based on an analysis of five macroeconomic indicators commonly used in comparative assessments of macroeconomic performance: (a) the rate of economic growth, (b) unemployment rate, (c) inflation rate, (d) general government balance, and (e) current-account balance. The key tool used in this analysis is called the pentagon of macroeconomic performance.[7] It illustrates the extent to which individual countries meet five macroeconomic goals: (a) economic growth, (b) full employment, (c) internal equilibrium (no inflation), (d) public finance equilibrium, and (e) external payments equilibrium. The extent to which these goals have been achieved in a given year is expressed by the five variables marked on the pentagon axes.

The tips of the pentagon, representing maximum or minimum values of the indicators, are considered to be desirable (positive) targets, although in some cases this can be disputable. For example, a high current-account surplus or a budget surplus, accompanied by zero inflation or zero unemployment, may not be an optimal result. Another problem is interrelations (notably conflicts) between various macroeconomic goals. For example, low unemployment (according to the Phillips curve) is often accompanied by high inflation, and vice versa. A separate question is the relative significance of each criterion (e.g. whether low inflation is as important as low unemployment). All these reservations should be taken into account when interpreting such charts.

When comparing the pentagons drawn for a given year among individual countries or when comparing them over time for any single country, we should consider both their surface and shape. A larger surface of the pentagon is assumed to mean better economic performance, while a more harmonious shape indicates more balanced growth. Of course, such an assessment is confined to the five aforementioned parameters of current macroeconomic performance. It tells nothing about the size of an economy, its potential, or its development prospects. It does not even tell much about its possible performance in the next year, though an economy in good condition increases the chances of good future performance. Nevertheless, any analysis based on this method should be conducted with caution.

Let us now compare the overall performance of the Polish economy in 2015 with the situation seen in three other CEE countries: Hungary, the Czech Republic, and

[7] This method was also used in the comparative analysis of Poland's macroeconomic performance in earlier reports by this publisher. This is also where the merits and limitations of this kind of analysis are discussed in greater detail, along with a list of references (cf. Weresa (ed.), 2013, pp. 27–33).

Slovakia, and in five Western European economies: Germany, France, Italy, Spain, and Sweden. Table 1.6 includes data on the five macroeconomic indicators reflecting the performance of the analyzed economies in 2015. These are the most recent estimates, released by European Commission on Feb. 4, 2016 as part of its newest economic forecast (European Commission, 2016). Most of the data are preliminary estimates that may be subject to further corrections and revisions. In the case of Poland, these data are more or less in line with preliminary data published by the Central Statistical Office (GUS, 2016a, 2016b). Some minor differences do not significantly affect our general assessment.[8] Figure 1.2 presents the data in the form of pentagons, which are more convenient for a comparative analysis.

Table 1.3. Key macroeconomic indicators for Poland and selected other EU countries in 2015

Country	GDP growth	Inflation	Unemployment	General government balance	Current-account balance
	%	%	%	% of GDP	% of GDP
Czech Republic	4.5	0.3	5.1	–1.6	–2.4
France	1.1	0.1	10.5	–3.7	–1.4
Germany	1.7	0.1	4.8	0.5	8.8
Hungary	2.9	0.1	6.7	–2.1	5.0
Italy	0.8	0.1	11.9	–2.6	2.2
Poland	**3.5**	**–0.7**	**7.5**	**–3.0**	**–0.2**
Slovakia	3.5	–0.3	11.5	–2.7	0.3
Spain	3.2	–0.6	22.3	–4.8	1.5
Sweden	3.6	0.7	7.4	–1.0	5.4

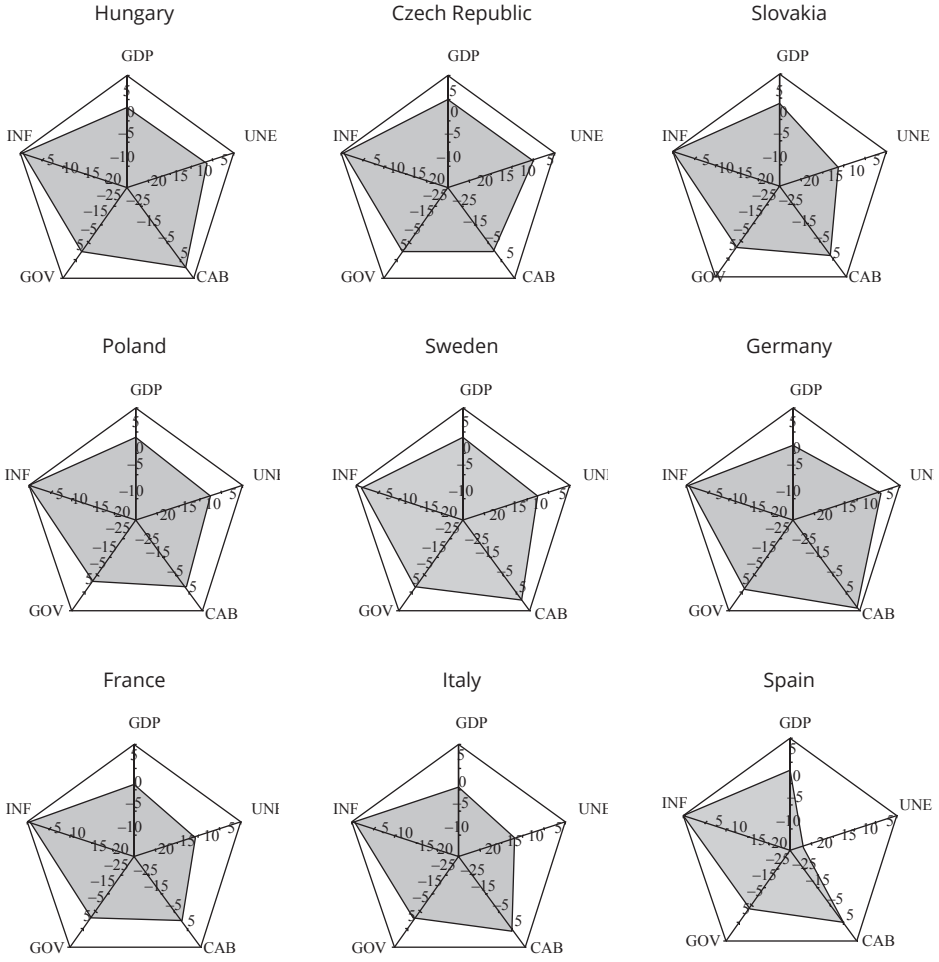
Note: All the data are preliminary estimates. Data on inflation refer to consumer price inflation. Data on unemployment are the harmonized unemployment rates based on labor market survey data (yearly average).

Source: European Commission (2016).

We begin our analysis with an inter-country comparison of the five macroeconomic indicators (in light of the overall economic situation in the EU28). Next, we will compare the general performance of the economies concerned in 2015 from the point of view of the comparative position of the Polish economy, taking into account changes from the previous year.

[8] The Central Statistical Office's preliminary estimate – released on Jan. 25, 2016 – for Poland's 2015 GDP growth was 3.6%, and its estimate for consumer price inflation was –0.9% (GUS, 2016b).

Figure 1.2. Macroeconomic performance in Poland and selected other EU countries in 2015



GDP – GDP growth rate (%)
UNE – unemployment (%)
INF – CPI inflation (%)
GOV – general government balance (% of GDP)
CAB – current-account balance (% of GDP)

Source: Author's own elaboration based on the data shown in Table 1.3.

The year 2015 was the sixth year of moderate growth in the world economy after the global economic crisis of 2008–2009. After a slowdown in 2012–2013 triggered by the financial crisis in the euro area, economic growth in the eurozone and in the EU as a whole remained unimpressive. According to preliminary estimates, total real GDP in the euro area increased by 1.6% in 2015, and the combined EU28 GDP grew by 1.9%

(compared with around 3% growth in global output). The weak economic growth indicators in Europe were mainly due to relatively slow output growth in Germany, France, and Italy, which could not be outweighed by firmer growth in Ireland, Sweden, Luxembourg, and most CEE countries. In the analyzed group, the best growth results were achieved by Poland (3.5%), Slovakia (3.5%), and the Czech Republic (4.5%) as well as by Sweden (3.6%) and Spain (3.2%), though this last economy has yet to expand vigorously enough to neutralize a previous fall in output during a prolonged recession. Germany noted modest output growth (1.7%), and France and Italy both recorded meager growth of around 1%.

Despite some acceleration in output growth in Europe, last year brought a further decline in inflation in most countries. In 2015, average consumer price inflation in the EU28 was suppressed to zero. In all EU countries inflation was cut to less than 1%, and some economies faced slight deflation. In the analyzed group, only the Czech Republic and Sweden reported some rises in consumer prices (0.5%–1%), while all the remaining countries saw virtually no inflation or faced some deflation. The deepest deflation appeared in Poland (almost 1%). Inflation in Europe has subsided as a result of both slackening demand and restrained fiscal and monetary policies. But now governments and central banks must be alert because deflation may soon become an additional drag on economic growth.

The average unemployment rate in the EU28 decreased slightly due to some acceleration in output growth, but it has remained quite high, at 9.5%. A small decrease in unemployment was also seen within the analyzed group. The unemployment rate continued to be relatively low in Germany and the Czech Republic (around 5%). In Poland, Hungary, and Sweden, the unemployment rates (ranging from 7% to 8%) were also below the EU28 average. In Italy, France, and Slovakia, unemployment was much higher (10%–12%), and in Spain it remained extremely high (22%) despite a remarkable rise in output. It should be recalled that the figures quoted here refer to unemployment rates recorded in labor market surveys; these are usually lower than the registered unemployment rates.

The last few years have brought some improvement in the state of public finance in the European Union, as reflected by a reduction in the average size of the general government deficit in the EU28 from 6.5% of GDP in 2010 to 2.5% of GDP in 2015. This is the result of the deliberate policies pursued by the governments of most EU countries, strongly supported by the European Commission, aimed at fiscal consolidation (even at the expense of slower output growth). Nevertheless, the road toward meeting the budget deficit limit imposed by the Maastricht Treaty (3% of GDP) is still quite long for several EU member countries, including some EMU members. In the analyzed group, Germany was the only country where government expenditure was

fully covered by budget revenues in 2015. All the remaining countries reported budgets deficits ranging from 1%–2% of GDP in Sweden, the Czech Republic, and Hungary to 2.5%–3% in Italy, Slovakia, and Poland, and 4%–5% in France and Spain. In Poland, the budget deficit calculated according to EU standards stood at 3% of GDP, a figure significantly lower than in the preceding year. However, this improvement was partly a temporary consequence of a change in the pension system in 2014 (which may be soon reversed by a plan to reinstate the previous retirement age).[9]

Continued budget deficits lead to a rise in public debt, both in absolute terms and relative to the GDP value. By the end of 2015, the total gross public debt in the EU28 had risen to €12,800 billion, or almost 90% of the total GDP produced that year, according to preliminary data (European Commission, 2015a). In the analyzed group, the public debt-to-GDP ratio at the end of 2015 ranged from 41% in the Czech Republic and Sweden to 51%–52% in Poland and Slovakia, 72% in Germany, 76% in Hungary, 96% in France, 101% in Spain, and 133% in Italy (European Commission, 2016). In most countries, public debt is growing in absolute terms due to continuous budget deficits and rising interest payments.

The current-account balances in the individual countries are not directly comparable because they depend on a variety of factors that determine the volume of exports and imports, terms of trade, current international payments, private income transfers, and short-term capital flows. The current-account deficits or surpluses reported by individual countries are to a large extent structural in nature. At the same time, cyclical changes in the current-account balance do not follow a regular pattern and are difficult to forecast. In 2015, acceleration in economic growth had a limited impact on the relative size of the current-account balances of the countries in the analyzed group. A slight worsening in the current-account balance was only recorded in Sweden, Slovakia, and the Czech Republic, while other countries in the group noted some improvement. Poland and Slovakia roughly equalized their current-account balances. The remaining countries in the group recorded surpluses that ranged from about 2% of GDP in Spain and Italy to about 5% in Hungary and Sweden, and almost 9% in Germany.

In analyzing the changes in the five indicators of macroeconomic performance compared with the previous year, we can conclude that 2015 brought some acceleration in economic growth in Europe, but the revival has not been very conspicuous so far. Nevertheless, almost all the countries in the analyzed group noted a remarkable rise in economic activity and some improvement in their GDP growth rates. Faster

[9] The decrease in Poland's public debt from 56% of GDP in 2013 to 50% of GDP in 2014 and 51% in 2015 was mainly due to a new arrangement in public finance statistics following a change in the public pension system.

output growth was accompanied by decreased unemployment, but the unemployment rates remained relatively high in most countries. Despite some revival in output and demand, inflation fell to almost zero in all the countries in the group, and some countries faced the prospect of slight deflation. Most countries in the sample improved their fiscal stance by reducing their budget deficits (in relation to GDP), and some of them also improved their foreign current accounts.

Let us now assess Poland's economic performance in terms of the five macroeconomic indicators, compared with other economies in the analyzed group.

Both the surface and the shape of the pentagon reflecting the overall condition of the Polish economy in 2015 are similar to those shown by Hungary, the Czech Republic, and Slovakia. This means that in terms of these indicators, the overall performance of these economies was more or less comparable. All four countries noted a considerable rise in output last year, combined with a decrease in unemployment, though its level remains quite high, especially in Slovakia. Inflation was practically eliminated in all these countries. Poland's budget deficit was higher than in Slovakia and Hungary, and much higher than in the Czech Republic. Poland and Slovakia closed their external current accounts in equilibrium; the Czech Republic noted a deficit, while Hungary succeeded in raising its surplus.

The shape of the pentagon for Poland is also similar to the shapes for Germany and Sweden, but its surface is smaller. This indicates that using these five criteria, the results achieved by the Polish economy in 2015 were generally poorer than in the previous year. GDP growth in Poland was much faster than in Germany, and the inflation rate was lower than in Germany (according to the official data), but in all other respects Germany had better scores. Poland shared with Sweden a similar output growth and a similar unemployment level, but had a higher budget deficit and no current-account surplus.

The shape of the pentagon for Poland is also similar to that for France, but its surface is larger. This suggests that the overall current performance of the Polish economy in 2015 was better under these five macroeconomic terms. The main handicap of the French economy, compared with Poland, was very slow output growth, coupled with high unemployment. As regards the three remaining indicators of economic performance, the results noted by both economies were similar in 2015.

Poland continued to perform better economically than Spain, which finally overcame a prolonged recession but is still plagued by huge unemployment, a large budget deficit, and a substantial public debt. Much the same can be said about the general macroeconomic performance of Poland and Italy, whose economy was still slack, with slow output growth, high unemployment, and a giant public debt.

Compared with the preceding year, the overall performance of the Polish economy improved in 2015, but the improvement was not radical. GDP growth was moderate but slightly faster than in the previous year; inflation was stopped and even turned into deflation; the budget deficit – expressed as a percentage of GDP – was reduced, and the current-account deficit was cleared for the first time since 1995. The labor market improved slightly, though unemployment remained high.

Overall, Poland did relatively well in 2015 in terms of the five basic macroeconomic performance indicators, especially in the context of the general economic situation in Europe. The assessment of the general condition of the Polish economy offered by the OECD in its *Economic Survey of Poland* (OECD, 2014) was also highly positive. According to the OECD, Poland's overall economic performance has been impressive over the past decade, and the country's relatively rapid economic growth has made it possible to considerably shorten the distance to the EU average in terms of the standard of living.

Nevertheless, Poland's economic achievements throughout the transformation period and its relatively good macroeconomic performance in the last two years should not obscure the existence of several unresolved economic and social problems as well as some serious threats to future development. The new Polish government, formed after the parliamentary elections in October 2015, has declared its determination to solve some acute social problems and to improve institutional conditions conducive to further economic growth. However, it is not clear how some major changes introduced by the new government in socioeconomic and fiscal policies will influence the actual condition of the Polish economy in the short and long term.

The Polish economy in 2015 and the outlook for the years ahead

Poland was the only EU member country that managed to avoid recession during the global economic and financial crisis of 2008–2009. Even though this was mainly the result of an improved foreign trade balance (a deeper fall in imports than in exports), the very fact that the Polish economy was able to avoid a decrease in real GDP during the crisis was an unquestionable success, testifying to its noteworthy resilience to external shocks as well as its good general condition. After two years of relatively fast GDP growth (3.7% in 2010 and 4.8% in 2011), the next two years were marked by a considerable deceleration, to 1.8% in 2012 and 1.7% in 2013. The Polish economic slowdown was a direct outcome of slackening demand and economic stagnation in Western Europe, linked with the debt crisis in the euro area. The next two years

produced another revival in the Polish economy. In 2014, Poland's real GDP expanded by 3.3%, and in 2015 it grew by 3.6%, according to preliminary data (GUS, 2016b). The question is whether this accelerated growth will prove to be a permanent trend. The prognosis is difficult because future growth trends in both Europe and the global economy remain uncertain, and there is also uncertainty over the results of some economic and fiscal policies launched by Poland's new government.

Some judgments about the sustainability of economic growth and the possibilities of its acceleration might be possible after examining the changes in the main components of final demand, which determined the dynamics of GDP in the last two years.[10] This kind of analysis makes it possible to show the main demand components responsible for GDP growth – to identify the demand components that either stimulated or sustained output growth and those that hampered it. It also enables us to establish whether the observed output growth was adequately matched by an increase in internal and external demand, which is essential for a further rise in output. Thus, the results of the analysis may be helpful in assessing the growth prospects of the Polish economy in 2016 and beyond.

In 2014, the main driver of output growth was a solid increase in domestic demand, whose volume rose by almost 5%, following a prolonged slack period. Private consumption increased by 2.5%, but public consumption rose by almost 5%, with a resulting 3% increase in total consumption (in constant prices). But the strongest growth stimulus was provided by a heavy rise in investment outlays (both private and public), whose volume increased by almost 10%, after a deep fall in previous years. Exports increased by 6.5%, while imports rose by 10%, so the net effect of foreign trade on GDP growth was negative. Nevertheless, the revival of domestic demand, reinforced by rising exports, provided a strong growth impulse, which resulted in a substantial growth of real GDP, by 3.3%.

In 2015, the satisfactory GDP growth rate was sustained and even slightly increased, to 3.6%, according to preliminary data, but the proportion between internal and external demand growth changed slightly. Real consumption spending (private and public) rose by more than 3% and investment outlays increased by about 6%, but the rise in fixed investments was partly neutralized by a decrease in inventories, so the growth stimulus provided by gross capital formation was weaker. Nevertheless, total domestic demand rose by 3.4%, and aggregate output grew a bit more thanks to a positive change in foreign trade whereby exports, fueled by revived demand

[10] Detailed information on the contribution of various demand components to changes in the GDP volume (on a quarterly basis) may be found in national accounts statistics (e.g. GUS, 2016a). A more extensive analysis of demand changes and their impact on GDP growth in previous years was offered in some earlier editions of this report (e.g. Weresa (ed.), 2014, 2015).

in Western Europe and some depreciation of the Polish currency, began to rise more rapidly (around 7%) than imports (about 6%). Comparing the contribution of various demand components to GDP growth last year, we can say that the demand structure was marked by a well-balanced composition of rising private consumption, government expenditure, investment, and exports. Keeping up such a healthy demand and supply balance could guarantee similar or even slightly faster GDP growth in 2016.

To secure further output growth, it is essential that the positive demand trends of the last two years are sustained and reinforced. Critically important is, above all, a further rise in three autonomous demand streams: government expenditure, private investment, and exports, which determine the dynamics of total demand and aggregate output. Private consumption, as the largest demand component (and the ultimate production aim), is most important in maintaining output growth, but its volume will adjust closely to the actual rise in output and income. As regards government spending, its total volume (including public consumption, public investment, and transfer payments) will probably rise considerably in the next few years as a result of new socioeconomic policies and social spending programs announced by the new government (including the "Family 500+" child subsidy program), but the actual increase in public expenditure will be limited by the level of tax revenue. Of utmost importance, then, is a further evolution of private investment and exports. Both are difficult to foresee. As regards total investment outlays, much will depend on the effectiveness of government policy aimed at stimulating domestic enterprise, savings, and investment, especially since foreign capital inflow will probably decrease, at least this year. The prospects of export growth, in turn, depend on the development of economic activity in Poland's major export markets and on further evolution of the exchange rate. All these factors are difficult to predict even in the short run because they are strongly influenced by economic policies pursued by governments and are highly dependent on future political and economic developments in the international environment.

On the supply side, industrial production increased by a healthy 4.8% in 2015, more than in 2014. On the other hand, construction raised its production volume by only 1%, much less than in the previous year's level. Agricultural production was 4% lower than in the previous year due to a poor harvest and some disturbances in exports (especially those to the Russian market). However, industry, construction, and agriculture – the three basic sectors of material production – represent a relatively small part of total output in a modern economy, which is now dominated by the service sector in the broad sense. In Poland, these three sectors account for just over one third of total value added in the economy. Almost two-thirds of it is created in trade, finance, and services. Nevertheless, those three sectors of material production are the true

pillars of any economy and determine its real strength; in Poland, these sectors continue to have a significant impact on current GDP dynamics.

With a substantial rise in consumer spending, the total volume of retail sales increased by almost 3.5% in 2015, slightly less than a year earlier. The stock of commodities did not change much, but the total volume of stocks in the economy decreased, meaning a fall in inventory investment. With a considerable rise in residential construction, the number of new housing units completed last year increased by 3%.

The labor market has not improved radically as yet. A distinct rise in total employment would require more vigorous output growth. Total employment in the economy increased by 0.9% in 2015 compared with the previous year, and average employment in the enterprise sector rose by 1.3%. The level of unemployment recorded in labor market surveys decreased to about 7% at the end of 2015 and registered unemployment fell below 10%, but the overall labor market situation did not improve perceptibly. Some economists argue that official unemployment data tend to conceal the real scale of unemployment because many jobless people leave the country every year in search of better job opportunities abroad.

When assessing the rise in living standards, an important factor is an increase in wages and other income sources. According to official GUS data (GUS, 2016a, 2016b), the average real gross wage rose by 4.2% in 2015, and the average real gross pension increased by 3.5%, though both of these indicators depend on the reliability of statistical data on nominal incomes and on the accuracy of the adopted cost of living index. It would be interesting to check whether these statistical data are supported by the results of household budget surveys, but the survey data is not yet available so it is impossible to assess the change in the reported household incomes over the whole of last year. Nevertheless, beyond any doubt, the rise in the real incomes of the population was the main driving force behind the increase in consumer spending in 2015.

Business sentiment indicators for industry, construction, trade, and other sectors, based on survey data, reveal a rising trend, though some indicators remain in negative territory. Consumer confidence, as reported in household opinion surveys, improved significantly last year, yet it is still relatively low. The same is true of households' assessments of their own financial situation and of the general situation in the economy. Nevertheless, both business sentiment surveys conducted by GUS and similar surveys run by the Research Institute for Economic Development at the Warsaw School of Economics point to a marked improvement in the general business climate.

In 2015, Poland's budget closed with a deficit of PLN 50 billion, or about 3% of GDP. The new budget for 2016 (Rada Ministrów, 2015) envisages an increase in the public finance deficit to PLN 55 billion, but the deficit-to-GDP ratio is not expected

to increase over the 2015 level.[11] Both government expenditures and revenues are expected to rise by 9.5%. New expenditures include the "Family 500+" child subsidy program, and new revenues are planned from the introduction of a sales tax on retail trade and a new tax imposed on bank assets. Critics have voiced doubts about the government's ability to finance all the planned expenditures (many of them tied to the ruling party's election promises) under the 2016 budget. This budget was drafted with targets including 3.8% GDP growth and 1.5% inflation. Even if the 2016 budget closes with the same deficit-to-GDP ratio as in 2015 and does not overstep the Maastricht limit of 3% of GDP, it is likely that this ceiling will be exceeded considerably in 2017. The European Commission in its newest economic forecast (European Commission, 2016) suggests that the public finance deficit in Poland may rise to 3.4% of GDP in 2017.

In the money market, the M3 money supply increased by about 9% in 2015. The banking sector tried to keep the balance between the growth of assets and liabilities, which increased by 7% and 9% respectively, reflecting the increase in credit outstanding and the value of deposits. The basic interest rates of the National Bank of Poland were lowered by 0.5 p.p. in March 2015, but since then the reference rate has been kept at the same level of 1.5% despite some deflation. In the currency market, the exchange rate of the euro increased by 1.6% last year, but the exchange rates of the Swiss franc and the U.S. dollar jumped by 14% and 19% respectively. The depreciation of the Polish currency (PLN) stimulated a rise in exports, but increased the prices of imported goods and services and negatively affected the inflow of foreign investment.

For the financial market as a whole, the depreciation of the Polish currency was just one of several pieces of bad news. Much more important was a prolonged slump on the local stock market. This was reflected by a deep fall in the share prices of most companies listed on the Warsaw Stock Exchange (WSE) and the resulting decline in their total capitalization by almost 14%. The WSE's overall share price index (WIG) decreased by almost 10% last year, and the share price index for the 20 largest companies (WIG20) fell by 20%. The deepest fall in share prices was noted in the raw material and energy sectors, 44% and 31% respectively. The slump on the local stock market is partly a reflection of negative trends on global financial markets, linked with falling oil prices and an economic slowdown in China. But it is mainly the result of slack demand on the local investment market, caused by reduced investment by Open Pension Funds and a massive outflow of foreign speculative capital. Even if this slump is unrelated to the overall condition of the Polish economy, it will probably have an adverse effect on the volume of real investment and thus on further output growth.

[11] The deficit was set at 2.8% of GDP, the same target as that for the 2015 budget.

On Jan. 15, 2016, Standard & Poor's lowered its credit rating for Poland from A- to BBB+, with a negative outlook. The decision was attributed to fiscal expansion instituted by the new Polish government and the related increased political risk. Even though the two other major rating agencies, Moody's and Fitch, did not follow Standard & Poor's action, this controversial move may adversely affect FDI inflows to Poland and increase the costs of interest paid on public debt. In another decision on Feb. 8, 2016, Standard & Poor's downgraded its outlook for the Polish banking sector from "stable" to "negative."

Meanwhile, despite some turbulence in the financial market, the Polish economy continues to do well, as evidenced by its performance in 2015.

The growth prospects for the Polish economy in 2016 and beyond will strongly depend on future economic developments in Europe and the global economy. The latest forecasts for the world economy predict some acceleration in global output growth in the next two years. According to a recent forecast by the World Bank (World Bank, 2016b), the global economy will grow 2.9% in 2016 and 3.1% in 2017. The latest IMF forecast (IMF, 2016) assumed slightly faster growth in global output – 3.0% in 2016 and 3.2% in 2017 if converted into constant U.S. dollars, and 3.6% in 2016 and 3.8% in 2017 based on constant local prices. The OECD forecast (OECD, 2015) was also relatively optimistic: it put global output growth at 3.3% in 2016 and 3.6% in 2017. The European Commission, in its latest winter forecast (European Commission, 2016), slightly lowered its former growth projections for Europe, envisaging 1.7% GDP growth for the euro area in 2016 and 1.9% in 2017, and predicting 1.9% and 2.0% respectively for the EU28 as a whole. The IMF's and the World Bank's growth forecasts for the European Union are similar.

Growth forecasts for Poland vary for this year and the next, depending on the source and publication date. The European Commission, in its economic forecast for Europe released on Feb. 4, 2016 (European Commission, 2016), maintained its former projections for Poland's GDP growth at 3.5% in both 2016 and 2017. Similar GDP growth forecasts for Poland for the next two years have been released by the IMF (2016): 3.5% in 2016 and 3.6% in 2017, and the OECD (2015): 3.4% and 3.5%. The World Bank, in its January 2016 forecast (World Bank, 2016b), significantly upgraded its previous GDP growth projection for Poland to 3.7% in 2016 and 3.9% in 2017. On the other hand, the EBRD's latest forecast update for the transition region, released in November 2015 (EBRD, 2015), kept the bank's previous GDP growth projection for Poland at 3.4% in 2016 and 3.3% in 2017.

Among growth forecasts produced domestically, the latest forecast by the Gdańsk Institute for Market Economics, released in January 2016 (IBnGR, 2016), suggests that Poland's real GDP will grow by 3.6% in 2016 and 3.1% in 2017. When drafting

the budget for 2016, the government (Rada Ministrów, 2015) adopted an optimistic assumption that Poland's GDP would grow by 3.8% in 2016 (a similar assumption was made by the previous government in the 2015 draft budget). The National Bank of Poland, meanwhile, in its latest *Inflation Report* (NBP, 2016), raised its GDP growth forecasts to 3.8% in 2016 and 3.4% in 2017.

The IMF's medium-term growth forecast until 2020, published in October 2015 and revised in January 2016 (IMF, 2016), assumed that global output growth would accelerate to about 4% a year by the end of this decade and that the euro area and the EU28 as a whole would return to their "usual" growth rates of around 1.5% and 2.0% respectively. For Poland, the IMF predicted moderate GDP growth in the next five years, at a rate of around 3.5% a year.

Several analyses of growth factors for Poland published in the last few years suggest that the development potential of the Polish economy is still considerable and, if properly utilized and supported by an active growth-oriented economic policy, it could ensure a sustainable growth rate of about 4% a year (provided there is sufficient demand on both the domestic and foreign markets).[12] However, some recent studies warn that future growth in the Polish economy may be significantly reduced, to around 2% a year or even less, due to unfavorable demographic trends.[13]

Even if economic growth in Poland continues to run at a rate of around 3.5% a year for the next few years, as suggested by these medium-term forecasts, it is unlikely that the country will soon return to the kind of rapid growth it experienced before the outbreak of the global crisis, when Poland's economy grew at a healthy rate of 4% to 5% a year. In order to achieve and sustain such a growth rate, Poland would need a much higher investment rate and much better conditions in its export markets. Moreover, long-term growth forecasts, taking into account supply constraints related to demography, are extremely unfavorable to Poland and some other CEE countries.

A long-term growth forecast (until 2060) released by the European Commission (2015b) suggests that Poland and other CEE countries will experience a gradual deceleration of economic growth if no action is taken to remove the emerging supply constraints (not to mention possible demand barriers). According to this forecast, under *laissez-faire* conditions, Poland's potential GDP growth rate may decrease from 3.5% in 2015 to 2.6% in 2020, 1.9% in 2030, 1.3% in 2040, 0.6% in 2050, and 0.7% in 2060. A similar downward growth trend for Poland was predicted by an earlier long-term growth forecast by the OECD (OECD, 2012). The slowdown of economic growth

[12] Such a long-term growth rate was assumed in many projections for the Polish economy for the next 10–20 years – see e.g. Boni (ed.), 2009; Kleer *et al.* (eds.), 2011; Matkowski, 2010; Rapacki, 2002; Kołodko, 2013.

[13] Cf. Matkowski, 2015; Matkowski, Próchniak, Rapacki, 2014.

predicted in both these forecasts would be mainly due to unfavorable demographic changes, including population aging, low fertility, and a massive outflow of young, well-educated working-age people.

If these forecasts come true, Poland may face not only slower growth in incomes and social well-being, but also a possible reversal of its catching-up process around 2045, coupled with a renewed widening of the country's income gap with Western Europe. In order to avoid such a scenario, the government should adopt a set of proper socioeconomic policies to neutralize the risks and keep GDP growth at a satisfactory rate. The same is true of other CEE countries facing similar risks to economic growth.[14]

Meanwhile, the growth of the Polish economy will still be critically dependent on further economic developments in Europe and worldwide. A big challenge for Poland in the next few years is public finance consolidation. A serious threat is posed by the aging population and the growing burden imposed on the economy by the costs of retirement payments, especially in light of the planned return to the previous retirement age. In any case, a continuous rise in exports and investments is the basic condition for sustained economic growth in the coming years.

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[14] For more on this subject and the recommended policy measures, see chapter 2, which discusses the implications of this long-term growth forecast for the income convergence process between CEE and Western Europe.

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Chapter 2

Income Convergence in Poland vis-à-vis the EU: Major Trends and Prospects

Zbigniew Matkowski, Mariusz Próchniak, Ryszard Rapacki

Economic growth and income convergence: the empirical picture

During the last 26 years, the Polish economy has experienced a fast real convergence vis-à-vis both EU countries and all transition economies. The improvement in Poland's relative development level was primarily due to its economic growth – the fastest among the new EU members from Central and Eastern Europe (EU11), and more than twice as fast as the average for the "old core" (EU15). Poland and these two groups of countries had similar economic growth trajectories from 2004 to 2015, after Poland's EU entry. The same was true of the 2010–2015 period. Table 2.1 provides a statistical picture of the trend.

In 2010–2015 Poland's GDP grew by 17%, or around 3.2% per annum on average. This gave Poland third place, together with Estonia, among the new EU members from Central and Eastern Europe (EU11). At the same time, it exceeded the EU15's GDP growth rate by about 16 p.p. As a result (see Tables 2.2 and 2.3), Poland managed to narrow its gap in economic development with all the current EU members. In addition, Poland's income gap narrowed with regard to seven of 10 CEE economies in the EU11 group (except the Baltic states). Changes in the relative development level of the Polish economy resulted not only from its fast growth but also from diverging demographic trends and different appreciation paths for real exchange rates in individual CEE countries.[1]

[1] While the Polish population increased only slightly between 1989 and 2015 (to 38.446 million from 38.173 million, or 0.7%), EU15 countries experienced more sizeable demographic growth. Their overall population increased by 9.2%, from 369 million to 403 million. These demographic trends are reflected in larger GDP growth rate differentials in per capita terms. While the rate for Poland was 2.9% annually, the EU15 average for GDP per capita growth was 1.3% per annum.

Table 2.1. Growth of Gross Domestic Product, 1990–2015

Country	Real GDP growth rate (constant prices)					Real GDP index in 2015		
	Average annual % growth	Annual % growth						
	1990–2015	2010	2013	2014	2015[a]	1989 = 100	2004 = 100	2010 = 100
Poland	**3.0**	**3.7**	**1.3**	**3.3**	**3.6**	**218**	**151**	**117**
Bulgaria	0.8	0.1	1.3	1.5	3.0	122	135	114
Croatia	0.0	–1.7	–1.1	–0.4	1.5	101	104	97
Czech Republic	1.4	2.3	–0.5	2.0	4.2	144	128	104
Estonia	1.6	2.5	1.6	2.9	1.3	152	129	117
Lithuania	0.8	1.6	3.5	3.0	1.5	122	136	123
Latvia	0.5	–3.8	3.0	2.4	2.6	115	129	118
Romania	0.9	–1.0	3.0	2.9	3.8	126	136	109
Slovakia	2.4	5.1	1.4	2.5	3.3	184	150	114
Slovenia	1.5	1.2	–1.1	3.0	2.7	146	116	99
Hungary	1.3	0.7	1.9	3.7	2.9	140	112	109
EU15[b]	1.5	2.1	0.1	1.2	1.7	148	110	101

[a] The data for 2015 refer to the first three quarters and are calculated as the arithmetic averages of the quarterly GDP growth rates, compared with the corresponding quarter of the previous year.
[b] Weighted average.
Growth indices 1989 = 100 are also based on EBRD estimates that go back to 1989.

Source: Eurostat (2016); own calculations.

Table 2.2. Relative development levels in Poland and selected EU countries, 1989–2015 (GDP per capita at PPP, Poland = 100)

Country	1989	2000	2004	2006	2008	2010	2012	2014	2015[a]
Poland	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Germany	279	251	235	229	213	192	184	182	179
France	268	246	223	214	195	175	161	158	154
Italy	274	252	220	211	194	167	152	142	138
Britain	256	259	254	244	209	175	161	161	158
Spain	199	205	203	204	187	157	139	134	134
Ireland	195	279	292	291	243	210	198	198	204
Portugal	159	168	155	158	145	131	116	115	113
Greece	178	183	195	187	172	141	111	107	101
EU15 average	**262**	**247**	**231**	**224**	**204**	**178**	**164**	**160**	**157**
Bulgaria	122	60	70	76	82	72	69	69	68
Croatia	133	104	115	116	116	95	90	87	85
Czech Republic	197	153	160	161	150	131	123	125	125

Country	1989	2000	2004	2006	2008	2010	2012	2014	2015[a]
Estonia	142	91	112	128	125	103	111	112	110
Lithuania	145	83	102	111	115	97	105	111	109
Latvia	137	77	95	110	110	85	91	94	93
Romania	89	54	68	76	89	80	81	81	81
Slovakia	155	105	115	124	131	118	112	113	113
Slovenia	194	168	174	171	164	134	122	122	120
Hungary	146	114	126	124	116	105	98	100	100

[a] Own estimates calculated using GDP growth rates for the first three or four quarters of 2015 and 2014 data for relative development levels.

Source: IMF (2005) for 1989; Eurostat (2016) for 2000–2015; own calculations.

As seen in Table 2.2, at the time of the EU's enlargement in 2004, the level of economic development in the EU15 was more than twice as high as in Poland on average (131%). Since its EU accession in 2004, Poland has narrowed its gap to the "old" EU countries in terms of development level by 74 percentage points, a rate of more than 6 p.p. a year. The process of real income convergence was the fastest with respect to Britain (96 p.p.), Greece (94 p.p.), and Ireland (88 p.p.). From 2010 to 2015 Poland narrowed its gap with the EU15 in the level of economic development by 21 percentage points on average; this process of convergence was fastest with respect to Greece (40 p.p.), Italy (29 p.p.), and Spain (23 p.p.).

Table 2.3. Development gap in new EU member countries vis-à-vis the EU15 average, 1989–2015 (GDP per capita in PPP, EU15 = 100)

Country	1989	2004	2010	2014	2015[a]
Poland	**38**	**43**	**57**	**62**	**64**
Bulgaria	47	30	40	43	44
Croatia	51	50	54	54	54
Czech Republic	75	69	73	78	80
Estonia	54	48	58	70	70
Lithuania	55	44	52	69	69
Latvia	52	41	46	59	59
Romania	34	30	42	51	52
Slovakia	59	50	67	71	72
Slovenia	74	75	77	76	77
Hungary	56	55	59	62	63

[a] Own estimates calculated using GDP growth rates for the first three quarters of 2015 and 2014 data for relative development levels.

Source: IMF (2005) for 1989; Eurostat (2016) for 2004–2015; own calculations.

As far as the new EU CEE member countries are concerned, Poland was the most successful in catching up with the region's wealthiest countries in 2010–2015. It narrowed its gap in the level of economic development with Slovenia by 13 p.p. and with the Czech Republic by 9 p.p. However, a process of real income divergence was at work as well: Poland's development gap vis-à-vis Estonia and Lithuania increased. At the same time, two other countries, i.e. Latvia and Romania, edged closer to Poland's development level.

As seen in Table 2.3, in 2015 Poland's GDP per capita in PPP terms stood at 64% of the EU15 average.[2] This was equivalent to a gain of 26 percentage points from 1989 to 2015, of which 21 points were gained since Poland's EU entry in May 2004. These trends can be attributed to a remarkable acceleration in Poland's real convergence process after EU accession. From 1990 to 2003, the gain was 0.5 p.p. per year on average; in 2004–2015 it quadrupled to nearly 2 p.p. annually.

Poland's growth and real convergence performance looks quite good compared with other new EU members from Central and Eastern Europe, particularly in the long term encompassing the systemic transformation process so far. From 1990 to 2015, Poland was the undisputed leader in catching up with the EU15 in terms of economic development. However, that changed after 2004. In the period following the EU's enlargement, the real convergence process was the fastest in Lithuania, which narrowed its income gap vis-à-vis the EU15 by 25 percentage points. Further down the list were Estonia, Slovakia, and Romania, each of which narrowed their income gaps by 22 p.p. In Poland, this process was not much slower (21 p.p.). From 2010 to 2015, Lithuania (17 p.p.) was the most successful in the convergence process, followed by Latvia (13 p.p.), Estonia (12 p.p.), and Romania (10 p.p.). Further down the list were the Czech Republic and Poland (each with 7 p.p.).

Income convergence between the EU11 and EU15

This subchapter intends to assess income convergence among the 11 Central and Eastern European (CEE) countries that joined the EU in 2004, 2007, and 2013: Poland, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia, and Slovenia (EU11). Convergence in these countries is analyzed in relation to the old EU members (EU15). This study is a follow-up to previous analyses on the subject published in earlier editions of this report (see e.g.: Matkowski and Próch-

[2] This indicator is based on the latest available statistics (February 2016) and is slightly different from the indicator adopted in the simulation projections of the convergence process in the next section of this chapter (63).

niak, 2015). The 2013 edition includes an analysis of regional convergence in regions across the EU (Matkowski and Próchniak, 2013). The methodology of the analysis is described in detail in the 2008 edition of the report (Próchniak, 2008).

This analysis covers the 1993–2015 period. All the calculations were also made for three subperiods, 1993–2000, 2000–2007, and 2007–2015, in order to assess the stability of the catching-up process over time. The calculations are based on the time series of real GDP per capita at purchasing power parity (PPP in $), extracted from the International Monetary Fund database (IMF, 2016). When converting nominal GDP per capita at PPP (in current prices) into real GDP per capita at PPP (in constant prices), we used the GDP deflator for the United States.

The results of testing β-convergence between the EU11 countries and the EU15 are presented in Table 2.4 and Figure 2.1. The convergence is analyzed among the 26 EU countries as well as between the EU11 and EU15 areas. The aggregated data for the two regions, EU11 and EU15, are weighted averages with variable weights reflecting the population of a given country included in a specific group in a given year.

Table 2.4. Regression results for β-convergence

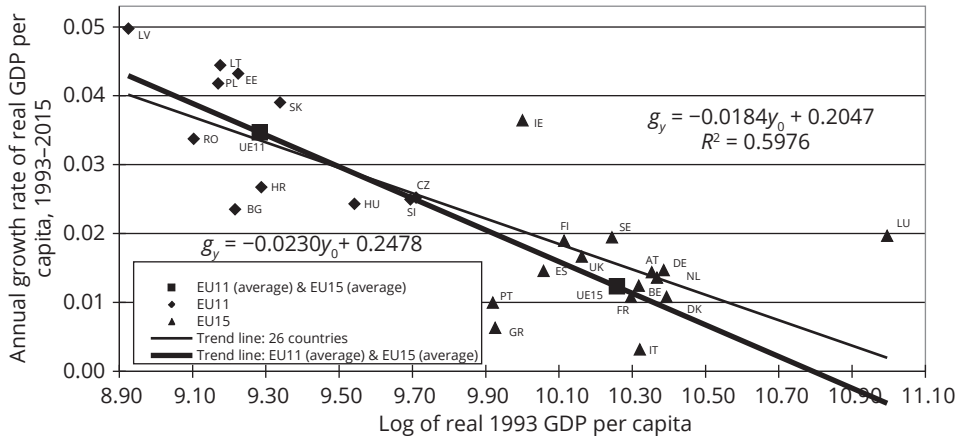
Period	α_0	α_1	*t*-stat. (α_0)	*t*-stat. (α_1)	*p*-value (α_0)	*p*-value (α_1)	R^2	β-convergence	β
26 countries of the enlarged EU									
1993–2015	0.2047	–0.0184	6.72	–5.97	0.000	0.000	0.5976	yes	0.0186
1993–2000	0.0722	–0.0039	1.14	–0.61	0.265	0.548	0.0152	no	–
2000–2007	0.4229	–0.0383	7.69	–7.03	0.000	0.000	0.6729	yes	0.0390
2007–2015	0.1673	–0.0160	2.64	–2.62	0.014	0.015	0.2228	yes	0.0162
2 regions (EU11 and EU15)									
1993–2015	0.2478	–0.0230	.	.	.	.	1.0000	yes	0.0232
1993–2000	0.1390	–0.0111	.	.	.	.	1.0000	yes	0.0112
2000–2007	0.4287	–0.0396	.	.	.	.	1.0000	yes	0.0404
2007–2015	0.3380	–0.0322	.	.	.	.	1.0000	yes	0.0328

Source: Own calculations.

The results confirm the existence of a clear-cut income-level convergence of the EU11 countries toward the EU15 throughout the 1993–2015 period. The catching-up process took place both among the 26 countries of the examined sample and between the two regions, EU11 and EU15. Countries with lower 1993 income levels recorded more rapid economic growth on average in 1993–2015 than those countries that were initially more developed. Since the Central and Eastern European economies were

less developed in 1993, these results demonstrate an evident catching-up process by the EU11 countries with Western Europe.

Figure 2.1. GDP per capita growth rate over the 1993–2015 period and the initial GDP per capita level



Source: Own calculations.

Figure 2.1 shows that the dispersion of the points representing individual countries is not far from the negatively sloped trend line. This results in a relatively high value of the *R*-squared coefficient, at 60%. Differences in the initial income level account for almost two-thirds of the differences in the economic growth rates for the 1993–2015 period.

The points marked in Figure 2.1 make it possible to compare the outcomes of individual countries and to assess changes in their competitive positions during the studied period. The highest GDP per capita growth rates were reported by the Baltic states and Poland. GDP per capita in Latvia, Lithuania, Estonia, and Poland grew at a rate exceeding 4% annually throughout the 1993–2015 period, although these countries' initial income levels were relatively low. Slovakia also recorded a rate of economic growth at about 4%, but its initial income level was slightly higher. The results shown by these countries helped strengthen convergence inside the group.

The position of Poland is favorable compared with other CEE countries. Poland ranked fourth in terms of the average rate of economic growth among the 26 EU countries in 1993–2015. Rapid economic growth in Poland was one of the factors leading to an improvement in the country's competitive position.

Aggregated data for the two regions, the EU11 and EU15, further confirm the existence of convergence in the 1993–2015 period. In Figure 2.1, the points representing

these two regions are marked by squares. The EU11 group as a whole recorded more rapid economic growth than the EU15 area, but the group's initial income level was much lower.

The β-coefficients, which measure the speed of convergence, stand at 1.86% for the 26 countries and at 2.32% for the two regions. The β-coefficients allow us to estimate the time needed to reduce the development gap between the studied countries. If the average growth patterns observed in 1993–2015 continue, the countries of the enlarged EU will need about 30–35 years to reduce the gap to their common hypothetical steady state by half. (The value is calculated as follows: $-\ln(0.5)/0.0186 = 37.3$ years and $-\ln(0.5)/0.0232 = 29.9$ years).

These results point to a slow catching-up process by the EU11 countries toward Western Europe. Based on these estimates, it is not expected that the income levels in Poland and other Central and Eastern European countries will become equal to those in Western Europe in the medium term.

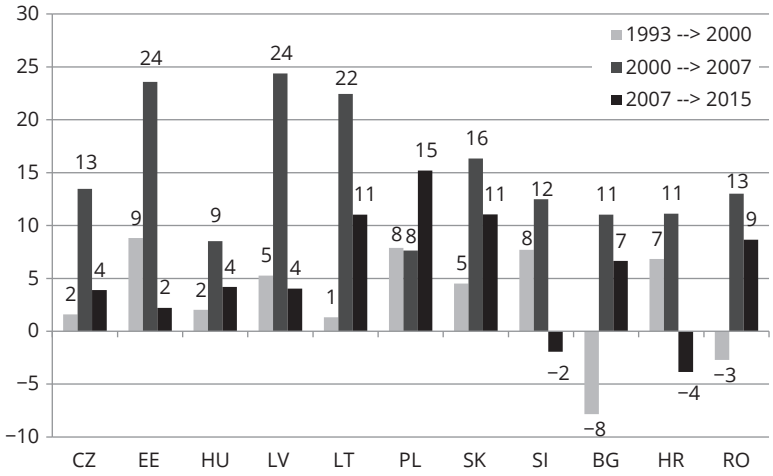
A closer look at the stability of the convergence process over time reveals that the speed of the catching-up process during the periods was highly differentiated. The high instability of the pace of convergence in the analyzed countries was driven by several factors, including the global crisis. In 1993–2000, in the sample of the 26 EU countries, there was no statistically significant decrease of the income gap between the CEE economies and the EU15 (on average for the whole group). For the 1993–2000 period, the slope of the trend line is negative but statistically insignificant. Such statistical outcomes of model estimation indicate a lack of convergence despite a negative slope of the trend line. The speed of convergence accelerated strongly from 2000 to 2007 in a trend that was undoubtedly driven by the EU's enlargement. The clear-cut convergence trend that occurred at the beginning of the first decade of the 21st century slowed down substantially after 2007. This was largely due to the global crisis.

The results of β-convergence presented here are the average results for the whole region. As shown in Figure 2.1, individual EU11 countries displayed different rates of GDP per capita growth and different degrees of convergence toward Western Europe. It is worth examining the nature of the catching-up process in individual EU11 countries toward the EU15 in the respective subperiods.

Figure 2.2 shows by how many percentage points the income gap of a given EU11 country to the EU15 area decreased in the 1993–2000, 2000–2007, and 2007–2015 periods. The data in Figure 2.2 confirm the conclusions drawn from the analysis of β convergence. Namely, for all the CEE countries except Poland, the income gap toward Western Europe closed at the fastest rate in 2000–2007. In the three Baltic states, the income gap in this period decreased by more than 20 percentage points. Poland was the only country that significantly improved its relative development level in the last

several years. In the 1993–2000 and 2000–2007 periods, Poland reduced its income gap with Western Europe by 8 p.p. This process accelerated from 2007 to 2015, with Poland narrowing its development gap by 15 p.p. during that period. EU funds probably played a major role in accelerating the pace of convergence in Poland after EU enlargement, leading to increased competitiveness in the Polish economy. Poland was a key recipient of funds from the EU's 2007–2013 budget. The amount of money granted by the EU in the form of various types of aid and structural funds positively influenced the Polish economy on both the demand and supply sides. As a result, Poland recorded relatively good economic growth figures in the last few years, becoming the only EU country to avoid recession during the global crisis. The EU's 2014–2020 budget sets aside more structural funds for new member states and should prove to be a major driver of convergence in Poland toward Western Europe in the coming years.

Figure 2.2. The reduction in individual EU11 countries' income gap toward the EU15 in the three consecutive subperiods[a]



[a] The changes are expressed in percentage points; in each year the EU15 GDP per capita at PPP is taken as a base equal to 100.
Source: Own calculations based on IMF data (IMF, 2016).

σ-convergence of the Central and Eastern European countries toward Western Europe is measured by changes in the standard deviation of the GDP per capita levels among the 26 EU countries as well as between the EU11 and EU15 areas. The results of the trend line estimation for standard deviations are shown in Table 2.5. Figure 2.3 offers a graphical illustration of the outcomes.

The data in Table 2.5 show that there existed σ-convergence both among the 26 EU countries and between the EU11 and EU15 areas during the time period as a whole.

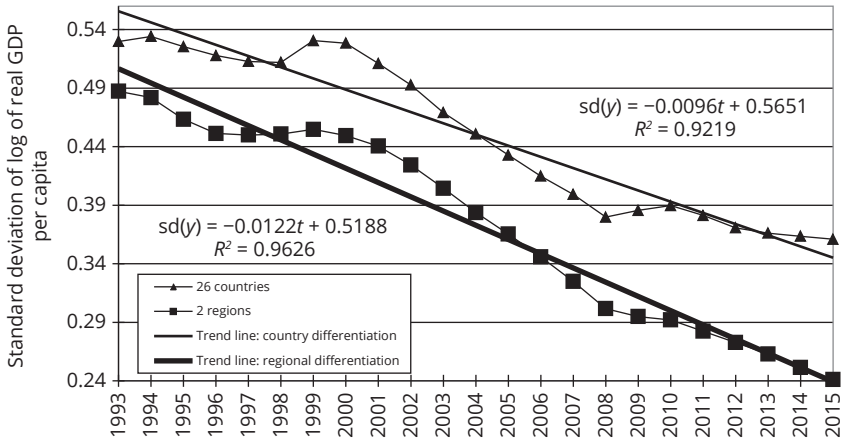
The slopes of both estimated trend lines are negative and statistically significant at high levels of significance (confirmed by *p*-values standing at 0.000). The high values of the *R*-squared coefficients (exceeding 90%) reflect a very good fit of empirical points to the trend line.

Table 2.5. Regression results for *σ*-convergence

Period	a_0	a_1	*t*-stat. (a_0)	*t*-stat. (a_1)	*p*-value (a_0)	*p*-value (a_1)	R^2	*σ*-convergence
26 countries of the enlarged EU								
1993–2015	0.5651	–0.0096	67.87	–15.74	0.000	0.000	0.9219	yes
1993–2000	0.5278	–0.0009	76.02	–0.64	0.000	0.548	0.0634	no
2000–2007	0.5471	–0.0188	323.38	–56.24	0.000	0.000	0.9981	yes
2007–2015	0.3991	–0.0043	96.74	–5.91	0.000	0.001	0.8330	yes
2 regions (EU11 and EU15)								
1993–2015	0.5188	–0.0122	72.31	–23.23	0.000	0.000	0.9626	yes
1993–2000	0.4846	–0.0052	69.99	–3.82	0.000	0.009	0.7087	yes
2000–2007	0.4749	–0.0184	152.87	–29.85	0.000	0.000	0.9933	yes
2007–2015	0.3279	–0.0095	104.60	–17.04	0.000	0.000	0.9765	yes

Source: Own calculations.

Figure 2.3. Standard deviation of GDP per capita, 1993–2015



Source: Own calculations.

Figure 2.3 shows the standard deviation of log GDP per capita levels. As we can see, income differences between the EU11 countries and the old EU members displayed

a downward trend. Income differences decreased the most obviously and consistently in the second part of the analyzed period, which means after 2000. In 2009–2010, due to the global economic crisis and decelerated economic growth in many rapidly developing countries, income differences among the 26 countries of the analyzed group increased, although the average data for the two regions do not support this evidence.

Closing the income gap: a forecast

This section presents a simulative forecast of the catching-up process between the CEE countries (EU11) and Western Europe (EU15). Our forecast (or, more precisely, simulation) will be made according to three hypothetical scenarios, which update our earlier forecasts presented in previous editions of this report.[3] The presentation is arranged similar to our previous income convergence forecasts in order to facilitate comparisons, but it uses new information, based on entirely new calculations and the newest input data.

The first scenario is a simple extrapolation of past growth trends. It assumes that individual CEE countries and the EU15 group as a whole will in the future maintain the average yearly growth rates of per capita GDP noted in the 1993–2015 period.[4] For most CEE countries, and particularly for Poland, this is a very optimistic scenario from the point of view of the period needed to close the income gap between the two groups of countries.

The second scenario is more analytical in nature. It is based on the newest medium-term GDP forecast released by the IMF (IMF, 2016) and on a long-term demographic forecast published by Eurostat (Eurostat, 2015). The latter assumes that during the next five years, CEE countries and the EU15 group as a whole will develop in line with the GDP growth forecast given by the IMF, and from 2021 on they will continue to grow at the constant GDP growth rate foreseen by the IMF for 2020. The assumed growth rates of total GDP have been transformed into per capita terms using Eurostat's population projections until 2080.[5] Compared with the first scenario, this second scenario

[3] See e.g. Matkowski and Próchniak, 2013, 2014, 2015.

[4] The GDP per capita growth rates quoted here refer to the growth of real GDP measured at constant prices in national currencies (euro in the case of EU15). The rates differ slightly from the growth rates calculated from PPS GDP data, which were used in the calculations made in the previous section of this paragraph.

[5] Due to the lack of comparable demographic data, we have assumed no further change in population numbers after 2080.

seems to be more realistic, though the assumptions about future GDP growth in the CEE countries are also quite optimistic.[6]

The common feature of both these scenarios is the assumption that the CEE countries will maintain some lead over the EU15 group as regards the growth of per capita GDP and, as a result, the catching-up process will continue. We shall focus on calculating the probable length of the period needed to close the income gap (against the average per capita GDP level in the EU15). The basic difference between the two variants is that the ratios of the GDP per capita growth rates between the CEE countries and the EU15 group in the first scenario are assumed to remain constant, at their average levels noted in the 1993–2015 period, while in the second scenario these ratios may change, according to the assumed future GDP growth and the expected population change.

In both of the above scenarios, the reference point in our forecast is the relative level of GDP per capita in 2015. The initial income gaps existing in 2015 (relative levels of per capita GDP) have been calculated using European Commission estimates (European Commission, 2015a). The period necessary to close the income gap depends on the initial income gap and the assumed future growth rate of per capita GDP. The algorithm used to calculate the length of the catching-up period was presented and discussed in an earlier edition of this report.[7]

Our calculations have been made in two versions as regards the estimation of the initial income gap and the expected length of the catching-up period. In the first version, the income gap is measured by the relative level of per capita GDP calculated at the purchasing power standard (PPS). In the second version, the income gap is measured by the relative level of per capita GDP calculated at current exchange rates (CER). Although such calculations are usually done with respect to per capita income calculated at PPS, in this analysis we will consider both ways of measuring the income gap (at PPS and CER) because it is still not certain if the estimates of per capita GDP at PPS for CEE countries are adequate and not overestimated.

It should be remembered that the EU15 group, used here as a reference frame to represent the average income level in Western Europe, is composed of 15 countries that belonged to the EU before its major enlargement in 2004 and 2007 (it does not correspond exactly to the group of 15 Western European countries that belong to the euro area, usually denoted as the EA15). The growth rates of per capita GDP for the EU15 group used in the first scenario refer specifically to this group, but under the second and third scenarios, because of the lack of data for this group, we used the

6 The assumed GDP growth rate for Poland after 2020 (3.6% per year) lies within the range viewed as feasible in several growth forecasts for the next 10–20 years, though it may not be sustained in the longer term due to the demographic barrier.

7 See Matkowski and Próchniak, 2012, p. 57.

GDP growth rates given by the indicated data sources for the euro area (EA19), which do not differ much from those for the EU15 group and are an acceptable substitute.

Table 2.6. Closing the income gap – scenario 1

Country	GDP per capita growth rate (%)	GDP per capita in 2015 (EU15 = 100)		Number of years necessary to reach the average level of GDP per capita in the EU15	
	1993–2015	PPS	CER	PPS	CER
Bulgaria	3.4	43	19	39	77
Croatia	2.8	54	31	39	75
Czech Rep.	2.5	79	47	18	59
Estonia	4.5	69	47	12	24
Hungary	2.4	64	33	38	94
Latvia	5.0	59	38	14	26
Lithuania	4.6	69	38	11	29
Poland	**4.2**	**63**	**33**	**16**	**38**
Romania	3.5	50	24	31	64
Slovakia	4.0	72	44	12	30
Slovenia	2.5	77	56	20	45
EU15	1.2	100	100	–	–

Source: Authors' calculations based on data from Eurostat (2016) and the European Commission (2015a), supplemented where necessary by some auxiliary data from the IMF (2016).

Table 2.7. Closing the income gap – scenario 2

Country	GDP growth rate (%)		GDP per capita in 2015 (EU15 = 100)		Number of years necessary to reach the average level of GDP per capita in the EU15	
	2015–2020	2021–	PPS	CER	PPS	CER
Bulgaria	2.1	2.5	43	19	54	139
Croatia	1.7	1.8	54	31	176	.
Czech Rep.	2.4	2.2	79	47	37	122
Estonia	3.2	3.4	69	47	16	33
Hungary	2.2	2.1	64	33	56	184
Latvia	3.8	4.0	59	38	15	28
Lithuania	3.2	3.6	69	38	10	28
Poland	**3.6**	**3.6**	**63**	**33**	**20**	**46**
Romania	3.4	3.3	50	24	33	70
Slovakia	3.3	3.1	72	44	18	42
Slovenia	2.0	2.0	77	56	47	122
EU15	1.6	1.6	100	100	–	–

Source: Authors' calculations based on data from Eurostat (2016), the European Commission (2015a) and the IMF (2016).

The assumptions made in the first two scenarios and the results of our calculations are presented in Table 2.6 and Table 2.7. The first column in both tables shows the assumed growth rates of per capita GDP or total GDP; the next two columns give the initial levels of GDP per capita at PPS and CER relative to the average level in the EU15; and the last two columns indicate the number of years necessary to reach the average level of per capita GDP in the EU15 if the initial per capita GDP level is measured at PPS or at CER.

In 2015, GDP per capita in all the CEE countries belonging to the EU was much lower than the EU15 average. The lowest per capita GDP was noted in Bulgaria (43% of the EU15 average at PPS and 19% at CER) and Romania (50% and 24% respectively), while the highest levels were seen in Slovenia (77% at PPS and 56% at CER) and in the Czech Republic (76% and 47%). In Poland, per capita GDP in 2015 accounted for 63% of the EU15 average when calculated at PPS and 33% when calculated at CER. For all the CEE countries, the per capita GDP values calculated at PPS are much higher than those converted at CER. Consequently, the period necessary to close the income gap calculated at PPS is considerably shorter than the period required for closing the income gap calculated at CER.

Scenario 1 is a simple extrapolation of the past trends of GDP per capita, assuming that the CEE countries (EU11) and the EU15 group will maintain the average yearly growth rates of per capita GDP recorded in the 1993–2015 period. Under this assumption, individual CEE countries would need 11 to 39 years to reach the average level of per capita GDP seen in the EU15 group if the initial income gap is calculated at PPS, and 24 to 94 years if it is calculated at CER. The three Baltic states, Estonia, Latvia, and Lithuania, along with Slovakia and Slovenia, would have the best catching-up prospects if they continued to develop according to their past trends. Estonia would need only 12 years at PPS or 24 years at CER to reach the average income level of the EU15. Lithuania would need 11 or 29 years for the same, and Latvia would take 14 or 26 years. Poland would need 16 years if the initial income gap is calculated at PPS or 38 years if it is calculated at CER. For Slovakia, the respective catching-up periods are 12 or 30 years, for Slovenia they are 20 or 45 years, and for the Czech Republic 18 or 59 years. Hungary, Romania, Bulgaria, and Croatia are in the worst positions. Hungary, keeping up its earlier growth trend, would need 38 years to achieve the average income level at PPS seen in the EU15, or 94 years if it is measured at CER. Romania would need 31 or 64 years, and Bulgaria together with Croatia would wait 39 or 75–77 years.

The time required to close the income gap against the EU15 under scenario 2 differs from that obtained in scenario 1 because the future GDP growth rates assumed here differ from past trends. For most CEE countries, the catching-up period turns out to be longer than in the first scenario. The convergence period becomes a little

shorter only for Lithuania (10 years at PPS and 28 years at CER). For the remaining countries in the group, the catching-up period does not change much or it becomes longer. For Latvia and Estonia, the expected catching-up period rises to 15–16 years at PPS or 28–33 years at CER. For Slovakia, it rises to 18 or 42 years respectively, and for the Czech Republic and Slovenia to 37 and 47 years at PPS or 122 years at CER. For Romania, the catching-up period remains almost the same: 33 years at PPS or 70 years at CER. For Hungary, Bulgaria, and Croatia, the prospects of full income convergence with Western Europe are very remote. For Hungary and Bulgaria, the catching-up period is about 55 years at PPS and 140 or 180 years respectively at CER. In the case of Croatia, only the first figure (at PPS) can be assessed reasonably: it is 176 years, while the alternative estimate (at CER) jumps into a very distant future and may be meaningless. Poland is placed in the middle of the CEE group in this respect, with a chance to close the income gap toward Western Europe within 20 years if the initial income gap is calculated at PPS, or 46 years if it is calculated at CER.

The above estimates of the catching-up period in terms of per capita GDP measured at PPS should be treated as minimal because they have been made at constant prices and exchange rates noted at the starting point, on the assumption that the current price differentials between the CEE and EU15 will not change. In fact, due to the gradual equalization of price levels within the EU28, the purchasing power of the future income earned in any of the CEE countries may turn to be lower than expected on the basis of constant price calculations, with a resulting increase in the period needed to close the income gap.

In addition to the purely extrapolative forecast presented in scenario 1, which is based on the growth trends observed in the whole transition period of 1993–2015 – or instead of this forecast – we could also develop a similar extrapolative forecast of income convergence based on the growth pattern observed in the 2004–2015 period, after the EU's enlargement to include CEE. The retrospective analysis of the catching-up process, presented in the preceding section, brings some empirical evidence of the acceleration of income convergence between the CEE countries and Western Europe after their EU accession. However, identification of the specific effect of integration on the speed of convergence would require further research. The growth patterns seen in the last 10 years, influenced by the global financial and economic crisis as well as the debt crisis in the euro area, were rather atypical and are unlikely to be repeated (let us believe so) in the years to come. Therefore, the average growth rates noted by various EU countries in that period and the resulting growth differentials cannot be directly applied to any reasoning about possible future developments. For instance, Poland, thanks to its continuous output growth, has noted a substantial increase in its real GDP volume since 2004. This was reflected in a relatively high GDP per capita

growth rate of 3.8% per year, whereas the respective average growth rate for the EU15 group in the same period was 0.3%, leading to a growth differential of almost 13:1 between Poland and the EU15. Such a huge difference in the growth rates between the member countries of the same integrated economic area cannot be sustained in the long run. Therefore, the growth patterns seen during the period after Poland's EU accession cannot be used to forecast the future course of the convergence process.

We have also analyzed some other scenarios of the convergence process, including some alternative extrapolation variants with longer and shorter backward observation periods as well as some other variants of analytical forecasts, with different assumptions as to the future growth rates in the CEE countries and in the EU15 group.[8] In all the analyzed variants, the period necessary for Poland to close the income gap toward the EU15, measured at PPS and adjusted for the 2015 starting point, ranged from 15 to 20 years. We can therefore conclude that, under all realistic assumptions, the minimum period necessary for Poland to catch up with the EU15 in terms of the average PPS income level is now 15–20 years.

Thus, expectations voiced until recently by some optimistic authors[9] – that Poland could reach the income level seen in Western Europe within 10 years – were entirely unrealistic. This is simply impossible, both economically and mathematically.[10] Therefore, we have to accept that Poland may be capable of closing the development and income gap with Western Europe, but this would require a lot of time and effort. On the other hand, we cannot exclude the possibility of a considerable slowdown in future growth in Poland and other CEE countries, which could lower the rate of the convergence process and eventually reverse it into divergence. Such a possibility is implied by the third scenario, presented below.

Scenario 3 is based on a long-term growth forecast for EU countries up to 2060, drawn up under the auspices of the European Commission (European Commission, 2015b). This forecast is based on a thorough analysis of the unfavorable demographic trends and their impact on employment and labor productivity, as well as on the expected changes in total factor productivity (TFP). Under the forecast, beginning around 2030, economic growth in Poland and most other CEE countries will slow down, mainly as a result of population aging and the outflow of young working-age people seeking jobs and better living conditions abroad. This would lead to a gradual decrease in the per capita GDP growth rate differential between the CEE countries and Western Europe up to the complete disappearance of any growth advantage, and even

8 Cf. Matkowski 2010, 2013, 2015; Matkowski and Próchniak 2013, 2014, 2015; Matkowski, Próchniak, Rapacki, 2013, 2014.

9 See e.g. Rybiński, 2009.

10 A formal proof can easily be made – see e.g. Matkowski and Próchniak, 2012, p. 62.

a reversal of the growth ratio between the two groups, with very low growth rates. One of the consequences of the changing growth patterns would be a decrease in the rate of income convergence between the two groups of countries, up to the complete reversal of the convergence process (at least in some CEE countries) and a switch into divergence, i.e. a renewed widening of the income gap. This forecast is highly pessimistic not only because, for most CEE countries, it practically excludes the chance of closing the income gap toward Western Europe within the lifetime of a single generation, but also because it foresees very slow growth in real income and wealth (about 1.5%–2% a year in terms of per capita GDP) over the next 50 years for both the EU15 and most CEE countries.

The implications of this scenario for the catching-up process between the CEE countries and Western Europe are shown in Table 2.8. Unlike the first two scenarios, which indicated the length of the period needed to close the income gap, this scenario – because of the stopping or reversal of the convergence process within the forecast horizon – gives only the relative income levels foreseen at the beginning of the consecutive decades and the minimum size of the income gap at the turning point from convergence to divergence (for the countries affected by such a switch). For the sake of simplicity, the relative income levels illustrating the size of the income gap in the indicated years are given only in terms of GDP per capita calculated at PPS. The alternative estimates of the relative income calculated at CER would be much lower. The starting point in this scenario again is 2015. The initial income gap was calculated against the EU15 average, but the future GDP per capita growth rates for the reference group were assumed to be equal to the EA19 average, as given in the European Commission forecast.

Table 2.8 shows that starting about 2030, due mainly to unfavorable demographic trends (including expected migration), for most CEE countries the growth advantage over Western Europe will diminish or disappear completely. In the second half of the forecast period, four or five countries in the group, including Poland, will switch from convergence to divergence, while most other countries will stay at about the same relative income level against the EU15 that they have already reached, without any chance of closing the remaining income gap (at least not until 2060). No CEE country may close its income gap toward Western Europe within the next 45 years. Only Lithuania will be quite close to this target just before 2060. Slovakia will approach Western income standards much sooner, around 2040, but after that date its income gap with Western Europe will increase. The least developed countries in the group, Croatia, Bulgaria, and Romania, will cease reducing their income gap with Western Europe around 2050 or somewhat later, stopping at 60% to 65% of the average income level seen in the EU15. Hungary will probably remain at about 80% of the EU15 average, Slovenia and Estonia will reach no more than 85%, and the Czech Republic will stay

at 90% of the average income seen in the EU15. Poland is expected to reach 84% of the average income level in the EU15 around 2045, but after that date its income gap with Western Europe will begin to increase. A renewed divergence can also appear in Slovakia, Hungary, Romania, and Estonia (though, in this last case, it will be a halt rather than reversal of convergence). Of course, this scenario does not indicate the further development of the convergence vs. divergence process after 2060, which is beyond the time scope of the economic and demographic forecast underlying this scenario.[11]

Table 2.8. Closing the income gap – scenario 3

Country	GDP per capita growth rate, 2015–2060 (%)	Income gap (GDP per capita at PPS, EU15 = 100)						The minimum income gap
		2015	2020	2030	2040	2050	2060	
Bulgaria	2.0	43	47	53	56	58	58	.
Croatia	1.7	54	55	57	60	63	65	.
Czech Rep.	1.8	79	83	87	90	90	90	.
Estonia	1.8	69	73	81	85	85	84	85(2046)
Hungary	1.8	64	67	75	78	79	77	79(2051)
Latvia	2.3	59	66	80	86	87	88	.
Lithuania	2.1	69	75	87	90	93	96	.
Poland	**1.9**	**63**	**68**	**79**	**84**	**83**	**79**	**84(2044)**
Romania	2.0	50	54	60	62	65	65	65(2054)
Slovakia	2.0	72	78	93	97	95	92	97(2038)
Slovenia	1.6	77	80	83	84	83	84	.
EU15	1.4	100	100	100	100	100	100	.

Source: Authors' calculations based on data from Eurostat (2016) and the European Commission (2015a, 2015b).

One can hope that this depressing scenario, precluding any chance of bridging the development and income gap between CEE and Western Europe within one generation, will not come true. Nevertheless, the possibility of such undesirable developments, under *laissez-faire* conditions, cannot be ignored. It should be noted that the reliability of the alarming forecast announced by the European Commission is supported by similar results obtained in another long-term growth projection prepared by the OECD (OECD, 2012). In order to prevent this scenario, well-coordinated, multidirectional efforts must be made as soon as possible by the governments of the

[11] Our previous results for this scenario, based on an earlier version of the European Commission's long-term economic forecast, were even more depressing, suggesting a possible reversal of the convergence process in all the CEE countries except Bulgaria (cf. Matkowski, 2013; Matkowski, Próchniak, 2013, 2014; Matkowski, Próchniak, Rapacki, 2013, 2014).

countries concerned, accompanied by action as part of common European policy, aimed at overcoming the emerging threats to future economic growth and ensuring continuous and healthy development.

In the case of Poland, a complex long-term development program is needed as a guideline for government socioeconomic policy, dedicated to the maintenance and acceleration of economic growth. Such a program should focus on correcting unfavorable demographic trends, creating better institutional and financial conditions for enterprise development, stimulating investment and job creation, and ensuring more even regional development by taking into account the needs and abilities of local communities. Other priorities include the development of selected modern industries, further expansion and modernization of the infrastructure, better use of existing labor and material resources, and promotion of education, knowledge, and innovativeness – all crucial factors of economic growth in a highly competitive international environment.[12]

Poland's new long-term development program should be consistent with the sustainable development strategy adopted by the European Union,[13] but it must focus on solving the most important problems that endanger further development of the Polish economy. The ultimate aim of such a program should be to ensure further satisfactory growth of the Polish economy in order to improve the quality of life and well-being of all citizens. The "Plan for Responsible Development" recently adopted by the government (Ministerstwo Rozwoju, 2016), outlining the strategy of Poland's socioeconomic development may be a step in the right direction, but the future will show what kind of results it will deliver.

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[12] For more on the implications of this scenario for Poland's future development see: Rapacki, 2012, Rapacki and Próchniak, 2013, Matkowski, 2013, 2015; Matkowski, Próchniak, Rapacki, 2013, 2014.

[13] Cf. *Sustainable Development in the European Union …* (Eurostat, 2015).

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Chapter 3

Income Inequality and the Risk of Poverty and Social Exclusion in Poland Compared with Other EU Countries. Decomposition of Income Inequality by Income Source and Socioeconomic Group

Patrycja Graca-Gelert

This chapter seeks to outline key income inequality trends and the risk of poverty in Poland compared with other European Union countries from 2005 to 2014. It also focuses on: 1) the role of the main sources of income in shaping income inequality and 2) the decomposition of income disparities by socioeconomic group in Poland from 2005 to 2013. The analysis does not cover 2015 because of the lack of data for that year at the time of publication.

Income inequality and poverty in Poland from 2005 to 2014[1]

Income disparities in Poland have generated a lot of controversy in recent years. This is mainly because the debate on income inequality lacks a common denominator; everyone seems to understand the concept of income inequality in a different way. Available data provide a mixed picture of income disparities, depending on the source. The time series shown in Figure 3.1 comes from several sources and reflect two different measures of income dispersion for Poland. There are clear differences in the level of income inequality as well as in the trends involved. Two time series – the S80/S20 quantile ratio and the Gini coefficient calculated on the basis of EU-SILC (Eurostat[2])

[1] The data in this section are for the 2005–2014 period – not 2010–2014 – because they also apply to calculations based on household budget surveys (HBS) conducted by Poland's Central Statistical Office (GUS). This source was also used for calculations for the same period in the final section of this chapter.

[2] Both the GUS household budget survey data and the EU-SILC data are collected by GUS. These are two different data sources based on different data collection and processing methodologies.

data – indicate a downward trend in income inequality in the 2005–2014 period. By contrast, the GUS GINI series and the PGG Gini coefficient, both calculated on the basis of HBS data, did not show a well-defined direction of change in those years. In addition, there is a distinct difference in the level of income disparities between these data.

Researchers analyzing income inequality should take into account several factors that influence the usefulness, reliability, and quality of such analysis. These include the selection of the definition of income (or another aspect of inequality, such as consumption, expenditure, or salaries), selection of the unit of analysis (household, person), and the choice of equivalence scale (per capita or equivalent income). In addition to these aspects, a significant factor affecting conclusions about income inequality is the choice of an appropriate measure of dispersion (different properties and axioms of the measures that could lead to different rankings of income distributions), and the choice of the data source to calculate income inequality (differences in the methodology, in data collection methods, in the frequency of data collection, etc.). The data sources or some parts of the data can also vary in quality.[3]

The choice of the elements mentioned above depends on the purpose of study and on the research question because each choice ultimately leads to an analysis of different distributions of income (for example, distribution of available household income per capita or distribution of equivalent disposable income of individuals) and to divergent conclusions.

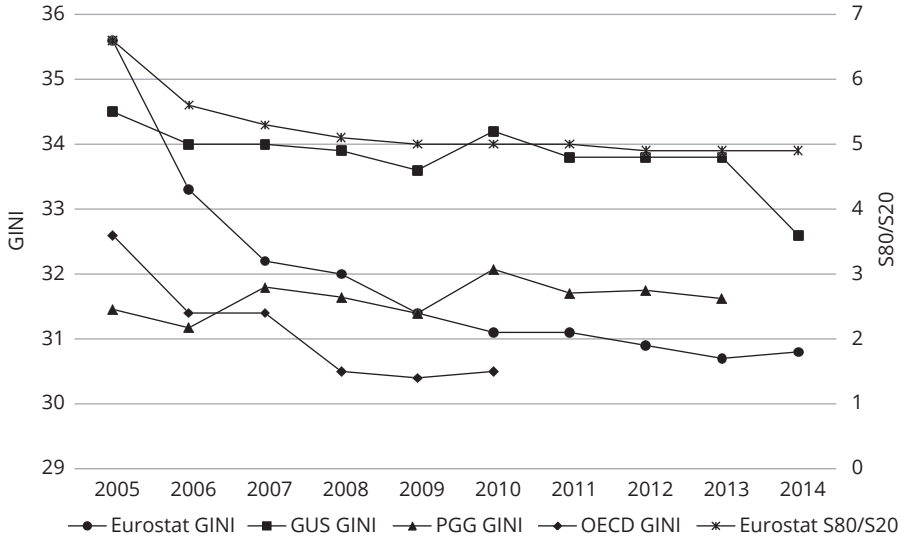
Regardless of these issues, the available data show that income disparities have not increased in Poland since 2005. In fact, the data indicate a downward trend in inequality.

As in the case of income inequality, there are many ways of measuring poverty and the risk of poverty. Poland's Central Statistical Office uses three key poverty measures: the subsistence poverty rate, the statutory poverty rate, and the relative poverty rate.[4] The first two indicators are absolute poverty measures. The subsistence poverty rate is based on the extreme poverty line calculated by the Institute of Labor and Social Studies. Expenditures below the extreme poverty line lead to biological deprivation. The statutory poverty line is the amount of income that entitles a household to social benefits. The relative poverty line is equivalent to 50% of the mean monthly household expenditure (GUS 2014b, p. 10).

[3] In this chapter, we do not discuss further issues, for example those related to the precision or reliability of the measurement of income inequality (resulting, for instance, from the lack of response of households selected for the HBS or from the precision of weights used to generalize survey findings to cover the entire population).

[4] We omit here yet another method of measuring poverty used by GUS: subjective poverty.

Figure 3.1. Income inequality trendsa in Poland, 2005–2014



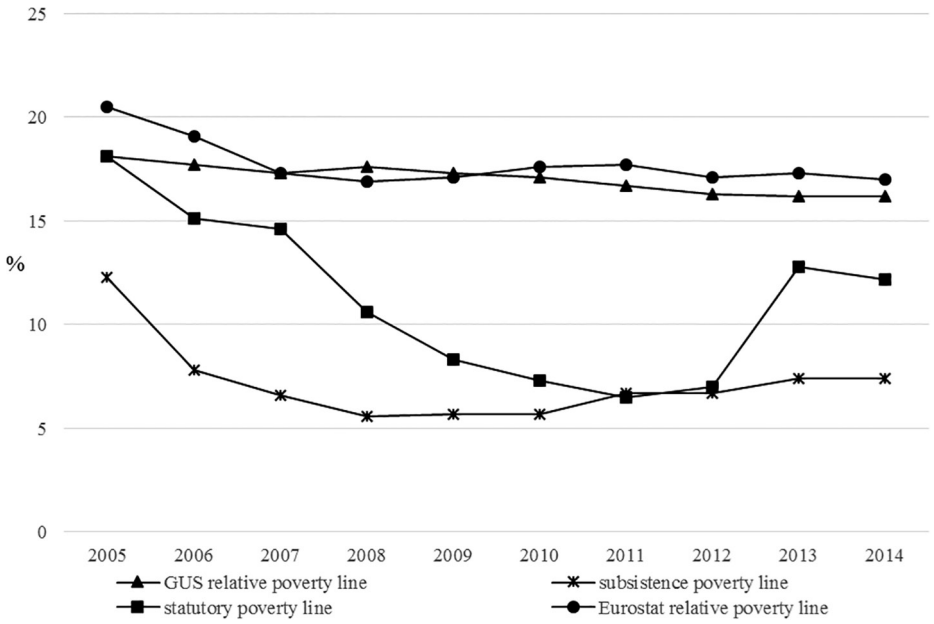
[a] Eurostat – equivalized disposable household income (modified OECD equivalence scale, with the person as the unit of reference); GUS – available per capita household income (with the household as the unit of reference), PGG GINI – equivalized disposable household income (modified OECD equivalence scale; with the household as the unit of reference), OECD GINI – equivalized disposable household income (root scale equivalence; with the household as the unit of reference).

Source: Eurostat; GUS, 2015a, Table 5, p. 287; WIID3b_1; own calculations based on GUS HBS.

Figure 3.2 includes a fourth measure of poverty and the risk of poverty, in addition to the three measures mentioned above: the basic risk-of-poverty rate used by Eurostat. It is a relative risk-of-poverty rate that is defined differently than in the case of the GUS relative poverty rate. Eurostat sets the risk-of-poverty threshold at 60% of median equivalized income.

In 2014, Poland's poverty measures either dropped slightly or stabilized compared with the previous year. Overall, to sum up the entire period shown in the graph, the scale of poverty and the risk of poverty generally decreased in 2014 compared with 2005, but between those two years poverty varied considerably, sometimes rising slightly. The only exception is the statutory poverty rate, which increased significantly from 2012 to 2013. This is because the social intervention threshold changed in October 2012, rather than because the living conditions of households changed (GUS 2014b, p. 3).

Figure 3.2. Poverty and the risk of poverty for different poverty lines in Poland, 2005–2014



Source: Eurostat; GUS, 2015b, Figure 1, p. 1.

Income inequality and the risk of poverty in Poland compared with other EU countries in 2010–2014

The year 2014 was another year in which the European Union saw income inequality increase. In comparison with 2013, this increase was 0.5 percentage points (0.1 p.p. in 2013 over 2012). Only five of the EU's 28 countries saw income disparities decrease. The greatest increase in income disparities occurred in Cyprus (2.4 p.p.), Slovakia (1.9 p.p.), and Britain (1.4 pp). The greatest decrease was recorded in Luxembourg (–1.7 p.p.), France (–0.9 p.p.), and Croatia (–0.7 p.p.). During the last five years income inequality has undergone more far-reaching changes, which have not always been monotonic for individual countries. The greatest increase in income disparities from 2010 to 2014 took place in Cyprus (4.7 p.p.), Hungary (3.8 p.p.), and Bulgaria (2.2 p.p.), while the greatest decrease occurred in Lithuania (–2.0 p.p.), Croatia (–1.4 p.p.), and Britain (–1.3 p.p.). Similar, though not identical, trends were noted in the case of the S80/S20 quantile ratio, but it should be remembered that this

measure, unlike the Gini coefficient, does not take into account the dispersion across the entire income distribution.

Table 3.1 also contains income inequality data without taking into account social transfers, including and excluding pensions from social transfers. A comparison of these data with the Gini coefficient calculated for total income makes it possible to assess the extent to which social transfers in different countries contribute to reducing income disparities. Of special note are countries such as Portugal, Greece, Germany, Denmark, and Sweden, where social transfers (including pensions) play a substantial role. By far the smallest role is played by social transfers in Cyprus.

Table 3.1. Income disparities[a] in Poland compared with other EU countries, 2010, 2012 and 2014[bc]

Country/Region	2010	2012	2014	2014		
	Gini coefficient (%) after social transfers			Gini coefficient (%) before social transfers excluding pensions	Gini coefficient (%) before social transfers including pensions	S80/S20
Slovenia	23.8	23.7	25.0	31.0	44.3	3.7
Czech Republic	24.9	24.9	25.1	29.6	45.0	3.5
Sweden	24.1	24.8	25.4	33.4	55.0	3.9
Finland	25.4	25.9	25.6	34.1	47.5	3.6
Belgium	26.6	26.5	25.9	34.5	47.6	3.8
Slovakia	25.9	25.3	26.1	30.0	42.8	3.9
Netherlands	25.5	25.4	26.2	32.3	45.8	3.8
Denmark	26.9	28.1	27.5	38.0	53.0	4.1
Austria	28.3	27.6	27.6	33.9	47.8	4.1
Malta	28.6	27.1	27.7	32.4	44.1	4.0
Hungary	24.1	26.9	27.9	34.6	51.5	4.2
Luxembourg	27.9	28.0	28.7	35.5	48.0	4.4
France	29.8	30.5	29.2	35.1	49.7	4.3
Ireland	30.7	29.9	30	46.3	54.5	4.5
Croatia	31.6	30.9	30.2	36.5	48.6	5.1
Germany	29.3	28.3	30.7	37.1	57.7	5.1
Poland	**31.1**	**30.9**	**30.8**	**34.0**	**47.9**	**4.9**
EU28	30.4	30.4	31.0	36.4	51.8	5.2
United Kingdom	32.9	31.3	31.6	40.1	54.0	5.1
Italy	31.2	31.9	32.7	35.2	49.4	5.9
Estonia	31.3	32.5	32.9	36.3	48.0	5.5
Greece	32.9	34.3	34.5	37.0	61.0	6.5
Portugal	33.7	34.5	34.5	38.7	60.4	6.2

Country/Region	2010	2012	2014	2014		
	Gini coefficient (%) after social transfers			Gini coefficient (%) before social transfers excluding pensions	Gini coefficient (%) before social transfers including pensions	S80/S20
Spain	33.5	34.2	34.7	39.9	50.9	6.8
Romania	33.3	33.2	34.7	37.7	51.0	7.2
Cyprus	30.1	31.0	34.8	37.5	46.7	5.4
Lithuania	37.0	32.0	35.0	39.4	51.8	6.1
Bulgaria	33.2	33.6	35.4	38.0	50.8	6.8
Latvia	35.9	35.7	35.5	38.5	50.3	6.5

[a] disposable income per equivalent unit; [b] in the case of Estonia and Ireland all the dispersion measures for 2014 come from 2013; [c] The countries in the table are sorted by the ascending scale of income inequalities measured by the Gini coefficient after social transfers in 2014.

Source: Eurostat.

As in the case of income inequalities, in 2014 the risk of poverty increased in the EU28 as a whole (by 0.6 p.p.). The greatest increase in the risk of poverty compared with the previous year occurred in Romania (3 p.p.), while the greatest decrease took place in Lithuania (by –1.5 p.p.). The relative poverty rate, which is linked with the concept of income inequality, is the measure of poverty that guarantees the greatest comparability among EU28 countries, so the ranking of countries according to the ascending risk-of-poverty rate is similar to the ranking of countries by increasing income inequalities. There are, however, several exceptions. The ranks of Slovenia, Sweden, Belgium, and Croatia in terms of income inequality are at least seven notches better than these countries' respective ranks in the risk-of-poverty league table. The opposite is true of France and Cyprus, where the difference is six and 16 notches respectively.

The greatest effectiveness in reducing the risk of poverty through social transfers (including pensions) is noted in Greece, Hungary, and Ireland. In Cyprus, Malta, and Estonia, the role of social transfers in reducing poverty is the smallest. There is a clear negative correlation between the risk-of-poverty rate and the absolute poverty threshold. This means that in general, the larger the proportion of a country's population is at risk of poverty, the smaller the poverty threshold. That makes poverty particularly onerous in countries with a low absolute poverty threshold.

Table 3.2. The risk of poverty[a] in Poland compared with other EU countries, 2010, 2012 and 2014[be]

Country/Region	2010	2012	2014	2014			
	Risk-of-poverty rate after social transfers			Risk-of-poverty rate before social transfers excluding pensions	Risk-of-poverty rate before social transfers including pensions	Poverty threshold[c] PPP, €	Depth of poverty[d]
Czech Republic	9.0	9.6	9.7	17.2	37.1	13,974	18.0
Netherlands	10.3	10.1	11.6	21.3	37.8	23,695	16.9
Denmark	13.3	13.1	11.9	26.8	41.5	25,110	18.8
Slovakia	12.0	13.2	12.6	19.6	38.0	12,355	29.0
Finland	13.1	13.2	12.8	27.6	43.3	24,252	13.9
France	13.3	14.1	13.3	24.0	44.5	24,377	16.4
Ireland	15.2	15.7	14.1	38.5	49.8	20,119	17.4
Austria	14.7	14.4	14.1	25.4	43.8	27,294	20.1
Cyprus	15.6	14.7	14.4	24.6	36.5	19,860	18.5
Slovenia	12.7	13.5	14.5	25.1	42.5	18,053	22.0
Hungary	12.3	14.0	14.6	26.3	49.9	9,632	22.4
Sweden	12.9	14.1	15.1	28.5	44.0	25,973	20.4
Belgium	14.6	15.3	15.5	27.5	43.1	24,684	18.8
Malta	15.5	15.1	15.9	23.8	37.8	19,531	17.8
Luxembourg	14.5	15.1	16.4	27.6	44.8	35,621	16.3
Germany	15.6	16.1	16.7	25.0	44.1	24,317	23.2
United Kingdom	17.1	16.0	16.8	29.3	43.5	21,335	19.6
Poland	**17.6**	**17.1**	**17.0**	**23.1**	**43.8**	**12,045**	**23.2**
EU28	16.4	16.8	17.2	26.0	44.6	.	24.7
Estonia	15.8	17.5	18.6	25.4	39.5	10,845	21.5
Lithuania	20.5	18.6	19.1	27.5	43.5	9,570	22.7
Croatia	20.6	20.4	19.4	29.9	45.2	9,756	27.9
Portugal	17.9	17.9	19.5	26.7	47.8	12,758	30.3
Italy	18.2	19.4	19.6	25.0	45.9	19,322	28.1
Latvia	20.9	19.2	21.2	27.0	41.7	9,223	23.6
Bulgaria	20.7	21.2	21.8	27.3	46.2	8,510	33.2
Greece	20.1	23.1	22.1	26.0	52.3	10,849	31.3
Spain	20.7	20.8	22.2	31.1	47.5	17,886	31.6
Romania	21.1	22.6	25.4	28.5	48.5	5,122	35.2

[a] relative poverty rates for a poverty line at 60% of median equivalized income. [b] The 2014 data for Estonia and Ireland refer to 2013. [c] The poverty threshold has been set for a household consisting of two adults and two children under 14 years of age.[d] The relative at-risk-of-poverty gap, which shows the difference between the median equivalized disposable income of people below the at-risk-of-poverty threshold and the at-risk-of-poverty threshold – in this case 60% of median equivalized disposable income – expressed as a percentage of this threshold. [e] The countries in the table are sorted by the ascending value of the risk-of-poverty rate after social transfers in 2014.

Source: Eurostat.

As in previous editions of this report, below we present the key indicators of the Europe 2020 strategy applying to the fight against poverty and social exclusion.[5] Unlike in the case of the risk of poverty and income inequality, the risk of poverty or social exclusion (aggregated indicator) decreased in the European Union from 2012 onward. In 2014, the percentage of people at risk of poverty or social exclusion declined by 0.1 p.p. in comparison with 2013. This indicator decreased the most in four post-socialist countries compared with 2013: Bulgaria (–7.9 p.p.), Lithuania (–3.5 p.p.), and Latvia and Hungary (each by –2.4 p.p.). The most noticeable increase in the aggregate risk-of-poverty or social exclusion rate was recorded in Spain (1.9 p.p.) and Finland (1.3 p.p.).

Table 3.3. The key targets of the Europe 2020 strategy in the fight against poverty and social exclusion: Poland compared with other EU countries, 2010, 2012 and 2014[a f]

Country/Region	2010	2012	2014	2014		
	People at risk of poverty or social exclusion[b] (%)			Severe material deprivation[c] (%)	Very low work intensity[d] (%)	Risk of poverty[e] (%)
Czech Republic	14.4	15.4	14.8	6.7	7.6	9.7
Netherlands	15.1	15.0	16.5	3.2	10.2	11.6
Sweden	15.0	15.6	16.9	0.7	6.4	15.1
Finland	16.9	17.2	17.3	2.8	10.0	12.8
Denmark	18.3	19.0	17.8	3.2	12.1	11.9
Slovakia	20.6	20.5	18.4	9.9	7.1	12.6
France	19.2	19.1	18.6	4.8	9.7	13.3
Luxembourg	17.1	18.4	19.0	1.4	6.1	16.4
Austria	18.9	18.5	19.2	4.0	9.1	14.1
Slovenia	18.3	19.6	20.4	6.6	8.7	14.5
Germany	19.7	19.6	20.6	5.0	10.0	16.7
Belgium	20.8	21.6	21.2	5.9	14.6	15.5
Estonia	21.7	23.4	23.5	6.2	8.4	18.6
Malta	21.2	23.1	23.8	10.2	9.8	15.9
United Kingdom	23.2	24.1	24.1	8.3	12.2	16.8
EU28	23.7	24.7	24.4	9.0	11.0	17.2
Poland	**27.8**	**26.7**	**24.7**	**10.4**	**7.3**	**17.0**
Lithuania	34.0	32.5	27.3	13.6	8.8	19.1
Cyprus	24.6	27.1	27.4	15.3	9.7	14.4

[5] The notion of social exclusion and how it is measured is discussed in greater detail in the previous edition of this report.

Country/Region	2010	2012	2014	2014		
	People at risk of poverty or social exclusion[b] (%)			Severe material deprivation[c] (%)	Very low work intensity[d] (%)	Risk of poverty[e] (%)
Portugal	25.3	25.3	27.5	10.6	12.2	19.5
Italy	24.5	29.9	28.1	11.5	12.0	19.6
Spain	26.1	27.2	29.2	7.1	17.1	22.2
Croatia	31.1	32.6	29.3	13.9	14.7	19.4
Ireland	27.3	30.0	29.5	9.9	23.9	14.1
Hungary	29.9	32.4	31.1	23.9	12.2	14.6
Latvia	38.2	36.2	32.7	19.2	9.6	21.2
Greece	27.7	34.6	36.0	21.5	17.2	22.1
Bulgaria	49.2	49.3	40.1	33.1	12.1	21.8
Romania	41.4	41.7	40.2	26.3	6.4	25.4

[a] The data for "people at risk of poverty or social exclusion," "very low work intensity," and "the risk of poverty" for Estonia and Ireland in 2014 refer to 2013. The data for severe material deprivation in the UK and Ireland in 2014 refer to 2013. [b] Aggregate risk of poverty or social exclusion, which is a combination of three basic dimensions of social exclusion (risk-of-poverty rate, severe material deprivation and very low work intensity), with the caveat that persons assigned to more than one of these three indicators are counted only once in the aggregate index. [c] The severe material deprivation indicator is the "percentage of people in households saying they are unable to meet at least four of nine... needs for financial reasons: 1) pay for a week-long vacation by all household members once a year, 2) eat meat, fish (or a vegetarian equivalent) every second day, 3) keep the home adequately warm, 4) face unexpected expenses (an amount corresponding to the monthly value of the relative poverty threshold adopted in a given country in the year preceding the survey), 5) pay the rent, mortgage or utility bills, 6) own a color TV, 7) own a car, 8) own a washing machine, 9) own a telephone (landline or mobile)" (GUS, 2014a, p. 44). [d] Households with very low work intensity are "people aged 0–59 living in households where members of working age (18–59 years) worked less than 20% of their total potential during the previous 12 months" (GUS, 2014a, p. 44). [e] The definition of the risk-of-poverty rate is the same as that used above in the analysis of the risk of poverty in the EU. [f] The countries in the table are sorted by the ascending value of the aggregate risk-of-poverty-or-social-exclusion indicator for 2014.

Source: Eurostat.

Decomposition of income inequality by income source and socioeconomic group in Poland in 2005–2013[6]

This part of the analysis seeks to: 1) show how the main sources of income contribute to income disparities in Poland and 2) trace the role of income inequality within and between socioeconomic groups in Poland from 2005 to 2013. For reasons of space, this will be a brief, general description of the research findings. The analysis is based on individual, non-identifiable data from household budget surveys. For the first objective, income was defined as available household income (in line with the GUS definition) per equivalent unit (modified OECD equivalence scale). For the

[6] The research findings presented in this section come from a study financed as part of the Research by Young Scientists 2014 program.

second objective, income was defined as disposable household income (in line with the GUS definition) per equivalent unit (modified OECD equivalence scale). In the section of the analysis focusing on income sources, the following categories of income were taken into account: income from employment, income from a private farm, income from self-employment, income from ownership, income from property rental, social security benefits, other social benefits, and other income (including gifts and alimony payments). In the part of the study focusing on socioeconomic groups, the following categories of households were examined: those formed by employees, farmers, the self-employed, old-age pensioners, disability pensioners, and those supporting themselves from non-earned sources. The following programs were used for the calculations: Excel 2010 and DAD 4.6. – software for distributive analysis (Jean-Yves Duclos, Abdelkrim Araar and Carl Fortin, "DAD: A Software for Distributive Analysis/Analyse Distributive," MIMAP Programme, International Development Research Centre, Government of Canada, and CIRPÉE, Université Laval).

The decomposition method used for income sources and socioeconomic groups is based on the Gini coefficient. The decomposition by source of income comes from a study by Lerman and Yitzhaki (1985) and looks as follows. The starting point of the analysis is the general form of the Gini coefficient:

$$G_0 = \frac{2cov\left[y_0, F\left(y_0\right)\right]}{\mu_0} \tag{1}$$

where G_0 is the Gini coefficient for overall household income, y_0 is total household income, μ_0 denotes mean overall household income, and $F(y_0)$ – is the cumulative distribution function of total household income. If we assume that household income can be divided into K sources of income

$$y_0 = \sum_{k=1}^{K} y_k ,$$

where $y_1, \ldots, y_k$ are sources of income, then formula (1) can be expressed as follows:

$$G_0 = \frac{2\sum_{k=1}^{K} cov\left[y_k, F\left(y_0\right)\right]}{\mu_0} = \tag{2}$$

$$= \sum_{k=1}^{K} \left(\frac{cov\left[y_k, F\left(y_0\right)\right]}{cov\left[y_k, F\left(y_k\right)\right]} \right) \left(\frac{2cov\left[y_k, F\left(y_k\right)\right]}{\mu_k} \right) \left(\frac{\mu_k}{\mu_0} \right) = \tag{3}$$

$$= \sum_{k=1}^{K} R_k G_k S_k \tag{4}$$

where S_k is the share of the k-th component of total household income, G_k is the Gini coefficient for the k-th component of household income, while R_k is the Gini correlation of component k with overall income. Equation (4) makes it is possible to calculate the effect of a 1 percent change in individual income sources on overall income inequality:

$$\frac{\partial G_0}{\partial e_k} = S_k\left(R_k G_k - G_0\right) \tag{5}$$

$$\frac{\partial G_0 / \partial e_k}{G_0} = \frac{S_k R_k G_k}{G_0} - S_k \ . \tag{6}$$

The applied method of decomposition by (socioeconomic) group can be found in many studies (e.g. Deutsch, Silber, 1999; Bellú, Liberati, 2006; Lambert, Aronson, 1993). The general form of the decomposition of the Gini coefficient by group is as follows:

$$G_0 = I_W + I_B + I_R \tag{7}$$

where I_W is the contribution of within-group inequalities to overall income inequality, I_B is the contribution of between-group inequalities to overall income inequality, and I_R is a residual component that shows the extent to which overlapping income distributions for various groups are attributable to overall income inequality. A more detailed form of intra-group inequalities takes the form of:

$$I_W = \sum_{k=1}^{K} P_k S_k G_k \tag{8}$$

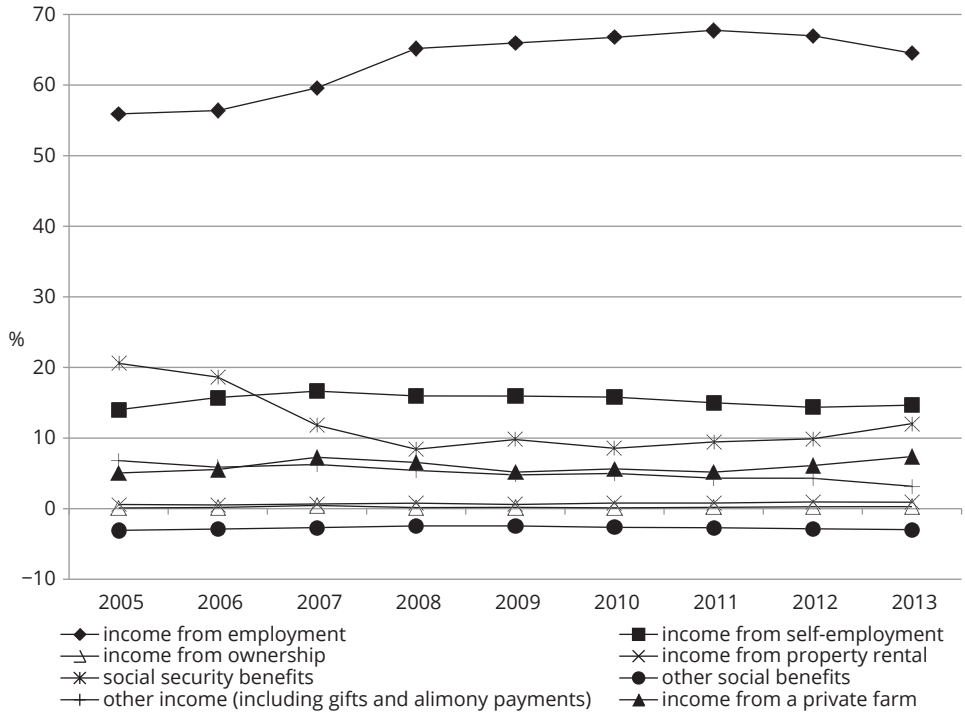
where P_k is the share of the population of group k in the total population, and the remaining symbols are as above.

Figures 3.3 and 3.4 show the main results of the decomposition of the Gini coefficient by source of income. Figure 3.3 shows that income from employment had the greatest contribution to overall income inequality in Poland. The contribution of this category of income to income inequality grew steadily from 2005 to 2011 and then decreased slightly during the next two years. The high impact on overall income disparities was mainly due to the growing share of income from employment in total income, and to a lesser extent due to a growing correlation of this source of income with overall income. The distribution of income from employment became more even during the studied period.[7]

[7] As already mentioned, not all the detailed calculations/research findings are given here.

The importance of social security benefits changed roughly in the opposite direction. The relative contribution of this source of income to overall income inequality decreased significantly from around 20.5% in 2005 to 8.5% in 2008, and then it remained stable for the next two years and increased after 2010 (to 12%). The decreased importance of this category of income resulted mainly from its decreased correlation with total income. The share of social security benefits in overall income decreased slightly during the studied period, while inequality within this category of income increased.

Figure 3.3. The relative contribution of different income sources to overall income inequality in Poland, 2005–2013



Source: Own calculations based on data from household budget surveys.

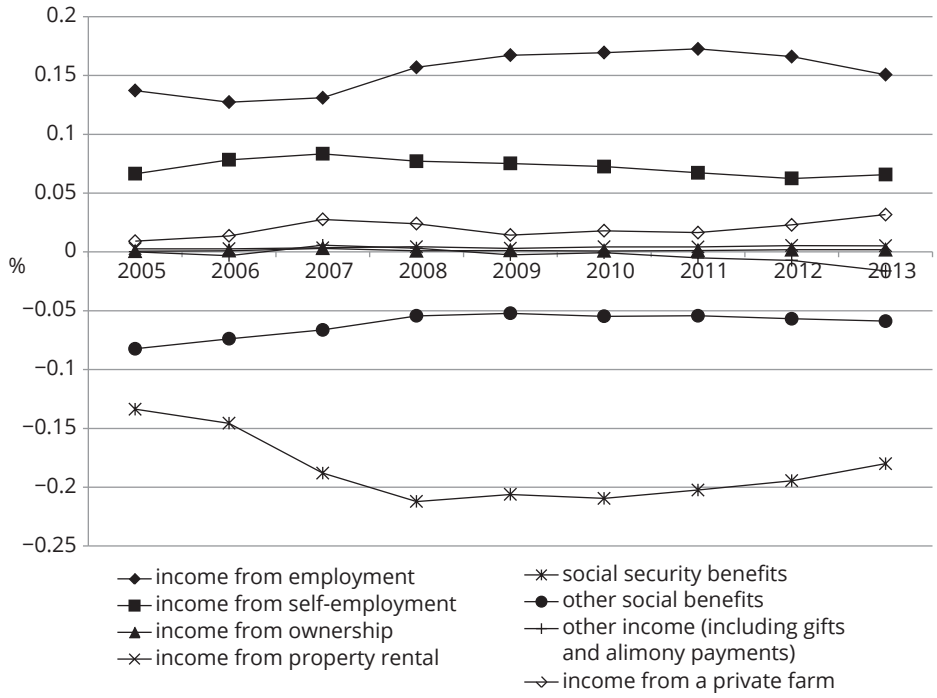
After 2006 income from self-employment was the second most important source of income in terms of contribution to income inequality in Poland. The importance of this category of income was relatively stable throughout the analyzed period, at around 15%. The distribution of income from employment was fairly unequal and strongly correlated with overall income. Both factors were neutralized by a relatively low share of this source of income in total income.

The remaining categories of income were less important in terms of their contribution to overall income inequality in Poland.

"Other social benefits" were the only source of income that contributed to an absolute reduction in total income inequality. Nevertheless, the share of this category of income in total income decreased by almost half in the studied period, which limited its negative impact on overall income disparities in Poland despite growing inequality of this source of income.

Figure 3.4 shows the marginal effect of an increase in individual income sources on overall income inequality. It turns out that, apart from social security benefits, which clearly contributed to reducing income inequality in Poland (as shown above), other income (including gifts and alimony payments) and other social benefits revealed a negative marginal effect of a one percentage change on overall income inequality as well. In turn, income from employment showed the greatest positive marginal effect of a one percentage change on overall income inequality.

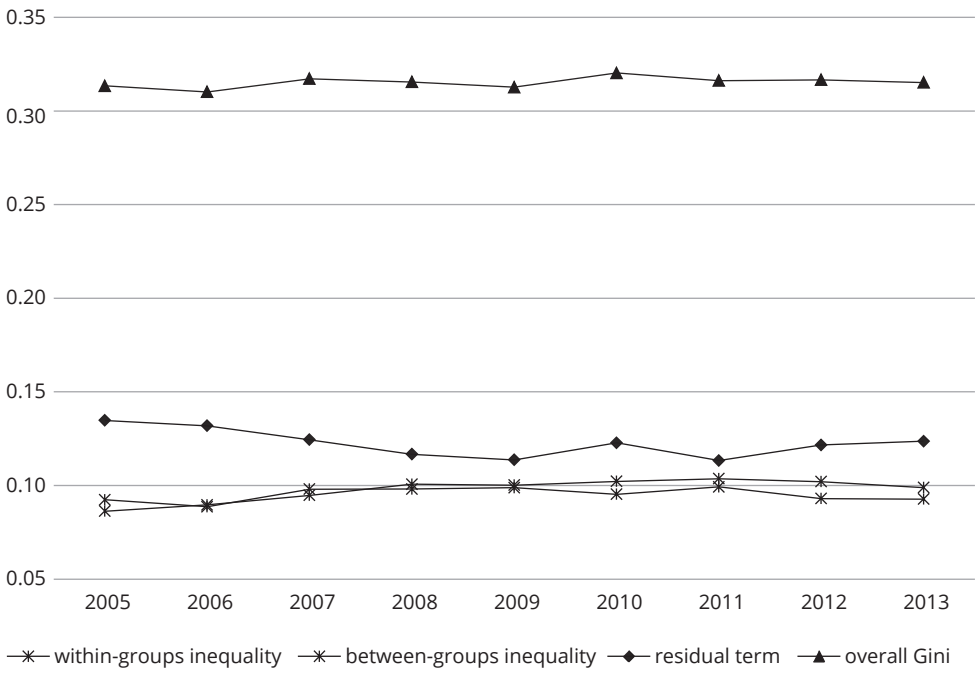
Figure 3.4. Effect of a 1 percent increase in individual income sources on overall income inequality in Poland, 2005–2013



Source: Own calculations based on data from household budget surveys.

Although the income disparities (according to the above definition) measured by the Gini coefficient, calculated on the basis of household budget surveys, showed no significant changes from 2005 to 2013, some changes were visible in the structure of income inequality by socioeconomic group. Figure 3.5 shows the main elements of this decomposition. Most of the overall income inequality was attributable to the overlapping income distributions of individual socioeconomic groups (between 0.115 and 0.134 in absolute terms); until 2009 the residual component decreased, while from 2011 onward it rose. Changes in within-group inequality occurred in roughly the opposite direction. Between-group inequalities showed no clear changes. The decrease in the value of the residual component may be due to two factors (equation (7)): 1) an increase in between-group inequality, I_B, which would mean growing disparities between the mean incomes of individual socioeconomic groups and/or 2) an increased value of the within-group inequality component, due to either increased income inequality within individual socioeconomic groups or/and from an appropriate change in inequality weights, $P_k S_k$, for these groups. Figure 3.5 appears to validate the second hypothesis.

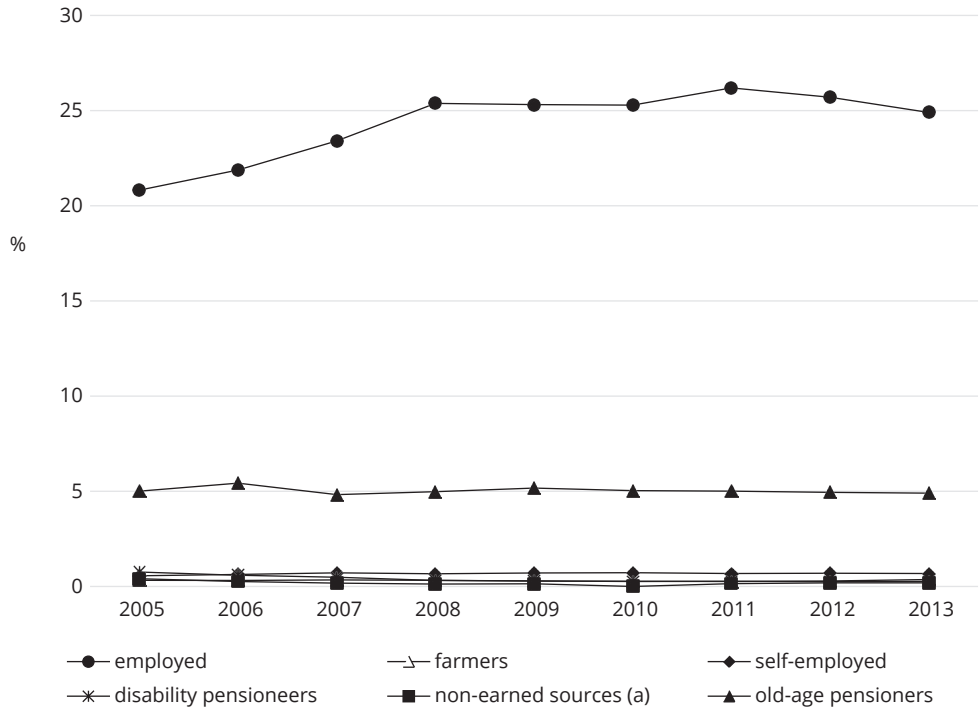
Figure 3.5. Elements of the decomposition of the Gini coefficient by socioeconomic group in Poland, 2005–2013, in absolute terms



Source: Own calculations based on data from household budget surveys.

As seen in Figure 3.6, among all households, income disparities for households of employees contributed the most to within-group income inequality. In second place were old-age pensioners' households, while the contribution of income disparities within other socioeconomic groups to overall income inequality was marginal (1.4–2.1% of the total income variance in all). This means that the increase in intra-group inequality resulted exclusively from the increased weighted disparities of incomes among households formed by employees. This does not mean that the distribution of income in this group became more unequal. In essence, the only viable conclusion that can be drawn is that the importance of this group increased among all the groups (an increased share of this group in the total population and an increased share of this group's income in total income).

Figure 3.6. The relative contribution of individual socioeconomic groups to overall income inequality in Poland, 2005–2013



[a] Households supporting themselves from non-earned sources.

Source: Own calculations based on data from household budget surveys.

To sum up, considering the inequality and poverty measures used in this chapter, it can be concluded that the downward trend in both income inequality and poverty

as well as in the risk of poverty has begun to decline in Poland in recent years. Poland is above the EU average in a ranking of EU28 countries by ascending income inequalities and risk of poverty.

From 2005 to 2013 there were some changes in the structure of income inequality in Poland, confirmed by a study of the decomposition of the Gini coefficient by income source and socioeconomic group. One of the most important conclusions of this analysis is that income from employment – and thus income generated by households formed by employees – significantly increased its contribution to income inequality in Poland in the studied period. Thus, it appears that a reduction in earnings disparities has the biggest potential for reducing income inequality in Poland.

References

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Chapter 4

Poland's Competitive Advantages in Foreign Trade and the Country's Balance of Payments in 2010–2015

Mariusz-Jan Radło

Introduction

This chapter traces changes in Poland's foreign trade, and it also examines how the country's balance of payments evolved from 2010 to 2015. The analysis focuses on medium-term changes in the trade of goods and services. It highlights changes in the structure of Poland's goods and service exports and imports as well as changes in revealed comparative advantages and changes in the balance of trade in goods and services. This chapter also contains an in-depth analysis of Poland's balance of payments. In the case of the latter, we pay special attention to factors behind a significant improvement in Poland's current-account balance since 2012. We also attempt to evaluate the external equilibrium of the Polish economy and prospects for how it may change in the future.

Although the study covers the 2010–2015 period, in some cases it does not cover all of 2015 due to the lack of available statistics. The balance-of-payments analysis uses data going back to 2004 to identify long-term trends in the Polish balance of payments. The research is based on data from the National Bank of Poland (NBP) and the Customs Service.

Apart from the introduction, conclusions and references, this chapter contains four logically interrelated sections. The first section offers basic data on Poland's foreign trade in goods and services. The second section presents a detailed analysis of the commodity structure of Poland's exports and imports and of how it has changed during the analyzed period. This section also examines revealed comparative advantage (RCA) indices and changes in the trade of various goods. The third part provides an in-depth analysis of Poland's trade in services. As in the case of goods, it analyzes changes in the structure of Poland's service exports and imports. It also analyzes revealed comparative advantages and changes in the balance of trade in services. The fourth part of this chapter examines changes in Poland's balance of payments

and traces factors behind these changes with regard to the current-account, capital and financial balances. This part of the chapter also outlines prospects for changes the balance of payments in the coming years. All four sections are then summarized.

The value of exports and imports

The data in Table 4.1 show that, according to the NBP, the nominal value of Polish goods and service exports rose by 34.5% from 2010 to 2014, from EUR 144.8 billion to EUR 194.9 billion. At the same time, the value of goods and service imports increased by only 25.5%, from EUR 152.5 billion to EUR 189.6 billion. These growth trends continued in 2015. Exports continued to grow faster than imports. The value of Poland's goods and service exports in the first half of 2015 came to EUR 103.5 billion, which accounted for 53.1% of the total value of exports in the full year 2014. The value of imports reached EUR 96.6 billion, or 50.9% of the value of imports in all of 2014.

The studied period marked a significant reduction in Poland's trade deficit for goods. If in 2010–2012 Poland had a clear deficit in the trade of goods, in 2013–2015 the negative balance in the trade of goods first approached 0, and in 2015 Poland recorded a EUR 2.5 billion surplus in the trade of goods. In the trade of services, meanwhile, Poland had a growing surplus of exports over imports throughout the analyzed period. From 2010 to 2015, this surplus increased from EUR 3.3 billion to EUR 9.9 billion. Poland's total surplus in the trade in goods and services with the world in 2015 reached EUR 12.5 billion.

Table 4.1. Poland's international trade in goods and services in 2010-2015[a] (EUR billion)

Item	2010	2011	2012	2013	2014	2015[a]
Trade in goods						
Balance of trade in goods	–10.9	–13.3	–8.1	–0.3	–3.3	2.6
Exports of goods	118.1	132.5	141.0	149.1	158.6	171.7
Imports of goods	129.0	145.8	149.2	149.4	161.9	169.1
Trade in services						
Balance of trade in services	3.3	5.2	6.0	7.6	8.6	9.9
Exports of services	26.8	29.4	31.9	33.6	36.3	39.2
Imports of services	23.5	24.2	25.9	25.9	27.7	29.1
Total trade						
Total exports	–7.6	–8.1	–2.1	7.3	5.3	6.9
Total imports	144.8	161.8	173.0	182.7	194.9	210.9
Balance of trade	152.5	170.0	175.1	175.4	189.6	198.4

Note: [a] The 2015 data are based on preliminary monthly figures.

Source: Author's elaboration based on NBP data.

Trade in goods

The trends described above indicate that in 2010–2015, Poland recorded a marked improvement in its balance of trade for goods and transformed a long-standing deficit into a surplus in 2015. It is worth considering the reasons for these changes and how the structure of Poland's trade in goods evolved in the studied period. The data in Table 4.2 show that 79.2% of Poland's goods exports in 2015 came from eight commodity groups. In descending order, these were: machinery and mechanical appliances (19.70%), vehicles, aircraft, and watercraft (19.31%), base metals and articles of base metal (9.78%), chemical products (8.01%), miscellaneous manufactured articles (6.58%), plastics and articles thereof (6.07%), food, beverages, alcohol, and tobacco (5.76%), and live animals and animal products (3.99%). It should be noted that the structure of Poland's goods exports changed only slightly in 2010–2015, with more far-reaching changes only in the case of several commodity groups.

The following commodity groups increased their role in Poland's goods exports by more than 1 p.p. (in descending order): vehicles, aircraft, and watercraft (3.34 p.p.), optical and photographic instruments and equipment (1.77 p.p.), chemical products (1.44 p.p.), leather and leather products (1.15 p.p.), and miscellaneous manufactured articles (1.05 p.p.). The following commodity groups saw their shares decline by more than 1 p.p.: machinery and mechanical appliances (–6.59 p.p.), mineral products (–1.93 p.p.), and base metals and articles of base metal (1.3 p.p.).

Table 4.2. The breakdown of Poland's goods exports by commodity group in 2004, 2010, 2014 and 2015

Commodity group	2004	2010	2014	2015	Change, p.p.	
					2004–2010	2010–2015
Live animals, animal products	2.98	3.73	4.21	3.99	0.75	0.26
Vegetable products	1.93	1.97	2.55	2.58	0.04	0.61
Fats, oils, waxes	0.07	0.27	0.35	0.17	0.20	–0.10
Food, beverages, alcohol and tobacco	3.72	5.18	6.07	5.76	1.46	0.58
Mineral products	5.84	4.34	4.33	2.41	–1.50	–1.93
Chemical products	5.03	6.57	7.00	8.01	1.54	1.44
Plastics and articles thereof	5.14	6.51	6.87	6.07	1.37	–0.44
Leather and leather products	0.60	0.39	0.55	1.54	–0.21	1.15
Wood and articles of wood, cork, straw, wicker	3.05	1.97	1.97	2.10	–1.08	0.13
Pulp, paper or paperboard	3.24	3.12	2.59	2.40	–0.12	–0.72
Textiles and textile articles	4.78	3.19	3.24	3.50	–1.59	0.31
Footwear, headgear, umbrellas, walking sticks...	0.45	0.39	0.54	0.83	–0.06	0.44

Commodity group	2004	2010	2014	2015	Change, p.p.	
					2004–2010	2010–2015
Articles of stone, plaster, cement, glass...	2.20	1.86	1.93	1.44	–0.34	–0.42
Pearls, precious stones and metals, jewelery	0.48	0.62	0.61	0.75	0.14	0.13
Base metals and articles of base metal	12.53	11.08	10.49	9.78	–1.45	–1.30
Machinery and mechanical appliances	21.92	26.29	24.83	19.70	4.37	–6.59
Vehicles, aircraft and watercraft	17.57	15.97	13.88	19.31	–1.60	3.34
Instruments and equipment, optical, photographic...	0.96	0.95	1.26	2.72	–0.01	1.77
Weapons and ammunition	0.01	0.01	0.03	0.04	0.00	0.03
Miscellaneous manufactured articles	7.48	5.53	6.63	6.58	–1.95	1.05
Works of art, collectors' items and antiques	0.03	0.02	0.01	0.32	–0.01	0.30
Complete industrial plants	0.00	0.04	0.07	n.a.	0.04	–0.04

Source: Author's elaboration based on Customs Service data.

The structure of Poland's imports presented in Table 4.3 changed only slightly. Eight commodity groups accounted for more than 79.3% of the country's total imports: machinery and mechanical appliances (26.47%), vehicles, aircraft, and watercraft (11.43%), base metals and articles of base metal (10.48%), chemical products (9.9%), mineral products (8.55%), plastics and articles thereof (7.52%), textiles and textile articles (4.95%), and food, beverages, alcohol, and tobacco (3.89%). It is also worth noting that share increases of more than 1 percentage point in Poland's imports in 2010–2015 were recorded for such commodity groups as machinery and mechanical appliances (1.97 p.p.), and vehicles, aircraft, and watercraft (1.07 p.p.). The greatest declines in import shares were recorded for mineral products (–3.34 p.p.), complete industrial plants (–2.13 p.p.), and optical and photographic instruments and equipment (–0.71 p.p.). It should also be noted that the decline in import shares for mineral products was particularly pronounced from 2015, probably due to a significant decline in the prices of raw materials, including crude oil on world markets, from mid-2014.

The trade balance presented in Table 4.4 improved the most in the following commodity groups from 2010 to 2014: vehicles, aircraft, and watercraft (EUR 9,058.5 million), optical and photographic instruments and equipment (EUR 3,664.9 million), chemical products (EUR 2,819.1 million), miscellaneous manufactured articles (EUR 2,798.3 million), and complete industrial plants (EUR 2,744.8 million). This means that the long-term improvement in the balance of trade in manufactured goods was an important factor that contributed to Poland's trade surplus in 2015.

Table 4.3. The breakdown of Poland's goods imports by commodity group in 2004, 2010, 2014 and 2015

Commodity group	2004	2010	2014	2015	Change, p.p.	
					2004–2010	2010–2015
Live animals, animal products	1.19	2.21	2.69	2.58	1.02	0.37
Vegetable products	1.97	2.13	2.17	2.27	0.16	0.14
Fats, oils, waxes	0.37	0.38	0.44	0.41	0.01	0.03
Food, beverages, alcohol and tobacco	2.60	3.39	3.64	3.89	0.79	0.50
Mineral products	10.65	11.79	11.49	8.55	1.14	–3.24
Chemical products	10.07	10.03	9.91	9.90	–0.04	–0.13
Plastics and articles thereof	7.53	7.29	7.60	7.52	–0.24	0.23
Leather and leather products	0.91	0.54	0.66	0.68	–0.37	0.14
Wood and articles of wood, cork, straw, wicker	0.92	0.79	0.77	0.74	–0.13	–0.05
Pulp, paper or paperboard	3.28	2.80	2.63	2.84	–0.48	0.04
Textiles and textile articles	5.51	4.37	4.55	4.95	–1.14	0.58
Footwear, headgear, umbrellas, walking sticks	0.47	0.61	0.79	0.89	0.14	0.28
Articles of stone, plaster, cement, glass...	1.50	1.26	1.08	1.11	–0.24	–0.15
Pearls, precious stones and metals, jewelery	0.11	0.19	0.20	0.21	0.08	0.02
Base metals and articles of base metal	10.46	10.31	10.45	10.48	–0.15	0.17
Machinery and mechanical appliances	25.28	24.5	24.03	26.47	–0.78	1.97
Vehicles, aircraft and watercraft	13.51	10.36	10.60	11.43	–3.15	1.07
Instruments and equipment, optical, photographic...	1.88	3.16	2.20	2.45	1.28	–0.71
Weapons and ammunition	0.05	0.06	0.06	0.08	0.01	0.02
Miscellaneous manufactured articles	1.75	1.67	2.22	2.53	–0.08	0.86
Works of art, collectors' items and antiques	0.01	0.01	0.01	0.01	0.00	0.00
Complete industrial plants	0.00	2.16	1.81	0.03	2.16	–2.13

Source: Author's elaboration based on Customs Service data.

At this point, it is worth taking a look at changes in the revealed comparative advantage presented in Table 4.5 to more clearly identify the changes in the competitiveness of Polish exports. Of special note are goods in the trade of which Poland had positive revealed comparative advantage indicators in 2015 and additionally saw these indicators improve from 2010 to 2015. In ascending order, these were: optical and photographic instruments and equipment (an RCA of 0.11, up by 1.32), vegetable products (an RCA of 0.13, up by 0.21), vehicles, aircraft, and watercraft (an RCA of 0.52, up by 0.09), leather and leather products (an RCA of 0.83, up by 1.14), wood and articles of wood, cork, straw, and wicker (an RCA of 1.04, up by 0.13), pearls, precious stones

and metals, and jewelry (an RCA of 1.27, up by 0.12), and works of art, collectors' items, and antiques (an RCA of 3.41, up by 2.38). Among these commodity groups, "vehicles, aircraft, and watercraft" as well as "food, beverages, alcohol, and tobacco" were of special importance to Poland's exports due to their role in the country's trade.

Table 4.4. Poland's balance in the trade of goods in 2010, 2014 and 2015

Commodity group	Value EUR million			Change EUR million	2015 (2010 = 100)
	2010	2014	2015	2010–2015	2015
Live animals, animal products	1,514.2	2,440.0	2,606.5	1,092.3	172
Vegetable products	–463.7	585.5	691.2	1,154.9	–149
Fats, oils, waxes	–179.1	–154.3	–389.3	–210.2	217
Food, beverages, alcohol and tobacco	1,681.7	3,911.6	3,494.2	1,812.5	208
Mineral products	–10,335.7	–11,888.8	–9,965.7	370.0	96
Chemical products	–5,386.9	–4,917.6	–2,567.8	2,819.1	48
Plastics and articles thereof	–1,862.2	–1,317.3	–1,962.8	–100.6	105
Leather and leather products	–247.1	–190.6	1,539.1	1,786.2	–623
Wood and articles of wood, cork, straw, wicker	1,294.7	1,948.5	2,381.1	1,086.4	184
Pulp, paper or paperboard	18.0	–108.4	–556.4	–574.4	–3,091
Textiles and textile articles	–1,959.5	–2,215.2	–2,149.6	–190.1	110
Footwear, headgear, umbrellas, walking sticks	–338.9	–421.5	–48.9	290.0	14
Articles of stone, plaster, cement, glass…	547.8	1,371.4	647.3	99.5	118
Pearls, precious stones and metals, jewelry	484.4	666.8	937.5	453.1	194
Base metals and articles of base metal	–416.9	–105.5	–467.2	–50.3	112
Machinery and mechanical appliances	–1,037.7	914.4	–9,817.5	–8,779.8	946
Vehicles, aircraft and watercraft	5,304.7	5,186.9	14,363.2	9,058.5	271
Instruments and equipment, optical, photographic…	–3,022.6	–1,572.1	642.3	3,664.9	–21
Weapons and ammunition	–66.9	–50.0	–63.1	3.8	94
Miscellaneous manufactured articles	4,353.1	7,170.6	7,151.4	2,798.3	164
Works of art, collectors' items and antiques	10.5	–0.2	531.7	521.2	5,064
Complete industrial plants	–2,787.2	–2,873.1	–42.4	2,744.8	2

Source: Author's elaboration based on Customs Service data.

Table 4.5. Poland's revealed comparative advantages in goods exports by commodity group in 2004, 2010, 2014 and 2015

Commodity group	2004	2010	2014	2015	Change, p.p.	
					2004–2010	2010–2015
Live animals, animal products	0.93	0.52	0.45	0.44	–0.41	–0.08
Vegetable products	–0.02	–0.08	0.16	0.13	–0.06	0.21
Fats, oils, waxes	–1.72	–0.34	–0.25	–0.90	1.39	–0.56
Food, beverages, alcohol and tobacco	0.36	0.42	0.51	0.39	0.06	–0.03
Mineral products	–0.60	–1.00	–0.98	–1.27	–0.40	–0.27
Chemical products	–0.70	–0.42	–0.35	–0.21	0.27	0.21
Plastics and articles thereof	–0.38	–0.11	–0.10	–0.21	0.27	–0.10
Leather and leather products	–0.41	–0.31	–0.18	0.83	0.10	1.14
Wood and articles of wood, cork, straw, wicker	1.20	0.91	0.94	1.04	–0.29	0.13
Pulp, paper or paperboard	–0.01	0.11	–0.02	–0.17	0.12	–0.28
Textiles and textile articles	–0.14	–0.31	–0.34	–0.35	–0.17	–0.04
Footwear, headgear, umbrellas, walking sticks	–0.05	–0.43	–0.38	–0.07	–0.39	0.36
Articles of stone, plaster, cement, glass...	0.38	0.39	0.58	0.26	0.01	–0.13
Pearls, precious stones and metals, jewelery	1.43	1.15	1.11	1.27	–0.28	0.12
Base metals and articles of base metal	0.18	0.07	0.00	–0.07	–0.11	–0.14
Machinery and mechanical appliances	–0.14	0.07	0.03	–0.30	0.21	–0.37
Vehicles, aircraft and watercraft	0.26	0.43	0.27	0.52	0.18	0.09
Instruments and equipment, optical, photographic...	–0.67	–1.21	–0.56	0.11	–0.54	1.32
Weapons and ammunition	–1.99	–1.43	–0.59	–0.71	0.55	0.72
Miscellaneous manufactured articles	1.46	1.20	1.09	0.96	–0.26	–0.24
Works of art, collectors' items and antiques	1.83	1.03	–0.14	3.41	–0.80	2.38
Complete industrial plants	2.60	–4.00	–3.24	n.a.	–6.59	n.a.

Source: Author's elaboration based on Customs Service data.

Trade in services

While the improvement in Poland's balance of trade for goods was mainly based on a reduced deficit, in the trade of services the country recorded a growing surplus throughout the analyzed period. The data in Table 4.6 show that the highest shares in revenues from the trade of services were recorded for transport services (27.6%), foreign travel (23.3%), "other business services" (22.4%), telecommunications, IT and information services (8.8%), and processing (8.1%). Altogether they accounted

for more than 90% of total revenue from the export of services. In 2010–2014 the following commodity groups recorded the greatest increases in their role in total service exports: telecommunications, IT and information services (3.1 p.p.), processing (3.1 p.p.), and transport services (2.6 p.p.). The greatest share decreases were recorded for foreign travel (3.9 p.p.), and "other business services" (4.8 p.p.).

Table 4.6. Structure of Poland's service exports, %, 2010–2014

Type of service	2010	2011	2012	2013	2014	Change, p.p.
Processing	5.0	5.4	5.8	7.5	8.1	3.1
Repair	2.0	2.2	1.4	2.3	2.4	0.4
Transport services	25.1	27.1	27.2	27.3	27.6	2.6
Sea transport	1.0	1.1	1.1	1.1	1.2	0.1
Air transport	2.6	3.2	3.2	3.3	3.1	0.5
Other transport services (not including sea and air transport)	21.2	22.6	22.7	22.7	23.2	2.0
Postal and courier services	0.2	0.2	0.2	0.2	0.2	0.0
Foreign travel	27.1	26.1	26.8	25.5	23.3	–3.9
Construction services	3.7	4.0	3.9	3.8	3.6	–0.1
Insurance services	0.6	1.0	0.7	0.7	0.5	–0.1
Financial services	1.9	1.7	1.7	1.6	1.6	–0.3
Fees for the use of intellectual property	0.7	0.7	0.6	0.7	0.7	0.1
Telecommunications, IT and information services	5.7	6.3	7.0	7.7	8.8	3.1
Telecommunication services	1.3	1.2	1.1	1.0	0.9	–0.4
IT services	3.9	4.7	5.4	6.1	7.3	3.3
Information services	0.4	0.5	0.4	0.5	0.6	0.2
Other business services	27.2	24.2	23.9	22.0	22.4	–4.8
Research and development services	1.6	1.8	1.7	1.8	2.2	0.7
Professional services	9.7	10.0	10.3	11.3	11.6	1.9
Legal, accounting, management and public relations services	4.8	5.3	5.8	6.8	7.2	2.4
Marketing services, market research and opinion research services	4.9	4.6	4.5	4.5	4.4	–0.6
Technical services, trade services and other business services	15.9	12.5	11.8	8.8	8.6	–7.4
Cultural and recreational services	0.9	1.3	0.9	0.9	0.9	0.0
Government services (not elsewhere specified)	0.0	0.0	0.0	0.0	0.0	0.0
Services not classified elsewhere	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's elaboration based on NBP data.

Table 4.7 shows that in 2014 the biggest roles in service imports were recorded for foreign travel (24.1%), "other business services" (24.1%), transport services (21.4%), telecommunications, IT and information services (8.2%), and fees for the use of intellectual property (8%). These five types of services accounted for a combined 85% of Poland's service imports. In 2010–2014, the biggest – though relatively small – increases in service import roles were recorded for repair (2.2 p.p.), transport services (1.3 p.p.) and telecommunications, IT and information services (1.1 p.p.). On the other hand, the greatest declines in import service shares were recorded for financial services (2 p.p.), and foreign travel (3.7 p.p.).

Table 4.7. Structure of Poland's service imports, %, 2010–2014

Type of service	2010	2011	2012	2013	2014	Change, p.p.
Processing	0.4	0.6	0.4	0.7	0.9	0.4
Repair	0.7	0.7	0.7	2.3	2.9	2.2
Transport services	20.2	20.7	21.5	20.7	21.4	1.3
Sea transport	3.5	3.3	3.5	3.5	3.6	0.1
Air transport	2.9	3.0	2.9	2.8	3.6	0.7
Other transport services (not including sea and air transport)	13.4	14.0	14.7	14.0	13.9	0.5
Postal and courier services	0.4	0.4	0.3	0.4	0.3	0.0
Foreign travel	27.8	24.9	26.4	25.7	24.1	–3.7
Construction services	2.3	2.1	2.4	2.4	2.2	–0.1
Insurance services	1.8	2.1	2.2	2.1	2.3	0.5
Financial services	5.3	5.2	4.7	3.4	3.3	–2.0
Fees for the use of intellectual property	7.2	7.1	7.0	7.8	8.0	0.8
Telecommunications, IT and information services	7.1	7.1	7.5	8.2	8.2	1.1
Telecommunication services	1.7	1.4	1.6	1.6	1.4	–0.3
IT services	4.7	5.3	5.4	6.1	6.3	1.5
Information services	0.6	0.4	0.5	0.6	0.5	–0.2
Other business services	23.8	24.3	23.5	24.0	24.1	0.3
Research and development services	0.5	0.6	0.6	0.8	0.9	0.4
Professional services	7.8	9.5	9.8	13.4	13.8	6.0
Legal, accounting, management and public relations services	6.2	7.5	7.8	11.0	11.2	5.0
Marketing services, market research and opinion research services	1.6	2.0	2.1	2.4	2.6	1.1
Technical services, trade services and other business services	15.5	14.3	13.0	9.8	9.4	–6.1
Cultural and recreational services	3.0	4.7	3.4	2.2	2.2	–0.8
Government services (not elsewhere specified)	0.4	0.4	0.4	0.4	0.4	–0.1
Services not classified elsewhere	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's elaboration based on NBP data.

To identify the sources of Poland's surplus in the trade of services, it is essential to compare the values of imports and exports presented in Table 4.8. The data show that Poland recorded the biggest surpluses in the trade of transport services (PLN 17.1 billion), processing (PLN 11.3 billion), foreign travel (PLN 7.4 billion), "other business services" (PLN 6.1 billion), and telecommunications, IT and information services (PLN 3.9 billion). The largest increases in the balance of trade in services were recorded in the case of transport services (PLN 9.2 billion), processing (PLN 6.4 billion), telecommunications, IT and information services (PLN 4.5 billion), and foreign travel (PLN 4.4 billion). The greatest deficits in the trade of services in Poland were recorded in the case of fees for the use of intellectual property (PLN –8.2 billion), followed by insurance services (PLN –1.9 billion), financial services (PLN –1.3 billion), and cultural and recreational services (PLN –1.2 billion). The greatest deepening in the deficit in the trade of services in 2010–2014 was recorded in the case of fees for the use of intellectual property (by PLN 2.1 billion).

Table 4.8. Balance on services, PLN billion, 2010–2014

Type of service	2010	2011	2012	2013	2014	Change, p.p.
Total	13.2	21.1	25.1	32.1	35.9	22.7
Processing	4.9	6.0	7.4	9.7	11.3	6.4
Repair	1.5	1.9	1.1	0.8	0.3	–1.2
Transport services	7.9	12.2	13.1	16.0	17.1	9.2
Sea transport	–2.2	–2.0	–2.4	–2.3	–2.5	–0.3
Air transport	0.1	0.9	1.1	1.7	0.5	0.4
Other transport services (not including sea and air transport)	10.1	13.4	14.5	16.8	19.1	9.0
Postal and courier services	–0.1	–0.1	–0.1	–0.2	–0.1	0.0
Foreign travel	3.0	6.6	7.2	8.0	7.4	4.4
Construction services	1.8	2.7	2.5	2.7	2.9	1.1
Insurance services	–1.0	–0.9	–1.4	–1.2	–1.9	–0.9
Financial services	–2.9	–3.2	–2.9	–1.4	–1.3	1.6
Fees for the use of intellectual property	–6.1	–6.3	–6.8	–7.5	–8.2	–2.1
Telecommunications, IT and information services	–0.6	0.6	1.3	1.8	3.9	4.5
Telecommunications services	–0.2	0.0	–0.2	–0.3	–0.3	–0.1
IT services	–0.2	0.4	1.4	2.0	3.8	4.0
Information services	–0.1	0.2	0.1	0.1	0.4	0.5
Other business services	6.9	5.0	6.5	4.8	6.1	–0.8
Research and development services	1.2	1.6	1.7	1.7	2.4	1.2

Type of service	2010	2011	2012	2013	2014	Change, p.p.
Professional services	3.1	2.6	3.1	1.4	1.6	–1.5
Legal, accounting, management and public relations services	–0.7	–1.1	–0.6	–2.3	–2.0	–1.3
Marketing services, market and opinion research services	3.8	3.6	3.7	3.8	3.6	–0.2
Technical services, trade services and other business services	2.5	0.9	1.6	1.8	2.1	–0.4
Cultural and recreational services	–1.9	–3.1	–2.4	–1.2	–1.2	0.7
Government services (not elsewhere specified)	–0.4	–0.4	–0.4	–0.4	–0.4	0.0
Services not elsewhere classified	0.0	0.0	0.0	0.0	0.0	0.0

Source: Author's elaboration based on NBP data.

Poland's competitiveness in the trade of services is also illustrated by the revealed comparative advantage indicators in Table 4.9. The table shows that in 2014, Poland had the greatest revealed comparative advantages in trade concerned with processing (2.25), construction services (0.5), transport services (0.25), and telecommunications, IT and information services (0.07). Poland had the greatest disadvantages in the trade of government services (–3.99), fees for the use of intellectual property (–2.42), insurance services (–1.48), cultural and recreational services (–0.91), and financial services (–0.7). Changes in revealed comparative advantages indicate that the studied period marked a slight improvement in the trade of cultural and recreational services, financial services, and telecommunications, IT and information services. By contrast, Poland's revealed comparative advantage indicators deteriorated markedly in the case of insurance services, repair services, and government services.

Table 4.9. Poland's revealed comparative advantage (RCA) indicators in the trade of services, 2010–2014

Type of service	2010	2011	2012	2013	2014	Change
Processing	2.49	2.24	2.66	2.32	2.25	–0.24
Repair	1.07	1.15	0.70	0.01	–0.19	–1.26
Transport services	0.22	0.27	0.24	0.28	0.25	0.03
Sea transport	–1.25	–1.13	–1.16	–1.17	–1.14	0.11
Air transport	–0.10	0.06	0.09	0.18	–0.17	–0.07
Other transport services (not including sea and air transport)	0.46	0.48	0.44	0.48	0.51	0.05
Postal and courier services	–0.38	–0.39	–0.46	–0.65	–0.46	–0.08
Foreign travel	–0.02	0.05	0.02	–0.01	–0.03	–0.01

Type of service	2010	2011	2012	2013	2014	Change
Construction services	0.49	0.64	0.46	0.45	0.50	0.01
Insurance services	–1.03	–0.75	–1.16	–1.02	–1.48	–0.45
Financial services	–1.01	–1.13	–1.02	–0.73	–0.70	0.31
Fees for the use of intellectual property	–2.39	–2.37	–2.52	–2.42	–2.42	–0.03
Telecommunications, IT and information services	–0.22	–0.12	–0.06	–0.07	0.07	0.29
Telecommunication services	–0.27	–0.20	–0.34	–0.45	–0.46	–0.19
IT services	–0.18	–0.12	0.00	0.01	0.15	0.33
Information services	–0.42	0.14	–0.05	–0.11	0.30	0.72
Other business services	0.14	0.00	0.02	–0.09	–0.07	–0.21
Research and development services	1.16	1.15	1.06	0.81	0.97	–0.19
Professional services	0.23	0.05	0.05	–0.17	–0.17	–0.40
Legal, accounting, management and public relations services	–0.26	–0.34	–0.28	–0.48	–0.44	–0.18
Marketing services, market and opinion research services	1.15	0.85	0.77	0.63	0.51	–0.64
Technical services, trade services and other business services	0.03	–0.13	–0.10	–0.11	–0.10	–0.13
Cultural and recreational services	–1.25	–1.30	–1.28	–0.95	–0.91	0.34
Government services (not elsewhere specified)	–2.61	–3.46	–4.65	–5.60	–3.99	–1.38

Source: Author's elaboration based on NBP data.

Balance of payments and its components

The balance of payments is a statement of an economy's transactions with foreign countries. It presents the country's economic transactions with the rest of the world in a given period. The main components of the balance of payments are the current account (including the balance on goods and services and the balance of primary and secondary income), the capital account, the financial account, and net errors and omissions.

Current account

The components of the current account are presented in Table 4.10. The current-account balance is the total measure of an economy's settlements with abroad resulting from current operations, mainly the purchase and sale of goods and services. The data in the table show that Poland had a current-account deficit throughout the 2004–2015 period, which means it was a net debtor to the rest of the world. As

pointed out by researchers including Najlepszy and Sobański (2010), this may have been due to the dynamic growth of the Polish economy at the expense of an increased current-account deficit. This interpretation is consistent with an intertemporal model of the external balance in which the current-account deficit reflects not only current but also future surpluses that will be generated by future revenue from investment. However, in 2013 and 2014, Poland's current-account deficit decreased significantly, and in 2015 it approached 0. The improvement in Poland's current-account balance in recent years has been due to factors including an increasingly balanced trade of goods, showing a slight surplus in the trade of goods combined with a growing surplus in the trade of services.

Table 4.10. Current account on a quarterly basis, 2004–2015, EUR billion, according to BMP6

Item	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Current account	–12.7	–6.4	–10.7	–18.8	–21.4	–13.6	–19.4	–20.4	–15.1	–5.3	–8.7	–0.7
Trade in goods												
Balance on goods	–7.6	–4.5	–7.7	–15.5	–20.6	–8.3	–10.9	–13.7	–8.5	–0.3	–3.4	2.6
Exports	66.1	71.0	83.7	92.7	98.8	103.1	117.9	136.4	147.5	156.5	166.0	171.7
Imports	73.7	75.5	91.4	108.3	119.5	111.4	128.8	150.1	156.0	156.8	169.4	169.1
Trade in services												
Balance on services	1.5	2.0	2.0	5.0	4.5	5.4	3.3	5.3	6.3	8.0	9.0	9.9
Credit	13.8	14.7	17.5	21.8	22.9	24.3	26.7	30.3	33.4	35.3	38.0	39.2
Debit	12.2	12.7	15.5	16.8	18.4	18.9	23.4	25.0	27.1	27.2	29.0	29.3
Primary income												
Balance of primary income	–7.4	–4.1	–5.5	–9.0	–6.1	–9.7	–11.8	–12.7	–12.7	–12.5	–13.8	–12.3
Credit	5.2	7.3	9.2	9.4	8.4	8.4	9.6	10.5	12.2	12.2	11.9	11.0
Debit	12.5	11.4	14.7	18.4	14.5	18.1	21.4	23.2	24.9	24.7	25.8	23.4
Secondary income												
Balance of secondary income	0.6	0.2	0.5	0.7	0.7	–1.0	0.0	0.8	–0.2	–0.4	–0.4	–0.9
Credit	3.6	4.0	4.7	5.2	5.5	5.7	5.2	6.2	6.4	6.3	6.2	5.7
Debit	2.9	3.8	4.1	4.5	4.8	6.7	5.2	5.4	6.5	6.8	6.6	6.6

Note: Preliminary 2015 data based on monthly estimates.

Source: Author's elaboration based on NBP data.

The final two current-account items listed in Table 4.10 are primary income and secondary income. Primary income includes short-term employee salaries, investment income, taxes and subsidies to products and production, Common Agricultural Policy funds, a portion of Poland's contribution to the European Commission related to the so-called Traditional Own Resources (TOR), and household lease payments for property abroad. Secondary income comprises current transfers between residents and non-residents, including the remaining portion of transfers between Poland and the EU earmarked for the financing of current expenditure by the government; this includes humanitarian assistance, the purchase of medicines, training programs, remittances, transfers in kind, including free-of-charge exports and imports of goods as part of international assistance, as well as tax flows related to the social security system and insurance services (NBP, 2015). The data in the table show that the balance of primary and secondary income was negative in 2010–2015. This was primarily due to a high negative balance of primary income, including mainly transfers of income earned by foreign investors from their capital involvement in the Polish economy. On the other hand, transfers from the EU budget and income from earnings had a positive effect on the balance of income, although they were unable to outweigh those items that had a negative impact on the balance of income.

Capital account

Another component of the balance of payments is the capital account. This includes non-refundable capital transfers for the financing of fixed assets, debt amortization, and the acquisition and sale of non-financial and non-productive assets as well as settlements resulting from the acquisition and sale of intangible non-financial assets, including patents, licenses, copyrights, and trademarks. The capital account also includes funds provided by European Union institutions or international organizations as well as those channeled free of charge by the Polish government to other institutions and earmarked for the financing of fixed asset investment (NBP, 2015). The capital account is presented in Table 4.11. It shows that Poland's capital account showed a rapidly growing surplus in 2010–2015, chiefly due to increased transfers of EU funds earmarked for investment projects.

In recent years, EU funds have enabled Poland to offset its current-account deficit with a capital-account surplus, and in the last few years, the country's total capital-account surplus significantly outweighed its current-account deficit. This does not mean, however, that Poland's balance of payments as a whole is no longer of the structural type typically seen in catching-up transition economies with relatively low-

priced key factors of production and shortages of investment capital. The improvement may be due at least partly to cyclical factors.

Table 4.11. Capital account on an annual basis, 2004, 2010–2015, EUR million, according to BMP6

Item	2004	2010	2011	2012	2013	2014	2015
Capital account	955	6,446	7,254	8,549	9,006	10,034	6,978
Credit	1,071	6,898	8,545	9,060	9,498	10,809	7,407
Debit	116	452	1,291	511	492	775	429

Note: Preliminary 2015 data based on monthly estimates.

Source: Author's elaboration based on NBP data.

Financial account

The last component of the balance of payments is the financial account. Its evolution in Poland in 2004 and from 2010 to 2015 is described in Table 4.12. The first major component of the financial account is direct investment, which reflects the role of foreign companies in financing investment in an economy and the involvement of domestic businesses on foreign markets. Significantly, foreign direct investment (FDI) is seen as the most secure type of capital because its withdrawal is usually a long and difficult process (Kocerka, 2014). The data in the table show that, except in 2013, Poland had relatively high FDI inflows in the analyzed period. However, the value of Polish FDI abroad increased and was relatively high from 2010 onward (except in 2013), though lower than incoming FDI.

A far more variable component of the balance of payments is portfolio investment (investments in domestic securities and futures transactions). These investments can be a source of additional risk to the economy because of possible speculative attacks or the so-called domino effect (Radomski, 2014). In 2010–2012, there was a high influx of this type of capital into Poland, but in the following years (2013-2015), these inflows decreased significantly. Polish portfolio investment, meanwhile, underwent considerable fluctuation.

In analyzing the remaining components of the financial account, it should be noted that official reserve assets (liquid foreign assets belonging to and controlled by the central bank) grew steadily to EUR 82.6 billion at the end of 2014. This balance began to show a small deficit after 2011. Official reserve assets also fluctuated. One significant negative change was an increase in gross external government-sector debt. In the longer term this factor is likely to pose a burden on the Polish economy, contributing to a deterioration in the country's balance of payments.

Table 4.12. Financial account, 2004–2015, PLN million, according to BMP6

Item	2004	2010	2011	2012	2013	2014	2015
Financial account	–5,922	–23,286	–19,686	–8,901	–4,478	–3,234	3,231
Direct investment abroad	1,711	7,051	3,412	1,055	–2,525	4,606	148
Direct investment in Poland	11,169	13,536	13,274	5,770	658	12,824	6,532
Portfolio investment assets	1,053	–120	–610	340	1,651	4,194	6,571
Portfolio investment liabilities	8,489	21,796	11,730	15,635	1,776	2,661	1,944
Other investment assets	9,628	2,987	2,716	1,722	1,215	3,100	2,059
Other investment liabilities	–812	9,817	5,014	–2,787	2,613	98	–2,768
Financial derivatives	–154	449	119	–2,133	–526	–16	–812
Official reserve assets	686	11,496	4,695	8,733	754	465	973

Note: Preliminary 2015 data based on monthly estimates.
Source: Author's elaboration based on NBP data.

Summary and conclusions

To sum up this analysis of Poland's competitive advantages in foreign trade and the country's balance of payments in 2010–2015, it is necessary to note that Poland's goods and service exports grew dynamically during this period. This made it possible to reduce the country's current-account deficit to a very small figure in 2015, influenced by a rapidly growing surplus in the trade of services and a slight surplus in the trade of goods. These changes resulted from structural factors related to an improved competitiveness of Polish exports. Throughout the studied period Poland showed a capital-account surplus. The country's official reserve assets do not give reason for concern either, because their value has been increasing each year. One negative trend, however, was a steady increase in the external government-sector debt, which may harm the balance of payments in the long term.

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Chapter 5

Impact of FDI-Related Policies on the Inflow of FDI and the Presence of Multinational Corporations

Tomasz M. Napiórkowski

Introduction

Incentives for foreign investors can happen at two levels: the macroeconomic level (e.g. trade openness and labor costs) and the microeconomic level (e.g. tax incentives and grants). This study looks at the latter.[1]

The aim of this study is to answer the following research question: Are Poland's current policies aimed at attracting foreign direct investment effective? The hypothesis of this study is that Poland's current policies to attract foreign direct investment play a significant role in accommodating foreign investors and multinational corporations.

The study is structured as follows. The first part defines the state of foreign direct investment (FDI) flows and stock in 2010–2014 and provides a breakdown of multinational corporations (MNC) active in Poland. For a comparative perspective, Poland (PL) will be presented in reference to other Visegrad Group (V4) members (i.e., the Czech Republic, CZ; Slovakia, SK; and Hungary, HU).

The second part of this chapter looks at the general impact of such incentives on FDI and MNC as presented in the scientific literature. The third part presents current Polish political initiatives aimed at attracting FDI and MNC.

The results show that 1) there is a pecking order of FDI incentives as seen by foreign investors and that 2) the impact of such incentives – which can prove to be very costly – on site selection is of secondary importance.

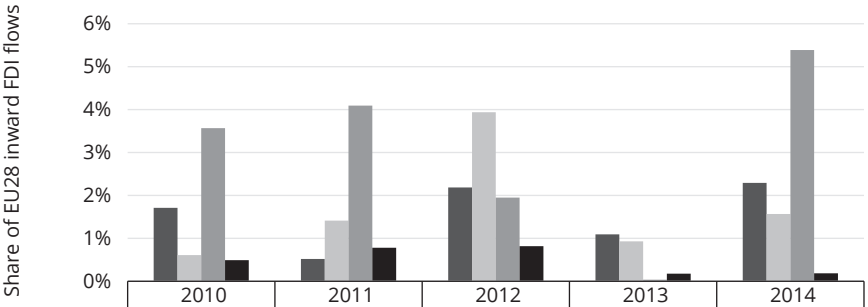
[1] The former is covered by the broad literature on the determinants of foreign direct investment.

FDI and MNC in Poland from 2010 to 2014

The aim of this section is to present the current state of Poland as a host of FDI and MNC activity, with a brief mention of it as an investor.

Even though FDI has been present in the global economy since 2500 B.C. (Lipsey, 2001, p. 17), there are differences between definitions and the methodology of calculations that lead to biased results (e.g., see: UNCTAD, 2015a). The definition of FDI will come from the source of its data as used in this study, i.e. UNCTAD: FDI refers to an investment made to acquire lasting interest, i.e. at least 10% of equity ownership in enterprises operating outside of the investor's economy (UNCTAD, 2015b). UNCTAD also provides a definition of MNC as incorporated or unincorporated enterprises comprising parent enterprises and their foreign affiliates (UNCTAD, 2015c).[2]

Figure 5.1. Inward FDI flows for V4 members as a share of the EU28 total (in %), 2010–2014



	2010	2011	2012	2013	2014
CZ / EU28	1.71%	0.52%	2.19%	1.09%	2.29%
HU / EU28	0.61%	1.41%	3.94%	0.93%	1.57%
PL / EU28	3.57%	4.09%	1.95%	0.04%	5.39%
SL / EU28	0.49%	0.78%	0.82%	0.18%	0.19%

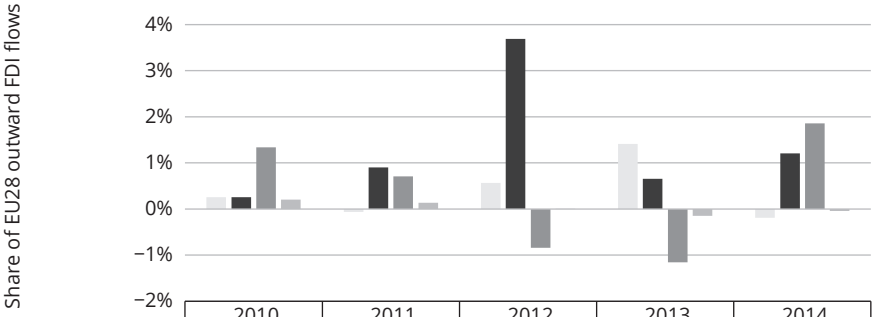
Source: Own graph based on data from UNCTAD (2015d). Data accessed on Nov. 2, 2015.

Poland was the leader in terms of attracting FDI flows[3] measured as a share of the EU28 total (Figure 5.1) from 2010 to 2014, with the exception of 2012 and 2013. The Czech Republic and Hungary alternated for second place.

[2] Additional definitions related to MNC are: parent enterprise ("an enterprise that controls assets of other entities in countries other than its home country, usually by owning a certain equity capital stake") and foreign affiliate ("an incorporated or unincorporated enterprise in which an investor, who is resident in another economy, owns a stake that permits a lasting interest in the management of that enterprise" (UNCTAD, 2015c).

[3] "For associates and subsidiaries, FDI flows consist of the net sales of shares and loans (including non-cash acquisitions made against equipment, manufacturing rights, etc.) to the parent company plus

Figure 5.2. Outward FDI flows for V4 members as a share of the EU28 total (in %), 2010–2014

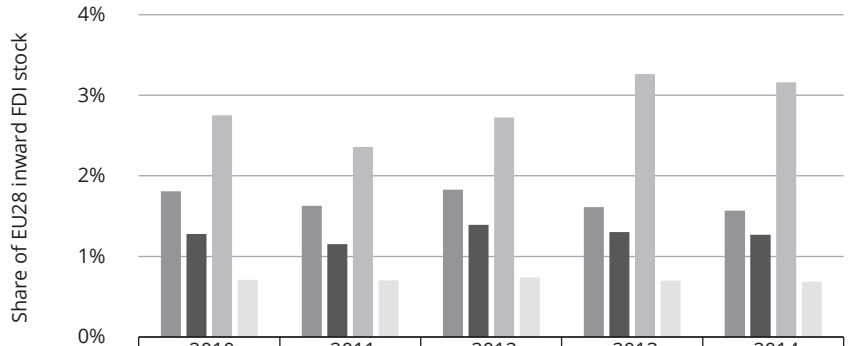


	2010	2011	2012	2013	2014
CZ / EU28	0.25%	–0.06%	0.57%	1.41%	–0.19%
HU / EU28	0.26%	0.90%	3.69%	0.66%	1.21%
PL / EU28	1.34%	0.71%	–0.84%	–1.16%	1.86%
SL / EU28	0.21%	0.14%	0.00%	–0.15%	–0.04%

Source: Own graph based on data from UNCTAD (2015d). Data accessed on Nov. 2, 2015.

After a significant decline in the importance of Poland as a source of FDI flows since 2010 (Figure 5.2) in favor of Hungary, Poland became the leading V4 source of the studied flows in 2014.

Figure 5.3. Inward FDI stock for V4 members as a share of the EU28 total (in %), 2010–2014



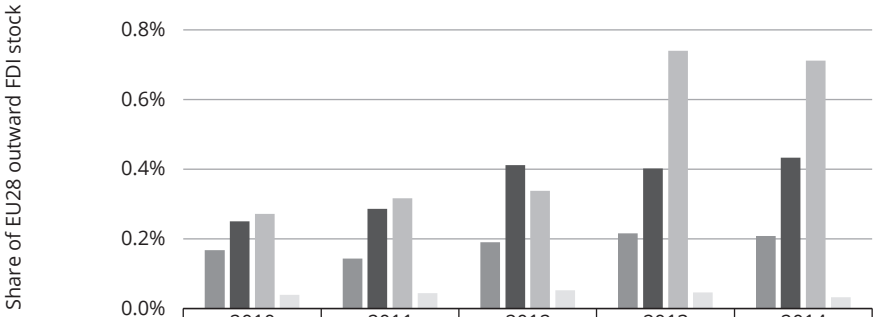
	2010	2011	2012	2013	2014
CZ / EU28	1.81%	1.63%	1.83%	1.61%	1.57%
HU / EU28	1.28%	1.15%	1.39%	1.30%	1.27%
PL / EU28	2.75%	2.36%	2.72%	3.26%	3.16%
SL / EU28	0.71%	0.70%	0.74%	0.70%	0.69%

Source: Own graph based on data from UNCTAD (2015d). Data accessed on Nov. 2, 2015.

the parent firm's share of the affiliate's reinvested earnings plus total net intra-company loans (short- and long-term) provided by the parent company. For branches, FDI flows consist of the increase in reinvested earnings plus the net increase in funds received from the foreign direct investor" (UNCTAD, 2015e).

Poland held the greatest share of inward FDI stock[4] (Figure 5.3) among the V4 countries throughout the studied timeframe, followed (in a constant order) by the Czech Republic, Hungary, and Slovakia. While Poland experienced significant volatility during a generally positive period, the shares of the other economies stayed relatively unchanged.

Figure 5.4. Outward FDI stock for V4 members as a share of the EU28 total (in %), 2010–2014



	2010	2011	2012	2013	2014
CZ / EU28	0.17%	0.14%	0.19%	0.22%	0.21%
HU / EU28	0.25%	0.29%	0.41%	0.40%	0.43%
PL / EU28	0.27%	0.32%	0.34%	0.74%	0.71%
SL / EU28	0.04%	0.04%	0.05%	0.05%	0.03%

Source: Own graph based on data from UNCTAD (2015d). Data accessed on Nov. 2, 2015.

Starting in 2013, Poland gained a significant advantage over the other V4 members as a source of outward FDI stock (Figure 5.4). The growth of the studied shares in the remaining V4 economies has been relatively stagnant.

When looking at the inward activity of multinationals (Table 5.1), the Czech Republic appears to be the most desired destination for MNC. However, when analyzing the changes between 2010–2011 and 2011–2012, the Czech Republic has all negative – and the most – changes among the V4 countries. By contrast, Poland recorded the greatest improvement in its attractiveness for MNC although it experienced fewer positive changes than Slovakia in 2010–2011 (Table 5.2).

[4] "For associate and subsidiary enterprises, it is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise (this is equal to total assets minus total liabilities), plus the net indebtedness of the associate or subsidiary to the parent firm. For branches, it is the value of fixed assets and the value of current assets and investments, excluding amounts due from the parent, less liabilities to third parties" (UNCTAD, 2015f).

Table 5.1. Inward activity of multinationals in V4 (number of MNCs), 2010–2012

CZ	Manufacturing	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)	HU	Manufacturing	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)
2010	4,132	15,626	21,562	2010	2,332	14,864	18,293
2011	3,794	10,146	15,371	2011	2,337	15,208	18,609
2012	3,429	8,827	13,396	2012	2,307	14,745	18,093
PL	**Manufacturing**	**Total services (sec G to N excl. K)**	**Total activity (sec B to N excl. K)**	SL	Manufacturing	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)
2010	**2,626**	**3,133**	**6,157**	2010	998	2,459	3,645
2011	**2,711**	**3,395**	**6,528**	2011	1,049	2,790	4,092
2012	**2,709**	**3,512**	**6,631**	2012	992	2,122	3,317

Source: Author's own table based on data from OECD (2015). Data accessed on Nov. 4, 2015.

Table 5.2. Percentage change in the number of multinationals in V4, 2010–2012

CZ	Man.	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)	HU	Man.	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)
2010–2011	–8.18%	–35.07%	–28.71%	2010–2011	0.21%	2.31%	1.73%
2011–2012	–9.62%	–13.00%	–12.85%	2011–2012	–1.28%	–3.04%	–2.77%
PL	**Man.**	**Total services (sec G to N excl. K)**	**Total activity (sec B to N excl. K)**	SL	Man.	Total services (sec G to N excl. K)	Total activity (sec B to N excl. K)
2010–2011	**3.24%**	**8.36%**	**6.03%**	2010–2011	5.11%	13.46%	12.26%
2011–2012	**–0.07%**	**3.45%**	**1.58%**	2011–2012	–5.43%	–23.94%	–18.94%

Man. – Manufacturing

Source: Author's own table based on data from OECD (2015). Data accessed on Nov. 4, 2015.

As is evident, Poland's position as both a foreign investor and a target of foreign investment has improved in recent years.

Impact of FDI incentives and related policy implications

This section seeks to examine: 1) the most common incentives offered to foreign investors, 2) their impact on inward FDI activity, and 3) some important incentive policy implications.

In their 2005 study on German multinationals, Buettner and Ruf found that there is a difference in the impact of tax incentives, which depends on the type of the tax in question. If it is the marginal tax rate, it has been found to have no impact on the location decisions of MNC. The impact of the effective average and (especially) the statutory tax rates is opposite. A positive, though not homogenous, impact of tax incentives for foreign investors has been found by Baccini *et al.* (2014) while studying Russian regions, with a note that tax cuts for FDI in government-selected areas have a weak impact. The role of lower taxes as a determinant of FDI has been analyzed by Eicher *et al.* (2012), who found that Bilateral Taxation Treaties have no impact on FDI, thus "supporting the view that such treaties are created not only to facilitate investment, but to restrict tax evasion and transfer pricing" (p. 368). In their study on Latin American, Caribbean and African economies, Klemm and Parys (2012) have shown that tax incentives can also take the form of tax holidays because, just like lower CIT rates, they were effective tools in attracting FDI for the first two studied regions. However, tax holidays have not been found to be an important incentive factor for attracting FDI by Parys and James (2010, p. 424) when studying 12 CFA Franc Zone countries. What the researchers have found is that investors positively react to a simplification of the complexity of offered tax incentives and to extended legal guarantees (i.e., increasing investor certainty).

Special economic zones (SEZ) are seen as a less valuable type of incentive than tax-related incentives because they are costly and the "local governments of those Polish regions that are least attractive to FDI may be advised to consider instead improving the investment climate through political, economic, and institutional reforms" (Chidlow *et al.*, 2009, p. 130). On the other hand, when studying the impact of China's SEZ policies (which include private property rights protection, tax breaks and land-use policies), Wang (2013) has found that they have a positive impact on attracting FDI.

The development of technology parks as incentives for inward FDI can work, but they have to work in parallel with the general innovation policy to be the most effective. This is because, given the homogeneity of two locations, proper incentives can be the deciding factor for location selection for R&D-intensive FDI (Guimón, 2009, p. 367).[5]

Shifting to the topic of incentive prioritization, in their study of behavioral approaches to optimal FDI incentives, Rosenboim *et al.* (2008) found that investors do not always act according to the utility theory. In terms of taxes and grants, the researchers found that the higher the uncertainty of future cash flows (i.e., the higher the risk of an investment), the higher the value of the grant should be for the investor to waive

[5] Similar conclusions have been reached by Zimny (2014) while discussing the relationship between EU funds in 2007–2013 and FDI. The impact of Poland joining the EU on FDI has been covered in Napiórkowski (2014).

tax relief. A change of a grant (a certain value) for a tax relief (a possible value) is seen unfavorably by the investor and requires compensation. This is because investors are afraid of not benefiting from future tax incentives under a high cash flow. Lastly, the way the basket of incentives is viewed by an investor depends on the way it is presented, i.e. the perceived attractiveness of a host economy can be changed by a reshuffle of the incentives in the said basket.

Dorożyński *et al.* (2015, p. 166) found that about one in three investors in Poland's Lodz region expected financial or non-financial support when choosing a site location or when deciding on continuing its stay. The authors of the study found that other factors, such as availability of resources, were of greater importance to investors.

The assumption underlying investment incentives to foreigners is that FDI and MNC will increase the welfare of the host economy through channels such as know-how transfer and spillovers, which do not happen instantly or automatically (see, for example: McGrattan, 2011). Blomström and Kokko (2003, pp. 20–21) point out that FDI incentive policies are not very efficient in achieving the end goal of economic growth unless there are parallel investments made in learning and developing local firms so that they have the ability and motivation to absorb the benefits coming from FDI and MNC.[6]

The most common incentive mentioned in the literature on the topic is a set of tax reliefs. The effect of such policies has been shown to depend not only on the type of investment, but also on the type of tax in question. However, the literature shows that these (and other incentives) are not the main deciding factors, but rather complementary ones, when foreign investors are looking at potential site locations. When looking at the pecking order of incentives by inward FDI entities, taxes are preferred to grants, but are inferior to long-term risk minimization through, e.g., the quality of the investment climate and the general treatment of foreign investors. Lastly, incentives should not be limited to foreign investors because without the absorptive ability, domestic firms will be unable to utilize FDI- and MNC-derived spillovers.

Poland's FDI-attracting policies

The goal of this section is to: 1) present the policies aimed at attracting foreign investors to Poland and 2) see how they relate to incentives presented in the literature on the topic.

[6] This, however, is unlikely to be an issue in Poland as Dorożyński *et al.* (2015), when studying the Lodz region, have found that exclusive incentives for foreign investors were a rare occurrence.

According to the Polish Information and Foreign Investment Agency (PAIiIZ, 2015a)[7] and the Ministry of Economy (2014), Poland's FDI-attracting policies (i.e., incentives) can be grouped as follows: 1) governmental grants, 2) investment incentives in SEZ, 3) industrial and technology parks, and 4) real estate tax exemption.

The aim of these incentives in relation to the Polish economy is to: 1) strengthen its macroeconomic stability, 2) increase its efficiency, 3) increase its innovativeness, 4) develop and improve human capital, and 5) strengthen the mechanisms for territorial development, balancing spatial integration in order to develop regional potentials (Ministry of Economy, 2014, pp. 18–20).

Government grants (established under a program for supporting investment projects of major importance to the Polish economy from 2011 to 2020) aim to "enhance the innovativeness and competitiveness of the Polish economy" (Ministry of Economy, 2014, p. 3). In general, grants are provided to investors in priority sectors including automotive, electronic and household appliances, aviation, biotechnology, food processing, modern services, and research and development. This list can be extended to other sectors if foreign investment is significant, i.e. minimum eligible costs of PLN 750 million and at least 200 new jobs or PLN 500 million of minimum eligible costs and 500 new jobs (Ministry of Economy, 2014, p. 28). Grants to foreign investors are given under two programs: 1) a program supporting the creation of new jobs, and 2) a program supporting new investment projects.[8] These programs provide monetary aid per job created and investment support accordingly.

Businesses investing in any of the country's 14 SEZs (Figure 5.5) can enjoy exemptions from corporate income tax (CIT) and personal income tax (PIT) (e.g. 25%–55% CIT relief in the Katowice SEZ), development-ready sites at competitive prices, no-cost administrative assistance, and a property tax exemption in selected regions (PAIiIZ, 2015b).[9]

There are about 80 industrial and technology parks in Poland (Figure 5.6). Technology parks[10] provide benefits such as consultancy in the establishment and development of firms, technology transfer, transfer of R&D results into technological innovation, and general business-friendly conditions. On the other hand, industrial and technol-

7 PAIiIZ is extensively involved in efforts to promote Poland as a destination for foreign investors, providing marketing and administrative support.

8 For detailed information on the projects, see: Ministry of Economy (2014, pp. 28–38).

9 More on SEZs in Poland can be found in: KPMG (2014).

10 "A technology park is a cluster of separate buildings together with physical infrastructure, created with the aim of attracting an influx of knowledge and technology for scientific bodies and businesses" (PAIiIZ, 2015d).

ogy parks[11] offer workspace for companies that use new technology and are commercially viable, attract investors, and create jobs (PAIiIZ, 2015d).

Figure 5.5. SEZs in Poland

Source: PAIiIZ (2015c).

As can be seen, Poland's FDI-attracting incentive policies focus on: a) providing subsidies, b) providing tax exemptions (i.e., monetary incentives), c) providing consultancy, and d) providing a business-friendly environment (i.e., non-monetary incentives).[12] It is important to understand that these incentives are give-and-then-you-receive programs, which the government uses to promote Polish economic goals.

Through the design of its FDI incentive policies, the Polish government aims to direct the location of foreign investors within Poland. For example, in order to qualify for a grant, an investment project needs to be located in a district in which unemployment exceeds 75% of the national average. Additional incentives are provided (e.g., an

[11] "An industrial and technology park is... a cluster of separate buildings together with an infrastructure remaining after restructuring, the bankruptcy of an enterprise or of other buildings added to it. These types of parks are formed with the assistance of local authorities and are aimed at providing preferential conditions for businesses, in particular for small and medium sized firms" (PAIiIZ, 2015d).

[12] As has been noted by Zimny (2015), current initiatives do not solve problems such as a high level of complexity of Polish law (e.g., tax law) – issues highlighted by Parys and James (2010). The reason for this standstill is that " [d] eclarations and intentions are not followed by actions and actions are often inconsistent and difficult to understand" (Zimny, 2015, p. 28).

extra 20% in the case of an employment grant and an extra 5 percentage points in the case of an investment grant) if the project is located in eastern Poland (Ministry of Economy, 2014, pp. 30, 35).

Figure 5.6. Industrial and technology parks in Poland

Source: PAIiIZ (2015d).

As has been shown, benefits provided to foreign investors looking to do business in Poland fall well in line with incentives presented in the literature on the studied topic.

Conclusions

The aim of this study was to answer the following research question: Are Poland's current policies aimed at attracting foreign direct investment effective?

To do so, the study first presented the *status quo* of FDI and MNC activity in Poland, showing that Poland is advancing as both an investor and a recipient of the studied activities. Next, the literature on FDI incentives was studied, which described a specific pecking order of the said incentives and showed that incentives generally tend to have a positive impact on inward FDI activity, but are not of key importance to foreign investors. Lastly, various programs implemented by Polish policy makers were described that aim to attract inward FDI and MNC activity.

The incentives put in place to attract foreign investors to Poland are well in line with those seen in the literature on the topic and they have been shown to play a secondary role. The implication of the finding is that an extensive cost-benefit analysis from a micro and macro level should be carried out prior to committing any additional resources to FDI incentives.

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Part II

Determinants of Poland's Competitiveness

Chapter 6

Development of Human Resources in Poland; Migration Trends in 2010–2015

Mateusz Mokrogulski

This chapter seeks to evaluate trends in the development of human resources in Poland as one of the factors behind the country's economic competitiveness from 2010 to 2015. The analysis covers the main factors determining the state of and changes in human resources in the Polish economy, including demographic trends, developments in employment and unemployment, wages, and changes in labor productivity. The research incorporates the latest legislative initiatives and places particular emphasis on current labor market trends.

Demography

At the end of 2014, 2.32 million Poles were temporarily staying abroad, compared with 2.196 million a year earlier, and 2 million in 2010, the beginning of the analyzed period. In 2014, the United Kingdom was still home to the largest number of Polish immigrants, at 685,000. It was followed by Germany (614,000), Ireland (113,000), and the Netherlands (109,000). In the studied period, emigration from Poland increased particularly to Germany, which was the last EU country (together with Austria, in May 2011) to open its labor market to citizens from new member states. The Netherlands also gained significance in this respect, with the number of Poles temporarily residing in that country almost equaling those in Ireland. The number of Polish citizens living outside Poland is an obvious demographic problem that will be more difficult to solve with each passing year. Many immigrants are able to find work abroad quickly (though often below their qualifications), develop professionally, and achieve their desired economic status. Many are opening their own businesses and becoming highly regarded professionals. Unable to pursue their professional dreams at home, they decide to stay abroad. For Poland this means a loss not only in demographic terms, but also because its citizens are working abroad instead. Also important is the fact that these people have received their education in Poland, often at public universities.

Thus, many of those who once studied at the expense of Polish taxpayers are now contributing to the GDPs of other countries. In the long term, this trend is bound to have a negative impact on the Polish economy.

Meanwhile, the fertility rate in Poland inched up to 1.32 at the end of 2014, from 1.29 in the previous two years. In 2009 and 2010, the rate hit a high of 1.41.

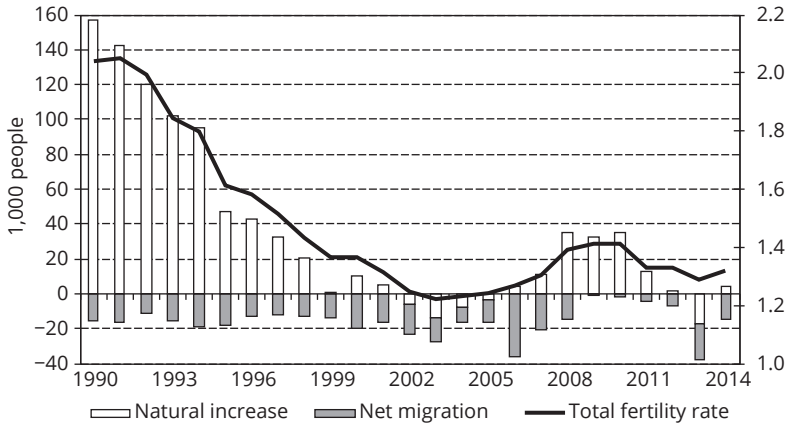
The fertility rate in Poland has remained below 2.1 – a level that ensures the so-called simple replacement of generations – since the beginning of the transition period. Poland has been among EU member states with low fertility rates for years. In 2014, only Portugal, Greece, and Cyprus had lower rates, of 1.23, 1.30, and 1.31 respectively. The EU average is 1.58, while France, Ireland, and Sweden – countries using extensive family policy tools – have the highest rates, 2.01, 1.94, and 1.88 respectively in 2014.

The steadily declining fertility rate has led to a deterioration in Poland's demographic structure. In mid-2015, citizens aged 60–65 and older accounted for 19.3% of the total population, up from 19.0% in 2014 and 14.8% in 2000. The proportion of those aged 17 and younger is steadily decreasing. In mid-2015, it stood at 18.0%, down from 18.1% a year earlier and 24.4% in 2000.

Unless the negative demographic trends are reversed due to measures such as family policy, it is expected that Poland's population will continue to age gradually, echoing a problem seen in many other economies. Poland's new government has come up with a special program to support family and fertility. The program, dubbed 500 plus and ushered in by a law on State Support in Bringing up Children, has been passed by parliament and was signed by the Polish president on Feb. 17. Under the program, families with two or more children are eligible for a benefit of PLN 500 (around EUR 120) per child per month. Families with one child are also eligible for the benefit if their average monthly income per household member does not exceed PLN 800 (around EUR 190). If any of the children in a family is disabled, the monthly income limit rises to PLN 1,200 (around EUR 285).

The program seeks to offer solid financial support to families bringing up children. The new benefit will accompany child tax credits introduced in 2007. An underlying idea behind these efforts to support fertility is that a child is an investment whose cost is borne by parents or carers. After the upbringing and schooling period, a young man or woman enters the labor market, pays their taxes and contributes to the country's economic growth. It is thus in the interest of society as a whole to see the fertility rate grow in Poland and to at least partially compensate parents or carers for the costs of bringing up and educating their children. The "500 plus" program offers a guarantee of income stability for households, but the program should be supplemented with measures focusing on the labor market, education, and home purchases.

Figure 6.1. Natural increase, net migration (left axis) and total fertility rate (the number of newly born children per woman – right axis) in Poland, 1990–2014



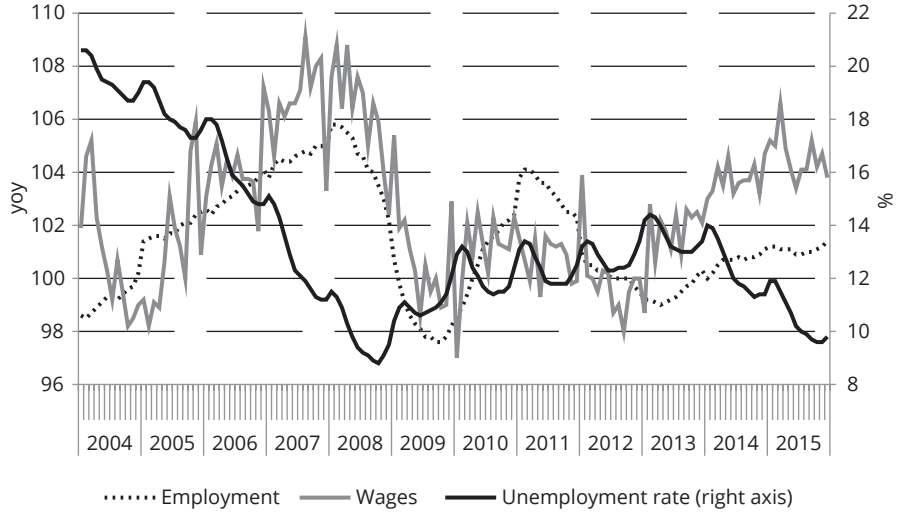
Source: Central Statistical Office (GUS).

Labor market

Poland's employment and unemployment statistics have been stable for around four years, starting from the beginning of 2010. At the end of 2013, the country's unemployment rate stood at 13.4% and was unchanged from the end of 2012. Employment in the enterprise sector increased at a moderate rate of 0.7% a year on average from the end of 2010 to the end of 2013. Wages grew at a slow rate in the economy as a whole in real terms: 1.4% in 2011, 0.1% in 2012, and 2.5% in 2013. The marked rise in 2013 was in part due to an unexpected drop in inflation and nominal wages not yet adjusted due to their rigidity. Wages in the enterprise sector fell by 0.2% in real terms in 2012.

In 2014, the trend from the previous four years changed markedly, setting a new pattern that continued into 2015. The unemployment rate decreased significantly, to 11.5% at the end of 2014 and then 9.8% at the end of 2015. The number of those unemployed decreased by almost 600,000 in 2014 and 2015 combined. Last year, due to seasonal factors, the lowest unemployment rate was noted in October and November, at 9.6% in both cases. Moreover, employment in the enterprise sector increased markedly in 2015, 1.4% in year-on-year terms at the end of the year and 1.3% in average annual terms. Wages in the enterprise sector increased by 3.5% year-on-year on average in nominal terms and by 4.5% in real terms. Real wages grew in part due to deflation that began in July 2014. In 2015, the prices of goods and services in Poland were 0.9% lower than a year earlier.

Figure 6.2. The growth of real wages and employment in the enterprise sector (corresponding month of the previous year = 100) and the registered unemployment rate in Poland



Source: Central Statistical Office (GUS).

Enterprise-sector employment underwent various changes in individual sectors of the economy in 2015. The greatest average annual increases were noted in the following sectors (according to the Polish Classification of Activities – PKD 2007):

- information and communication (7.6%),
- administrative and support service activities (6.7%),
- manufacturing (2.4%),
- transportation and storage (2.4%).

Not everywhere were the trends positive; some industries are still experiencing a slowdown or decline. In the construction industry, for example, demand for labor decreased by 5.3%, and in "mining and quarrying" and "electricity, gas, steam, and air conditioning supply" it dropped by 8.4% and 4.5% respectively. "Accommodation and catering" experienced a sharp decline (–6.0%). Employment in construction increased until mid-2012, despite the economic downturn. The latest data suggests a correction to the upward trend.

Data on gross wage growth in the enterprise sector by industry only partially matches the data on employment. The greatest average nominal wage growth was recorded in the following PKD-2007 sections:

- construction (5.7%),
- information and communication (5.3%),

- administrative and support service activities (5.2%),
- real estate activities (4.6%).

Wage growth was positive in all of the analyzed sections, except "mining and quarrying," where wages decreased by 1.6%.

The Polish labor market became increasingly inflexible in 2010–2013, with a rising long-term unemployment rate and growing unemployment in the youngest age group, those 15–24. By the end of 2013, the long-term unemployment rate had risen to 4.4%, from 3.0% at the end of 2010. Unemployment in the 15–24 age group increased to 27.3%, from 23.6% at the end of 2010. In the following years, the figures improved slightly. The long-term unemployment rate dropped to 3.8% at the end of 2014, and unemployment in the 15–24 age group fell to 20.2% at the end of 2015. However, young people in Poland still have significant problems finding their first job and the increasing number of long-term unemployed may eventually lead to their social exclusion. In the fourth quarter of 2015, the average time of job-seeking decreased slightly to about one year, which was still a long time. The increased rigidity of the labor market was one of the causes of emigration after the first phase of the financial and economic crisis.

An economic climate survey conducted by the National Bank of Poland[1] among businesses showed positive employment forecasts in the first quarter of 2016. For more than two years, more companies have been planning to increase rather than decrease employment, reversing the trend of the previous five years and lifting the employment rate significantly above its long-term average. In terms of ownership, the greatest demand for work is declared by private enterprises, particularly those that are foreign-controlled. In terms of branches, the greatest growth is expected in industry and services, especially transport services.

Meanwhile, more companies are declaring a readiness to increase wages; 46.1% plan to increase wages in 2016 and 12.6% plan wage hikes in 2017. The highest percentage of companies planning to increase wages (in terms of the Polish Classification of Activities – PKD 2007 section) is in industry and services (mainly transport). In construction, this percentage is slightly lower. In what is already a well-established trend, wage increases are more often planned by large enterprises than those from the SME sector.

Similar conclusions about demand for labor can be drawn from the Manpower Employment Outlook Survey.[2] According to a representative sample of 750 employers, 18% are planning an increase in total employment, 6% are planning to reduce the

[1] The NBP's economic climate survey is conducted quarterly. This chapter presents the results of a survey conducted in the final quarter of 2015 and examining businesses' forecasts for the first quarter of 2016.

[2] The survey is conducted quarterly in 42 countries and covers 65,000 HR departments. This chapter presents the results of a survey examining employers' expectations for the second quarter of 2016.

number of jobs, and 70% are not expecting any personnel changes. The remaining 6% were undecided. The net employment outlook is +12% and +10% after seasonal adjustments. Expectations improved slightly compared with the first quarter of 2015; the net employment forecast remained positive for the last four quarters.[3]

The Manpower research showed positive labor market expectations in Poland through most of the economic slowdown, with the exception of a short period from the fourth quarter of 2012 to the second quarter of 2013. In all 10[4] surveyed sectors, more employers were planning to increase employment rather than cut jobs in the first quarter of 2016.

Especially optimistic forecasts were formulated by large enterprises with more than 250 employees; their net employment outlook was +29%. The figure for micro-companies with no more than nine employees was +1%. A high level of optimism was observed among companies in the following sectors: "construction," with a net employment forecast of +20% (an increase of 2 p.p. from the previous quarter and no change in year-on-year terms); "restaurants/hotels," with a net employment forecast of +14% (up by 7 p.p. qoq and up by 11 p.p. yoy); "manufacturing" (+13%, down by 5 p.p. qoq and no change yoy), "transport/logistics/communication" (+12%, up by 5 p.p. qoq and down by 6 p.p. yoy); and "retail and wholesale trade" (+11%, down by 3 p.p. qoq and up by 2 p.p. yoy). The following sectors were the least optimistic about employment: "mining, quarrying" (+1%, no change from either the preceding quarter or the corresponding quarter of the previous year); "agriculture/hunting/forestry and fishing" (+1%, a decline of 6 p.p. qoq and a growth of 2 p.p. yoy); and "electricity/gas industry/water supply" (+2%, marking stabilization in qoq terms and an increase of 9 p.p. yoy).

These results do not fully correspond with the current trends in employment. In particular, there are significant discrepancies in the construction industry.. Meanwhile, companies in other EU countries, such as Bulgaria (+13%), Hungary (+11%), Romania (+10%), and Slovenia (+9%), expect an increase in demand for labor. The forecast is negative only for France (– 1%).

In a positive trend, the employment rate in Poland is steadily rising. From 2004 to 2014, the overall rate (for the 15–64 age group) increased from 51.7% to 61.7%, with the EU28 average at 64.8%. When it entered the European Union in 2014, Poland had the lowest employment rate in the EU. By the end of 2014 it had surpassed seven member countries. The Czech Republic stood out among EU countries in Central

3 All the data below are seasonally adjusted data.

4 The following sectors were surveyed: construction; energy/gas industry/water supply; finance/insurance/real estate/services; retail and wholesale trade; public sector institutions; mines/mining; manufacturing; restaurants/hotels; agriculture/forestry/fisheries; and transport/logistics/communication.

and Eastern Europe at the end of 2014, with an employment rate of 69.0%. Hungary's employment rate has grown sharply in recent years based on a visible recovery on the labor market.

Poland's employment rate in the 55–64 age group increased from 26.2% in 2004 to 42.5% in 2014, enabling the country to move from last to sixth-to-last position in the EU (with the EU28 average at 51.8%).

Table 6.1. The employment rate in 2014 and the average unemployment rate in 2015: Poland compared with selected other countries

Country	Employment rate (%), 15–64 age group				Unemployment rate (%)		
	Total	Women	Men	aged 55–64	Total	under 25	Long-terma
Poland	**61.7**	**55.2**	**68.2**	**42.5**	**7.5**	**20.9**	**3.8**
Czech Republic	69.0	60.7	77.0	54.0	5.1	20.6	2.7
Slovakia	61.0	54.3	67.6	44.8	11.5	26.4	9.3
Hungary	61.8	55.9	67.8	41.7	6.8	17.3	3.7
Lithuania	65.7	64.9	66.5	56.2	9.1	16.3	4.8
Latvia	66.3	64.3	68.4	56.4	9.9	16.3	4.7
Estonia	69.6	66.3	73.0	64.0	7.4[a]	15.0[a]	3.3
Germany	73.8	69.5	78.1	65.6	4.6	7.3	2.2
France	63.8	60.4	67.3	46.9	10.4	25.1	4.4
Spain	56.0	51.2	60.7	44.3	22.1	48.3	12.9
Ireland	61.7	56.7	66.9	53.0	9.4	20.9	6.7
Netherlands	73.1	68.1	78.1	59.9	6.9	11.3	3.0
United Kingdom	71.9	67.1	76.8	61.0	6.1[a]	16.9[a]	2.2
Denmark	72.8	69.8	75.8	63.2	6.2	10.8	1.7
Romania	61.0	53.3	68.7	43.1	6.8	21.7	2.8
Bulgaria	61.0	58.2	63.9	50.0	9.4	21.5	6.9
Croatia	54.6	50.0	59.1	36.2	16.6	44.6	10.1
EU28	64.8	59.5	70.1	51.8	9.4	20.4	5.1
USA	71.8[b]	66.0[b]	77.8[b]	60.9	6.2	13.4	1.9

[a] Data for 2014. [b] Data for people aged 20–64.

Source: Eurostat.

Education, labor costs and productivity

Poles are relatively well educated compared with other Europeans in terms of the percentage of people with at least a secondary education among those aged 25–64. In Poland, this indicator stood at over 90.0% in 2014, compared with the EU average of

75.8%, after a steady rise in recent years, including the crisis period. However, Poland is below the EU average in terms of the percentage of the population with a university education (26.1% against 29.1%), despite an upward trend in recent years. A relatively small number of people in Poland participate in various courses and training programs: 3.5% in 2014, against 10.6% in the EU28 on average. Statistics confirm that the level of education has a positive impact on wages. However, lifelong learning is just as important. Focusing on self-development and professional growth helps avoid unemployment during an economic downturn and reduces the risk of joblessness among those approaching the retirement age.

Table 6.2. Education indicators (data for 2014), unit labor costs (Q3 2015), and minimum wage (2016): Poland compared with selected other EU countries

Country	Population with upper secondary or tertiary education	Population with tertiary education	Participation rate in education and training[a]	Unit labor costs (%, yoy)	Minimum wage	
	% of population (aged 25–64)				EUR	PPS
Poland	**90.5**	**26.8**	**3.5**	**1.8**	**431**	**792**
Czech Republic	93.1	21.2	8.6	2.3	366	564
Slovakia	91.2	20.4	3.0	1.6	405	597
Hungary	82.9	22.9	6.3	–0.8	353	625
Lithuania	93.4	36.1	5.5	0.0	350	557
Latvia	89.6	30.4	5.1	2.9	370	528
Estonia	91.0	38.8	12.5	–3.4	430	569
Germany	86.8	27.4	7.9	0.8	1,473	1,451
France	76.9	33.2	18.3	0.8	1,467	1,361
Spain	56.3	34.4	9.7	0.0	764	828
Luxembourg	81.7	44.8	16.5	3.0	1,923	1,597
United Kingdom	79.0	40.4	15.5	2.3	1,529	1,133
Sweden	83.6	38.3	29.4	3.7	-	-
Romania	73.8	15.8	1.1	4.2	233	445
Bulgaria	81.2	26.8	1.7	2.3	215	449
Croatia	82.7	21.3	2.6	n.a.	408	618
EU28	75.8	29.1	10.6	0.7	-	-

[a] Preliminary data for 2015.

Source: Eurostat.

When entering the European Union, Poland had one of the lowest labor productivity rates (expressed as GDP per person employed in PPS terms) among member states,

outperforming only the Baltic states.[5] In 2007, labor productivity in Poland[6] began to rise slowly but steadily. Paradoxically, the financial and economic crisis improved Poland's position against other EU economies. However, Poland is still among countries with low labor productivity. In 2014, only Bulgaria, Romania, Latvia, Hungary, and Croatia trailed it in terms of labor productivity (Table 6.3). Now that EU economies are undergoing a moderate recovery, a slow increase in labor productivity can be expected in Poland, along with a continued process of catching up with Western Europe.

Table 6.3. Labor productivity expressed in GDP (PPS) per person employed: Poland compared with selected other EU countries (EU28 = 100 for each year)

Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Poland	**60.4**	**60.1**	**59.7**	**61.1**	**60.8**	**64.5**	**69.5**	**71.7**	**73.6**	**73.6**	**73.7**
Czech Republic	73.9	74.1	75.1	77.6	75.2	77.0	75.4	77.0	75.6	76.0	77.6
Slovakia	65.4	68.2	71.1	76.1	79.3	79.0	81.9	79.6	80.9	82.7	83.4
Hungary	66.3	67.1	67.2	66.6	70.5	72.7	72.5	72.8	71.2	71.8	70.4
Lithuania	52.9	55.1	57.9	62.0	64.8	61.2	67.1	70.5	72.7	74.2	74.4
Latvia	49.2	52.3	53.9	56.5	57.0	56.3	58.2	60.5	62.7	62.4	64.7
Estonia	55.7	58.8	60.7	65.4	65.1	65.2	69.0	70.4	73.2	72.8	73.8
Slovenia	80.9	82.5	82.5	82.3	83.1	79.6	79.1	80.0	79.2	79.3	81.5
Germany	107.4	108.2	108.2	107.9	107.3	103.7	106.3	107.2	105.7	104.8	106.3
France	115.9	116.7	115.5	115.8	115.7	116.9	116.7	116.4	114.6	116.2	115.3
Ireland	138.5	137.5	137.3	137.9	128.6	135.0	140.9	146.2	145.7	142.2	143.9
United Kingdom	116.0	116.2	115.5	112.5	109.5	108.3	103.6	101.9	102.1	102.0	102.2
Luxembourg	167.1	162.7	171.6	171.4	165.2	157.9	160.5	165.0	161.2	165.1	167.3
Romania	33.9	35.3	38.9	42.5	48.7	48.9	49.3	50.6	55.6	55.8	56.7
Bulgaria	34.9	36.0	36.6	38.8	40.8	41.2	41.6	42.1	43.4	43.0	43.7
Croatia	72.5	73.5	72.5	70.4	70.9	67.8	66.4	69.7	72.2	72.8	70.4

Source: Eurostat.

Conclusions

Recent years have marked a clear deterioration in demographic trends in Poland. In addition, economic emigration within the EU continues to grow even though the labor market has gradually improved since 2014. At the same time, Poland has introduced

5 As well as Bulgaria and Romania, both of which joined the European Union in 2007.

6 At this writing 2015 data were not yet available.

new family policy tools that are expected to improve fertility and the financial situation of families bringing up children. Poland still has relatively low labor productivity compared with Western European economies. A major challenge for economic policy makers is to create incentives for young and educated people to remain in the country and continue their family and professional life here. Family policy should also cover the labor market and include arrangements for home buyers.

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Chapter 7

Investment and Domestic Savings in Poland Compared with Other EU Countries

Piotr Maszczyk

Investment and domestic savings are important determinants of the competitiveness of economies. This subsection analyzes the role of investment and domestic savings in shaping the competitiveness of the Polish economy, with a focus on changes from 2010 to 2015.

Investment

An in-depth look at investment outlays in Poland from 2010 to 2015 – a time when the negative implications of the global crisis of 2008 decreased steadily – reveals that this component of aggregate demand underwent far-reaching transformations in terms of both its level and the rate at which it changed, primarily due to the situation in the global economy. The first three years of the analyzed period (2010-2012) marked a drop in the value of investment in Poland, except for 2011 when the value of investment increased by more than 8%, driven by a significant acceleration in GDP growth. The negative trends in investment during this three-year period were in an obvious way related to the fallout from the global crisis. Even though Poland's economic growth in 2011 was more than 1 percentage point faster than in 2014, at 4.5% vs. 3.3%, investment outlays grew at a much slower rate: 8% vs. 9.6%. Until the negative effects of the crisis affected the world, they also weighed heavily on the Polish economy. The year 2013 marked a positive change in this area. With fewer negative consequences of the global crisis, the rate at which investment grew in Poland was positive that year. The trend continued in 2014 and 2015. Nevertheless, as in the case of GDP growth, the adverse influence of the global turbulence on Poland was relatively moderate, at least compared with the rest of the EU. The value of investment outlays decreased by only 1.7% in year-on-year terms, compared with a 17.6% increase in 2007.

On the one hand, growing investment improved the competitiveness of the Polish economy. On the other, Polish enterprises performed better on the European mar-

ket and increased their investment outlays and thus their capacity to meet growing demand. The global crisis empirically confirmed the demand model. Because of a specific feedback mechanism described in the Keynesian model, investment outlays influence the economy far more dramatically than private consumption or government spending and are responsible for the part of aggregate demand most strongly dependent on the business climate. Thus investment stimulated both the demand and supply sides of the Polish economy. However, as data analyzed later in this chapter show, the relationship between investment and economic growth described by the demand model could not withstand the empirical test in the last three years.

In 2010, the Polish economy grew 3.9%. This was not enough to increase the value of investment outlays, but the rate at which this part of aggregate demand decreased was slower than in the previous year (0.4%). In 2011, Poland's economic growth picked up again (to 4.5%) and investment increased by around 8% because of the feedback mechanism described above. The year 2012 (which marked "the second wave of the crisis") produced another deceleration in GDP growth (to 1.9%) and investment outlays dropped by 1.7%, as expected. When the growth rate decreased in 2013 (by 0.3 percentage points), expectations that investment outlays would drop seemed to be justified. The anticipated effect did not materialize, and investment outlays grew by 0.9%.

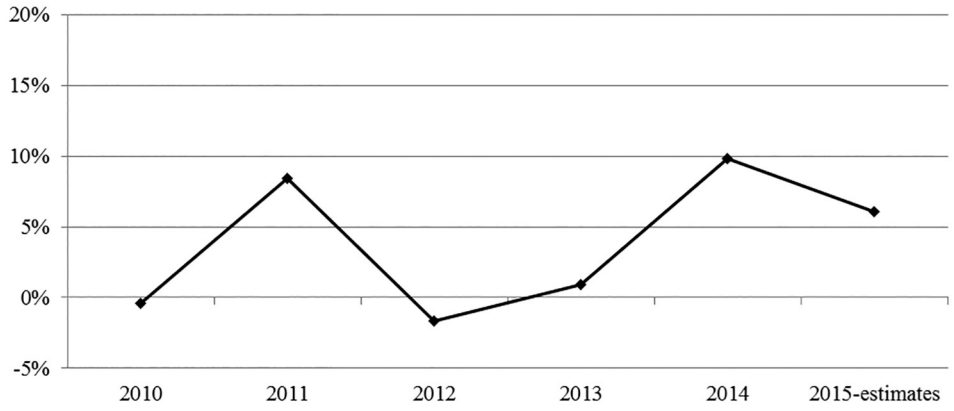
Taking into account data for 2014 and preliminary data for 2015, it is difficult to judge to what extent the 2013 reversal of the trend in the relationship between investment and GDP growth was permanent in nature and to what extent it was just a one-off effect driven by short-term factors.

While the fast acceleration in the country's economic growth in 2014 resulted in an even faster rise in investment that year, preliminary data for 2015, released by the government's Central Statistical Office (GUS) in January and February this year, do not make it possible to unambiguously determine whether investment also gained momentum in 2015 on the back of a further slight acceleration of GDP growth. A forecast for investment in 2016 offered later in this section suggests that, in connection with the expected stabilization in the rate of economic growth at around 4%, investment will continue to grow at a rate of more than 5%. It is therefore impossible to judge at this point whether that would mean a return to the mechanism and relationships observed in 2010–2012.

According to optimistic expectations voiced last year in outlets including this report, the upward trend in the value of investment in Poland continued in 2015, but it is difficult to evaluate at this point whether this component of aggregate demand grew faster or more slowly than in 2014. Under the optimistic scenario formulated last year, the value of investment was expected to increase by more than 10% (compared with around 5% in the pessimistic scenario). Preliminary GUS data released in Feb-

ruary 2016 showed that investment outlays as of the end of the third quarter of 2015 totaled PLN 85.8 billion and were almost 14% higher than at the end of the corresponding period of the previous year. GUS data for all of 2015 show that investment outlays in the full year 2015 came to PLN 266 billion and were 6.1% higher than the previous year (in 2014, investment in Poland increased by 9.8%). Considering that GUS preliminary data were usually underrepresented in previous years, it can be expected that the rate at which investment outlays grew in 2015 was slightly higher than that, but not in double-digit territory, contrary to the optimistic scenario formulated last year. Thus the 2015 investment ratio in the economy (the relation of investment outlays to the GDP in current prices) – in line with preliminary GUS data – stood at 20.2%; compared with 19.6% in 2014 and 18.8% in 2013.

Figure 7.1. Investment growth in Poland, 2010–2015



Source: Author's calculations based on Central Statistical Office data.

The probable deceleration in investment outlays in the Polish economy in 2015 was accompanied by slightly faster GDP growth than in the previous year (3.6% in 2015, compared with 3.3% in 2014, according to preliminary GUS data). This means that the link between this part of aggregate demand and the overall economic situation was different than the relationship described by the Keynesian demand model. However, while the data describing the Polish economy in 2004–2012 testified to such a feedback mechanism, in 2013 and 2015 the relationship between GDP growth and the value and growth of investment outlays was shaped in a different way.

The prime factor driving investment in 2015 was that the negative influence of the prolonged eurozone crisis was no longer felt in the Polish economy. Even though the overall impact of the global financial crisis on Poland was relatively moderate, at least compared with the rest of the EU, it undoubtedly had a negative impact on the value

of investment. From 2008 to 2015, the Polish economy expanded by almost 30%, while the average cumulative growth in the EU as a whole during that period was just above zero. Still, the crisis, which spread from the financial sector to the real economy, led to a general decline in sentiment and confidence among both households and enterprises, triggering a decreased propensity to consume and invest. The rate at which investment grew slowed in 2008, followed by a significant drop in investment outlays in 2009 and 2010. In addition, in the first two years of the crisis, the availability of credit offered to both households and enterprises decreased significantly because of a new, restrictive policy introduced by commercial banks. However, as time passed, banks became accustomed to the poorer climate and started to lend money to enterprises planning investment projects, which led to a positive growth rate for investment in 2011, although this rate did not fully reflect the positive endogenous factors influencing the Polish economy. In 2012, the value of investment outlays dropped again (and the growth in 2013 was moderate), indirectly showing that the fallout from the global crisis still negatively influenced Poland's corporate sector, which was hesitant to invest and continued to amass giant savings instead. It was not until 2014 and 2015 that these funds were allocated for capital expenditure, evidently in connection with quickly improving business sentiment.

The slower rate at which investment grew in 2015 compared with the previous year primarily stemmed from two factors. First, after the EU's 2007–2013 budget was formally closed, the rate at which Poland absorbed structural funds flowing into the country from the EU budget slowed down markedly, leading to an increased value of investment projects under way in both the public and private sectors. Government data show that the total expenditure of businesses, institutions, and individuals benefiting from EU funds in Poland in 2015 came to PLN 371.9 billion (PLN 264 billion directly financed by the EU) and increased by PLN 52.5 billion (PLN 37.8 billion directly financed by the EU), compared with PLN 64.2 billion in 2014 (PLN 45.4 billion directly financed by the EU).

Another factor responsible for the slower growth of capital expenditure in 2015 was a lower value of foreign direct investment (FDI). Preliminary data by the Polish Information and Foreign Investment Agency (PAIiIZ) show that the value of FDI midwived by this government agency was a mere EUR 770 million, down from EUR 1.8 billion a year earlier. According to PAIiIZ estimates, anywhere from 10% to 15% of all FDI in Poland goes through the agency, which suggests the total value of FDI in Poland in 2015 approached USD 10 billion. This marks a nearly 40% drop from the previous year and means that optimistic forecasts made last year, suggesting that the slump in the flow of FDI in 2012 and 2013 had been overcome in a sustainable manner, have proven to be premature.

In 2004–2011, foreign direct investment in Poland ranged from USD 10 billion to USD 24 billion annually. In 2012, it was only $4.76 billion and in 2013 the FDI inflow was negative for the first time since 2000, when the National Bank of Poland (NBP) began publishing its own statistics according to the current methodology. Of course, both the negative value of FDI in 2013 and its rapid increase in 2014 were largely due to one-off factors. In 2013, the negative value of FDI was mainly due to a single decision to close down a special-purpose entity established previously in Poland and a transfer of nearly €3.5 billion to the British tax haven of Jersey. The total value of FDI in Poland in 2013 came to EUR 9 billion. The fast growth of FDI in 2014 was largely because of a new investment project by Volkswagen A.G. in Biełężyce near Poznań. Taking this into account, the total value of FDI in 2015 of around €10 billion meant stable growth compared with 2012 and 2013 but a decrease compared with the 2004–2011 period.

Even though the fall in the value of FDI handled by the PAIiIZ looks dramatic in year-on-year terms, the number of new jobs created by foreign investors in Poland did not change much. In 2014, PAIiIZ put their number at 4,391, compared with 4,339 in 2015. According to PAIiIZ experts, the four main factors determining Poland's investment appeal are low labor costs, the availability of qualified staff, the availability of production workers, and foreign language skills. Contrary to popular belief, foreign investors emphasize the high level of Poland's higher education system and are also happy with its technical and vocational training system, which, combined with the growing popularity of engineering and technical education in the country, is producing a growing supply of skilled professionals. It seems that the availability of unique employee skills and foreign language competence, combined with measures to support innovation, will contribute to the further development of Poland's manufacturing sector.

Other interesting trends regarding FDI include the growing importance of reinvestment, a greater readiness by production companies to set up research and development facilities, and renewed interest in the Polish market by Asian companies. The automotive, aerospace, and food industries are the preferred sectors for foreign investors and have been attracting the largest number of production projects. Half of the foreign companies that invested in Poland in 2015 launched operations in the country's special economic zones to secure income tax exemptions. Sixteen percent benefited from government grants.

A comparison of the rate at which investment changed in Poland in 2010–2014 with those for the Czech Republic, Slovakia, and Hungary – Poland's main competitors in the region for FDI – clearly shows that there are important differences between these countries,[1] although the level and rate of accumulation in these Central and East-

[1] The data on investment outlays in the Czech Republic, Hungary, and Slovakia in 2010–2014 come from the Eurostat website: http://epp.eurostat.ec.eu.int.

ern European countries, all of which joined the EU in 2004, have mainly been influenced by exogenous factors (the global crisis). Specifically, an increasingly stronger convergence trend was in evidence between Poland and Slovakia in terms of the rate at which the value of investment changed, while this pattern increasingly differed from the mechanisms at work in the Czech Republic and Hungary.

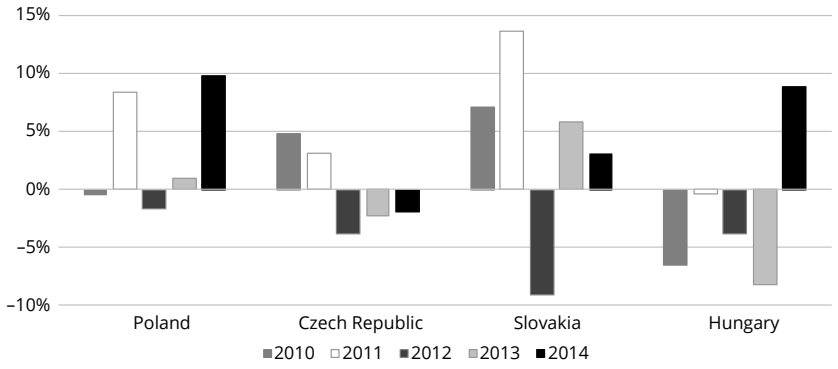
During the studied period, investment in the Czech Republic increased only in 2010 and 2011. As a result, the Czech economy was unable to return to its 2008 investment level. After a nearly 24% drop in 2009 and another cumulative drop of 8% in 2012–2014, the Czech economy could not muster a stable growth rate in this part of aggregate demand.

In the analyzed group of countries, the Slovak pattern of investment outlays and their growth has been the closest to Poland's for more than 10 years. In the analyzed period, the direction of changes in this component of global demand was in line with the trend observed in Poland in four years. The only difference was in 2010, when the value of investment outlays in Slovakia increased significantly (by more than 7%), while in Poland it decreased slightly. In other studied years, the direction of changes in the value of investment in Poland and Slovakia was convergent. It should be noted, however, that the variations in the value of investment in Slovakia were much higher than in Poland, in terms of both positive and negative growth rates. Generally, the variations in the value of investment in Slovakia were the highest in the group. Regardless of whether the rate rose or fell, the Slovak figure was always the highest.

Hungary, like Poland and Slovakia, also recorded a positive growth rate for investment in 2014 similar to that observed in Poland (8.8%, i.e. only 1 percentage point less). However, in 2011 and 2013, Hungary, unlike Poland, recorded a decrease in the value of investment. The value of this component of aggregate demand showed opposite trends in these two countries. Until last year, in times of relatively good economic trends, the Hungarian growth rate for investment was the lowest among Central European countries, and at a time of economic slowdown or recession, the decrease in this part of aggregate demand in Hungary was usually the most severe. But in 2014, Hungary's investment growth rate was almost as high as Poland's and much higher than Slovakia's. This could mean that the negative impact of a serious slump in the Hungarian public finance sector on investment outlays became much smaller in that country, while the threat of the Hungarian public finance sector losing its liquidity dropped dramatically.

Figure 7.2 compares Poland with other new EU member states in terms of the rate at which total investment outlays grew from 2010 to 2014.

Figure 7.2. A comparison of investment growth in Poland, the Czech Republic, Slovakia, and Hungary, 2010–2014

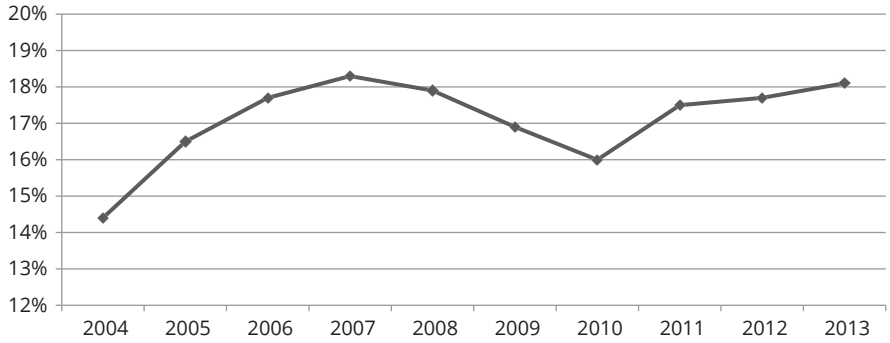


Source: Author's calculations based on Eurostat data.

Domestic savings in Poland in 2010–2015 are difficult to analyze because the most recent GUS data are for 2013; no data are available for 2014 and 2015. Most economists agree that the insufficient level of domestic savings is slowing down investment processes and forcing Poland to use foreign savings in the form of FDI and other sources of foreign capital. Domestic savings are consequently seen as a stabilizing factor for economic growth in the long term.

In 2004–2007, a steady rise was recorded in the ratio of gross domestic savings to GDP. In 2007, this ratio increased by 3.9 percentage points over 2004. In 2008, after the crisis began in the United States, the gross domestic savings-to-GDP ratio decreased, and this trend continued until 2010, when negative factors connected with the global financial crisis evidently began to peter out. In subsequent years, the ratio began to increase again. In 2013, the gross domestic savings-to-GDP ratio was 18.1%, of this: 15.8% for non-financial corporations, 2.3% for households, minus 0.7% for the government and local-government sector, 1.2% for financial institutions, and minus 0.5% for non-commercial institutions. In all institutional sectors, savings are in part earmarked for accumulation and liabilities. The fact that non-financial corporations accounted for the largest figure shows that Poland had failed to overcome the negative trends caused by the economic slowdown by the end of 2013; the domestic savings rate had not returned to its pre-crisis level.

Figure 7.3. Gross domestic savings-to-GDP ratio, 2004–2013



Source: *Wskaźniki Zrównoważonego Rozwoju Polski 2015*, GUS, Katowice 2015.

The future path of investment growth: a tentative forecast

Considering the combination of factors that contributed to slower investment growth in 2015, forecasting the value of this component of aggregate demand in 2016 is a difficult and risky task, especially as investment outlays in 2015 grew more slowly than in 2014 despite faster GDP growth. A look at individual components of aggregate demand in each quarter of 2015 and at preliminary data for the first quarter of 2016 indicates that capital expenditure will continue to grow, but the actual rate of this growth is anybody's guess.

The trend on the supply side, in particular the productivity of capital in the Polish economy, was extensively examined in previous editions of this report. That analysis showed that rapid investment growth was correlated with rapid GDP growth in Poland for many years. When the growth of fixed capital investment in Poland started to decelerate at the end of 1997, GDP growth slowed as well**.** When fixed capital outlays began to grow again at the end of 2003, the same trend was noted for GDP until 2008. This could suggest a specific "business cycle" in which periods of rapidly growing capital expenditure and declining productivity are interspersed with periods of decreasing capital and labor inputs, accompanied by Total Factor Productivity increases resulting in accelerated GDP growth.

In this context, 2013 and 2015 marked a departure from the overall pattern. In 2015, economic growth was to a lesser extent driven by increased domestic demand (which rose 3.4%, while GDP grew 3.6%; in 2014, the corresponding figures were 4.9% and 3.3% respectively). This means that the specific feedback mechanism described many times in this report did not produce accelerated investment growth.

Data for January released by the Central Statistical Office, combined with a business sentiment survey in February 2016, offer the hope that the current rate of GDP growth will be maintained, or even slightly accelerated. What is particularly important is that growth is expected to be primarily driven by revived consumer demand and increased investment outlays. All of these changes suggest that investment will grow no less than 5% in Poland in 2016, assuming that GDP will expand by at least 3.5%. However, the existing relationship between investment and economic growth may no longer work. Then investment outlays will not necessarily grow at a faster rate even if GDP continues to expand; they would continue to grow in value, but at a moderate rate of 3%–6%.

Government officials, international organizations, and independent experts have all suggested in the media that they do not expect deflation to end in Poland in the first half of 2016. This means that the rate-setting Monetary Policy Council (RPP) will probably maintain its current expansionary policy and the threat of an interest rate hike would be put off until the third or even fourth quarter. Cheap credit, together with positive shocks on the supply side (deflation in Poland is largely "imported" and stems from falling commodity prices) will probably also stimulate investment growth.

With all these favorable data and forecasts for the Polish economy, it is highly unlikely that investment in Poland will decline in 2016. The worst-case scenario is moderate growth of 3%, while the optimistic scenario is around 10% growth in this component of aggregate demand.

Two key factors – first mentioned in last year's report – should be considered in analyzing the probability of a negative scenario. First, the negative scenario is more likely because of the decreasing inflow of financial transfers from the EU budget. Funds available under the bloc's previous budget for 2007–2013 have run out and the possibilities of using cash from the new budget in the first three quarters of 2016 are limited due to natural administrative lag. Investment projects in 2015 were carried out not only in the public sector; EU co-financing positively influenced both public and private investment. This positive climate will probably turn negative in 2016, especially in the public sector. New investment projects in the next 12 to 15 months will likely be financed from companies' own funds or bank loans, and the cost of money from this source is much higher than that of EU funds, even with its burdensome and costly procedures.

Second, in the longer term, the "conservative" structure of investment in Poland could limit GDP growth to 2%–3.5%, leaving Poland in the "middle income trap." Because of the feedback mechanism described above, investment is strongly dependent on the business climate. With such moderate GDP growth, investment outlays would increase relatively slowly, thus having a negative impact on the economy. Even though

this risk is most likely in the medium and long term – not during the next year – it poses a serious threat to Poland's real convergence path. So far the Polish economy, with its emerging "model of capitalism" and institutions supporting market development, has managed to grow without any significant investment in innovative projects. But the efficiency of the predominant strategy whereby Polish enterprises import technology (mostly machinery) and know-how from more developed economies and countries – as a result of which the Polish economy is growing faster than more developed countries – is quickly declining. Moreover, the "model of capitalism" based on imitation (instead of innovation) and low costs, which has functioned well in Poland so far, could end quickly with production reallocated to countries with cheaper labor.

What the Polish economy really needs is a strategy in which the corporate sector manages to transform imported technology in an original and productive way in order to create innovative goods and services. Such a process would be impossible without new (or at least reformed) institutions that will ensure an appropriate level of factors of production, and thus enable sufficient investment in innovation. Institutions such as universities, investment funds, venture capital, and business angels have to be financed – at least in part and in the first few years – from public sources, including EU funds.

All these forecasts have been made with the assumption that Poland's economic and political environment will develop according to a baseline scenario in which no unexpected positive or negative trends will emerge either in Europe or worldwide during 2016, and that internal political risk in Poland will continue to run at a moderate level. Poland's central bank will be able to pursue an expansionary monetary policy – one encouraging a moderate increase in credit offered by commercial banks to the corporate sector – only if the RPP remains committed to its policy of lowering interest rates. A trend – favorable to Poland – whereby prices on the market for energy sources are falling could quickly reverse in connection with factors including developments in the Ukrainian-Russian conflict and the civil war in Syria, which is having a growing impact in the EU through the waves of refugees. The financial crisis in Greece and the political turmoil surrounding the country's negotiations with Brussels and the International Monetary Fund could also have a negative impact on investment in the Polish economy. Yet another potential problem is the upcoming referendum in Britain on whether the country should stay in the EU. A decision by any country to leave the EU would produce difficult-to-predict negative, short-term consequences for the Polish economy, including the exchange rate of the Polish currency.

On the other hand, data on economic growth in the United States in the fourth quarter of 2015 warrant moderate optimism and mean that exogenous factors have had a positive effect on GDP and investment growth in Poland. If, additionally, the eco-

nomic and political situation in Ukraine, Syria and above all in Russia, does not deteriorate dramatically, corporate-sector and household sentiment might improve quickly. This would provide a major impetus for faster economic growth in Poland above the baseline-scenario target. However, some unexpected negative events affecting the condition of the Polish economy, as well as the EU and the global economy as a whole, seem to be far more probable today than positive developments.

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Chapter 8

The Polish Financial System in the Context of Regulatory Changes in the European Union

Katarzyna Sum

This chapter traces changes in Poland's financial system in the context of regulatory processes in the European Union from 2010 to 2015. Modifications to existing regulations were primarily aimed at increasing the stability of the financial system, so implementing these changes should help improve the competitiveness of the Polish economy. Before we proceed with our discussion of regulatory changes, we compare key indicators of financial system stability in Poland and other countries in Central and Eastern Europe. The study covers Poland, Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Romania, Slovakia, and Hungary. Subsequently we overview implemented and planned changes to legal regulations concerning the EU financial system and identify major challenges faced by Polish regulatory institutions in the context of the current developments in the financial system.

Banking sector stability

The banking sector is the most important component of the Polish financial system; it has a dominant share in the total assets of financial institutions and plays a key role in financial intermediation. Due to the relatively poor development of the Polish banking sector compared with its counterparts in Western European countries, Polish banks have managed to shield themselves from the fallout of the latest financial crisis. However, due to the need to restructure banks from other EU countries that have subsidiaries and branches in Poland, the Polish banking system was exposed to an increased risk of financing and ownership changes during the studied period (NBP, 2012a).

Below we examine the key indicators of banking sector stability in Poland compared with other countries in Central and Eastern Europe. The capital-to-assets ratio in Polish banks during the studied period ranged from 8% to 10% (Table 8.1) and was

in line with values recommended by the Third Basel Accord (Basel III).[1] In most other countries in the region, the ratio was higher and stood at 9%–13%; the exceptions were the Czech Republic and Romania, where it remained below 8% for most of the analyzed period. The new regulations call for maintaining and strengthening the capital positions of banks, which should contribute to a further improvement in the stability of the Polish banking system. However, this could possibly increase the operating costs of credit institutions and lead to higher prices of services.

Table 8.1. The bank capital-to-assets ratio (%)

Country	2010	2011	2012	2013	2014
Bulgaria	10.47	10.76	10.10	10.35	11.57
Czech Republic	6.49	6.49	6.87	7.21	7.19
Estonia	9.28	8.92	9.88	11.26	11.69
Lithuania	8.53	10.78	12.28	12.62	12.91
Latvia	9.27	9.93	10.48	11.30	10.13
Poland	**8.20**	**7.82**	**8.69**	**9.10**	**9.25**
Romania	8.88	8.07	8.02	7.96	7.63
Slovakia	9.72	10.75	11.69	12.12	11.86
Hungary	8.20	9.10	9.10	n.a.	n.a.

Source: Own calculations based on World Bank data.

Testifying to the stability of the Polish financial system is a low ratio of non-performing loans to assets for Polish banks, a ratio that remained constant at around 5% throughout the studied period (Table 8.2). A lower ratio was reported only by Hungarian banks; in other countries the ratio ranged from 10% and 25% and was subject to considerable fluctuations.

The Polish banking sector had a relatively high ratio of liquid assets to total assets, ranging from 14% to 17% (Table 8.3). Higher ratios were recorded only for the banks in Slovakia and Romania. However, the Capital Requirements Regulation (CRR)[2] provides for more stringent liquidity standards for banks. They are expected to meet short- and long-term liquidity requirements defined by the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). A study by the Polish Financial Supervision Authority (KNF) shows that about 25% of Polish banks did not meet these requirements in 2011. One aspect of deteriorating liquidity risk is the fact that many Polish

[1] The Basel III recommendations are now being implemented in EU regulations.

[2] Capital Requirements Regulation, Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No. 648/2012.

banks finance their operations from funds obtained from their foreign parent entities, which implies a high concentration of financing and dependence on a foreign bank (NBP, 2011a). The possibility of establishing liquidity groups provided for by the new regulations could prove to be another problem. Participation of Polish subsidiaries in such groups could exacerbate their already excessive dependence on foreign parent entities. To improve the liquidity of Polish banks, it is consequently necessary to diversify the financing of their operations.

Table 8.2. The non-performing loans-to-assets ratio in banks (%)

Country	2010	2011	2012	2013	2014
Bulgaria	11.92	14.97	16.63	16.88	16.75
Czech Republic	5.39	5.22	5.24	5.20	5.59
Estonia	5.38	4.05	2.62	1.47	1.43
Lithuania	23.33	18.84	14.80	11.59	8.19
Latvia	15.93	14.05	8.72	6.41	4.90
Poland	**4.91**	**4.66**	**5.20**	**4.98**	**4.89**
Romania	11.85	14.33	18.24	21.87	15.33
Slovakia	5.84	5.61	5.22	5.14	5.35
Hungary	10.04	13.68	16.04	16.83	15.62

Source: Own calculations based on World Bank data.

Table 8.3. The liquid assets-to-total assets ratio in banks (%)

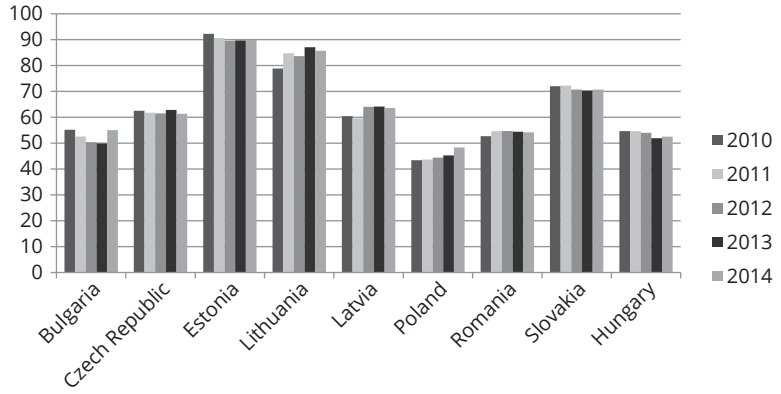
Country	2010	2011	2012	2013	2014
Bulgaria	11.26	11.17	13.38	11.80	13.49
Czech Republic	15.41	14.41	13.80	22.28	22.14
Estonia	n.a.	2.59	8.78	7.94	15.59
Lithuania	6.42	11.08	8.48	9.10	25.44
Latvia	10.26	7.84	11.22	19.09	9.96
Poland	**14.71**	**13.52**	**16.94**	**16.56**	**13.17**
Romania	25.06	23.63	21.13	24.10	21.88
Slovakia	17.30	20.73	23.82	33.80	n.a.
Hungary	3.17	3.08	3.17	4.36	3.14

Source: Own calculations based on World Bank data.

The Polish banking sector has a low level of concentration compared with its counterparts in other countries in the region. The five largest banks slightly increased their share of the total assets of the system in the analyzed period, but this did not exceed 50% (Figure 8.1). In other countries in the region, this indicator was above 50%;

in Slovakia, it was over 70%, and in Lithuania and Estonia it exceeded 80% and 90% respectively. Because the degree of concentration is an important systemic risk factor, its low level contributes to the stability of the Polish banking system.

Figure 8.1. Banking sector concentration measured by the share of the five largest banks in total assets (%)



Source: Own work based on European Central Bank data.

Table 8.4. The private-sector credit-to-GDP ratio (%)

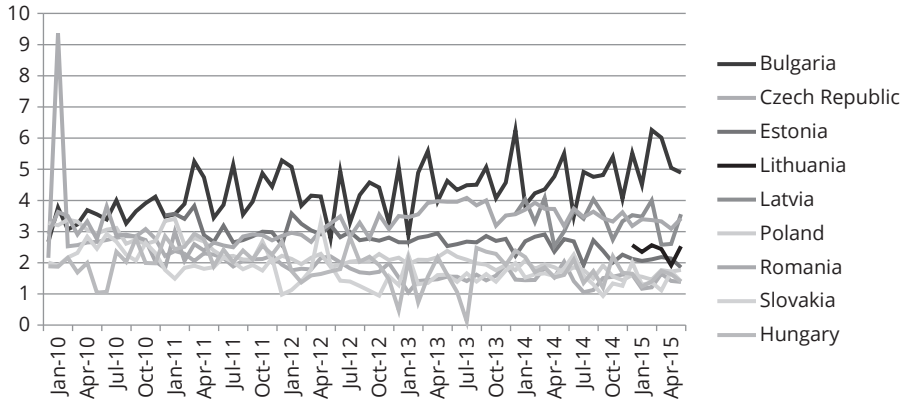
Country	2010	2011	2012	2013	2014
Bulgaria	70.93	67.43	67.83	67.73	60.57
Czech Republic	46.78	48.79	49.90	51.30	50.28
Estonia	92.98	79.30	74.04	70.09	69.04
Lithuania	58.68	49.60	46.64	43.11	41.12
Latvia	135.26	78.46	63.84	56.94	50.41
Poland	**49.02**	**51.83**	**50.52**	**50.89**	**52.08**
Romania	39.51	39.49	38.02	34.20	31.26
Slovakia	45.33	46.95	47.12	48.35	50.42
Hungary	61.36	59.37	51.04	46.83	n.a.

Source: Own calculations based on World Bank data.

Of considerable importance to the competitiveness of the Polish economy is the volume of credit for non-financial firms and the lending rate (Table 8.4 and Figure 8.2). The table below shows that the private-sector credit-to-GDP ratio in Poland in the studied period was around 45%, similar to several other economies in the region. In Estonia, Latvia, and Bulgaria, the volume of credit was higher, but the lending rate in these countries was higher than in Poland (Figure 8.2). In Poland, the lending rate

for non-financial firms was relatively low; it decreased steadily and was not subject to significant fluctuations. In many countries in the region, the rate ran at a similar level, but it underwent significant fluctuations in most economies. To improve the competitiveness of the Polish economy, lending to non-financial corporations needs to increase.

Figure 8.2. The lending rate for the non-financial sector (%)

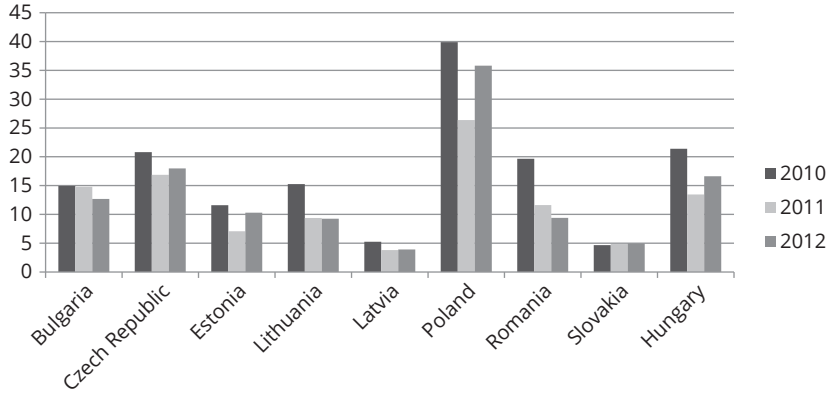


Source: Own work based on European Central Bank data.

Capital market stability

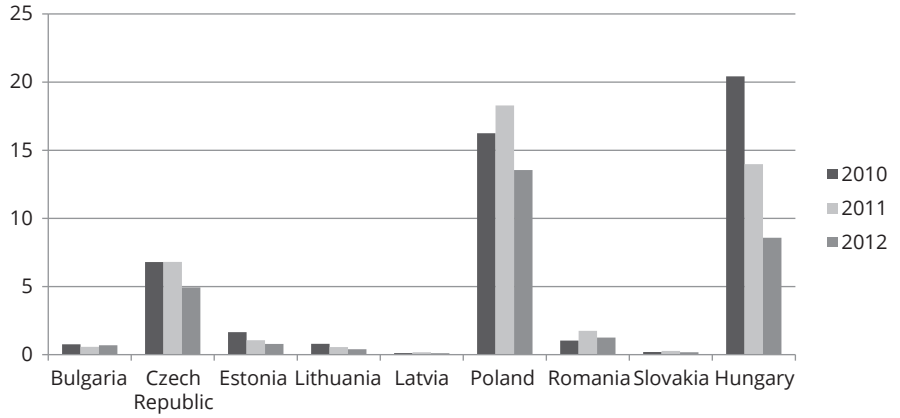
The Polish capital market is one of the most developed in Central and Eastern Europe. Its main components are the stock market, the Treasury bond market, and the growing non-Treasury debt securities segment. The Polish market for equity instruments boasts the highest capitalization among the analyzed economies; in 2010–2012 its capitalization was equivalent to 27%–39% of the country's GDP (Figure 8.3). The Polish stock market also has the highest volume of trading in equity instruments (Figure 8.4). A comparable volume of trading was noted only in Hungary; in all the other economies it was much lower. Stock index volatility as measured by Standard and Poor's was comparable in all the analyzed economies, pointing to a similar degree of stock market stability (Table 8.5).

Figure 8.3. Stock market capitalization (% of GDP)



Source: Own work based on World Bank data.

Figure 8.4. Volume of trading in equity instruments (% of GDP)



Source: Own work based on World Bank data.

Table 8.5. Standard & Poor's stock index (annual increase/decrease in dollar terms)

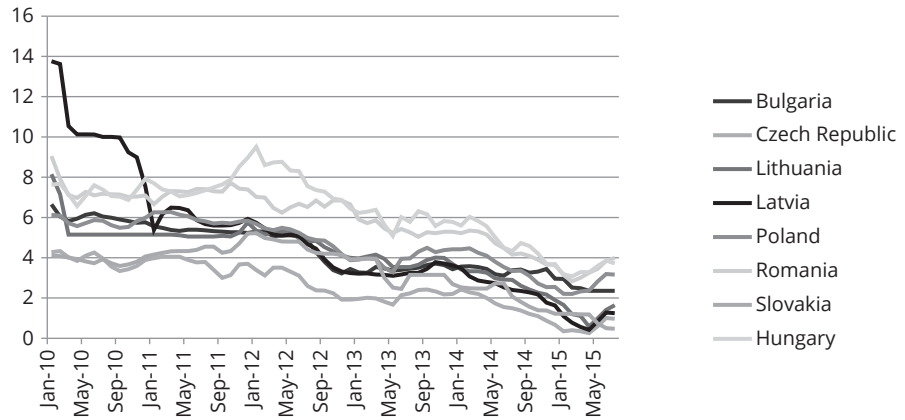
Country	2010	2011	2012	2013	2014
Bulgaria	–15.16	–22.10	–8.07	43.13	–21.63
Czech Republic	0.21	–15.02	–3.23	–15.69	–10.46
Estonia	56.03	–23.29	24.55	4.03	–28.46
Lithuania	43.96	–16.14	14.92	11.42	–15.42
Latvia	39.41	–17.34	9.02	31.66	–32.64

Country	2010	2011	2012	2013	2014
Poland	**11.26**	**–33.35**	**34.12**	**3.04**	**–16.39**
Romania	–6.58	–18.16	9.80	27.29	–5.16
Slovakia	5.36	3.05	3.36	9.63	–10.29
Hungary	–10.75	–35.29	18.73	0.19	–28.66

Source: Own calculations based on World Bank data.

An important indicator of the stability of the debt market is the level of long-term interest rates, reflecting the risk premium attributed to Treasury bonds by market players. The chart below shows that yields on 10-year Treasury bonds decreased in all the researched economies in the analyzed period (Figure 8.5). Yields in Poland were similar to those in other countries in the region.

Figure 8.5. Long-term interest rates (%)



Source: Own work based on European Central Bank data (no data available for Estonia).

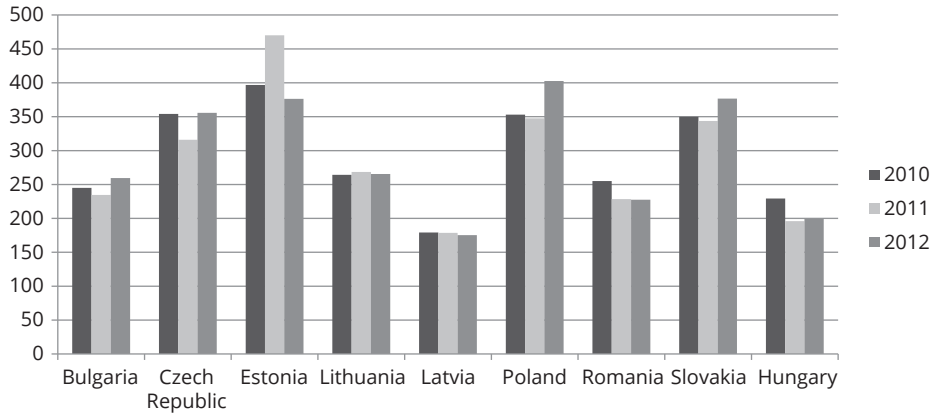
New EU regulations could increase the stability of the Polish capital market by implementing directives governing the requirements for individual market players. Of special importance is the UCITS IV Directive,[3] which aims to unify conditions for operating investment funds throughout the EU.

[3] *Undertakings for Collective Investments in Transferable Securities*, Directive 2009/65/EC of the European Parliament and Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS).

Insurance sector stability

Insurance sector risk is mainly due to non-traditional investment activities undertaken by insurance companies. The chart below shows the solvency ratio of insurance companies to the threshold required under the standards of the European Insurance and Occupational Pensions Authority (EIOPA). The chart shows that insurance companies in all the analyzed economies met the capital requirements (Figure 8.6). The Polish insurance market had one of the highest capital adequacy ratios among the studied countries (350%). Higher indicators were achieved only by insurance companies in Estonia.

Figure 8.6. The capital adequacy ratio for insurance companies4 in relation to the required EIOPA ratio (%)



Source: Own work based on EIOPA data.

Due to new regulations resulting from the Solvency II[5] directive, insurance companies will have to meet capital requirements depending on the level of risk they take. In addition, insurance supervision authorities will focus on supervising ways of risk management by insurance companies. The new regulations will strengthen the capital positions and stability of insurance companies. However, they will increase their operating costs and may lead to an increase in premiums.

4 Not including reinsurance companies.

5 Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance.

Investment fund sector stability

Investment fund sector risk depends on the type of instruments traded by these companies. In Poland, this risk is assessed as low because investment funds trade mostly traditional instruments and provide specific services (NBP, 2015a). The chart below shows that the sector developed steadily in Poland in the studied period; the total value of investment fund assets grew steadily from 0.5% of GDP at the start of the period to 1.1% of GDP at the end (Table 8.6). A similar upward trend was noted in other analyzed countries. The implementation of the UCITS IV Directive should lead to the further development of this market by unifying regulations for investment funds at the EU level.

Table 8.6. The total value of investment fund assets as a percentage of GDP (%)

Quarter	Czech Republic	Estonia	Lithuania	Latvia	**Poland**	Romania	Slovakia	Hungary
2010-Q1	0.42	0.97	0.44	0.69	**n.a.**	0.28	0.33	0.62
2010-Q2	0.41	0.96	0.43	0.76	**0.49**	0.25	0.33	0.60
2010-Q3	0.46	0.97	0.46	0.75	**0.55**	0.25	0.36	0.68
2010-Q4	0.50	0.95	0.53	0.85	**0.58**	0.25	0.39	0.69
2011-Q1	0.52	0.98	0.52	0.84	**0.60**	0.28	0.40	0.72
2011-Q2	0.56	0.94	0.52	0.84	**0.61**	0.28	0.40	0.70
2011-Q3	0.53	0.78	0.45	1.18	**0.49**	0.26	0.37	0.56
2011-Q4	0.60	0.73	0.46	1.18	**0.48**	0.25	0.55	0.48
2012-Q1	0.66	0.79	0.50	1.22	**0.58**	0.34	0.59	0.55
2012-Q2	0.65	0.74	0.50	1.16	**0.57**	0.70	0.62	0.54
2012-Q3	0.72	0.81	0.54	1.15	**0.62**	0.68	0.65	0.56
2012-Q4	0.84	0.82	0.58	1.16	**0.67**	0.78	0.70	0.58
2013-Q1	0.85	0.85	0.69	1.19	**0.72**	0.83	0.74	0.64
2013-Q2	0.86	0.88	0.79	1.21	**0.74**	0.85	0.76	0.74
2013-Q3	0.89	0.89	0.83	1.46	**0.79**	0.87	0.82	0.77
2013-Q4	0.89	0.97	0.82	1.51	**0.89**	0.92	0.88	0.82
2014-Q1	0.91	0.98	0.88	0.80	**0.93**	0.93	0.91	0.88
2014-Q2	0.95	1.04	0.94	0.80	**0.98**	1.02	0.96	0.94
2014-Q3	0.99	1.02	0.99	0.98	**0.99**	1.04	1.02	1.02
2014-Q4	1.05	0.91	1.04	1.08	**0.99**	0.99	1.03	1.02
2015-Q1	1.11	1.05	1.16	1.35	**1.12**	1.02	1.08	1.13

Source: Own calculations based on ECB data (no data available for Bulgaria).

Regulatory changes in the EU financial system from 2010 to 2015 and their implementation in Poland

As indicated in the analysis of sustainability indicators, the implementation of new EU regulations will be of major importance to the Polish financial system. In some respects the introduction of EU standards will constitute a big challenge for Polish regulatory bodies and entities subject to the new regulations, due to the need for extensive adjustments to their structure and business principles.

Regulatory changes in the EU financial system from 2010 to 2015 stemmed from the need to improve the stability of the system in response to the latest crisis. The reforms were based on recommendations of the Basel Committee and the Financial Stability Board (FSB), as well as guidelines from the de Larosière and Liikanen reports. The regulatory changes were aimed at increasing the security and transparency of financial markets, protecting financial service consumers, improving the quality of financial sector supervision, creating crisis management mechanisms (including an orderly liquidation and restructuring of financial institutions), and deepening integration on the European financial services market. Some of the new directives took the form of regulations directly binding in EU member states, while others were implemented as goal-setting directives requiring adjustments in national law (NBP, 2013b).

The crisis demanded the establishment of a new architecture for the EU financial system. In November 2011, a set of regulations was adopted based on the de Larosière report. Their aim was to establish supervision at the supranational level and set up a supervisory body for monitoring systemic risk. The body exercising macro-prudential supervision is the European Systemic Risk Board (ESRB), while micro-prudential supervision is exercised by the European Supervisory Authorities (ESAs). Three European Supervisory Authorities have been created: the European Banking Authority, the European Securities and Exchange Commission, and the European Insurance and Occupational Pensions Authority. Although supervision over financial institutions will remain in the hands of national authorities, European Supervisory Authorities are responsible for developing a single set of rules (referred to as a "single rulebook") and intensifying supervision of cross-border groups (NBP, 2010a). European Supervisory Authorities are also empowered to issue decisions requiring financial institutions to apply EU law.

In the banking sector, a significant regulatory change was the adoption of the CRD III[6] Directive, which was designed to improve models for predicting capital require-

[6] Directive 2010/76 /EU of the European Parliament and of the Council of 24 November 2010 amending Directives 2006/48/EC and 2006/49/EC as regards capital requirements for the trading book and for re-securitizations, and the supervisory review of remuneration policies.

ments, reduce their pro-cyclicality, and strengthen their resilience to extreme market conditions. The directive also introduced new rules for remuneration in banks and investment firms in order to limit incentives for excessive risk taking. Of key importance were also the CRD IV[7] and the aforementioned CRR Regulation. The CRD IV regulates the rules for establishing banks, capital buffers, and bank supervision. The CRR Regulation stipulates the requirements for banks' own funds, capital standards, liquidity, and leverage.

Changes were also made in financial market regulations. They liberalized the rules for issuing prospectuses[8] and standardized regulations throughout the EU on undertakings for collective investment in transferable securities (UCITS IV). They also regulated the trading of OTC derivatives (EMIR).[9]

Significant legal changes are taking place in the insurance sector. They are the result of the aforementioned Solvency II directive, which established capital requirements for insurance companies, and of the Omnibus II[10] directive, which includes the newly established supervisory authorities in existing regulations.

The new regulations also provided for supplementary supervision of financial conglomerates (FCD Directive[11]). The existing regulations were adapted to the new structure of financial supervision in the EU. Another important piece of legislation for promoting a functioning financial system is the BRR Directive, which establishes the rules for the obligatory restructuring of banks.[12]

The new regulations are being implemented gradually in Polish law. Significant changes will also take place in the financial supervision system within the EU. The

7 Capital Requirements Directive IV, Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

8 Directive 2010/73/EU of the European Parliament and of the Council of 24 November 2010 amending Directive 2003/71/EC.

9 European Market Infrastructure Regulation, Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

10 Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014 amending Directives 2003/71/EC and 2009/138/EC and Regulations (EC) No. 1060/2009, (EU) No. 1094/2010 and (EU) No. 1095/2010 in respect of the powers of the European Supervisory Authority (European Insurance and Occupational Pensions Authority) and the European Supervisory Authority (European Securities and Markets Authority).

11 Financial Conglomerates Directive, Directive 2011/89/EU of the European Parliament and of the Council of 16 November 2011 amending Directives 98/78/EC, 2002/87/EC, 2006/48/EC and 2009/138/EC as regards the supplementary supervision of financial entities in a financial conglomerate.

12 Bank Recovery and Resolution Directive, Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/56/EC, 2007/36/EC, 2011/35/EU, 2012/30/EU and 2013/36/EU, and Regulations (EU) No. 1093/2010 and (EU) No. 648/2012, of the European Parliament and of the Council.

changes mean that, in the case of financial institutions operating as part of international holding companies, national supervision authorities will lose some of their powers to supranational bodies. Another significant change is the separation of national supervisory powers from responsibility for Deposit Guarantee Schemes (DGS) in the banking sector. The new regulations also require that a macro-prudential supervisory authority be established to monitor systemic risk in line with a recommendation by the European Systemic Risk Board on the macro-prudential mandate of national authorities.[13]

So far, the introduction of the CRD IV/CRR package has led to no major changes in the level of banks' own funds or their capital ratios, so it should not increase the operating costs of credit institutions. However, extensive adjustments are necessary in how cooperative banking is regulated in Poland (NBP, 2015a). Cooperative banks will not meet the LCR and NSFR liquidity standards because mutual deposits in associating banks cannot be considered liquid assets and a stable source of funding. A potential solution is the establishment of an Institutional Protection Scheme that would guarantee mutual liquidity and solvency by institutions participating in the system (NBP, 2015a). Legislative work on such changes is in progress.

The aforementioned possibility of creating liquidity groups may prove to be an unfavorable solution from the point of view of the stability of the Polish banking system. Banks that are part of such a group will largely depend on the financial condition of their parent entities. Given the fact that many Polish banks finance their operations with funds obtained from foreign parent entities, establishing such groups may mean an increased risk of concentration in financing.

As a consequence of the regulatory changes, it is necessary to transpose to Polish law the BRR Directive on the obligatory restructuring of financial institutions. Introducing these provisions to Polish law would help solve the problem of the poor financial condition of credit unions (SKOK). Available tools do not favor a quick restructuring of these institutions, so the process is generating huge costs. The changes in question will be introduced by amending a law on the Bank Guarantee Fund and on the deposit guarantee scheme and obligatory restructuring. However, legislative work on the bill has been slow; it has been in progress since 2011 (NBP, 2015a).

[13] Recommendation of the European Systemic Risk Board on the macro-prudential mandate of national authorities (ESRB/2011/3).

Conclusions

The stability of the Polish financial system chiefly depends on the condition of the banking sector due to its dominant share in the total assets of financial institutions and in financial intermediation. The Polish banking system can be regarded as stable due to the strong capital positions of the country's banks and a consistently low share of non-performing loans in total assets compared with other countries in Central and Eastern Europe. Contributing to the low systemic risk is also the small concentration of the Polish financial system. The introduction of the CRR/CRDIV package will not significantly increase the operating costs of Poland's banks. However, meeting the new liquidity standards may prove to be a problem. In order to meet these requirements, it will be necessary to change Poland's cooperative banking model. In addition, due to the group approach to liquidity management ushered in by the new regulations – and the related increased risk of dependence on foreign parent entities – it is necessary to diversify the financing of bank operations. An improvement in the liquidity of Polish banks is especially important because of the need for increased lending to non-financial corporations. Poland has a low ratio of credit to GDP compared with other countries in the region, which could slow down the country's economic growth and adversely affect competitiveness.

Also important for the functioning of the Polish financial system is prompt implementation of the BRR Directive on the restructuring of financial institutions. Introducing these regulations would help solve the difficult financial situation of SKOK credit unions.

Opportunities for further development of the capital market and the investment fund sector are created by the UCITS IV Directive, which seeks to unify the rules governing the operations of collective investment entities.

If implemented quickly, regulatory changes will make it possible to improve the functioning of the Polish financial system while also helping improve the competitiveness of the economy.

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Chapter 9

Changes in Total Factor Productivity

Mariusz Próchniak

This analysis of total factor productivity (TFP) will be conducted using the growth accounting framework. Growth accounting is an empirical exercise aimed at calculating how much economic growth is caused by changes in measurable factor inputs and in the level of technology.

The research methodology was presented in previous editions of this report (see, for example, Próchniak 2015). In the 2013 edition, we estimated total factor productivity in various sectors of the economy for Poland and selected other countries in Central-Eastern and Western Europe (10 sectors were examined according to the NACE-2 classification) (Próchniak, 2013). In the 2012 and 2014 editions, in addition to the basic model of growth accounting, we also estimated a model expanded to include human capital (Próchniak, 2012, 2014).

The analysis covers 11 CEE countries, referred to as the EU11 (Poland, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Slovakia, and Slovenia) during the 2006–2015 period. To assess changes in total factor productivity during that period, we also present the average TFP growth rates for the following subperiods: 2006–2007, 2008–2010, 2011–2014, and 2015.

In this round of research, we updated all the time series of the analyzed variables. All the steps of the analysis were recalculated. Moreover, some time series have new coverage. Thus, all the results are fully documented in the study and the analysis does not use information from previous editions of the report.

The following time series were collected for the purposes of our analysis: (a) the growth rate of GDP, (b) the growth rate of labor, and (c) the growth rate of physical capital. The data are derived from the following sources: the International Monetary Fund (IMF, 2016), the International Labor Organization (ILO, 2016), and the World Bank (World Bank, 2016). The economic growth rate is the real annual GDP growth rate, taken from the IMF database. The growth rate for labor is the change in total employment according to the ILO data (ILO, 2016). The amount of physical capital is calculated using the perpetual inventory method based on World Bank data (World Bank, 2016). This method requires a number of assumptions. We assumed a 5%

Table 9.1. Labor. physical capital. and TFP contribution to economic growth in 2006–2015

		2006			2007			2008			2009			2010		
		growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)
Bulgaria	L	4.6	2.3	36	4.5	2.3	33	3.2	1.6	28	–3.4	–1.7	34	–6.1	–3.1	–467
	K	5.3	2.7	41	6.1	3.0	44	6.8	3.4	59	8.5	4.2	–85	5.2	2.6	399
	TFP	1.5	1.5	23	1.6	1.6	23	0.7	0.7	13	–7.5	–7.5	150	1.1	1.1	168
	GDP	6.5	6.5	100	6.9	6.9	100	5.8	5.8	100	–5.0	–5.0	100	0.7	0.7	100
Croatia	L	0.8	0.4	8	1.6	0.8	16	1.1	0.5	26	–1.6	–0.8	11	–3.9	–1.9	114
	K	4.2	2.1	44	4.7	2.4	46	4.9	2.5	120	5.3	2.7	–36	3.4	1.7	–100
	TFP	2.3	2.3	48	2.0	2.0	38	–1.0	–1.0	–47	–9.3	–9.3	126	–1.5	–1.5	86
	GDP	4.8	4.8	100	5.2	5.2	100	2.1	2.1	100	–7.4	–7.4	100	–1.7	–1.7	100
Czech Rep.	L	1.1	0.5	8	1.9	1.0	17	1.2	0.6	21	–1.5	–0.8	16	–0.6	–0.3	–14
	K	4.3	2.1	31	4.4	2.2	40	5.2	2.6	97	5.0	2.5	–51	3.5	1.8	77
	TFP	4.2	4.2	61	2.4	2.4	43	–0.5	–0.5	–18	–6.6	–6.6	135	0.8	0.8	37
	GDP	6.9	6.9	100	5.5	5.5	100	2.7	2.7	100	–4.8	–4.8	100	2.3	2.3	100
Estonia	L	5.3	2.7	26	1.3	0.7	9	–0.1	–0.1	1	–9.1	–4.6	31	–4.4	–2.2	–90
	K	7.2	3.6	35	9.0	4.5	58	9.2	4.6	–85	6.3	3.1	–21	1.7	0.9	35
	TFP	4.0	4.0	39	2.6	2.6	33	–9.9	–9.9	184	–13.3	–13.3	90	3.8	3.8	155
	GDP	10.3	10.3	100	7.7	7.7	100	–5.4	–5.4	100	–14.7	–14.7	100	2.5	2.5	100
Hungary	L	0.3	0.2	4	–0.2	–0.1	–15	–1.0	–0.5	–60	–2.3	–1.1	17	–0.2	–0.1	–13
	K	3.4	1.7	43	3.2	1.6	315	3.3	1.6	187	3.1	1.6	–24	2.2	1.1	141
	TFP	2.1	2.1	52	–1.0	–1.0	–200	–0.2	–0.2	–28	–7.0	–7.0	106	–0.2	–0.2	–28
	GDP	4.0	4.0	100	0.5	0.5	100	0.9	0.9	100	–6.6	–6.6	100	0.8	0.8	100
Latvia	L	5.0	2.5	21	2.1	1.1	11	–0.6	–0.3	10	–13.7	–6.8	48	–6.3	–3.1	109
	K	7.7	3.8	33	8.5	4.3	44	10.3	5.1	–162	7.6	3.8	–27	2.8	1.4	–49
	TFP	5.3	5.3	46	4.5	4.5	46	–8.0	–8.0	252	–11.1	–11.1	79	–1.1	–1.1	40
	GDP	11.6	11.6	100	9.8	9.8	100	–3.2	–3.2	100	–14.2	–14.2	100	–2.9	–2.9	100
Lithuania	L	0.8	0.4	5	1.6	0.8	7	–2.1	–1.1	–40	–8.1	–4.1	27	–5.5	–2.8	–170
	K	4.9	2.5	33	6.3	3.1	28	8.0	4.0	152	6.6	3.3	–22	1.6	0.8	50
	TFP	4.5	4.5	61	7.1	7.1	64	–0.3	–0.3	–12	–14.0	–14.0	95	3.6	3.6	220
	GDP	7.4	7.4	100	11.1	11.1	100	2.6	2.6	100	–14.8	–14.8	100	1.6	1.6	100
Poland	L	4.2	2.1	34	5.1	2.5	35	4.3	2.2	55	0.4	0.2	8	0.0	0.0	0
	K	1.7	0.9	14	2.5	1.2	17	3.7	1.9	47	4.1	2.1	78	3.6	1.8	48
	TFP	3.2	3.2	52	3.4	3.4	47	–0.1	–0.1	–2	0.4	0.4	15	1.9	1.9	52
	GDP	6.2	6.2	100	7.2	7.2	100	3.9	3.9	100	2.6	2.6	100	3.7	3.7	100
Romania	L	1.2	0.6	7	0.0	0.0	0	–1.0	–0.5	–6	–2.8	–1.4	20	–1.1	–0.6	69
	K	4.5	2.2	28	6.0	3.0	43	10.6	5.3	62	11.5	5.8	–82	4.4	2.2	–275
	TFP	5.2	5.2	65	3.9	3.9	57	3.7	3.7	43	–11.4	–11.4	162	–2.4	–2.4	306
	GDP	8.1	8.1	100	6.9	6.9	100	8.5	8.5	100	–7.1	–7.1	100	–0.8	–0.8	100
Slovakia	L	3.2	1.6	19	2.6	1.3	12	3.3	1.7	31	–3.1	–1.6	29	–2.2	–1.1	–23
	K	4.6	2.3	28	5.0	2.5	24	5.4	2.7	50	5.0	2.5	–48	2.8	1.4	29
	TFP	4.3	4.3	52	6.9	6.9	64	1.1	1.1	20	–6.3	–6.3	118	4.5	4.5	94
	GDP	8.3	8.3	100	10.7	10.7	100	5.4	5.4	100	–5.3	–5.3	100	4.8	4.8	100
Slovenia	L	1.3	0.7	12	2.8	1.4	20	0.6	0.3	9	–1.1	–0.6	7	–1.3	–0.7	–53
	K	3.8	1.9	34	4.4	2.2	31	5.0	2.5	76	5.2	2.6	–34	2.6	1.3	104
	TFP	3.1	3.1	54	3.4	3.4	49	0.5	0.5	15	–9.8	–9.8	126	0.6	0.6	48
	GDP	5.7	5.7	100	6.9	6.9	100	3.3	3.3	100	–7.8	–7.8	100	1.2	1.2	100

		2011			2012			2013			2014			2015		
		growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)	growth (%)	contr. (% points)	contr. (%)
Bulgaria	L	–3.6	–1.8	–90	–0.9	–0.5	–95	0.0	0.0	–1	1.4	0.7	41	1.0	0.5	29
	K	3.0	1.5	76	2.4	1.2	247	2.4	1.2	112	2.2	1.1	65	2.3	1.2	68
	TFP	2.3	2.3	114	–0.3	–0.3	–52	–0.1	–0.1	–10	–0.1	–0.1	–7	0.0	0.0	3
	GDP	2.0	2.0	100	0.5	0.5	100	1.1	1.1	100	1.7	1.7	100	1.7	1.7	100
Croatia	L	–3.6	–1.8	649	–3.3	–1.6	75	–2.7	–1.3	125	2.8	1.4	–388	0.9	0.5	56
	K	1.9	0.9	–337	1.6	0.8	–36	1.3	0.6	–60	1.3	0.6	–177	1.0	0.5	60
	TFP	0.6	0.6	–212	–1.3	–1.3	61	–0.4	–0.4	35	–2.4	–2.4	665	–0.1	–0.1	–16
	GDP	–0.3	–0.3	100	–2.2	–2.2	100	–1.1	–1.1	100	–0.4	–0.4	100	0.8	0.8	100
Czech Rep.	L	0.5	0.3	13	0.4	0.2	–20	1.0	0.5	–93	0.9	0.4	22	0.8	0.4	10
	K	3.4	1.7	85	3.2	1.6	–176	2.7	1.3	–253	2.3	1.1	57	2.2	1.1	29
	TFP	0.0	0.0	2	–2.7	–2.7	296	–2.4	–2.4	446	0.4	0.4	21	2.4	2.4	61
	GDP	2.0	2.0	100	–0.9	–0.9	100	–0.5	–0.5	100	2.0	2.0	100	3.9	3.9	100
Estonia	L	6.3	3.1	41	1.3	0.6	12	1.4	0.7	44	0.6	0.3	10	1.2	0.6	29
	K	1.4	0.7	9	3.5	1.8	34	3.8	1.9	121	3.7	1.9	64	3.2	1.6	80
	TFP	3.7	3.7	49	2.8	2.8	54	–1.0	–1.0	–64	0.7	0.7	25	–0.2	–0.2	–9
	GDP	7.6	7.6	100	5.2	5.2	100	1.6	1.6	100	2.9	2.9	100	2.0	2.0	100
Hungary	L	0.7	0.3	19	1.5	0.8	–52	1.5	0.8	50	5.6	2.8	78	0.6	0.3	10
	K	1.4	0.7	39	1.2	0.6	–41	0.9	0.4	29	1.2	0.6	17	1.9	0.9	31
	TFP	0.8	0.8	42	–2.9	–2.9	193	0.3	0.3	21	0.2	0.2	5	1.8	1.8	59
	GDP	1.8	1.8	100	–1.5	–1.5	100	1.5	1.5	100	3.6	3.6	100	3.0	3.0	100
Latvia	L	2.3	1.1	23	2.1	1.1	22	2.2	1.1	26	0.2	0.1	5	0.1	0.1	3
	K	1.1	0.5	11	2.5	1.2	26	3.3	1.7	39	2.6	1.3	55	2.4	1.2	56
	TFP	3.3	3.3	67	2.5	2.5	53	1.5	1.5	34	1.0	1.0	40	0.9	0.9	41
	GDP	5.0	5.0	100	4.8	4.8	100	4.2	4.2	100	2.4	2.4	100	2.2	2.2	100
Lithuania	L	2.8	1.4	23	1.3	0.6	17	0.2	0.1	4	1.5	0.8	26	–0.1	–0.1	–4
	K	1.6	0.8	13	2.8	1.4	37	2.5	1.2	38	2.9	1.5	49	3.1	1.5	88
	TFP	3.9	3.9	64	1.8	1.8	46	1.9	1.9	58	0.7	0.7	25	0.3	0.3	16
	GDP	6.1	6.1	100	3.8	3.8	100	3.3	3.3	100	3.0	3.0	100	1.8	1.8	100
Poland	L	0.4	0.2	4	0.1	0.1	4	0.0	0.0	0	2.1	1.1	31	1.6	0.8	22
	K	3.3	1.6	34	3.7	1.8	105	3.2	1.6	94	2.9	1.4	42	3.4	1.7	49
	TFP	3.0	3.0	62	–0.2	–0.2	–9	0.1	0.1	6	0.9	0.9	27	1.0	1.0	29
	GDP	4.8	4.8	100	1.8	1.8	100	1.7	1.7	100	3.4	3.4	100	3.5	3.5	100
Romania	L	–2.2	–1.1	–102	0.5	0.2	36	–1.0	–0.5	–15	1.7	0.9	30	–1.1	–0.5	–16
	K	3.8	1.9	179	3.7	1.9	289	3.4	1.7	50	2.7	1.3	48	1.9	1.0	29
	TFP	0.2	0.2	23	–1.4	–1.4	–225	2.2	2.2	65	0.6	0.6	22	2.9	2.9	87
	GDP	1.1	1.1	100	0.6	0.6	100	3.4	3.4	100	2.8	2.8	100	3.4	3.4	100
Slovakia	L	1.0	0.5	19	0.4	0.2	12	0.1	0.0	3	1.4	0.7	29	2.1	1.0	33
	K	3.1	1.6	57	3.9	1.9	120	2.7	1.4	96	2.4	1.2	51	2.5	1.3	40
	TFP	0.6	0.6	23	–0.5	–0.5	–32	0.0	0.0	0	0.5	0.5	20	0.9	0.9	27
	GDP	2.7	2.7	100	1.6	1.6	100	1.4	1.4	100	2.4	2.4	100	3.2	3.2	100
;Slovenia	L	–2.9	–1.4	–223	–1.2	–0.6	22	–2.0	–1.0	94	0.7	0.4	12	–0.2	–0.1	–4
	K	1.4	0.7	108	1.0	0.5	–18	0.4	0.2	–20	0.5	0.2	8	0.6	0.3	14
	TFP	1.4	1.4	215	–2.6	–2.6	96	–0.3	–0.3	26	2.4	2.4	80	2.1	2.1	91
	GDP	0.6	0.6	100	–2.7	–2.7	100	–1.1	–1.1	100	3.0	3.0	100	2.3	2.3	100

Source: Author's calculations.

depreciation rate and an initial capital/output ratio of 3. In the perpetual inventory method, the initial year should be earlier than the first year for which TFP is calculated. In our analysis the perpetual inventory method starts in 2000; this is the year for which we assume a capital/output ratio of 3. Investments are measured by gross fixed capital formation. The labor and physical capital shares in income are one-half each.

Table 9.1 shows the detailed breakdown of economic growth. Tables 9.2 and 9.3 sum up the data given in Table 9.1.

Over the entire period, the highest TFP growth rate was recorded in Poland, Slovakia, and Lithuania. In 2006–2015, total factor productivity grew at an average rate of 1.4% per annum in Poland, 1.2% in Slovakia, and 1.0% in Lithuania. In the remaining EU11 countries, the growth of productivity was much slower, not exceeding 0.3%, and in many countries it was negative. Romania and Slovenia recorded TFP growth rates of 0.3% and 0.1% per annum respectively in the years 2006–2015, while the remaining countries noted a fall in TFP per annum on average: –0.1% in Bulgaria and Latvia, –0.2% in the Czech Republic, –0.6% in Hungary, –0.7% in Estonia, and –1.1% in Croatia.

In interpreting the results for TFP changes, it is necessary to point out that the part of TFP which is due to increased labor productivity should be partly considered as a human capital contribution to economic growth. Because of the difficulties in calculating the stock of human capital for the group of countries studied, TFP in our approach also includes the impact of human capital on economic growth.

Poland's superior performance in terms of changes in total factor productivity compared with the other EU11 economies can undoubtedly be treated as a success. In studies conducted several years ago, the Baltic states had the best TFP growth rates. Prior to the global crisis, they showed very rapid economic growth, which was hard to explain by changes in labor and physical capital, and consequently it was attributed to TFP. The position of Poland in these analyses was moderate – not as good as that of the Baltic states, but neither was it trailing the group. The extension of the time horizon significantly changed the outcomes for individual countries in favor of Poland, while worsening the position of the Baltic states. This is visible when the results for the individual subperiods are discussed.

In previous rounds of this research, published in earlier editions of this report and covering a longer time horizon before the crisis (e.g. Próchniak, 2012), the rates of TFP growth were higher on average. The global crisis had a negative impact on the TFP growth rates calculated using the residual method and as a result, many countries recorded negative TFP growth rates in the entire period from 2006 to 2015. There is a visible lowering of the TFP growth rates in the wake of the global crisis when the results for the individual subperiods are discussed.

Table 9.2. TFP growth rates (%)

Country	The whole 2006–2015 period			2006–2007	2008–2010	2011–2014	2015
	Mean	Minimum	Maximum	Mean	Mean	Mean	
Bulgaria	–0.1	–7.5	2.3	1.5	–1.9	0.4	0.0
Croatia	–1.1	–9.3	2.3	2.1	–3.9	–0.9	–0.1
Czech Republic	–0.2	–6.6	4.2	3.3	–2.1	–1.1	2.4
Estonia	–0.7	–13.3	4.0	3.3	–6.5	1.6	–0.2
Hungary	–0.6	–7.0	2.1	0.5	–2.5	–0.4	1.8
Latvia	–0.1	–11.1	5.3	4.9	–6.8	2.1	0.9
Lithuania	1.0	–14.0	7.1	5.8	–3.6	2.1	0.3
Poland	**1.4**	**–0.2**	**3.4**	**3.3**	**0.7**	**1.0**	**1.0**
Romania	0.3	–11.4	5.2	4.6	–3.4	0.4	2.9
Slovakia	1.2	–6.3	6.9	5.6	–0.2	0.2	0.9
Slovenia	0.1	–9.8	3.4	3.2	–2.9	0.2	2.1

Source: Author's calculations.

Table 9.3. TFP contribution to economic growth (%)

Country	The whole 2006–2015 period		
	Mean	Minimum	Maximum
Bulgaria	43	–52	168
Croatia	78	–212	665
Czech Republic	108	–18	446
Estonia	56	–64	184
Hungary	22	–200	193
Latvia	70	34	252
Lithuania	64	–12	220
Poland	**28**	**–9**	**62**
Romania	60	–225	306
Slovakia	39	–32	118
Slovenia	80	15	215

Source: Author's calculations.

The highest variance of TFP growth rates in the analyzed period was noted in the Baltic states and Romania. The strong differences in how productivity grew in these countries resulted to a large extent from high fluctuations in GDP growth rates. The Baltic states recorded rapid economic growth in the first few years of their EU membership, at times exceeding 10% per annum. These countries were also hardest hit by

the implications of the global crisis because, in 2009, they noted a double-digit fall in GDP. As a result, TFP changes in the Baltics were the most differentiated among EU11 countries. The difference between the highest and the lowest TFP growth rates was slightly above 21 percentage points in Lithuania (ranging from –14.0% to 7.0%) and 16–17 p.p. in the two other Baltic states and Romania. In the remaining CEE countries except Poland, the spread between the TFP growth rates ranged from 13 p.p. in Slovenia and Slovakia to 9 p.p. in Hungary. Poland, which exhibited regular growth in output throughout the 2006–2015 period and was the only EU country to avoid recession, recorded the smallest variations in TFP, at 3.6 percentage points. This last result is another reason to positively assess Poland's achievements in terms of total factor productivity. Apart from the fact that Poland recorded the fastest growth of productivity in the last 10 years, it was the most stable of the whole group of Central and Eastern European countries. In Poland, the slowest growth of TFP in the examined period was recorded in 2012 (–0.2%), while the fastest growth appeared in 2007 (3.4%).

Based on the data in Table 9.2, it is worth analyzing the dynamics of total factor productivity in the individual subperiods. Before the global crisis, in 2006–2007, all the CEE countries recorded a positive growth rate of TFP. It was the highest in Lithuania (5.8%), Slovakia (5.6%), Latvia (4.9%) and Romania (4.6%), which was due to very rapid GDP growth in these countries before the crisis. The growth rate of TFP in Poland at that time was moderate at 3.3% on average (the same as in Estonia and the Czech Republic and similar to Slovenia's). The other three CEE countries, Croatia, Bulgaria and Hungary, showed slower dynamics in terms of total factor productivity in 2006–2007, at 2.1%, 1.5%, and 0.5% respectively.

The crisis brought significant changes in the dynamics of total factor productivity. In 2008–2010, all the CEE countries except Poland recorded negative TFP growth. The Baltics, which recorded the highest pre-crisis TFP growth rates, performed the worst in terms of productivity growth during the crisis, with negative growth rates at –6.8% in Latvia, –6.5% in Estonia, and –3.6% in Lithuania. Poor results in 2008–2010 were also recorded in Croatia (–3.9%), Romania (–3.4%), Slovenia (–2.9%), and Hungary (–2.5%). Poland was the only country with positive TFP growth, at 0.7% in 2008–2010.

In 2011–2014, the CEE countries improved their position compared with the 2008–2010 period in terms of TFP dynamics. The Baltic states again recorded positive TFP growth rates. They stood at 2.1% in Latvia and Lithuania, and 1.6% in Estonia. Poland maintained positive TFP growth at 1.0% per annum, slightly better than in previous years. Bulgaria, Romania, Slovakia, and Slovenia also noted positive TFP growth rates, but very close to zero (not exceeding 0.5%). Hungary, Croatia, and the Czech Republic displayed negative TFP growth rates in this period, ranging from –0.4% to –1.1% a year.

In 2015, the CEE countries posted varied outcomes in terms of TFP dynamics. Some of them improved their performance in relation to 2011–2014, while others worsened their positions. The TFP growth rate in Poland in 2015 was 1.0%, identical to the average for the 2011–2014 period. Seven other CEE countries also recorded positive TFP growth: Romania (2.9%), the Czech Republic (2.4%), Slovenia (2.1%), Hungary (1.8%), Latvia and Slovakia (0.9%), and Lithuania (0.3%). In three CEE countries, the TFP growth rate was either equal to zero or negative in 2015: Bulgaria (0.0%), Croatia (–0.1%) and Estonia (–0.2%).

As regards TFP contributions to economic growth, the figures for the studied period are strongly distorted by the fact that positive TFP growth during a recession means a negative contribution to economic growth. On the other hand, in the case of a strong economic slowdown with GDP growth close to 0%, a change of a few percent in total factor productivity translates into a several thousand percent TFP contribution to economic growth. Nevertheless, it is possible to determine some trends and regularities on the basis of the aggregated results for the whole period.

As indicated by the data presented in Table 9.3, TFP contributions to economic growth in most countries (except the Czech Republic, Poland, and Hungary) ranged between 40% and 80% in 2006–2015. This confirms the important role of TFP in the economic growth of the studied countries after their EU entry. In Poland, the TFP contribution to economic growth was 28% on average in 2006–2015.

Summing up, our overall results for the analyzed period show that changes in productivity played an important role in Poland's economic growth and helped improve the relative competitive position of the Polish economy with regard to other Central and Eastern European countries.

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Part III

Institutional Change and Economic Policy in Poland

Chapter 10

Institutional Changes and Their Impact on the Polish Economy from 2005 to 2015

Piotr Maszczyk

The role of institutions in economic analysis is often marginalized, but the global crisis of 2008 prompted many economists to propose profound methodological changes in how major differences among institutions operating in different countries are quantified. This applied to the organizational structure of these institutions as well as their objectives, assumptions and ways of functioning. Economists increasingly sought to analyze these differences and, on the basis of such empirical investigation, classify them into different varieties and models of capitalism with the aim of identifying the most effective model.

Later in this chapter, the terms "variety" and "model" are used interchangeably. We define a model of capitalism as a system of mutually complementary institutions in accordance with the approach adopted in the literature. We take a broad approach to institutions, understanding them to include what are known as informal institutions, which means norms, values, and attitudes.

Of course, this is not the first attempt of this kind in economic research. The first comparative studies of various economic models were conducted in the mid-20th century. They focused on describing differences between capitalist and socialist countries and on identifying similarities among countries with different institutional systems. In 2001, P.A. Hall and D. Soskice published a key book for institutional economics, entitled *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage.*

After the transition process got under way in Central and Eastern Europe and the principles of the so-called Washington Consensus were formulated in 1990, an impression emerged, especially in post-socialist countries, that there was only one variety of capitalism and that there was no real alternative to it. It would seem that the target model of the economy that should emerge from the transition process would be hotly debated in post-socialist countries. It turned out, however, that no such debate was held. This applies to both the normative approach (which model of capitalism would be best for post-socialist countries) and the positive one (which variant of capitalism actually emerged in a given country as a result of the transition process). No assess-

ment has been made of whether the models of capitalism developed in Poland and other post-socialist countries are optimal in terms of the direction of the transition process and existing formal and informal institutions rooted in individual economies and societies.

Therefore, it seems reasonable to ask if the emergence of specific varieties of capitalism in individual post-socialist countries was spontaneous, as Hayek (1967) suggested – unintended and chiefly aimed at resolving the issue of coordinating activities between equal entities guided by similar or even identical interests – or whether this process resulted from an interplay of interests of entities with diverse motives of action and different possibilities for taking it, as Amable (2003) and earlier Knight (1992) suggested. If the latter argument is true, the ultimate variety of capitalism would be the outcome of how the economic system is shaped by various interest groups and would reflect their impact on economic reality. Of course, adopting this last assumption means a complete redefinition of the concept of effectiveness in the context of economic institutions. In such a situation, the word "effective" would not comply with the definition proposed by V. Pareto and would not refer to the maximization of social welfare, but only to the maximization of the usefulness of specific entities or groups of entities.

Models of capitalism: selected taxonomies

P.A. Hall and D. Soskice distinguish two models of capitalism: a Coordinated Market Economy (CME) and a Liberal Market Economy (LME). The distinction is the result of a microeconomic approach to analysis adopted by these authors. They treat the economy as a system in which businesses operate on the basis of relationships with other entities, which entails coordination dilemmas. In their view, the problems of coordination exist in five areas: industrial relations, vocational training and education, corporate governance, relations between enterprises, and internal relations among company employees.

Hall and Soskice classified six countries – the United States, Britain, Australia, Canada, New Zealand, and Ireland – as Liberal Market Economies. They designated Germany, Japan, Switzerland, the Netherlands, Belgium, Sweden, Norway, Denmark, Finland, and Austria as Coordinated Market Economies. Six other countries that did not fall into either the CME or LME categories were classified as a Mediterranean model. These are France, Italy, Spain, Portugal, Greece, and Turkey. A characteristic feature of Mediterranean-model countries is a large share of the agricultural sector as well as a broad spectrum of state intervention leading to a specific type of non-mar-

ket coordination in corporate finance, accompanied by a relatively liberal approach to labor force regulations (Hall and Soskice, 2001).

Historically, another inspiring approach to the problem of models of capitalism is a classification proposed by B. Amable (2003). This is widely regarded as the most thorough and comprehensive analysis of alternative models of capitalism. Amable not only offered his own original theoretical framework, but also came up with a convincing classification system based on methodological considerations. Also innovative is an empirical study described by that author, based on the concept of clusters.

Of key importance in Amable's concept is the notion of institutional complementarity, borrowed from M. Aoki (2005). In the economic understanding of the concept, complementarity is defined as a relationship between two institutions in which the presence of one institution increases the effectiveness of the other. The labor market itself may be both organized along laissez-faire lines and be subject to strict regulation. If, however, a flexible labor market is accompanied by a financial market organized so that it enables quick access to resources and new job creation, it will be more effective than when enterprises are mainly financed by the banking sector. In the latter situation, a regulated and stable employment system will be more efficient because the banking sector focuses on the long-term perspective, which makes it possible to absorb short-term fluctuations in demand for labor. On the basis of his observations, Amable formulates a conclusion important for his argument. In his opinion, models of capitalism "should not be considered just as a collection of more-or-less random institutional forms, but also as a set of complementarity relations among these institutions, which form the basis of the coherence between the specific institutional forms of each model" (Amable, 2003, p. 6).

The starting point for Amable's analysis – unlike in the case of other authors, who usually began by identifying some ideal models of capitalism – was the selection of five key areas in which an important role was played by formal and informal institutions as well as institutional complexes. These are:

- the type and extent of product market competition,
- the way in which the labor market is organized and the impact of market players on wages,
- the way in which financial intermediation and corporate governance are organized,
- the extent of social protection and welfare state,
- and the organization of the education sector.

Amable sees strong complementary links among these "institutional" areas, which – together with empirical research on the characteristics of capitalist economies – makes it possible to distinguish five models with specific types of institutional complementarity:

– Anglo-Saxon model (United Kingdom, United States, Australia, New Zealand, and Ireland),
– social democratic model (Sweden, Norway, and Denmark),
– continental European model (France, Germany, Netherlands, and Austria),
– Mediterranean model (Greece, Italy, Spain, and Portugal),
– Asian model (Japan and South Korea).

The author's monograph is exclusively focused on the varieties of capitalism found in Europe. Amable only marginally deals with the Asian model although he does mention the existence of three different types of this variety of capitalism. Nor does he devote much space to analyzing differences between variants of the market model that can be seen in Britain and the United States.

In his monograph, Amable lists three strictly European varieties of capitalism.

A defining feature of the social democratic model is strong external competitive pressure. The model requires a certain measure of workforce flexibility. However, this flexibility is not achieved through layoffs and other market adjustments. Investment in human capital is protected by a combination of moderate protection of employment, a high level of social protection, and opportunities for easy retraining through extensive use of active labor market policies. A system of coordinated wage bargaining promotes solidarity in shaping wages, which in turn has a positive effect on innovation and productivity.

The continental model, which shares some of the features of the social democratic model, is marked by higher employment and a certain measure of welfare state. The financial system is based on the banking sector and encourages long-term business strategies. Wage negotiations are well coordinated and wage policy is based on social solidarity. The system of retraining employees is less well developed than in the social democratic model, which limits labor market flexibility.

The Mediterranean model is marked by greater reliance on protecting employment than on social security. This is because the financial system is highly centralized. However, unlike in the continental European and social democratic models, workforce education and skills are insufficient to permit an industrial strategy based on high wages and productivity.

The main feature of the Anglo-Saxon model as described by Amable is minimal government involvement in subsidizing market coordination mechanisms, especially compared with the social democratic and continental models. This means that enterprises are forced to compete mainly on price on the product market and that the domestic market is poorly protected from foreign entities. In countries classified into the Anglo-Saxon model, the labor market has high external flexibility, wage negotiations are decentralized, and there is a relatively low level of unionization and low

employment protection. In countries representing this variety of capitalism, the government becomes involved in alleviating the effects of poverty only to a small extent, while pension systems are largely based on private equity funds. What is particularly important is that the corporate governance system gives preference to and protects the rights of minority stakeholders, while the capital market remains the most important mechanism of fund allocation and ownership rights (Amable, 2003, pp. 102–114).

Both Hall & Soskice and Amable focused on describing complementary relationships between institutions operating in specific sectors of the economy and limited their assessment of the effectiveness of individual models, thus leaving out issues related to the impact of specific institutional systems on the rate and volatility of economic growth. Other researchers who adapted their concepts increasingly assessed the effectiveness of different varieties of capitalism rather than just describing them. One of the most successful classifications that made a direct reference to the effectiveness of models of capitalism was a division proposed by A. Sapir (2006). In his often-cited study, Sapir – referring directly to the classification proposed by Amable – identifies four models of socioeconomic policy in the European Union. Assessing the defined varieties of capitalism, he introduces two categories: effectiveness, understood as an ability to generate stable economic growth and reduce unemployment, and solidarity, understood as an ability to minimize poverty. The models proposed by Sapir are:

1. The Nordic model – effective and based on solidarity, followed in countries including Finland, Sweden and Denmark; characterized by high taxes and public spending on education, social welfare, strong trade unions, low wage disparities, and freedom in laying off workers, combined with generous allowances for the unemployed.
2. The Anglo-Saxon model – effective but less solidarity-based, practiced in the UK and Ireland; characterized by weak trade unions, considerable differences in wages, poor protection of workers from dismissal combined with active help in finding a job, and a minimum social security level.
3. The Continental model – based on solidarity, but less effective, practiced in France, Germany, Belgium and Luxembourg; marked by high social spending, strong protection of workers against dismissal, low unemployment benefits, and strong trade unions despite a decreasing number of members.
4. The Mediterranean model – neither solidarity-based nor effective, practiced in Italy and Greece; characterized by high though often irrational public expenditure, protection of workers against dismissal combined with low unemployment benefits, and early retirement.

To justify his thesis that the Nordic model prevails over other models of capitalism and that Nordic-model countries cope better than other economies under

intensifying globalization, Sapir cites a range of indicators of economic growth and stability, employment and unemployment, balance of payments and budgetary performance, in addition to inflation and interest rates, factor productivity, propensity to save, and international competitiveness rankings.

The opposite of the effective and fair Nordic model is the Mediterranean model, which, even though it seeks to protect workers, cannot ensure a high level of effectiveness or provide a socially perceptible sense of justice when it comes to economic structures. According to Sapir, strong legal protection of the supply side of the labor market (through both regulations and trade union influence) leads to a segmentation of this market and the exemption from these mechanisms of young people without experience, immigrants and women, who are at best offered temporary employment contracts or employment in the informal sector, but more often there are no job offers for them.

In his work, however, Sapir made no formal assessment of the impact of institutions on the rate and volatility of economic growth. He thus failed to unequivocally rebut charges against a research approach within institutional economics focusing on identifying and analyzing individual varieties of capitalism. According to critics, a description of different models of capitalism alone is pointless, and it is impossible to draw conclusions about the effectiveness of individual models in detachment from factors determined by economic policies.

The countries covered by the study were matched with specific models on the basis of taxonomies existing in the literature and taking into account institutions functioning in these countries, as shown in the table below.

Table 10.1. Models of capitalism

Anglo-Saxon	Continental European	Social Democratic (Nordic)	Mediterranean
Australia	Austria	Denmark	Greece
Canada	Belgium	Finland	Spain
Ireland	Netherlands	Iceland	Portugal
New Zealand	France	Norway	Italy
Britain	Luxembourg	Sweden	
USA	Germany		
	Switzerland		

Source: B. Amable: *The Diversity of Modern Capitalism*. Oxford University Press, Oxford 2003; A. Sapir: *Globalization and the Reform of European Social Models*. "Journal of Common Market Studies," 2006, No. 44(2), pp. 369–390.

Evolution of the Polish model of capitalism

In assessing the possible impact of institutional changes on the condition of economies in the context of their complementarity, it is necessary to note two aspects. The first is "institutional comparative advantage," a key factor that either increases or limits the competitiveness of economies. Specific institutional systems can either promote or limit the effectiveness of an economic model selected via political decisions or shaped in an evolutionary manner. Inflexible labor markets will certainly have a negative impact on the competitiveness of economies basing their advantage on cheap labor (for example, Portugal, Greece, and Spain), but it will not have a negative impact on countries manufacturing products whose primary competitive advantage is high quality (for example, Germany and Sweden). Similarly, if a corporate governance system based on universal banks with high participation of employees at various levels of management and taking into account the position of enterprise stakeholders works excellently in innovation-driven economies focusing on a gradual and continuous improvement of products (e.g. Austria and Germany), it limits the possibilities of creating groundbreaking innovations. In such a situation it is far more advantageous to use capital markets as the main tool of the corporate governance system, accompanied by mechanisms for financing investment ideas at an early stage of development (such as business angels and venture capital funds) and enabling investors to achieve high average returns on investment (for instance, the United States).

The use of an "institutional comparative advantage" is particularly important for countries at a relatively low level of development in which the model of participation in the international division of labor is continually changing. While in the case of the United States or Germany, it is possible to assume that their production specialization is permanent and subject to only minor changes, in Poland and other Central and Eastern European countries the foundations of economic competitiveness continue to evolve. It therefore seems that a key issue is skillful institutional matching in order to maintain a comparative advantage. Institutions that thrive at a stage of growth based on imitation and FDI inflow will perform poorly in a situation in which the focus is shifted from the production of components within the supply chains of multinational corporations to the manufacture of final products with high value added and based on cutting-edge technology. In fact, a lack of institutional change will make it impossible to change factors behind sustained fast economic growth.

Second, in the context of the risks outlined above, it could be particularly dangerous to base the model of capitalism in a specific country on a set of hybrid institutions. It is difficult to secure an institutional comparative advantage if the institutional

system is not adapted to the growth factors in a specific economy. This will also be impossible if the model of capitalism takes into account solutions from a variety of models in different institutional areas. The institutions are not mutually complementary and there are institutional mismatches in many areas.

In this context, institutional changes in the Polish economy should be assessed as largely misguided and having a neutral, if not negative, impact on its competitiveness. The hybrid nature of the Polish model of capitalism is strongly associated with the conditions and reforms introduced during the transition process. Changes in the institutional environment, which are arguably the most important part of the whole process, were introduced in Poland to fend off growing social disgruntlement. Reforms carried out under time pressure created the temptation of incorporating into the Polish model institutions from well-established capitalist systems without deeper analysis of Poland's own informal institutions. The solutions that were implemented had passed the test in other economic models, but there was no guarantee that they would be equally efficient in Poland (Kowalik, 2009, p. 30). Due to this inappropriate adjustment to local conditions and failure to consider the historical context, a discrepancy emerged inside the system between institutions implemented from the outside and real demand for them, as well as their desired level of effectiveness.

As work to implement the transformation strategy progressed, the legacy of Poland's command-and-quota system became less important, while the process of European integration gained favor. The country's aspiration to become a member of the European Union required a variety of social, cultural, economic, and legal changes. The specific features of Polish capitalism during the first decade of the country's transition – which included the route to overcoming communism and its legacy and the unprecedented political and economic changes after the collapse of real socialism – continued to shape the target model of capitalism in Poland in later years. But with time, these factors ceased to be decisive. The process of integration with the EU meant a transfer of formal institutions into Poland – direct incorporation of a part of the EU's legal system and the need to adapt it. The changes were enormous and covered a number of key sectors. Fiscal policy, competition law, and the principles of subsidizing private and public enterprises were all made more stringent, which, of course, was of paramount importance to most market players.

Another characteristic feature of institutional changes during the transition period was the creation, under the pressure of potential investors, of financial sector institutions whose rules of operation were favorable to foreign companies and international corporations (Walicki, 2013). Foreign investors expected – and most of these expectations were met by Polish authorities – preferential tax treatment and many other privileges as well as accelerated privatization of not only state-owned enterprises but

whole markets (including the telecommunication market during the privatization of telecommunications giant TP SA). The impression is that the processes of internationalization of the Polish economy served the interests of Western corporations and made it possible to achieve high investment returns, due to a wide opening of markets accompanied by free accumulation of capital. The central role of transnational corporations seems to have been a key determinant of the shape and direction of changes in formal institutions in Poland and has made the country's model of capitalism close to the Mediterranean variety.

But even in this context, it is possible to see that the process of forming institutional governance by maximizing the benefits for foreign investors was inconsistent and left much to be desired. Efforts to make the labor market far more flexible, combined with stagnant real wages after 2008 – reflected in a declining role of wages and salaries as a percentage of GDP – were delayed from the point of view of potential foreign investors. These reforms were embraced at a time when, from the institutional point of view, Poland needed instead measures to stabilize employment and changes focused on the qualitative aspect of jobs.

Under the pressure of external factors, particularly the global crisis, attempts were made to straighten out Poland's institutional system by focusing on complementarity. It turned out that these reforms were not too late, but quite off the mark.

Analyzing the factors that have shaped the Polish model of capitalism, what should be most strongly emphasized is the weakness of state structures and lack of qualified administration, which halted implementation of long-term transformation projects that exceeded the period of any one political group exercising power. It was mainly due to these factors that those building Poland's institutional system mainly drew from solutions borrowed from other European economies, while marginalizing any potential original ideas that could help usher in a system of informal institutions specific to Poland. The list below outlines the most important conditions underlying the Polish model of capitalism:

- strong influence of institutions linked to the previous system and informal institutions in the first phase of the transformation process, i.e. until 1998,
- a transformation process based primarily on the transfer of formal institutions without taking into account the local context,
- institutional instability, a strong tendency to make far-reaching transformations as a result of changes in the political system (e.g. new rules for financing public and private goods, including healthcare, from public funds)
- lack of debate (in either normative or positive terms) on the ultimate model of capitalism for Poland

- illusion of a transition from a system that was inefficient to one that would be permanent, uniform and safe
- perception of the EU as a homogeneous entity, lack of in-depth discussion about institutional differences between individual member countries, the prospect of becoming part of the "European model of capitalism."

Analyzing the Polish variety of capitalism, it is easy to see that the country's institutional system is a hybrid of solutions from all European models of capitalism, but especially the Mediterranean variety. This is primarily due to an exogenous model of development in which a key role is played by capital and foreign investment as well as by the transfer of external institutional patterns. Other factors include European integration and the fact that the majority of the population espouses norms and values similar to those in Mediterranean-model countries. These include a low level of social capital; a high level of distrust; "amoral familism;" a key role of family and values attributed to this sphere of life; a strong historical role of trade unions in the fight against the previous political system; and a strong role of organized religion. Below is a concise description of institutional areas in the Polish model of capitalism with a special focus on manifestations of its institutional hybridization.

Table 10.2. Characteristic features of institutional areas within the Polish model of capitalism

Institutional area	Features	Identification and evolution over time
Type and extent of product market competition	Price competition, minor role for quality competition. Key role for foreign investors (main coordination link). Small capacity for accumulation of domestic resources. Administrative and legal-and-administrative burdens, bureaucracy. Investment barriers. Major role for SME sector (dominance of micro-enterprises). Very weak consumer movement and public institutions for competition and consumer protection.	Evolution toward Mediterranean model with elements of Anglo-Saxon model
The way in which the labor market is organized and the impact of market players on wages	Unstable, changing, limited trilateral government-business-trade union relations. Market coordination of labor relations. Strong labor market segmentation, combination of statism (with the state as the strongest participant of the trilateral relations), weak corporatism (industries and state-owned companies, public sector) and dominant pluralism (private sector). An employer's market, weak position of workers and strong position of employers. Persistently high structural unemployment and economic migration.	Elements of the Anglo-Saxon and Mediterranean models, slow evolution toward continental European model

Institutional area	Features	Identification and evolution over time
Organization of the financial intermediation sector and corporate governance	A system based on universal banking. Relatively small and simple financial market. Low-quality business environment, early stage of corporate governance. Limited activity of market for corporate control. Key importance of foreign investment and transnational corporations. Low stock exchange capitalization, limited supply of domestic credit to private sector. Early stage of development of venture capital market and business angels.	Mediterranean model, slow evolution toward continental European model
Scope of social protection and welfare state	Moderate level of social welfare. Spending focused on "overcoming difficult situations in life" (social risks) and on pension benefits. Withdrawal from the capital pillar of the pension system. Premium-financed social insurance system. Key political and social importance of social security for citizens.	Mediterranean model, slow evolution toward continental European model
Organization of the education and knowledge creation sector	Removal of vocational education. Development of the general public school system (education and general skills). Labor market mismatches, rising unemployment among workers with a higher education, especially young people. Moderate public expenditure, mainly on elementary education, low spending on higher education. Very low R&D expenditure, especially in the private sector, low innovation. Expansion of higher education (significant rise in the enrollment ratio), commercialization of education and massive popularity of university studies. Poorly developed lifelong learning system.	Anglo-Saxon model, uncoordinated changes using solutions from a variety of models.

Source: Own work.

The low complementarity of institutions constituting the Polish model of capitalism, which directly results from its hybridization, points to limited objective effectiveness of this variety of capitalism. Research reports on the subject strongly emphasize the impact of institutions on the rate of economic growth and development. The low complementarity of the institutional system has a negative impact on the performance of the Polish economy. This trend is particularly dangerous in the long term, because for now the negative impact of hybridization of the Polish model of capitalism is being offset by an inflow of EU funds, which makes it possible to maintain a relatively fast rate of economic growth, at least by European standards. However, once the amount of funds flowing into the Polish economy from the EU budget drastically decreases after the end of the EU's current financial framework, of crucial importance to the further course of real convergence by the Polish economy will be the emergence of such a model of development that will make it possible to steer clear of risks associated

with strong regional differences, an insufficient focus on orientation, the so-called middle-income trap, an immature industrial policy, and barriers to the development of the private sector. Overcoming these weaknesses would have to involve a deep correction of the existing institutional system, whose characteristic feature is that it incorporates the institutional shortcomings of the Mediterranean model and continuous underdevelopment (despite evolutionary changes) of institutions borrowed from the market and continental models.

The above description of the Polish model of capitalism and of the possibilities for modifying it should come with an important caveat. A change in the institutional system almost always means a change of those in power. A struggle for maintaining dominance in areas delineated by the institutional system is still in progress in both business and politics. Remembering what Amable wrote about the effectiveness of institutions, there can be no illusions that any objective criteria will be sufficient to transform the existing model of capitalism in Poland. As long as there are entities benefiting from structural oversupply on the labor market, it will be possible to see slogans defending the current model and emphasizing its validity, transparency and – contrary to empirical experience – irreplaceability.

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Chapter 11

Key Economic Policy Developments in 2007–2015 and Challenges Ahead

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This chapter seeks to assess the main thrusts of Polish economic policy from 2007 to 2015, a period when the governing coalition of the Civic Platform (PO) and the Polish People's Party (PSL) was in power, with a focus on measures designed to boost growth and streamline the country's public finances in 2010–2015.[1] After a sea change in Polish politics in the wake of the presidential and parliamentary elections in 2015, we also attempt to sum up the track record of the previous ruling coalition, which governed the country for eight years. At the same time, this chapter looks at the conditions in which the government formed by the conservative Law and Justice (PiS) party started its work, outlining the most important economic policy challenges for this new government.

Key macroeconomic policy developments

For the purposes of this analysis, the period when the PO-PSL coalition was in power can be roughly divided into three stages:

- a period of economic boom in 2007–2008, when most of the changes in economic policy[2] were the result of laws passed by a parliament dominated by PiS and its junior governing coalition partners, Samoobrona and the League of Polish Families (LPR);
- the global economic crisis period that began in the fourth quarter of 2008 and ended in early 2010;

[1] In our assessment, we focus mainly on macroeconomic policy, more specifically on the demand side of economic policy. We offered a more comprehensive assessment of supply-side economic policy (structural policy) in last year's edition of this book (Weresa 2015). The conclusions contained there continue to hold true today.

[2] These included a reduced pension premium and lower income tax rates. The latter were introduced in January 2009 and became one of the factors that caused the public sector deficit to soar in 2008–2009.

- the post-crisis period of 2010–2015, marked by strong business cycle fluctuations, significant uncertainty and numerous changes in economic policy, especially those related to public finance consolidation.

Of particular relevance to this evaluation of macroeconomic policy pursued in 2007–2015 are government efforts to reduce the general government deficit in the post-crisis period. During the global downturn the deficit increased to 7.5% of GDP in 2009, from 1.9% in 2007, according to ESA95 accounting standards (Eurostat 2014). As a result, after Poland exceeded the 3% of GDP deficit threshold imposed by the EU Stability and Growth Pact (SGP), the European Commission in May 2009 launched its Excessive Deficit Procedure (EDP) and demanded that the Polish government reduce persistent public finance imbalances (Council of the European Union, 2009).

The government imposed an austerity policy on both the revenue and expenditure side of the Polish budget. The most important measures aimed at boosting public revenues were:

- an increase in the VAT rates from January 2010 to December 2016 (the main rate rose from 22% to 23%);
- an increase in disability pension contributions by 2 p.p. to 8% as of February 2012;
- several increases in excise taxes on tobacco products and alcoholic beverages;
- freezing income tax brackets at their 2008 levels;
- implementing several anti-tax evasion laws, including one to prevent fraud in VAT payments by companies trading in goods such as steel rods, fuel, and precious metals, and one imposing taxes on companies registered in tax havens such as Cyprus, Malta, and Luxembourg and thus evading corporate income taxes;
- adopting a law increasing the tax on undisclosed income and
- adopting regulations launching a national "receipt lottery" in a bid to boost the country's VAT revenues.

Most of the savings made by the government in the post-crisis period focused on the expenditure side of fiscal policy (4.1 percentage points of GDP, compared with 0.1 p.p. of GDP on the revenue side in 2010–2014 (Rada Ministrów, 2015)). The most important measures concerned the pension system. These included a reduction in the size of the Private Pension Funds and an increase in the retirement age. The first modifications focused on the mechanism for transferring pension contributions. In 2011, the government temporarily reduced the amount of pension premiums transferred from the Social Insurance Institution (ZUS) to Private Pension Funds (OFE) from 7.3% to 2.3% (with a subsequent increase to 2.8% in 2013). The key change in the system, however, took effect in early February 2014, when 51.5% of OFE assets were transferred to ZUS. The transferred T-bonds were redeemed and public debt fell by 9 p.p.

to 49.5% of GDP at the end of the first quarter of 2014, according to ESA'95 methodology (Eurostat, 2014).

The key change in the fully funded pillar was in the amount of funds that will be transferred from ZUS to OFE in subsequent years. Prior to 2011, the entire pension contribution of 7.3% was transferred to OFE. Under the new rules, it will now stay in ZUS and be recorded on a special sub-account indexed against nominal GDP growth. Those who wished to continue saving in the fully funded pillar were given an alternative option. They could declare that they wanted the state to transfer 2.98% of their contributions to private pension funds. Such a decision was made by 2.5 million Poles, or 15.1% of all those who were eligible. This is probably not enough to keep in positive territory private pension fund net inflows (paid-in contributions minus the transfer of assets to pensioners). In January 2015, a year after the reform, ZUS transferred PLN 184.5 million to private pension funds from premiums, and OFEs transferred to ZUS PLN 346 million[3] worth of assets for the payment of benefits to people approaching retirement. After the introduction of the new law, government expenditure in 2015 was PLN 18.6 billion (1 percent of GDP) lower than in the no-change-in-economic-policy scenario. This was due to a lower Social Security Fund deficit combined with lower debt-servicing costs (Ministry of Labor, 2014).

Another important change in the pension system was a decision in 2012 to increase the retirement age to 67 for both men and women. Previously, men retired at 65 and women at 60. The retirement age is set to increase gradually. Beginning January 2013, the retirement age will be increasing at a rate of three months per month. The target level will be reached in 2020 for men and in 2040 for women. In all, the government saved around PLN 6 billion as a result of this from 2012 to 2015 (MPiPS, 2012).

In order to reduce the nominal and structural deficit, the PO-PSL government decided to go ahead with institutional changes. Since 2010, the parliament has passed a number of new expenditure rules aimed at limiting the growth of public spending at both the central and local government levels. The most important of these was the so-called stabilizing expenditure rule, which was introduced in 2014 to replace the ineffective disciplinary rule. This new rule was based on a complex mathematical formula for the upper ceiling on planned public spending enshrined in subsequent budgets. The limit depends on historical and projected real GDP growth, the CPI[4] inflation forecast, and on the public deficit and debt levels. The rule takes into account

[3] According to ZUS and OFE press release data.

[4] In December 2015, the inflation forecast was replaced by the NBP's inflation target (2.5%). The change stemmed from a number of forecasting errors that led to cuts in public spending, as well as a need to raise the ceiling for government expenditure in 2016.

discretionary policy changes to the income side of the budget.[5] It covers nearly 90% of general government expenditures and was first applied to the 2015 draft budget.

The introduction of the stabilizing fiscal rule changed the process of drafting the budget. Previously, the budgets of the central and local governments and other public institutions were drafted independently. Under the new rule, the Ministry of Finance must be informed by all institutions covered by the new regulations about expenditures planned for the subsequent year. Taking this into account, the ministry adjusts central budget spending in order to keep public spending below the limit. This increases central administration control over fiscal policies pursued by the public sector as a whole.

To reduce the budget deficit, the Ministry of Finance introduced another important institutional change: central liquidity management in the public sector. Some public institutions, including the national healthcare fund (NFZ), special-purpose funds, and the State Forest authority, were forced to keep their surplus funds on a Ministry of Finance account in the publicly owned BGK bank. In this way, other institutions could use surplus liquidity in the sector to finance their short-term deficits instead of issuing bonds or borrowing money from private banks. Thanks to this management system, general government debt-service costs were reduced by several hundred million zlotys a year and the borrowing needs were lowered by a total of PLN 33 billion (2% of GDP) in 2010–2014. Another important measure aimed at reducing the budget deficit was a decision to freeze compensation expenditures in the public sector at their 2009 nominal level. This move yielded PLN 2.2 billion in savings in 2014 alone (Ministry of Finance, 2014).

As a result of these measures, the government managed to permanently reduce the general government deficit from 7.6% of GDP in 2010 to 3.2% in 2014. Thanks to this, the European Commission dropped the excessive deficit procedure against Poland in June 2015 (Council of the European Union, 2015). The introduction of long-term austerity measures (including the pension system reform, the establishment of the stabilizing expenditure rule, and the centralization of liquidity management) brought down the structural deficit to 2.9% of GDP in 2014, from 6.0% in 2011 (European Commission, 2014).

Because of the need to cut public spending in the post-crisis period, the room for active labor market policies by the government was limited and focused mostly on activities that did not pose additional burdens on the public finance sector. One of the most important government programs designed to support economic development, and one that has produced tangible economic results, was the so-called de minimis

[5] As of December 2015, the rule also includes one-off and temporary changes in government revenue, such as proceeds from the sale of a license for the use of broadband LTE internet frequencies.

guarantee program. Introduced in March 2013, this program was based on BGK bank guarantees granted to secure up to 60 percent of the amount of business and investment loans[6] incurred by companies with less than 250 employees in commercial banks. A total of 100,100 companies benefited from the program from 2013 to 2015, and the value of BGK guarantees reached PLN 25.6 billion for loans totaling PLN 45.5 billion. The results of a study conducted by BGK (Kowalczyk, Kaczor, 2015) show that during the first three years, these guarantees helped increase lending to companies by PLN 12.3 billion, which accounted for a third of the total increase in the value of loans to companies under the program (PLN 35.8 billion). As a result, companies increased employment by around 54,000.

In its policy regarding the labor market, the government took action to increase the efficiency of spending by labor offices. To this end, for the first time in the history of the Polish public sector, a conditional subsidy was introduced. As of May 2014, the amount of money transferred to labor offices for salaries depends on how successful they are in reducing the unemployment rate. Seventy percent of the subsidy is disbursed as previously, but the remaining 30% goes only to the most efficient labor offices. Furthermore, under the new regulations, unemployed citizens registered in labor offices are now classified into three categories depending on the skills of the unemployed person and when they were registered at the labor office. Each group will be subject to different conditions and entitled to different privileges.

The government pursued an active housing policy in the analyzed period. From 2007 to 2012, a subsidy program financed by BGK and called "Family on its Own" was at work to help first-time buyers purchase a home. More than half of the 192,000 households that used funds under the program acquired an apartment on the resale market, mostly in the first three years (BGK, 2013). In 2010–2012, the program helped prevent a sudden drop in demand for new housing in the wake of increased unemployment and tighter lending policies by banks. Transaction prices on the new-home market in major cities fell by only 14% between the first quarter of 2010 and the fourth quarter of 2012 (Łaszek et al., 2014). This was accompanied by a reversal of proportions among those benefitting from the “Family on its Own” program. The proportion of households that used program funds to buy new homes grew from 9.6% in 2007 to 39.8% in 2013.

After the “Family on its Own” program ended, the government began working on another housing subsidy program for young families to make new housing more affordable and help revive the country’s stagnant real estate market. A new stimulus

[6] BGK began offering guarantees on investment and development loans after the program was expanded in November 2013.

program, "Housing for the Young," came into force at the beginning of 2014, allowing first-time buyers to partially finance their down payments and pay their loan installments. This program initially covered all types of new residential premises. Beginning Sept. 1, 2015, it was expanded to include residential premises offered on the resale market and by housing cooperatives. In addition, support for large families was increased. The program led to a gradual reduction in surplus housing unsold by developers and to a steady increase in transaction prices (by 2% in the first three quarters of 2014 on average).

In 2014, the government also launched a third program to stimulate the supply of housing, called "Apartments for Rent." That same year the government also started work to support building societies (TBS) with BGK loans. Both of these programs began to produce results in mid-2015, but a detailed assessment of their impact on the housing market cannot be made until the end of 2016.

Other flagship PO-PSL government programs to support economic development, including an initiative called Polish Investment for Development, designed to co-finance investment growth through public-private partnerships, produced no tangible economic results.

Key challenges

In this section, we outline the "opening balance" of the new Law and Justice government and list the biggest challenges facing Polish economic policy makers in the years ahead. We focus on two categories of development barriers and threats to the Polish economy: (i) threats that have been growing for many years, including those resulting from the negligence and failures of the PO-PSL coalition (as well as a number of previous governments), and (ii) new challenges that are a direct consequence of the first 100 days of the PiS government.

Major economic policy challenges in Poland can be classified into two interconnected categories. The first category deals with conceptual, political and institutional development barriers that make up a broad framework of economic activity in Poland and determine the structure and strength of incentives influencing the behavior and decisions of economic agents. The second category covers challenges that stem from the mode of operation of the Polish economy, its growth factors and macroeconomic performance.

Conceptual, political and institutional challenges

In the first category, the most fundamental weaknesses of Polish economic policy include the failure of successive governments and policy makers to define the target point on Poland's road from "plan to market" – the model of capitalism that should be built in the country. The goal of systemic transformation in Poland used to be defined vaguely – explicitly or implicitly – as the creation of a liberal market economy (or capitalism), without a clear vision of what shape it should take.

Meanwhile, the European Union is home to at least four models – or varieties – of capitalism with diverse institutional architectures and market infrastructures. A study by Hanson (Hanson 2006) finds that the European Union's body of law, acquis communautaire, gives member countries a surprisingly wide margin of freedom in designing and implementing their own national institutions and solutions that best fit their specific needs.

Due to the lack of a clear vision about the model of capitalism that would best fit the country's development determinants and aspirations, Poland's emerging market economy is largely a hybrid. Various parts of the country's institutional architecture come from different institutional orders and are not complementary. As a consequence, instead of triggering positive synergies and increased efficiency, this institutional ambiguity has generated rising frictions and increased idle capacity in the system.

Second, the government has apparently failed in its attempts to precisely define Poland's present and future role in the EU – other than just being a recipient of EU funds. While the need for efficient absorption of EU funds (and institutions) goes without saying, an optimal allocation and choice of alternative uses for these funds should originate from a national development strategy (an outline of which, known as the Morawiecki Plan, appeared only recently). While Poland has done relatively well in terms of gaining access to EU funds, it has performed much worse in defining its development priorities in the allocation and use of these funds. At the same time, it has underperformed in its endeavors to fully recognize the costs and benefits of various EU programs in terms of Poland's national interest.

Third, Poland risks becoming a peripheral EU member country in this context. Under this scenario, Poland would increasingly specialize in the production of simple manufacturing goods with a low level of processing and relatively low value added, being at best a subcontractor for more technologically advanced products.

Fourth, apart from fundamental weaknesses, the list of major challenges includes a failure by government to create favorable conditions for sustainable, long-term economic growth, in particular failure to generate positive externalities for the private business sector. Specifically, key government failures in this area include underfunding

of R&D activities, insufficient or unavailable support for the development and upgrading of human capital, neglecting the significance of social capital – whose insufficient stock ranks among the most acute development barriers in the Polish economy – and ineffective efforts to foster the development of information and communication technologies (ICT).

This government weakness stems mainly from a strong redistributive bias in Poland's public expenditure policy (a distorted pattern of government functions) at the expense of development spending. Other causes include a failure to meet the "golden rule" of public finance, the continually growing scale of rent-seeking, and the persistence of an unproductive model of entrepreneurship, as described by American economist William Baumol (Baumol 1990).

Moreover, Poland continues to exhibit many symptoms of the Myrdalian "soft state" pattern where the incidence of corruption still tends to be excessive, the judiciary branch of power is increasingly inefficient (in particular business courts), and law enforcement continues to be weak, which means a strong asymmetry between formal and informal institutions in favor of the latter (Rapacki 2012). At the same time, there have been mounting symptoms of a declining quality of public and merit goods such as healthcare and education.

Finally, in contrast to some other transition countries in the region (Slovakia and the Baltic states), Poland has not managed to substantially downsize its government sector and reduce the scope of its functions during the past eight years (and more generally throughout the transition period). If the proportion of public expenditure to GDP is adopted as the basic gauge of the size of government, this index has remained stable in Poland since the early 1990 s, at above 40%. In the global perspective, the index for Poland has been about twice as high as those in peer countries with a similar level of economic development (23%–24%). At the same time, the figure has remained close to the average level in the European Union and the OECD. This pattern implies that Poland displays indicators comparable to those in the most developed EU countries. In other words, the size of government in Poland is excessive for the country's economic development level. What's more, in the last three to four years the size of government in Poland has begun to grow again. Employment in public administration has increased by over 10% to more than 600,000.

Macroeconomic challenges

Polish economic policy faces a number of major macroeconomic development challenges. These include the following:

The first challenge that is likely to adversely affect Poland's development prospects in the next 30 to 45 years is its unfavorable demographic trends. These include a shrinking population, unfavorable changes in the age composition of Polish society, emigration and brain drain, and a permanent decline in the dependency ratio – the number of those working per one retired person.

The second challenge is that the Polish labor market is not particularly efficient; as a result, the level of economic activity in Poland ranks among the lowest in the European Union. At the same time, the youth unemployment rate and the share of flexible forms of employment are among the highest in the EU (Rapacki 2016).

Third, the Polish economy displays the lowest propensity to save and the lowest investment-to-GDP ratio in Central and Eastern Europe. Under the endogenous growth model, a sufficiently high investment rate and adequate domestic savings – which provide funding for investment in the long term – are the necessary conditions for fast and sustainable economic growth.

A fourth key barrier is a persistently low innovative capability of the Polish economy. Of special note among its numerous symptoms is a low proportion of high-tech products in manufacturing exports (7%) and a huge license trade deficit (the ratio of export receipts to import spending is 1:10).

A fifth major challenge for Polish economic policy is a low (and shrinking, according to some empirical studies) stock of social capital. Using the terminology devised by Francis Fukuyama, Poland should be described as a low-trust society (Fukuyama 1997). Moreover, while Poles' distrust of government has strong historical roots, a new trend has emerged suggesting a similar distrust on the part of the state toward citizens and private business. As a result, the government and public administration in Poland tend to devise bureaucratic hurdles, which, combined with increased government intervention, limit economic freedom.

A sixth serious development challenge stems from rapidly growing tensions in Poland's energy mix, which are mostly due to delayed investment projects aimed at developing and modernizing the country's power-generation base. The effect of this factor is compounded by the prospect of a substantial rise in the costs of generating and supplying electricity in Poland, in the wake of an intergovernmental agreement (known as the climate package) adopted by the EU in the autumn of 2014. The package calls for considerable reductions in toxic emissions and the resulting need to switch to more environment-friendly energy generation technologies.

Overall, the cumulative effect of these development barriers, combined with a missing or insufficient response of economic policy, may eventually lead to a steady deceleration of growth dynamics and a subsequent deterioration in the international competitiveness of the Polish economy. Some symptoms of this new unfavorable trend

have already appeared in Poland. In the past few years the Polish economy has decelerated in terms of potential GDP growth, from more than 5% to around 3% per annum, i.e. by about 2.5 percentage points. What's more, based on long-term forecasts by the European Commission, the OECD and our own projections (Matkowski, Próchniak, Rapacki 2013 and 2014),[7] after 2020 Poland's economic growth is likely to decelerate further – to a level below 2% annually. This may lead to a persistently high unemployment rate, in the range of 6.5%–7.5%.

Even worse, there are reasons to believe that such a scenario is likely to produce one more serious long-term threat: it may perpetuate an imitative model of development under which Poland would become an importer of ready-made institutions, even though some of these would be incompatible with the country's priorities and development potential.

New challenges

In this section, we attempt to outline key economic policy challenges resulting from recent moves by the Law and Justice (PiS) government during its first 100 days in power. We assume that PiS will try to deliver on its election promises, which would lead to the high probability of an expansionary fiscal policy, and – to a lesser extent – expansionary monetary policy. We also believe it is likely that the government will press ahead with the kind of institutional changes it launched in November 2015 in a bid to change the foundations of Poland's political system and liberal democracy. This could negatively affect Poland's image abroad and weaken its position in the European Union. This scenario, if it materializes, will mean the emergence of new economic policy challenges in the form of a variety of threats to short-, medium-, and long-term development.

Short-term effects

- Strong fiscal expansion, resulting mainly from increased government expenditure on allowances for large families (the so-called 500+ program with a total price tag of anywhere from PLN 15 billion to PLN 18 billion in 2016 and PLN 20 billion to PLN 25 million in 2017) and a more than 100% increase in the free-tax threshold for personal income (leading to a decrease in tax revenues by anywhere from

[7] The newest simulative forecast for the development trajectory of the Polish economy and the process of income convergence in relation to the EU15 can be found in chapter 2 of this report.

PLN 12 billion to PLN 16 billion and the corresponding rise in disposable income). Meeting all election promises in the area of social transfers would pose an additional burden on the budget to the tune of around PLN 50 billion a year.

- A likely increase in the 2017 budget deficit to above 3% of GDP, thus exceeding the Maastricht nominal convergence criterion. According to the latest forecast by the European Commission, Poland's general government deficit in 2017 could reach 3.4%, with the prospect of a further rise in 2018 and 2019.
- As a result, the European Commission may reopen its excessive deficit procedure with regard to Poland.
- Increased government spending (mostly on consumption) financed from a growing deficit and public debt would lead to a crowding-out effect in the economy with regard to private investment, which would consequently change the way in which national income is distributed (on the demand side); the role of the private sector would fall in favor of the public sector.
- At the same time, due to increased "rigid" government expenditure, not accompanied by a parallel increase in permanent sources of funding, the structural deficit might increase.
- A growing general government deficit, which is equivalent to increased negative government savings, would reduce the possibility of financing investment projects from domestic private-sector savings.
- An increased perceived risk of investing in Poland would translate into a higher cost of borrowing on international financial markets. Such a scenario is increasingly probable after a January 2016 decision by rating agency Standard and Poor's to downgrade Poland's investment rating.
- Possible temporary acceleration in economic growth on the demand side, as a result of increased government and household spending.
- This effect may be somewhat strengthened if the government goes ahead with its announced policies to encourage the development of small and medium-sized enterprises (SMEs) through the launch of a system of cheap loans subsidized by the government (more expansionary monetary policy). The probability of such a scenario increases with recent changes in the lineup of the Monetary Policy Council (RPP) and a planned change of central bank governor in June 2016. However, due to structural and supply-side barriers existing in the Polish economy, which are highlighted in the next section, the pro-growth effects of these measures may prove to be short-lived and much smaller than the government expects.
- High probability of a complete dismantling of the three-pillar pension system accompanied by the takeover by the government of the remaining part of pension assets accumulated in OFE pension funds.

- A reversal of the previous government's pension system reform (based on raising the retirement age from 60 to 65 years for women and from 65 to 67 years for men) would create additional constraint for the current and future liquidity of the Social Insurance Fund and the national budget.

Medium- and long-term effects

- Increased inflationary pressure and expectations resulting from two interrelated factors: (1) a significant loosening of fiscal and monetary policies, and (2) almost full use of the production capacity in the Polish economy (with the output gap estimated at only –0.6% of potential GDP) and a significant deceleration in the rate of potential economic growth (to no more than 3.0% a year).
- This may mean that additional incentives for growth from fiscal and/or monetary expansion (in the form of measures such as increased lending to SMEs) may lead to an overheating of the Polish economy and accelerated inflation rather than accelerated GDP growth.
- In the slightly longer term, insufficient propensity to save (currently standing at 18%–19% of GDP) and a low investment rate (20% instead of at least 24–25% of GDP) may contribute to a slowdown in the Polish economy.
- The crowding-out effect (see above) may have a similar effect. It will lead to a less efficient use of resources in Poland on average (a decrease in TFP) and thus a deceleration of potential economic growth.
- In this context, it is also worth highlighting a contradiction between the actual moves of the governing party and the main objectives announced by Deputy Prime Minister Mateusz Morawiecki in mid-February 2016. Morawiecki's Plan for Responsible Development calls for a significant increase in domestic savings and investment, coupled with increased national innovative capability and support for domestic capital. However, according to standard economic theory, it is impossible to increase the consumption and investment rates while limiting the role of foreign savings in an economy.
- A takeover by the government of the remaining OFE assets would result in a conversion (postponement) of the official, "visible" part of the public debt into hidden, "invisible" debt (promises of future pension payments) and a significant increase in the latter form of debt.
- A possible decision by the government (parliament) to backtrack on the pension reform based on extending the retirement age would decrease the supply of labor and lead to a drastic reduction in the replacement rate for future retirees. At the

same time, it could threaten the long-term solvency of the Social Insurance Institution and the public sector.

- Such a decision could also deal a further body blow to the Warsaw Stock Exchange, which has already underperformed significantly in the wake of the 2014 nationalization of half of the OFE pension funds' assets by the PO-PSL government.

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Chapter 12

Regional Policy, Smart Specialization and the Competitiveness of Regions

Marta Mackiewicz

Introduction

Smart specialization is a relatively new concept of how innovation policy should be pursued. Smart specialization is increasingly at the core of strategies to exploit existing potential, resources, and competencies, and create new comparative advantages. Theoretical models of economic growth suggest that smart specialization could enhance innovation and help improve the competitiveness of regions in both the short and long term. This is chiefly because smart specialization strategies launch measures to upgrade technology and human capital.

This chapter seeks to determine how, if at all, smart specialization can become an effective tool to enhance the competitiveness of Poland's regions. Because smart specializations are only beginning to emerge and are at an early stage of implementation, the research took the form of an *ex-ante* analysis that consisted of the following steps:

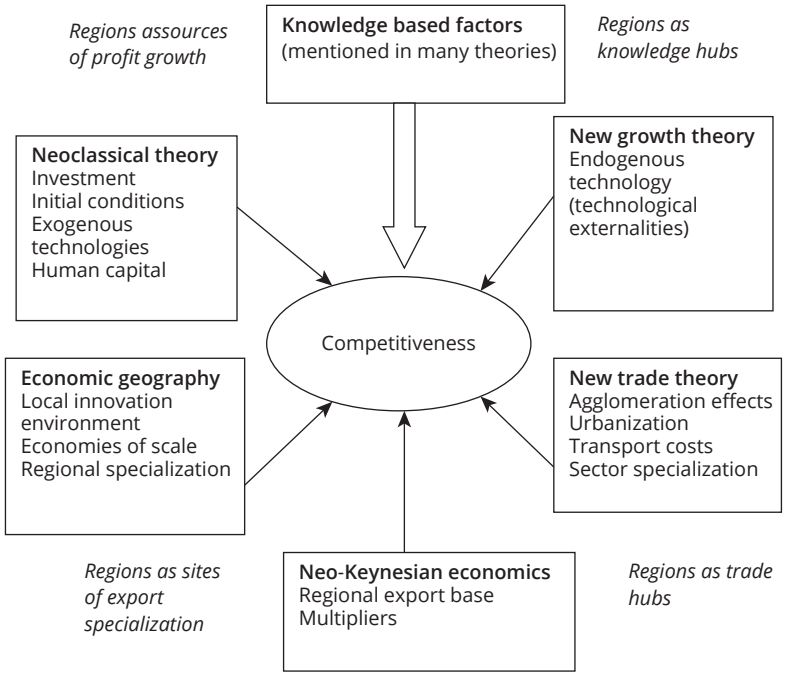
- an analysis – based on existing research reports – of how the nature of specific regions impacts their competitiveness,
- an evaluation – based on the experience of various EU regions – of the impact of regional conditions on regional innovation strategies and smart specializations,
- an empirical study – based on statistical analyses and international comparisons – of factors existing in Polish regions.

The competitiveness of regions in light of the theory and practice of supporting regional development

Regional policy guidelines continue to evolve as theories highlight the role of innovation and cooperation networks in economic development and the role of human capital and management abilities. Changes in the concept of economic development lead to new approaches to competitiveness factors and modifications in the defini-

tion of regional competitiveness. Regional competitiveness is usually understood as a set of characteristics that ensure stable socioeconomic development. But there are many approaches to regional competitiveness. The diagram below illustrates the various aspects of competitiveness.

Figure 12.1. Aspects of regional competitiveness



Source: Own work based on *European Competitiveness Report 2003*, EC 2003 and Martin (2005).

Competitiveness is often understood as the ability of regions to achieve a relatively high level of income and employment amid international competition. In this context, competitiveness is the ability to produce and offer goods and services that are likely to attract buyers on both domestic and foreign markets with their technological and operational parameters, prices, quality, and conditions of sale.

One form of regional development policy aimed at increasing competitiveness is the concept of smart specialization. In simple terms, this is based on an effective and synergistic use of public support for strengthening innovation capacity by focusing on the most promising areas where regions have a comparative advantage. Smart specialization is about identifying the unique features and resources of countries and regions as well as their competitive advantages and about orienting regional partners toward achieving specific objectives (European Commission, 2012).

The smart specialization concept involves enhancing innovation and competitiveness on the basis of the endogenous potential of regions, in particular in already existing sectors. Smart specializations can be developed both within and between sectors in order to achieve a specific competitive advantage. Smart specialization can also be defined as "an entrepreneurial process of discovery that can reveal what a country or region does best in terms of science and technology" (European Commission, 2012). This entrepreneurial process of discovery is based on seeking out new opportunities, particularly in the research and development sector, and on experimenting and learning from the best examples in order to secure unique competitive advantages (Foray, 2009).

The concept of smart specialization is associated with multiple theories of regional development, in particular location and economic base theories (Krugman, 1995) as well as F. Perroux's theory of growth poles (Perroux, 1995), an endogenous development strategy based on the new growth theory (Romer 1990, Grossman, Helpman, 1991), and the so-called new economic geography. This means that the smart specialization concept is not new; many researchers have indicated a link between the number of companies located in the same area and forming linkages and the development of the market. The concentration of production increases diversity and therefore the ability to meet consumer demand and sell products (Fujita, Krugman, Venables, 2001).

The smart specialization concept is also based on Mansfield's innovation diffusion model, which holds that companies are increasingly eager to innovate – and innovation becomes less risky – as they gather information and experience (Mansfield, 1961). Furthermore, smart specialization is rooted in the theory of competitive advantage, under which an optimal strategy for regions is to focus on areas of research and innovation that are complementary to their assets and are likely to contribute to strengthening their comparative advantages (David, Foray, Hall, 2007).

The importance of regional conditions and factors and their impact on regional innovation strategies in the context of prior EU experience

Contemporary theories show that building a network of cooperating institutions and companies contributes to innovation and helps improve the flow of information and technology (Storper, 1997, Cooke, Morgan, 1998). However, this is not always the case and such a network may not develop quickly enough. For this reason, the European Union started to use instruments aimed at strengthening the competitiveness

of regions. On the basis of the Lisbon Strategy, regional innovation strategies began to emerge in the form of experimental programs.

With this initiative, a series of interactive inter- and intra-regional learning processes got under way. In response to problems associated with the concentration of funds in the wealthiest regions, referred to as islands of innovation, the European Commission in 1990 came up with the Science and Technology for Regional Innovation in Europe (STRIDE) initiative. The program aimed to ensure the removal of barriers for the less favored regions in order to take part in EU programs. In particular, the aim was to build innovation and institutional capacities in weaker regions by helping them strengthen their technology, innovation, and research infrastructure. The program also sought to help regions join national and international research and technology development programs (RTD) and take part in collaboration between industry and RTD centers.

The program failed because economically weak regions were unable to ensure adequate private-sector involvement in projects. According to Landabaso (1997), the program backfired for two key reasons: first, innovation was not seen as an interactive process, as a result of which regions took excessive interest in university research projects hoping that these would support industry; and second, organizations in disadvantaged regions lacked networking experience and knowledge.

This experience showed that the transfer of funds to RTD projects was insufficient and that a policy focused on innovation in management, quality standards and organizational models was needed. Another conclusion was that new forms of institutional cooperation were needed to design and implement policies adapted to local conditions (Henderson, Morgan, 2001). This made it possible to lay the groundwork for a Regional Technology Plan (RTP) to replace STRIDE. The focus was primarily on encouraging less favored regions to develop innovation processes involving regional actors. These processes were expected to result in the emergence of bottom-up strategies tailored to the needs of specific regions.

Although initiatives aimed at promoting technological development and innovation contributed to an improvement in infrastructure and services intended for SMEs, the analysis shows that further efforts are needed to improve innovation capacity in less well developed regions. That is why the European Commission launched the Regional Innovation and Technology Transfer Strategies (RITTS) and Regional Innovation Strategies (RIS). One of the priorities was to improve the quality of ties between technical support and financial institutions, on the one hand, and regional businesses, mainly SMEs, on the other. These two strategies were similar; the main difference was that the RIS placed greater emphasis on developing partnerships between key actors in a region. The RIS focused on promoting innovation-driven development, while the

RITTS paid more attention to increasing the efficiency of infrastructure and innovation support policies. The program was based on three key assumptions:

- a bottom-up approach,
- consensus building,
- practical action in response to identified problems.

These assumptions are similar to those underlying the development of smart specializations. In subsequent years, new programs emerged based on the results of RITTS/RIS projects. These included RIS+ projects and successive rounds of regional innovation strategies, including the latest round: regional research and innovation strategies for smart specialization (RIS3).

Economic changes, combined with the lack of spectacular results from previously applied policies that sought to boost innovation in EU economies, meant that more attention began to be paid to the importance of location factors in economic growth. Based on the experience of various European regions, it can be concluded that the main weakness of regional innovation policy was limited human capital and its low quality. In addition to factors such as a region's socioeconomic condition, a major role was played by strategic management (Charles, Nauwelaers, Mouton, Bradley, 2000). This is confirmed by research by Landabaso (2014) on how selected EU regions have embraced smart specialization.

In recent years there has been a visible focus on location-specific regional policies, combined with an emphasis on adapting these policies to local needs. This stems from factors including a belief that local processes help forge and maintain competitive advantages (Bachtler *et al.* 2003, Barca *et al.* 2012). Greater emphasis was placed on factors shaped at the regional level such as human capital and its quality, the availability of a knowledge infrastructure, and the existence of a network and cluster linkages (Capello, Nijkamp, 2009, Rodriges-Pose, Crescenzi, 2008).

Smart specialization in Polish regions compared with EU peers

Based on a database posted on the Smart Specialisation Platform (S3P)[1] website, below we sum up the most popular smart specializations.[2] Table 12.1 lists specializa-

[1] The database contains 176 EU regions and 18 non-EU regions.

[2] The names of individual smart specializations may be slightly misleading and such an analysis requires a broader context. This context is created by three dimensions that are further identified by subcategory. The first dimension concerns the research and development potential of regions. The second dimension refers to objectives aimed at strengthening the business sector (defined on a bottom-up basis),

tions most common in European regions. On average, a region selects six smart specializations, although in Poland less than five specializations are usually chosen. As can be seen, specializations most common in Polish regions largely coincide with those popular in the EU as a whole (in the table, the dark gray color indicates the most common shared specializations, while gray denotes those that coincide less often).

Table 12.1. Smart specializations/priority areas most often chosen by EU regions as a whole and by Polish regions

EU regions as a whole	%	Polish regions	%
Energy	12.2	Information and communications technology (ICT)	15.8
Health	11.2	Health	13.2
Food	9.1	Food	10.5
Materials	8.3	Manufacturing	10.5
Information and communications technology (ICT)	8.2	Transport and logistics	9.2
Tourism	7.1	Energy	7.9
Services	7.4	Sustainable development	7.9
Sustainable development	7.0	Materials	6.6
Creative industries	5.1	Chemicals and pharmaceuticals	5.3
Manufacturing	4.4	Creative industries	3.9

Source: European Commission, 2015.

The map of Polish smart specializations by category reveals many similarities between Polish regions and EU regions as a whole. This is probably because possibilities for financing projects from EU funds have been narrowed down to the priorities set out in the Europe 2020 Strategy. In many regions, EU funds are the main source of financing RIS3 projects, so it is not surprising that similar choices have been made in terms of specialization. It is worth noting that smart specializations were expected to lead to diversification in this area and to a considerable diversity of development policies; they were expected to be an answer to problems related to the fact that regions decide to follow specific models (Foray, 2009).

while the third dimension is compliance with key areas of EU development policy. This last category makes it possible to determine whether a given smart specialization can be supported with EU funds.

Table 12.2. Smart specializations in Polish regions

Bio-smart specialization – natural environment potential; Eco-efficient technologies for the production, transmission, distribution and consumption of energy and fuels; Green economy; Bio-economy; Green industry; Bio-economy	High-quality food; Safe food – agriculture, processing, fertilizers and packaging; Innovative agriculture and agri-food processing; Healthy food; Safe food; Agri-food technology; Healthy food; Quality foods	Cultural heritage, art, creative industries. Creative and leisure industries Interiors of the future	Regional mobility Transport, logistics, trade – inland waterways and overland routes Specialized logistics processes Aerospace Offshore and port-and-logistics technologies Maritime and logistics Automotive, transport equipment and industrial automatics
Low-carbon energy Energy (including EE, RES) Sustainable energy Efficient use of energy Energy industry (including renewables) Energy (including environmental technologies)	Medicine, medical and health tourism services Health and quality of life Medicine Medical technologies for lifestyle and old-age diseases Modern medical technology Medical and health services Health tourism Tourism and health High quality of life Quality of life	Information and communications technology (ICT) Information processing, multimedia, software engineering, ICT services Information and automation technology IT Information and telecommunications technology Smart management systems Interactive technologies in an information-intensive environment; Telecommunications Information technology Industry of the future ICT-based development	Specialization in markets beyond Poland's eastern border Water economy Life sciences Modern business services Services of the future
Natural and recyclable resources Bio-resources	Chemicals and pharmaceuticals Medical sector, pharmaceuticals and cosmetics (including spa treatment) Chemistry Chemical technology	Advanced building materials (including design); Manufacture of metals and metal products and manufacture of non-metallic mineral products Construction and wood Construction Woodworking and furniture production	Production of machinery and equipment, materials processing Electrical and mechanical engineering Mechanical engineering and metal industry Metal and machine industry Tools, injection molds, plastic products Modern textile and fashion industry (including design); Foundry and metal industry

Source: Own work based on regional innovation strategies.

The similarities between EU and Polish regions in terms of smart specialization raise doubts as to whether Polish regions, most of which are classified among less developed regions (cf. Camagni, Capello, 2012), will be able to strengthen their competitiveness and comparative advantages in selected areas. This is because few Polish regions are able to successfully compete on global markets for innovative products and services. Developed regions tend to respond more quickly to technological initiatives, focusing on developing a range of supply-side requirements that are the basis of innovation (Simmie, 2003).

The map of Polish smart specializations shows that these specializations are interrelated at the country level. This can produce positive results because inter-industry ties spur the development of entrepreneurship and innovation. Such linkages help create opportunities for joint development work and strengthen the knowledge dissemination effect (David *et al.*, 2010). Linkages also have a positive impact on the economies of scale and help solve problems through the cooperation of specialists from different regions (David *et al.*, 2010). This also creates an opportunity to reduce the risk that accumulated resources could become useless if a particular specialization proved to be insufficiently competitive, for example due to rapid technological change and less well developed regions unable to keep up with it.

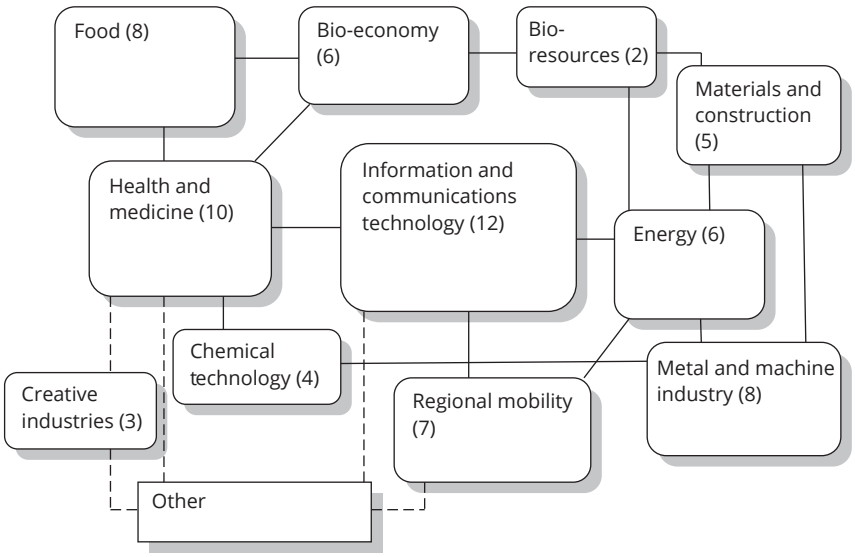
The strength of ties between similar specialization areas in the matrix presented in Table 12.2 is illustrated by the grayscale (the darker the color, the more links there are). Figure 12.2 shows the possibilities for synergistic linkages between specializations (the numbers in parentheses indicate how many times a specific field has been selected by Polish regions).

Overall, the smart specializations of Polish regions are diversified, though interrelated. Thanks to mutual linkages, they fit into the fundamental aspects of the smart specialization logic, at least in part. Smart specialization is designed to deepen ties between regions and thus generate economies of scale (Thiessen, van Oort, Diodato, Ruijs, 2013). Other key aspects of smart specialization include the process of entrepreneurial discovery and the size of the sector involved (Foray, 2009). These two factors are usually found in highly developed regions because the process of entrepreneurial discovery is closely linked to the availability of funding, the number and diversity of business options, and the scale and depth of available markets (McCann, Ortega Argiles, 2011). This leads to doubts over whether less developed regions fit into the logic of smart specialization-based development. These concerns stem from factors including differences between well and poorly developed regions:

a) well-developed regions usually have a higher level of entrepreneurship and innovation;

b) more developed regions are more diversified in terms of business sectors, which promotes entrepreneurship and innovation;
c) developed regions tend to attract large companies, including firms with international ties, which creates opportunities for the development of innovation and entrepreneurship (McCann, Ortega Argiles, 2011).

Figure 12.2. Linkages between priority areas



Source: Own work.

Various research reports suggest that rather than specialization, greater sector diversification is needed in less developed regions. Given the OECD classification (2011), this appears to apply to most of Poland's regions (most of which are classified as "non-S&T-driven regions"), although (as noted by McCann) sector diversification in a region does not exclude smart specialization.

Despite the existence of a minimum critical mass in selected priority areas in regions and the occurrence of linkages between these areas, support for smart specialization may not produce the desired results unless some additional conditions are met. Interviews with regional administration officials show that smart specialization in Polish regions is not integrated with the overall regional development policy. Funds have not been assigned from local government budgets for smart specialization, and there is a lack of resources for action in this area. Those who took part in the process of creating strategies indicated difficulties in establishing close cooperation with companies, especially large ones, and in getting business to become involved in RIS3

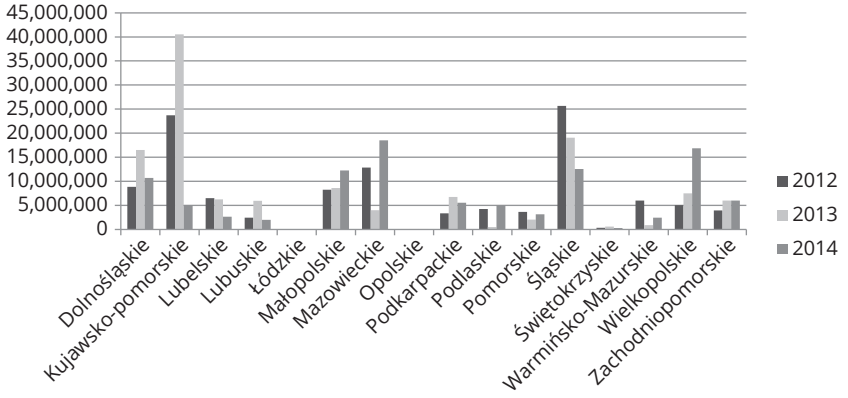
measures. If smart specialization were to become little more than a tool of targeted spending of EU funds in specific sectors, it would not contribute to strengthening regional competitiveness.

Focusing resources in selected sectors or areas of enterprise activity does not necessarily stimulate growth. This applies in particular to regions that are in a less advantageous position in terms of socioeconomic development. One example is Poland's Podkarpackie province, which smart-specializes in areas including aerospace. Due to the specific features of this industry, it is difficult to strengthen the competitiveness of domestic firms. Companies with a strong market presence have been taken over by foreign companies, while small companies with domestic capital are heavily dependent on cooperation with foreign corporations, mainly due to their poor market position and unstable orders. Support for research and development *de facto* means transferring public support to foreign corporations, which use funds allocated for smart specialization to solve their technological problems. Another example is Warmińsko-Mazurskie province, whose smart specializations are based on the growth prospects of various export-oriented sectors with (at least potential) comparative advantages. These specializations, which include water economy, wood and furniture, and quality food, are likely to perpetuate the outmoded structure of the region's economy, which is among the poorest and least innovative in the EU. Even though Foray (2009) defines smart specialization as "the capacity of an economic system to generate new specialties through the discovery of new domains of opportunity and the local concentration and agglomeration of resources and competences in these domains," in many regions new specializations may be hampered by support excessively concentrated in sectors that enjoyed comparative advantages in the past, even if these sectors are not strong enough to effectively spur growth in the region.

The next research step was the analysis of innovation policies in Polish provinces. The fact that, in their strategies, provinces declare adherence to objectives such as creating conditions for improving innovation potential, does not always mean that concrete action is being taken. This is best illustrated by local government expenditure (regional innovation strategies are implemented at the province level, with the assumption of participation by other local government units). Public expenditure was analyzed based on Ministry of Finance data from reports by individual local government units (LGUs) on how their 2012–2014 budgets played out.

At this point, data on innovation expenditure by local government units is available only for 2014 and prior years, the period before Polish regions chose their smart specializations and began to implement RIS3. Further analysis of these expenses is needed in the next few years once RIS3 implementation gets under way in earnest.

Figure 12.3. Innovation spending by local government units by region, 2012–2014 (in PLN)



Source: Own work based on Ministry of Finance data.

The bulk of the funds spent on innovation and on building an innovation-enabling environment comes from programs co-financed by the EU. This means that innovation expenditure by Polish local government units would be even lower were it not for the financing of specific types of projects from EU coffers. The table below shows how research infrastructure and equipment are financed in individual regions.

Table 12.3. Sources of funding for research infrastructure projects launched in 2013–2014 by province (in thousands of PLN)

Province	Number of entities	Total expenditure	of this:		
			Own funds	Central government funds	Foreign financing
Total	817	1,444,351,328	469,046,800	697,088,742	260,343,240
Dolnośląskie	80	73,795,307	44,663,143	27,831,863	n.a.
Kujawsko-Pomorskie	31	41,894,976	n.a.	n.a.	n.a.
Lubelskie	27	8,021,411	768,136	2,768,558	n.a.
Lubuskie	12	n.a.	n.a.	n.a.	n.a.
Łódzkie	58	64,687,514	n.a.	43,278,765	n.a.
Małopolskie	89	73,302,954	n.a.	28,986,282	22,896,113
Mazowieckie	185	303,286,972	153,680,806	118,057,046	30,639,082
Opolskie	9	n.a.	n.a.	n.a.	n.a.
Podkarpackie	28	25,903,626	n.a.	8,521,082	n.a.
Podlaskie	19	n.a.	n.a.	52,692,480	n.a.

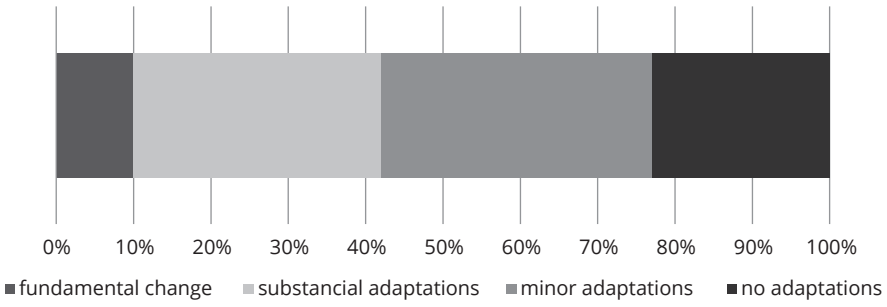
Province	Number of entities	Total expenditure	of this:		
			Own funds	Central government funds	Foreign financing
Pomorskie	42	94,975,876	17,566,205	n.a.	32,163,795
Śląskie	127	143,549,587	65,359,629	64,308,740	13,362,426
Świętokrzyskie	10	n.a.	n.a.	n.a.	–
Warmińsko-Mazurskie	13	n.a.	15,355,427	n.a.	n.a.
Wielkopolskie	65	60,792,069	23,591,311	33,988,851	n.a.
Zachodniopomorskie	22	258,103,878	69,898,921	170,197,410	18,007,547

Source: Central Statistical Office (2015), A study of research infrastructure and equipment and of collaboration between academic institutions, businesses, universities, research institutes and other institutions with research infrastructure at the NTS 2 (Nomenclature of Territorial Units for Statistical Purposes) level.

The table confirms that there are significant differences between regions. In some regions, positive innovation-driven development processes have been initiated, while in others development impulses have yet to appear that are strong enough to overcome the competitive weakness of these regions. The research shows that in some Polish regions, local authorities find it difficult to establish permanent collaboration with entrepreneurs.

An additional problem is that smart specialization is not sufficiently embedded in other development efforts undertaken in regions. A survey of EU regions (including 13 of Poland's 16 provinces) shows that 58% of the regional authorities polled have made no major changes in their policies; 83% of those who said their policies had not changed also said that the structure of allocation in their policies had remained virtually unchanged (Fraunhofer ISI survey, 2014).

Figure 12.4. Changes in smart specialization policies, as declared by regional authorities (n=57)



Source: Fraunhofer ISI survey (2014).

The high probability of inter-regional polarization puts a question mark over the positive effect of smart specialization. As mentioned earlier, it is possible that the current economic structures of regions will be petrified, putting less developed regions at a disadvantage. There is also concern that regional innovation strategies will fail to contribute to reducing regional disparities, which will be exacerbated by objective development factors, including knowledge.

Interviews with local government administration officials indicate that the weakness of smart specializations in Polish regions primarily stems from limited opportunities to finance projects and from insufficient involvement by entrepreneurs. Polish local government authorities responsible for carrying out smart specialization-based regional innovation strategies do not have a realistic influence on companies operating in the region or on research institutions. Although smart specialization offers considerable potential for extending the dialogue between key actors in a region, in practice it is difficult to encourage companies, particularly large ones, to join such a team effort.

Conclusion

Smart specialization is a relatively new concept that is still insufficiently described in the literature in terms of its impact on regional development and innovation. Although theoretical assumptions based on innovation policy experience and regional development seem reasonable (Barca, 2009, Foray, 2009 *et al.*), they do not take into account a host of factors that play a role in the economy. The impact of regional innovation strategies on the competitiveness of regions is difficult to assess *ex ante*. Any definite conclusions on this matter require further research in a few years. At this point, it is only possible to reflect on the scope of regional innovation strategies and on the weaknesses that need to be eliminated. It is also possible to assess the effects of a region choosing a particular specialization.

The development of smart specialization strategies requires extensive sector analysis combined with the collection of data from businesses in regions and efforts to integrate communities. Regional authorities pay more attention to bottom-up strategy making methods and use participatory methods of activating multiple quadruple helix stakeholders, who, by taking part in the strategy-making process, would take greater responsibility for its results. Considering the conclusions from the presented theories, smart specialization can be expected to produce a positive overall impact. First, however, a number of conditions must be met, such as the involvement of regional stakeholders, including large companies, along with political support, and integration of RIS3 with overall regional policy, as well as those related to the characteristic features

of a region, including a high level of human capital and the existence of knowledge-creation centers.

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Chapter 13

Effects of Additionality from Public Financial Support to Innovation in the European Union: Poland and Selected Other Member States Compared

Małgorzata Stefania Lewandowska, Marzenna Anna Weresa

Introduction

There is a long-standing debate concerning the drivers of the innovation process. The determinants of innovation are analyzed in the concept of national innovative capacity (Stern, Porter & Furman, 2002). They are also assessed in the *Innovation Union Scoreboard*, which compares the innovation performance of EU member states (EC, 2015). The Global Innovation Index is another attempt to measure the innovation performance of various countries and determine its drivers (Cornell University, INSEAD, and WIPO, 2015). Most theoretical and empirical studies show that innovative performance rests on many pillars, including the stocks of talent, physical capital, infrastructure, and networks.

There is no doubt that public funding is one of the important factors that can boost innovation. However, the efficiency of its use may differ depending on where public support goes, how it is distributed, and so on. Therefore, it is interesting to see how public funding supports innovation in Poland compared with other EU countries. In particular, as the role of EU funds supporting R&D and innovation has increased since Poland joined the EU, this chapter seeks to identify what results EU financial support to innovation has produced in Poland compared with other EU member states. The Czech Republic, Portugal, and Spain have been chosen for this comparative analysis because of similarities between the four countries. All have been eligible for cohesion funds,[1] and a huge part of these funds has been used to boost innovation. According to the Innovation Union Scoreboard, all four countries belong to the group of moderate

[1] http://ec.europa.eu/regional_policy/sources/what/future/img/eligibility20142020.pdf, accessed March 31, 2016.

innovators and their innovation performance is below the EU average (EC, 2015, p. 13). However, since 2006 the Czech Republic has outperformed the other three countries in innovation performance. Poland's innovative position did not change much from 2006 to 2014, while Spain and Portugal lost momentum relative to the EU average (EC, 2015, p. 13). Apart from innovation performance, there have also been significant differences between the analyzed countries in the design and implementation of innovation policies. The effectiveness of innovation systems and policies and its changes over time can be compared using the innovation efficiency ratio, which is calculated as the ratio of the Innovation Output Sub-Index score to the Innovation Input Sub-Index score (Cornell University, INSEAD, and WIPO, 2015, p. 26). Again, the Czech Republic seems to have the most efficient innovation system and policy among the analyzed countries, followed by Portugal, Spain, and Poland (Table 13.1).

Table 13.1. Comparative innovation performance: Poland, the Czech Republic, Portugal and Spain

Country	Poland		Czech Republic		Portugal		Spain	
Year	2011	2015	2011	2015	2011	2015	2011	2015
Global Innovation Index (rank)	43	46	27	24	33	30	32	27
Global Innovation Index (score)	38.02	40.16	47.30	51.32	42.40	46.61	43.81	49.07
Innovation Input Sub-Index (score)	46.29	48.44	53.11	54.18	50.32	53.80	52.43	57.00
Innovation Output Sub-Index (score)	29.74	31.87	41.49	48.46	34.47	39.41	35.19	41.14
Innovation Efficiency Index (score)	0.64	0.66	0.78	0.89	0.69	0.73	0.67	0.72

Source: Own elaboration based on INSEAD, WIPO, 2011 and Cornell University, INSEAD, WIPO 2015.

According to Eurostat data, the share of EU funds in total intramural R&D expenditures has been relatively stable in the "old" EU member states, while in the "new" EU member states it has been increasing since the EU's eastward enlargement. In the "new" cohesion countries, such as Poland and the Czech Republic, the share of R&D support from EU funds in total R&D expenditures grew from 2%–3% in 2006 to 10%–15% in 2012, whereas in the "old" cohesion countries, such as Spain and Portugal, the respective share was stable in 2006–2012, hovering around 2%–3%. As both groups are cohesion countries, it is worth comparing the effects of R&D support from EU funds in order to find out how Poland compares with some other cohesion EU members.

This chapter is structured as follows. The first part presents statistics derived from a Community Innovation Survey (CIS) concerning public financial support from the

local, central and EU levels among European countries. The research is based on data derived from three waves of Community Innovation Surveys (CIS), namely 2006–2008, 2008–2010, and 2010–2012. The aim is to show the intensity as well as the structure of public financial support across European countries. The second part of this chapter discusses the theoretical concept of additionality of public financial support for innovative activities and explains its different dimensions. The third part of the research brings empirical data on the effect of additionality that comes from EU funds.

This part of the research is based on micro data for enterprises derived from CIS 2008 for the Czech Republic, Spain, and Portugal and CIS 2010 for Poland. The sample of firms from the four countries covers 943 large and medium-sized enterprises in Poland, 981 enterprises in the Czech Republic, 4,584 Spanish firms, and 568 Portuguese enterprises. A detailed analysis investigates whether public financial support for innovation boosts firms' investment in innovation activity (*input additionality*). The research also shows whether EU financial support for innovation enhances the firms' quality and scale of internal resources, i.e. investment in internal R&D expenditures and personnel training (*internal behavioral additionality),* and whether it influences the intensity of innovation cooperation *(external behavioral additionality)*. Finally, the link between EU financial support for innovation and the firms' innovation performance (*output additionality)* is examined. We use structural equation modeling (SEM, path analysis) to assess the relationships between the variables. Thus, this chapter brings some insight into a deeper evaluation of the effectiveness of programs financed by the EU, especially those aimed at Central European countries (Weresa & Lewandowska, 2014).

Public financial support for innovation activity in European countries

The CIS questionnaire contains a section in which enterprises are asked if they receive public financial support from local or regional authorities, the central government and/or the European Union. The results show that in 2010–2012 the proportion of innovative enterprises that received public funds for supporting R&D in the total number of enterprises ranged from 16% in Sweden and Latvia to nearly 60% in France and the Netherlands[2]. In the same period, the percentage of innovative firms that said they got support only from the EU budget ranged from less than 3% in Croatia and

[2] The data for the CIS questionnaire is not available for all 28 EU countries; only 24 member states disclose such data.

Spain to more than 30% in Hungary. Therefore, on the basis of these two criteria (i.e., intensity of innovative enterprises that got public support and those that got some support from the EU budget), EU member states can be divided into nine groups with different performances regarding the use of national and EU public funds for R&D activity of their enterprises (Table 13.2).

Table 13.2. EU countries broken down by the proportion of innovative enterprises that reported receipt of public funds for supporting R&D and receipt of funding from the EU budget in 2006–2012

The percentage of enterprises that reported receipt of:		Public funding (local, regional, national or European) for supporting R&D		
		High (above 40%)	Medium (20%–40%)	Low (below 20%)
Funds from the European Union	High (above 20%)	Hungary	Czech Republic, Lithuania, Poland	-
	Medium (10%–20%)	Austria	Bulgaria, Slovakia, Malta, Estonia, Slovenia, Portugal	Romania, Latvia
	Low (below 10%)	Finland, Netherlands, Cyprus, France	Luxembourg, Germany, Croatia, Italy, Belgium, Spain	Sweden

Source: Own elaboration based on Eurostat data from CIS 2006–2008; CIS 2008–2010, CIS 2010–2012.

The four EU cohesion countries selected for our comparative analysis – Poland, the Czech Republic, Spain, and Portugal – belong to the same group in terms of the percentage of innovative enterprises that in 2010–2012 received some kind of public funding related to their innovation activity. In 2010–2012, the percentages of firms reporting receipt of public funds in those countries were 28%, 26%, 29%, and 32% respectively. These figures did not rise significantly from 2006, with exception of Portugal, whose percentage grew from 12%.

When it comes to EU funding, the differences between analyzed countries are significant. In 2010–2012, Poland and the Czech Republic had the EU's highest percentages of industrial enterprises that received support for innovation from the EU budget – both higher than 21%. Spain was among EU countries with the lowest proportion of innovative enterprises that received public funding from the EU budget – less than 3%. Portugal was in the middle of the pack, with 11%. In all the analyzed countries, the figures increased compared with 2006.

A comparison of the percentages of innovative enterprises reporting receipt of funding from local or regional authorities shows that from 2006 to 2012, more than 17% of Spanish innovative enterprises received this type of support, whereas in the other analyzed countries the figures were much lower (4% for the Czech Republic and Poland, and 3% for Portugal). As for funding from the central government, the percentage of Portuguese enterprises was the highest among the four countries, at

18%. Portugal was followed by Spain, the Czech Republic, and Poland (at 15%, 13%, and 7% respectively). Detailed data are presented in Table 13.3.

Table 13.3. Percentage of innovative industrial firms reporting receipt of public financial support for innovation during 2006–2012 in Poland, the Czech Republic, Spain and Portugal

Country	Percentage of enterprises reporting receipt of														
	Any public funding			Funding from local or regional authorities			Funding from the central government			Funding from the European Union			Funding under the 6th or 7th Framework Programme		
Year	2006–2008	2008–2010	2010–2012	2006–2008	2008–2010	2010–2012	2006–2008	2008–2010	2010–2012	2006–2008	2008–2010	2010–2012	2006–2008	2008–2010	2010–2012
Poland	22	22	26	4	4	5	7	7	9	14	17	22	3.8	3.4	4.1
Czech Republic	21	26	29	6	3	4	11	14	14	9	20	21	4.3	6.6	4.4
Spain	29	29	28	20	18	15	13	15	16	2	2	3	1.1	1.1	1.2
Portugal	12	25	32	1	2	4	9	21	25	5	7	11	1.9	1.6	1.8

Source: Own elaboration based on Eurostat data from CIS 2006–2008, 2008–2010, 2010–2012.

Additionality of public financial support for R&D and innovation: a conceptual approach

It is generally expected that increased public support for R&D results in *additionality*, which can be defined as a change in financed firms' R&D spending, behavior or performance that would not have occurred without the public program or subsidy (Buisseret *et al.*, 1995). The focus of *input additionality* is to estimate to what extent a specific program contributes to additional investment in R&D by a recipient firm. A large stream of research has focused on whether public R&D support stimulates additional R&D efforts (David, Hall & Toole, 2000). Although the results are inconclusive, there is little disagreement about the need for direct government support for commercial R&D projects (Klette, Moen & Griliches, 2000).

For the purpose of this research, in addition to the analysis of the impact of public support on investment in the purchase of R&D activities, we will also examine *additionality* in the case of investment in technology-advanced machinery that aims to create new or significantly improved products and processes. This leads to the following hypothesis:

H1: *Input additionality*
Public financial support for innovation boosts firms' investments in innovation activity, in particular investments in gaining external knowledge (H1a) and in buying machinery or equipment (H1b).

Government intervention also influences innovation performance indirectly by improving a firm's knowledge of the market and its relations with third parties (Norman & Klofsten, 2010). This can be summarized using the concept of *behavioral additionality*, first introduced by Buisseret, Cameron & Georghiou in 1995 to measure changes in the ways firms conduct R&D as a result of government intervention (Luukkonen, 2000; Gök & Edler, 2012). In this sense, *behavioral additionality* complements more traditional approaches to additionally measurements that focus solely on input/output results (OECD, 2006). The following is therefore hypothesized:

H2: *Internal behavioral additionality*
Public financial support for innovation enhances firms' quality and scale of internal resources, in particular investment in internal R&D expenditures (H2a) and in personnel training (H2b).

Apart from *internal behavioral additionality* there is also *external behavioral additionality*, referring to the situation where public support influences the scope of collaboration developed by firms provided with R&D support (Wanzenbock, Scherngell & Fischer, 2013). Garcia and Mohnen (2010) have found a positive relationship between public support and cooperation in innovation. Kang and Park (2012), analyzing biotechnology firms from South Korea, demonstrated a strong positive influence of government R&D support on how firms collaborate with domestic upstream partners and a significant positive effect on firms' collaboration with downstream partners. This leads to the following hypothesis:

H3: *External behavioral additionality*
Public financial support for innovation influences the intensity of firms' innovation cooperation.

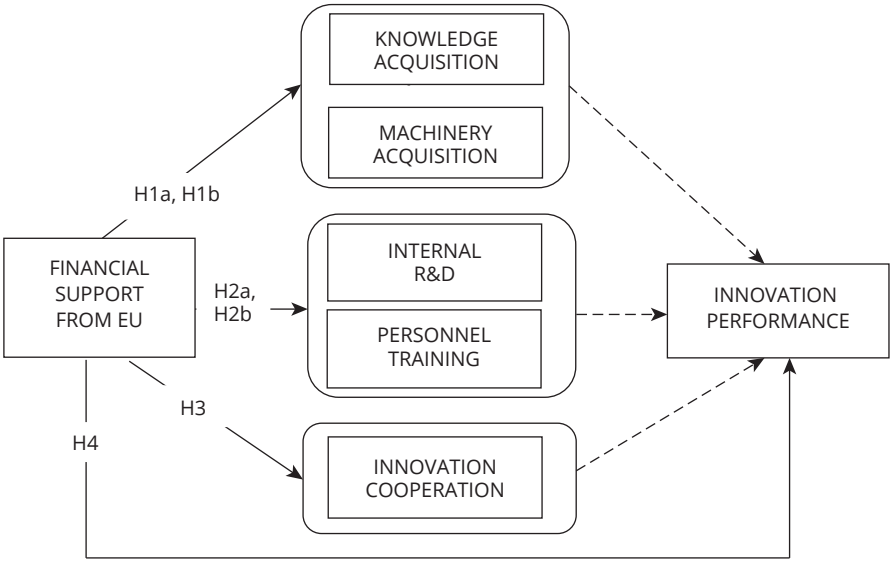
Whereas *input additionality* focuses on the degree to which public effort enhances private R&D spending, *output additionality* deals with its direct leverage effect on a firm's innovation performance (Luukkonen, 1998). While investigating firm-level data in Hungary, Halpern (2010) found a positive relationship between subsidies and both the R&D level and innovation. Garcia and Mohnen (2010) found that when

new-to-market product innovations are considered, central government support leads to a total effect on the share of new-to-market innovative sales. Given the empirical literature, the following research hypothesis is formulated:

H4: *Output additionality*
Public financial support for innovation improves firms' innovation performance.

The conceptualization of our research is presented in Figure 13.1.

Figure 13.1. Conceptual model of the impact of public financial support for R&D on the innovation activity of enterprises



Source: Own elaboration.

The additionality effect of public funds can occur under different scenarios. According to the taxonomy proposed by Marzucchi & Montresor (2012), there are five scenarios:

1. *Multi-dimensionality*. This will be the case when the public funding is able to add innovative inputs, outputs, and behaviors (internal and external) effects at the same time, and can be considered as a "system" type of policy intervention.
2. *Bi-dimensionality*. This kind of scenario will detect the effect of public funds in only two of three dimensions.
3. *Mono-dimensionality*. The effects of public intervention toward innovation processes within companies are limited to only one of the three dimensions.

4. *Partial cross-dimensional crowding-out*. A situation when negative additionality outcomes show up for one or more dimensions, while having a positive impact on the others at the same time.
5. *Full cross-dimensional crowding-out*. Regarding no or negative-only impact of policy on the innovation activities of firms.

In the four countries under study, these scenarios will be identified for additionality effects.

Additionality of European Union public financial support: the results of empirical research

Sample description, methods applied

This part of the study investigates the role of public financial support from the European Union in stimulating input, output, and the behavior of innovative industrial enterprises in Poland, the Czech Republic, Spain, and Portugal. A preliminary sample covered 7,783 large and medium-sized manufacturing enterprises in a study conducted by GUS – questionnaire PNT-02 (Polish version of *Community Innovation Survey*) – during 2008–2010, from NACE sections B-E.[3] The following three samples – 6,805 enterprises from the Czech Republic, 37,401 Spanish firms, and 6,531 Portuguese enterprises – were taken from the 2006–2008 wave of the CIS questionnaire, covering both manufacturing and service enterprises.

In the first step, in order to obtain samples of enterprises with similar characteristics from the four analyzed countries, we extracted only manufacturing enterprises (NACE sections B-E). In the next step, due to the design of the CIS/PNT-02 questionnaire where most of the questions refer to innovative enterprises, we, like other researchers (Veugelers & Cassiman 2004, Mothe *et al.*, 2010), used a filter variable that made it possible to select only those companies that introduced new or significantly improved products or processes. Furthermore, we assumed that only companies that received any public support for innovative activity in the researched period would be analyzed. Based on this we extracted n=943 enterprises from Poland, n=981 enterprises from the Czech Republic, n=4,584 enterprises from Spain, and n=568

[3] The selection of units for the survey was performed using the Polish Classification of Activities (PKD) 2007, consistent with the Statistical Classification of Economic Activities in the European Union (NACE Rev. 2). In 2011, the study on innovation in both industry (Sections B to E) and the service sector (Sections H to M) was conducted on the entire group of entities. For details, see: GUS (2012), *Innovation Activities of Enterprises in 2008–2010*, Central Statistical Office, Statistical Office in Szczecin, Warszawa, p. 15.

enterprises from Portugal. The details of the sample characteristics are presented in Table 13.4, and the operationalization of all the variables is presented in Table 13.5.

Table 13.4. Sample characteristics

Sample characteristics		Poland		Czech Republic		Spain		Portugal	
		n=943		n=981		n=4584		n=568	
		N	%	N	%	N	%	N	%
Introduction of product innovation		943	100.0[a]	836	85.2[b]	3440	75.0[c]	474	83.5[b]
Introduction of process innovation		711	75.4[c]	801	81.7[b]	3380	73.7[c]	520	91.5[a]
Introduction of marketing innovation		519	55.0[c]	642	65.4[a]	1970	43.0[d]	348	61.3[a]
Introduction of organizational innovation		572	60.7[b]	712	72.6[a]	2785	60.8[b]	437	76.9[a]
Firms size	Medium	558	59.2[c]	547	55.8[c]	3931	85.8[a]	436	76.8[b]
	Large	385	40.8[a]	434	44.2[a]	653	14.2[c]	132	23.2[b]
Target markets	Local market	855	90.7[a]	601	61.3[c]	4363	95.2[a]	458	80.6[b]
	Domestic market	884	93.7[a]	885	90.2[a]	4400	96.0[a]	505	88.9[a]
	EU	827	87.7[a]	828	84.4[a]	3662	79.9[a,b]	439	77.3[b]
	Other markets	648	68.7[a]	490	49.9[b]	2822	61.6[a]	369	65.0[a]

Each subscript letter (a, b) denotes a subset of categories whose column proportions (Bonferroni method) differ significantly from each other at the 0.05 level.

Source: Own calculation in SPSS IBM 21 based on data from questionnaire PNT-02 2008–2010 for Poland and the CIS questionnaire for 2006–2008 for the Czech Republic, Spain, and Portugal.

Table 13.5. Variable operationalization

Variable	Description and construction of variables
InnoActComp	Filter variable – "Innovation activity" and "Public support"
InnoActCompPr	"1" if the firm introduced product innovation; "0" otherwise and or
InnoActCompProc	"1" if the firm introduced product innovation; "0" otherwise
InnoActCompProc	"1" if the firm received public financial support from local agencies, government agencies or EU
InnoFundEU	Variable – "*Public financial support from EU*"
"1" if the firm received public financial support for innovation activity from EU, "0" otherwise.	
	Dependent variable – "*Innovation performance*"
Log of fraction (from 0 to 100) of turnover from innovative products introduced in 2008–2010 in total turnover in 2010.	
	Variables – "*Expenditures on innovation activities*"
Knowledge acquisition (ExtKnowAcq)	Counted if the firm declared acquisition of external R&D and/or acquisition of external knowledge (purchase or licensing of patents and non-patented inventions, know-how and other types of knowledge for the development of new products and processes).

Variable	Description and construction of variables
Machinery acquisition (MachAcq)	"1" if the firm declared acquisition of advanced machinery, equipment (including computer hardware) or software to produce new or significantly improved products and processes; "0" otherwise.
	Variable – "*Internal R&D*"
"1" if the firm perform R&D continuously (has permanent R&D staff in-house) during the three years 2008 to 2010, "0" otherwise.	
PersTrain	Variable – "*Personnel training*"
"1" if the firm conducted internal or external training for its personnel for the development and/or introduction of new products and processes; "0" otherwise.	
InnoCoop	Variable – "*Innovation cooperation*"
Counted if the firm declares cooperation with suppliers; customers; competitors; research institutes; universities, both domestic and international.	

Source: Own compilation based on CIS 2006–2008 and PNT-02 2008–2010, www.stat.gov.pl/formularze

In order to assess the relationships between variables, we use structural equation modeling (SEM, path analysis) to examine the structure and strength of the linear relationship between at least one independent variable and one or more dependent variables. The aim of SEM is to find a model that describes the reality in the best way (Bedyńska & Książek, 2012). The hierarchy of variables has been determined using an analysis of critical values between parameters. Because reasoning exclusively based on data from a single sample may result in an overestimation or underestimation of the parameters of the population, an analysis of the distribution of the estimation errors was made with multiple sampling with replacement from the sample (non-parametric bootstrap method) (Hayes, 2009; Efron 1979). The models applied the Bollen and Stine (1992) correction to test the null hypothesis of model fit.

Results of analysis, hypothesis verification

The Structural Modeling Analysis [IBM AMOS, ADF (Asymptotically Distribution Free estimation[4])], with bootstrap samples, resulted in models very well fitted to the data. The Bollen-Stine correction did not significantly change the models (Table 13.6). The analysis of standardized estimations (*bias-corrected*, 95% CI) shows that most paths in the models for Poland, the Czech Republic, Spain and Portugal are statistically significant at least at the $p < 0.05$ level (with simultaneous 95% CI).

An analysis of *input additionality* anticipated as a consequence of financial support for innovation activities from the European Union has shown that there is a positive and

[4] The ADF method does not require the multivariate normal distribution assumption. However, an estimation based on this method is only possible with large samples (Bedyńska & Książek, 2012). The study meets this requirement.

statistically significant relationship between EU funds and the acquisition of external knowledge in the case of the Spanish and Portuguese enterprises. In Poland, however, a negative and statistically significant relationship exists between the funds received and expenditures on external R&D, which indicates that the propensity for external expenditures decreases with an increase of EU funds. This may suggest a "crowding-out effect," although its clear confirmation would require additional in-depth research.

Table 13.6. Model characteristics

Poland	Czech Republic	Spain	Portugal
n=943	n=981	n=4584	n=568
Chi-square =.570	Chi-square = 21.863	Chi-square = 43.069	Chi-square = 6.500
Degrees of freedom = 2	Degrees of freedom = 2	Degrees of freedom = 2	Degrees of freedom = 2
Probability level =.752	Probability level =.000	Probability level =.000	Probability level =.039
CFI=1.000	CFI=0.937	CFI=0.964	CFI=0.947
RMSEA =0.000	RMSEA =0.101	RMSEA =0.067	RMSEA =0.063

Source: Own elaboration in SPSS21 based on CIS data.

The *input additionality* of EU funds for the acquisition of advanced machinery and equipment to produce new or significantly improved products and processes was revealed in Poland and the Czech Republic. Thus, hypothesis H1a is supported for enterprises from Spain and Portugal, whereas hypothesis H1b is supported for enterprises from Poland and the Czech Republic.

The existence of *internal behavioral additionality* (H2a) for internal R&D support was confirmed for enterprises from Spain and Portugal and rejected for enterprises from Poland and the Czech Republic. Hypothesis H2b, concerning a positive link between public support and personnel training, was supported only in the case of enterprises from Portugal.

The H3 hypothesis regarding the positive effect of European Union funds on *external behavioral additionality*, meaning enhanced innovation cooperation, was supported for enterprises from all the investigated countries except Portugal.

The existence of *output additionality* (H4), where innovation performance, operationalized by the log of the share of sales of innovative products in total sales, was only confirmed in the case of enterprises from Spain and Portugal.

The SEM method enabled us to investigate further relations between variables. This analysis shows that in most of the analyzed countries there is a strong relationship between personnel training and innovation cooperation. A strong relationship is also found between the acquisition of external knowledge and machinery and the level of internal R&D.

Table 13.7. Standardized estimates for the structural models for Poland, the Czech Republic, Spain, and Portugal

Parameter			H	Poland		Czech Republic		Spain		Portugal	
				Estimate	P value	Estimate	P value	Estimate	P value	Estimate	P value
Dependence between EU public financial support and expenditures on innovation activities (*input additionality*)											
InnoFundEU	--->	*ExtKnowAcq*	H1a	–0.076*	0.022	0.012	0.714	0.103***	0.000	0.157***	0.000
InnoFundEU	--->	*MachEqAcq*	H1b	0.185***	0.000	0.097**	0.002	0.028^	0.059	0.049	0.246
Dependence between EU public financial support and internal R&D and training (*internal behavioral additionality*)											
InnoFundEU	--->	*InternalR&R*	H2a	0.047	0.142	0.043	0.087	0.042**	0.004	0.097*	0.021
InnoFundEU	--->	*PersTrain*	H2b	0.059 ^	0.056	0.054	0.024	0.100	0.100	0.157***	0.000
Dependence between EU public financial support and innovation cooperation (*external behavioral additionality*)											
InnoFundEU	--->	*InnoCoop*	H3	0.143***	0.000	0.084**	0.006	0.131***	0.000	0.055	0.199
Dependence between EU public financial support and innovation performance (*output additionality*)											
InnoFundEU	--->	*InnoPerf*	H4	–0.035	0.295	–0.012	0.393	0.080***	0.000	0.099*	0.021
Other results derived from SEM models											
Hierarchy of variables influencing cooperation											
InnoFundEU	--->	*InnoCoop*		0.143***	0.000	0.084**	0.006	0.131***	0.000	0.055	0.199
PersTrain	--->	*InnoCoop*		0.075*	0.023	0.126***	0.000	0.078***	0.000	0.034	0.429

Parameter			H	Poland		Czech Republic		Spain		Portugal	
				Estimate	P value	Estimate	P value	Estimate	P value	Estimate	P value
MachEqAcq	--->	*InnoCoop*		0.060	0.074	0.023	0.455	0.033*	0.025	0.085*	0.045
InternalR&R	--->	*InnoCoop*		0.048	0.115	0.243***	0.000	0.107***	0.000	0.001	0.981
Hierarchy of variables influencing innovation performance											
InnoFundEU	--->	*InnoPerf*		–0.035	0.295	–0.012	0.393	0.080***	0.000	0.099*	0.021
InternalR&R	--->	*InnoPerf*		0.113***	0.000	0.059	0.074	0.003*	0.042	0.078^	0.065
TrainPers	--->	*InnoPerf*		0.084**	0.009	0.060	0.067	0.040**	0.007	0.012	0.778
MachEqAcq	--->	*InnoPerf*		0.084*	0.015	–0.011	0.725	0.019	0.205	0.003	0.949
ExtKnowAcq	--->	*InnoPerf*		–0.074*	0.029	0.089**	0.008	0.039*	0.014	0.051	0.239
InnoCoop	--->	*InnoPerf*		0.021	0.561	0.054	0.115	0.002	0.202	–0.007	0.869
Dependence among different innovation activity expenditures											
ExtKnowAcq	--->	*InternalR&R*		–0.117***	0.000	0.165***	0.000	0.159***	0.000	0.120**	0.004
MachEqAcq	--->	*ExtKnowAcq*		–0.095**	0.005	0.131***	0.000	0.019	0.209	0.141***	0.000
PersTrain	--->	*ExtKnowAcq*		–0.084*	0.013	0.147***	0.000	0.112***	0.000	0.025	0.554

Significant for: ***p< 0.001, **p<0.01, * p<0.05.
<--- (direction of dependency); ^ – statistical tendency.
The standardized coefficients (standardized estimates) show by how many standard deviations the value of the dependent variable will change when the value of the explanatory variable increases by one standard deviation (Bedyńska & Książek, 2012).

Source: Own calculations in AMOS21 based on the obtained structural models.

Further analysis also shows that there is a positive relationship between the level of internal R&D, personnel training, machinery acquisition, and external knowledge acquisition and innovation performance. The detailed statistics for all the analyzed countries are presented in Table 13.7.

Conclusions

Eurostat data shows that the importance of EU funds designed to support the activity of innovative enterprises in Poland has increased significantly since Poland joined the European Union in 2004. As a result, it is necessary to determine the effectiveness of the use of public funds, including EU funds, designed to support innovation. This was the main goal of the research presented in this chapter. Using the concept of additionality, this study examined the efficiency of public support for innovation. The comparative analysis showed that there have been huge differences among Poland, the Czech Republic, Portugal, and Spain with regard to the effects of EU financial support for innovation.

The results of the SEM show a *multi-dimensionality* of EU public support for enterprises from Spain and a *partial-multi-dimensionality* of EU support for enterprises from Portugal. In the case of enterprises from Poland and the Czech Republic, this role is far more limited; it results only in *bi-dimensionality* (input additionality for machinery acquisition and external behavioral additionality for innovation cooperation) (Table 13.8).

The analysis of statistical data in the first part of this chapter indicates that the percentage of innovative firms benefiting from EU public financial support is much higher in Poland and the Czech Republic than in Spain and Portugal. This support could be expected to produce better results and lead to *multi-dimensionality*, but this does not seem to be the case. One reason for this, although we did not investigate it here, may be the existence of complementarity between public support from different sources and firms' internal financial potential. We did not look at this latter effect, but in the case of Portugal and Spain, funding from local and regional authorities plays a much more important role than in Poland and the Czech Republic. Innovation policy design and implementation combined with current innovation performance may have an impact on the real absorption of EU funds.

Summing up, the results of the study indicate that the potential of EU support for R&D and innovation is still not fully exploited. In various EU member states there is still room for improvement with regard to policy design and implementation.

Table 13.8. Types of additionality effects from support for innovation in the studied countries

Type of additionality	H	Poland	Czech Republic	Spain	Portugal
Input additionality (external R&D)	H1a	Potential crowding-out effect	No	Yes	Yes
Input additionality (machinery)	H1b	Yes	Yes	No	No
Internal behavioral additionality (internal R&D)	H2a	No	No	Yes	Yes
Internal behavioral additionality (personnel training)	H2b	No	No	No	Yes
External behavioral additionality	H3	Yes	Yes	Yes	No
Output additionality	H4	No	No	Yes	Yes
Type of policy		Bi-dimensionality with potential crowding-out effect	Bi-dimensionality	Multi-dimensionality	Partial multi-dimensionality

Source: Own elaboration.

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Chapter 14

Barriers to Innovation in Poland Compared with Other European Countries: Implications for Innovation Policy

Małgorzata Stefania Lewandowska

Introduction

The European Union's Europe 2020 strategy, which defines the directions of development for member countries, sets forth three mutually reinforcing priorities: smart, sustainable, and inclusive growth.

One of the seven flagship initiatives to catalyze progress under each priority is called the Innovation Union. The project is designed to ensure access to funds for research and innovation and to improve framework conditions for innovative ideas to be turned into new products and services contributing to economic growth and job creation (Commission Communication on Europe 2020, 2010, p. 12). This means that efforts to create enabling conditions for innovation and to remove barriers in this area are becoming a priority. The same goes for the financial aspect of innovative projects. In addition, what should count under the Europe 2020 strategy is not only the actual amounts of money spent on innovative projects, but also their structure. From this point of view, especially innovative enterprises deserve special attention (Hölzl, Janger, 2013).

This chapter examines the research on the importance of barriers to innovation in European enterprises. We study the literature on the subject as well as data from Community Innovation Surveys (CIS) among European – including Polish – industrial enterprises for 2008–2010 and 2010–2012.

This chapter also seeks to assess how various innovation barriers are perceived by Polish industrial enterprises. We divide these enterprises into groups according to the level of innovation activity. This part of the empirical analysis uses data from 7,783 medium-sized and large enterprises covered by the Polish version of the CIS/GUS PNT-02 questionnaire for the 2008–2010 period.

Barriers to innovation: reviewing the literature

Innovation is a key factor affecting the growth of enterprises and ultimately of entire economies. What distinguishes it from routine business is high risk and uncertainty.

In this chapter, following the Oslo Manual (Oslo Manual 2005), we define an innovation barrier as every factor that slows down or prevents innovation activity. It can also adversely affect innovation activity to the extent that this activity does not produce the expected results.

From the perspective of an enterprise, innovation barriers can be divided into internal and external ones (Hadjimanolis, 2003). According to Saatcioglu and Timurcanday (2010), internal barriers include a lack of qualified staff, technical difficulties, return on innovation taking too long, innovation risk, and cost control difficulties. External barriers include poor patent and licensing policies and the lack of an incentive system for innovating enterprises. The results of interaction among these factors indicate that financial barriers have an impact on the perception of all the other barriers.

Buse *et al.* (2010) have drawn up a similar list of internal and external obstacles. After reviewing reports on the subject, the researchers identified four internal barriers: a lack of financing; a lack of qualified staff; limited internal know-how, and a lack of market knowledge. They identified three external barriers: protracted administrative procedures; restrictive laws and regulations; and inadequate protection of intellectual property rights. The authors argue that without a thorough understanding of these barriers, enterprises have a limited capacity to make full use of their resources and strengthen their innovation potential.

Meanwhile, D'Este *et al.* (2012) divide innovation barriers into revealed barriers, i.e. those reflecting the degree of difficulty of the innovation process, and deterring barriers, seen by the firm as insurmountable.

The Oslo Manual classifies factors hampering innovation into five groups: cost-related, knowledge-related, market-related, institution-related, and those that do not fall into any of these groups. Innovation barriers may apply to all types of innovation: product, process, organizational and marketing innovations. A similar classification of innovation barriers can be found in the Community Innovation Survey (CIS) questionnaire and its Polish version: the PNT-02 questionnaire. A detailed list of potential barriers to innovation is given in Table 14.1.

There are two main trends in studies of innovation barriers. One trend focuses on the specific features of enterprises that have an impact on the perception of barriers to innovation. The other trend analyzes the impact that innovation barriers have on

the propensity of enterprises to innovate and on the intensity of innovation (Wziątek-Kubiak *et al.*, 2010).

Iammarino *et al.* (2009), using data from the Italian CIS3 questionnaire, found that ownership is an important factor in how enterprises perceive innovation barriers. Foreign-owned enterprises tend to have a much stronger sense of innovation barriers than locally owned enterprises.

Research also shows that the perception of factors hampering innovation varies depending on the size of enterprises. But this only applies to financial barriers, which are especially important to small enterprises (Guijrro-Madrid *et al.*, 2009). Barriers such as limited market opportunities, overregulation and a lack of partners for cooperation are important to both small and large enterprises (Hewitt-Dundas, 2006).

It would seem that enterprises shying away from innovation should have a stronger sense of innovation barriers. But many empirical studies indicate that innovative enterprises are more sensitive to innovation barriers than non-innovative firms (Arundel, 1997; Mohnen, Roller, 2005). Among innovators, the greatest sensitivity to innovation barriers is declared by the most innovative firms with the highest R&D spending. Baldwin and Lin (2002) concluded, based on a representative sample of Canadian manufacturing enterprises, that innovators and enterprises from high-tech industries have a far greater sense of obstacles to innovation than non-innovators and less technologically advanced enterprises. Similar conclusions were reached by Mohnen and Rosa (2004), who studied a group of service enterprises from Canada. All these authors suggest that the declarations made by innovative enterprises do not concern real barriers but are rather their assessment of impediments and of the chances of overcoming them.

Many studies of barriers to innovation make a distinction between enterprises that are not innovative and not interested in innovating and those that are not innovative but are interested in undertaking innovative projects, which for various reasons have been either abandoned or discontinued. Research suggests that enterprises not interested in innovation have a very low level of sensitivity to innovation barriers. On the other hand, enterprises aspiring to be called innovative, including those that have abandoned innovative activity for various reasons, have just as strong a sense of innovation barriers as innovative enterprises (Savignac, 2008; D'Este, 2012). This may be because the actual launch of innovative activity is often enough for entrepreneurs to become aware of the weight of the problems involved (Galia, Legros, 2004).

Innovation barriers and their complementarity have also been investigated by Polish researchers (Wziątek-Kubiak, *et al.*, 2010). The issue of innovation barriers is analyzed for the entire population of enterprises (Tuźnik, 2014), but increasingly also in relation to specific industries (Nieć, 2011; Niziałek, 2013) as well as in the context of

the impact that innovation barriers have on both the level of innovation and the internationalization of enterprises (Lewandowska, 2014). The results of all these research reports clearly showed that enterprises perceive financial barriers as the most important stumbling blocks.

The perception of innovation barriers in European countries

The results of a *Community Innovation Survey* (CIS) conducted in 24 European countries for 2008–2010 show that the key innovation barrier (obstacle that hampers innovation or contributes to an enterprise deciding against innovating) for innovative industrial enterprises (NACE sections B-E) is a lack of funds within an enterprise. This obstacle is mentioned by an average 29% of the surveyed enterprises from the 24 European countries. The second most important barrier is excessive costs of innovation (28% on average). A lack of external funds (23%) follows in third place. For Poland, the figures were 33%, 36% and 28% respectively and were on all counts higher than the respective European averages. European enterprises also mentioned barriers such as uncertain demand for innovative goods or services (the European average is 17%), markets dominated by established enterprises (with the European average at 16%), and a lack of skilled workers (12%). The figures for Poland were 20%, 20% and 10% respectively. This means that the figures for Polish enterprises were lower than the EU average only in the case of this last barrier (online: inn_cis7_ham). Table 14.2 has details.

The structure of the CIS/PNT-02 questionnaire for 2010–2012 was changed from the 2008–2010 version, including the section on innovation barriers. The question about innovation barriers, which was previously separate, was incorporated into a section called "Strategies and obstacles to achieving a company's objectives". Respondents were asked to identify the validity of their enterprises' strategic goals and say how significant an obstacle was to achieving these goals. In the analyzed period, strong price competition on the market was the biggest obstacle the surveyed European enterprises faced in achieving their strategic objectives. The average for enterprises from 20 European countries that listed this factor was 53.1%. The second most important factor limiting the achievement of objectives of innovative enterprises was a lack of demand (27.4% on average); the third was high costs of adjustment to government and legal regulations (26.9% on average). The figures for Polish enterprises were 51.1%, 23.7%, and 20.5% respectively and were lower than the European averages. Respondents also mentioned a lack of sufficient funds (with the European aver-

age at 26.6%), strong product quality competition (the average is 25.7%) and high costs of access to new markets (25.6% on average). The figures for Poland are 21.3%, 23.9% and 20.4% respectively. The details are given in Table 14.3.

Due to major differences in how the questionnaire was structured and how the questions were worded, the figures from both time series cannot be directly compared. However, the 2008–2010 questions concerned barriers at the stage of creating innovations and a potential decision to drop work on them, while those on the 2010–2012 questionnaire applied to barriers to going commercial with an innovation. With such an interpretation, it is possible to infer that the cost of creating innovation is a key limiting factor for both Polish and European enterprises. Meanwhile, what matters most in the commercialization process is the presence of significant market-related barriers: strong competition, limited demand, and problems with adjusting a product to regulations, followed by problems with financing the process.

It should be emphasized that while Polish enterprises have a much stronger sense of innovation barriers than their counterparts in other countries, in the process of going commercial with an innovation, the average number of innovative Polish enterprises citing the importance of barriers in the commercialization process is much lower than the European average.

Analysis of innovation barriers faced by Polish industrial enterprises based on their innovativeness

The analytical part of this chapter presented below is based on micro data from a survey (CIS/PNT-02 questionnaire) conducted by GUS in 2011 among 7,783 medium-sized and large Polish industrial enterprises (NACE sections B-E). The studied population is dominated by "inactive innovators," meaning enterprises that did not introduce any process or product innovations during the analyzed period (n=4963). Enterprises that embraced innovation in the analyzed period, meanwhile, were divided into "active innovators" (enterprises that introduced process and/or process innovations in the analyzed period; n=2024); "unfulfilled innovators" (innovative enterprises that either discontinued or abandoned work on product and/or process innovations in the analyzed period; n=243), and "market pioneers" (enterprises pioneering specific product innovations in Poland, Europe or worldwide in the analyzed period; n=553).

The analysis uses a Chi-square method with column proportions and the Bonferroni correction to show statistically significant differences between individual groups of enterprises. We also conduct a factor analysis with a Varimax rotation to minimize the number of variables, in this case barriers to innovation. The measurements of the

accuracy of the sampling procedure were conducted using the KMO test. The strength of the correlation between the variables incorporated into the factor analysis was measured using Bartlett's test of sphericity, while the reliability of the measurement was estimated using Cronbach's Alpha coefficient.

We also used a multivariate analysis of variance in the general linear model with the Bonferroni correction in order to create a hierarchy of innovation barriers and demonstrate statistically significant differences in their rankings for the four groups of enterprises.

The four categories of enterprises display statistically significant differences in a number of aspects. The survey shows that product innovations are especially popular with market pioneers, followed by unfulfilled innovators, while process innovations are most often undertaken by active innovators as well as market pioneers. Marketing and organizational innovations are especially common among market pioneers and unfulfilled innovators. Medium-sized firms dominate in each category of enterprises, while the largest percentage of large firms is among market pioneers. Medium- and low-tech firms prevail when it comes to the level of technology represented by enterprises in each category. The largest percentage of medium-tech firms is seen among market pioneers. High-tech industries have the largest percentage of unfulfilled innovators. In each category, enterprises that are members of foreign groups of companies prevail over enterprises that are components of Polish corporations. The highest percentage of standalone companies is reported among inactive innovators. Pioneers, less often than other enterprises, say they sell their products and services locally, but more often than other enterprises tend to list "other markets" (i.e. markets other than the domestic market and the remaining EU market) as the most important markets for their products and services (see Table 14.4 for details).

A factor analysis with a Varimax rotation (KMO=0.895; $x^2(55) = 53081.365$; $p<0.001$) for innovation barriers identified by Polish enterprises made it possible to distinguish two factors with a cumulative variance of 66.438%. The first factor is non-financial barriers, made up of the following components: a lack of information about markets; lack of information about technology; lack of demand for innovation; lack of qualified staff; difficulties in finding partners for cooperation in innovating; no need to innovate following innovative activity in previous years; markets dominated by established enterprises (the squares of the weights after the rotation add up to 39.099% of the variance, with Cronbach's α equal to 0.893).

The second factor, financial barriers, includes the following components: a lack of funds within an enterprise or a group of companies; excessive innovation costs; lack of external funds (the squares of the weights after the rotation add up to 27.339% of the variance, with Cronbach's α equal to 0.874; see Table 14.5 for details).

Further analysis revealed that all the studied groups of enterprises tend to mention financial barriers more often than they mention non-financial barriers.

Financial barriers are most often mentioned by unfulfilled innovators, followed by market pioneers and active innovators. Responses from all these groups of innovative enterprises show no statistically significant differences. Inactive innovators mention financial barriers far less often than innovative enterprises. At the same time, their responses show a statistical significance.

Non-financial barriers were most often mentioned by unfulfilled innovators, followed by market pioneers, and then inactive and active innovators. Statistically significant differences were found between market pioneers and inactive and active innovators (see Table 14.6 for details).

Conclusion

Our analysis of micro data for Polish enterprises shows that insufficient funding, including external funds, is the factor that is the most often mentioned by enterprises as the biggest barrier to innovation, particularly in its initial phase. This conclusion is in line with empirical studies by various other researchers, and it also corresponds with statistics on enterprises from other European countries.

Does this mean that government spending on innovation should be increased? There is no clear-cut answer to this question.

Numerous studies have sought to determine whether public support for R&D is complementary with regard to enterprises' own spending. The question is whether public support stimulates additional financial efforts and produces an additionality effect, or whether it is substitutive to such efforts and produces a crowding-out effect[1]. In the latter case, public support causes a company to reduce its own spending and decide against taking planned action – in other words, such action would have been taken had it not been for the support (Edquist *et al.*, 2004).

Asymmetric information about the costs and benefits of innovation leads to a situation in which an optimal level of expenditure on innovative projects is virtually impossible to determine, even by the company itself. As Metcalf and Georghiou (1998, p. 81) put it, "While market failure provides a general rationale for policy intervention, it is inherently imprecise in its detailed prescription: a firm may spend too much or too little on innovation, it may innovate too quickly or too slowly, it may undertake

[1] For more on additionality effect, see Chapter 13.

excessively risky projects or be too conservative." This means there is no certainty that increased innovation spending will produce the desired result.

The results of the analysis from the second part of this chapter show that market pioneers and unfulfilled innovators have the strongest sense of both financial and non-financial innovation barriers of all the studied groups of Polish enterprises. Market pioneers and unfulfilled innovators are above-average innovators in both technological and non-technological innovation projects. They are particularly active on non-EU markets and tend to be the most internationalized, hence their high growth potential. Under the Europe 2020 strategy, such enterprises should be given priority treatment and supported as they struggle to overcome innovation barriers. The strategy states that the absolute value of R&D spending is not the only thing that matters; no less important is its breakdown.

On the other hand, leading innovators stay innovative despite the obstacles they encounter. This means they would probably go ahead with their projects even without outside support. Thus the probability of a "crowding-out effect" in their case is relatively high. However, their financing is very likely because public choice theory suggests that – even under ideal access to information and independent decisions on the selection of beneficiaries – leading enterprises will be supported because this increases the probability of success and hence the security of the agencies providing assistance (Radicic *et al.* 2014).

This analysis shows that the process of selecting entities for support should be extremely precise, but even then its results may defy clear evaluation and simple calculation, running counter to the expectation that additional funding will produce immediate results. It seems that the emphasis should be placed not only on increasing funding, but also on building an innovation framework by creating conditions for promoting experimentation, preventing inertia, and reducing the cost of failure.

In the case of the Polish economy, which faces the risk of what has come to be known as a middle-income trap, innovativeness will not increase exclusively through greater R&D expenditure or institutional reforms (Boni, 2009; Kleiber *et al.*, 2009). Such moves are indispensable, but insufficient (PARP, 2015, p. 92).

An active government role should remain key to overcoming stagnation and spurring growth. Many argue that the government needs to be innovative, think big, and help create new markets for products through measures such as smart specialization, because private companies are unable to cope with such a role. At the same time, the government should generate income from investment, stimulate the activity of enterprises and create hotbeds of creativity adapting to changing market requirements (Mazzucato, 2015). This requires a move away from the stopgap role that state intervention plays today. Indicators are needed to measure long-term effectiveness. It is

also necessary to scrap the current way of thinking about innovation in favor of an innovation system modeled after the "rainforest ecosystem" – meaning a complex, adaptive mechanism with a network structure (Hwang, Horowitt, 2012).

Table 14.1. Factors hindering innovation (innovation barriers): a classification proposed in the Oslo Manual

Area of impact	Product innovation	Process innovation	Organizational innovation	Marketing innovation
Cost factors				
High perceived risk	X	X	X	X
Excessive cost of innovation	X pl	X pl	X pl	X pl
Lack of internal funds within an enterprise	X pl	X pl	X pl	X pl
Lack of external funds	X pl	X pl	X pl	X pl
• Venture capital	X	X	X	X
• Public financing	X	X	X	X
Knowledge factors				
Insufficient innovation potential (R&D, etc.)	X	X		X
Lack of qualified staff	X pl	X pl		X pl
• within an enterprise	X	X		X
• on the labor market	X	X		X
Lack of information about technology	X pl	X pl		X pl
Lack of information about markets	X pl			X pl
Problems with the availability of external services	X	X	X	X
Difficulty in finding partners for cooperation in:	X pl	X pl		X pl
• developing products or processes	X	X		
• marketing				X
Enterprise vis-à-vis change:				
• Staff attitude to change	X	X	X	X
• Management attitude to change	X	X	X	X
• Enterprise management structure	X	X	X	X
• Inability to delegate workers to innovate	X	X		
Market factors				
Uncertain demand for innovative products or services	X pl			X pl
Markets dominated by established firms	X pl			X pl
Institutional factors				
Lack of infrastructure	X	X		X
Poor protection of ownership rights	X			X
Legislation, regulations, standards, taxes	X	X		X
Other reasons for not innovating:				
No need to	X pl	X pl	X pl	X pl
Lack of demand for innovation	X pl			X pl

"X pl" means that the PNT-02 questionnaire (CIS for Poland) contains a response concerning a specific factor.

Source: Oslo Manual 2005, PNT-02 questionnaire, report on innovation in industry from 2008 to 2010.

Table 14.2. Key innovation barriers identified by innovative European industrial enterprises (sections B-E) in 2008–2010, data in percentages

Country ranking	Lack of internal funds within an enterprise	Country ranking	Excessive cost of innovation	Country ranking	Lack of external funds	Country ranking	Uncertain demand for innovation	Country ranking	Markets dominated by established firms	Country ranking	Lack of qualified staff
Serbia	0.483	Portugal	0.427	Spain	0.366	Spain	0.301	Latvia	0.245	Turkey	0.177
Croatia	0.472	Bulgaria	0.421	Croatia	0.359	Bulgaria	0.294	Bulgaria	0.215	Bulgaria	0.173
Bulgaria	0.406	Cyprus	0.405	Cyprus	0.344	Hungary	0.245	Serbia	0.210	Croatia	0.169
Spain	0.395	Serbia	0.403	Serbia	0.335	Malta	0.234	**Poland**	**0.204**	Belgium	0.157
Portugal	0.378	Croatia	0.401	Portugal	0.332	Portugal	0.231	Malta	0.202	Latvia	0.155
Czech Republic	0.359	Spain	0.397	Bulgaria	0.319	Italy	0.225	Czech Republic	0.201	France	0.144
Cyprus	0.334	**Poland**	**0.367**	Italy	0.277	Serbia	0.223	Spain	0.193	Lithuania	0.136
Poland	**0.333**	Latvia	0.348	**Poland**	**0.275**	France	0.216	Croatia	0.192	Estonia	0.135
Slovakia	0.321	Italy	0.331	Slovakia	0.322	**Poland**	**0.198**	Portugal	0.184	Portugal	0.135
France	0.303	Turkey	0.320	Latvia	0.247	Ireland	0.195	Lithuania	0.171	Hungary	0.132
Hungary	0.300	Hungary	0.307	Ireland	0.226	Cyprus	0.191	Cyprus	0.168	Slovakia	0.129
Lithuania	0.297	Slovakia	0.281	Lithuania	0.206	Latvia	0.171	Slovakia	0.166	Norway	0.127
Italy	0.296	Lithuania	0.275	Malta	0.202	Croatia	0.163	Italy	0.161	Cyprus	0.123
Latvia	0.289	Malta	0.274	Czech Republic	0.196	Turkey	0.145	France	0.159	Spain	0.121
Ireland	0.277	France	0.269	Hungary	0.191	Czech Republic	0.144	Ireland	0.154	Serbia	0.119
Estonia	0.237	Czech Republic	0.261	Estonia	0.188	Luxembourg	0.144	Hungary	0.153	Sweden	0.113
Turkey	0.211	Norway	0.243	France	0.183	Slovakia	0.134	Belgium	0.147	**Poland**	**0.104**

Malta	0.210	Ireland	0.196	Turkey	0.179	Norway	0.113	Sweden	0.130	Czech Republic	0.100
Iceland	0.209	Belgium	0.196	Iceland	0.178	Lithuania	0.110	Turkey	0.125	Ireland	0.098
Finland	0.208	Estonia	0.156	Norway	0.157	Finland	0.106	Estonia	0.115	Luxembourg	0.091
Sweden	0.194	Finland	0.151	Finland	0.136	Belgium	0.102	Luxembourg	0.113	Finland	0.088
Norway	0.171	Iceland	0.151	Sweden	0.109	Sweden	0.087	Norway	0.097	Italy	0.084
Belgium	0.165	Sweden	0.119	Belgium	0.106	Estonia	0.087	Finland	0.069	Malta	0.081
Luxembourg	0.087	Luxembourg	0.087	Luxembourg	0.035	Iceland	0.066	Iceland	0.027	Iceland	0.035
Average	*0.289*	*Average*	*0.283*	*Average*	*0.228*	*Average*	*1.172*	*Average*	*0.158*	*Average*	*0.122*

Note: Data for Romania and Slovenia not available.

Source: Own work based on Eurostat data, *Hampered innovation activities* [inn_cis7_ham]. http://ec.europa.eu/eurostat/data/database

Table 14.3. Key obstacles to achieving strategic goals as identified by innovative European industrial enterprises (sections B-E) in 2010–2012, data in percentages

Country ranking	Strong price competition	Country ranking	Lack of demand	Country ranking	High cost of adjustment to government and legal regulations	Country ranking	Insufficient funds	Country ranking	Strong product quality competition	Country ranking	High cost of access to new markets
Austria	69.4	Italy	43.8	Serbia	42.5	Serbia	42.7	Malta	43.5	Serbia	42.7
Malta	67.4	Greece	40.6	Italy	40.6	Cyprus	37.6	Lithuania	37.1	Portugal	35.0
Germany	64.3	Serbia	39.1	Turkey	35.6	Croatia	37.3	Hungary	35.3	Turkey	34.2
Slovenia	64.2	Cyprus	37.7	Portugal	34.0	Greece	36.6	Portugal	32.3	Cyprus	33.6
Portugal	63.7	Portugal	36.5	Slovenia	32.9	Slovenia	33.2	Turkey	31.7	Greece	32.1
Cyprus	63.0	Hungary	32.3	Austria	29.6	Portugal	32.3	Estonia	29.4	Croatia	31.6

Country ranking	Strong price competition	Country ranking	Lack of demand	Country ranking	High cost of adjustment to government and legal regulations	Country ranking	Insufficient funds	Country ranking	Strong product quality competition	Country ranking	High cost of access to new markets
Estonia	62.5	Croatia	32.0	Cyprus	28.8	Lithuania	32.2	Slovakia	29.1	Slovenia	30.9
Hungary	58.9	Slovakia	31.4	Hungary	28.3	Turkey	30.6	Germany	26.3	Estonia	29.8
Slovakia	58.3	Slovenia	30.8	Croatia	27.9	Hungary	26.3	Serbia	25.9	Lithuania	29.5
Italy	55.9	Netherlands	28.0	Greece	26.2	Estonia	24.9	Slovenia	24.7	Hungary	28.6
Croatia	53.2	Bulgaria	26.1	Romania	24.2	Romania	24.8	Croatia	24.6	Bulgaria	28.3
Poland	**51.1**	Malta	25.4	Bulgaria	23.4	Italy	24.3	Austria	24.4	Malta	22.5
Lithuania	50.8	Turkey	24.9	Malta	21.7	Slovakia	23.6	**Poland**	**23.9**	**Poland**	**20.4**
Turkey	50.5	**Poland**	**23.7**	Lithuania	21.1	Bulgaria	21.9	Bulgaria	23.8	Slovakia	20.2
Greece	48.0	Sweden	18.7	Germany	20.7	**Poland**	**21.3**	Netherlands	21.1	Romania	20.1
Netherlands	46.2	Lithuania	17.6	Estonia	20.6	Malta	17.4	Greece	19.6	Austria	19.5
Bulgaria	45.2	Germany	17.5	**Poland**	**20.5**	Netherlands	15.9	Sweden	18.3	Italy	18.7
Serbia	43.1	Estonia	14.8	Slovakia	19.6	Germany	12.0	Cyprus	15.6	Germany	15.9
Sweden	37.9	Austria	14.0	Netherlands	12.5	Austria	10.2	Romania	14.0	Sweden	9.2
Romania	8.6	Romania	13.9	Sweden	-	Sweden	-	Italy	12.5	Netherlands	8.6
average	*53.1*	*average*	*27.4*	*average*	*26.9*	*average*	*26.6*	*average*	*25.7*	*average*	*25.6*

Note: Data for other countries unavailable.

Source: Own work based on Eurostat data, *Obstacles of innovative enterprises* [inn_cis8_obst]. http://ec.europa.eu/eurostat/data/database

Table 14.4. Characteristic features of the sample of medium-sized and large Polish industrial enterprises by level of innovative activity

Sample characteristics		Inactive innovators n=4963		Groups of innovative enterprises						Total sample N=7783	
				Active innovators n=2024		Market pioneers n=553		Unfulfilled innovators n=243			
		n	%	n	%	n	%	n	%	N	%
Product innovation		-	-	1,318	65.1[c]	553	100.0[a]	184	75.7[b]	2,055	26.4
Process innovation		-	-	1,584	78.3[a]	418	75.6[ab]	167	68.7[b]	2,169	27.9
Organizational innovation		455	9.2[d]	680	43.8[b]	319	62.2[a]	111	49.8[b]	1,565	23.2
Marketing innovation		399	8.0[d]	887	33.6[c]	344	57.7[a]	121	45.7[b]	1,751	19.4
Size of enterprise	Medium-sized	4,336	87.4[a]	1,442	71.2[b]	305	55.2[c]	158	65.0[bc]	6,241	80.2
	Large	627	12.6[d]	582	28.8[c]	248	44.8[a]	85	35.0[bc]	1,542	19.8
Level of technology	Not classified	653	13.2[a]	250	12.4[a]	6	1.1[b]	18	7.4[a]	927	11.9
	Low-tech	2,226	44.9[a]	664	32.8[b]	120	21.7[c]	65	26.7[bc]	3,075	39.5
	Medium-tech	2,010	40.5[c]	1,048	51.8[b]	394	71.2[a]	132	54.3[b]	3,584	46.0
	High-tech	74	1.5[d]	62	3.1[c]	33	6.0[b]	28	11.5[a]	197	2.5
Ownership	Member of a Polish group of companies	406	8.2[c]	307	15.2[b]	124	22.4[a]	47	19.3[bc]	884	11.4
	Member of a foreign group of companies	523	10.5[c]	416	20.6[b]	153	27.7[a]	50	20.6[bc]	1,142	14.7
	Standalone company	4,034	81.3[a]	723	64.3[b]	277	49.9[c]	97	60.1[b]	5,131	74.0
Target market	Domestic	1,829	36.9[a]	494	24.4[b]	40	7.2[c]	45	18.5[b]	2,408	30.9
	EU	1,643	33.1[a]	544	26.9[b]	111	20.1[c]	63	25.9[abc]	2,361	30.3
	Other markets	1,491	30.0[a]	986	48.7[b]	402	72.7[c]	135	55.6[b]	3,014	38.7

Note: Each letter denotes a subset whose characteristics differ significantly from one another at the 0.05 level (comparisons in rows between groups of enterprises based on estimated marginal means).

Source: Own calculations in SPSS 21 based on data on Polish enterprises covered by the GUS PNT-2 study for 2008–2010.

Table 14.5. Rotated component matrix for innovation barriers for Polish industrial enterprises surveyed, N=7783

Component	Non-financial barriers	Financial barriers
Lack of information about markets	0.833	
Lack of information about technology	0.827	
Lack of demand for innovation	0.735	
Lack of qualified staff	0.728	
Difficulties in finding partners for cooperation in innovating	0.724	
No need to innovate after innovative activity in previous years	0.721	
Markets dominated by established firms	0.604	
Lack of funds within an enterprise or a group of companies		0.883
Excessive cost of innovation		0.853
Lack of external funds		0.842

Rotation method: Varimax with Kaiser normalization. a. Rotation convergent in five iterations.

Source: Own calculations in SPSS 21 based on data on Polish enterprises covered by the GUS PNT-2 study for 2008–2010.

Table 14.6. Perception of financial and non-financial barriers among surveyed enterprises by level of innovative activity

Group		Average	Standard deviation	Population
Financial barriers	Market pioneers	1.69[a]	0.85	553
	Unfulfilled innovators	1.74[a]	0.90	243
	Active innovators	1.66[a]	0.93	2,024
	Inactive innovators	1.39[b]	1.13	4,963
	Total sample	1.49	1.06	7,783
Non-financial barriers	Market pioneers	1.28[a]	0.65	553
	Unfulfilled innovators	1.20[ab]	0.68	243
	Active innovators	1.06[b]	0.72	2,024
	Inactive innovators	1.07[b]	0.93	4,963
	Total sample	1.08	0.85	7,783

Note: Each letter denotes a subset whose characteristics differ significantly from one another at the 0.05 level (comparisons in rows between groups of enterprises based on estimated marginal means). Scale: 1 – "low importance"; 2 – "moderate importance"; 3 – "high importance".

Source: Own calculations in SPSS 21 based on data on Polish enterprises covered by the GUS PNT-2 study for 2008–2010.

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Chapter 15

Cluster Policy in Poland and its Role for the Competitiveness of Enterprises

Arkadiusz Michał Kowalski

The concept of business clusters is becoming increasingly important and popular in contemporary economics, both as a business model for companies and as a government economic policy instrument. This chapter outlines the characteristic features and key objectives of cluster policy in Poland and its role for the competitiveness of enterprises. The analysis poses the following research questions:

– What is the target of cluster policy intervention?
– What are the preferred cluster support instruments?
– What are the sources, strategic directions, and instruments of cluster policy in Poland?
– How important is cluster policy for the competitiveness of businesses?

To begin with, we define clusters as entities that are the indirect target of cluster policy makers. We also define cluster organizations as entities that directly benefit from public support and obtain public funds for members of the cluster initiatives they represent. Subsequently we outline the concept and characteristics of cluster-based economic development policy, which is inspired by positive examples of how competitive clusters have been created in various regions around the world. In this context, we focus on two types of cluster policy: a top-down approach involving public intervention aimed at developing clusters in the economy, and a bottom-up approach calling for building cluster structures as initiatives by entrepreneurs, with the government playing only a supportive role. The latter model is the basis of the European Union's cluster policy, which can be considered a source of cluster support instruments in Poland. This study pays special attention to the importance of cluster policy in the context of the smart specialization of regions, which is a key element of the Europe 2020 strategy. The concept of smart specialization is the basis of a system developed for identifying and channeling public support to key clusters in the 2014–2020 programming period, including those of special importance to the economy.

This study also examines a variety of methods for evaluating cluster policy. In this context, we assess both cluster policy objectives (to what extent they meet cluster

development needs) and individual instruments (in terms of their efficiency). The chapter concludes with a look at the sustainability of projects co-financed from public funds, which is important in assessing the value of programs as part of cluster policies in terms of their long-term usefulness.

Cluster policy target: clusters, cluster initiatives or cluster organizations?

To grasp the essence of cluster policy, it is essential to define its target. For this purpose, it is necessary to define three terms: clusters, cluster initiatives and cluster organizations. These three concepts are interdependent but not identical. According to a classic definition formulated in the early 1990s by M. Porter, clusters are "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, and trade associations) in particular fields that compete but also cooperate" (Porter, 1990). Cluster initiatives can be defined as "organized efforts to increase the growth and competitiveness of clusters within a region, involving cluster firms, government, and/or the research community" (Sölvell, Lindqvist, Ketels, 2003, p. 9). This means that cluster initiatives are a rather formalized and institutionalized form of cooperation between a group of local entities seeking to launch a new cluster or solve some major problems experienced by an already existing cluster. For the sake of terminological clarity, it is also necessary to define the concept of cluster organization, which can be understood as a legal entity dealing with managing a cluster initiative, including developing rules for taking part in joint operations and gaining access to a shared infrastructure.

A key objective of cluster policy is to develop clusters, understood as viable business structures consisting of geographically proximate enterprises cooperating and competing with one another within a specific industry and related industries. Public policy instruments are targeted at cluster initiatives with a varying degree of institutionalization; the direct beneficiary of support are cluster organizations, which are responsible for coming up with, carrying out and financially settling specific projects. While clusters exist independently of companies or any programs, a cluster initiative is based on undertaking a specific project or developing various types of cluster-like organizations, which may be the target of support as part of economic policy. The key importance of intervention undertaken is not limited to direct beneficiaries – meaning cluster organizations acting on behalf of cluster initiatives – and its essence is the development and transformation of cluster initiatives into full-fledged clusters, with

a view to improving the competitiveness of regional economies. This is particularly important in countries such as Poland where small, embryonic cluster initiatives are often established that do not meet the key assumptions of the theoretical cluster model, namely geographic and sector concentration (and therefore they do not correspond to the economic specialization of a specific region) and the existence of strong ties and cooperation between local actors (Kowalski, 2015).

In addition to economic policy instruments that are directly targeted at cluster initiatives and their coordinators, there are measures that are not focused on cluster organizations, but indirectly aid cluster development. This type of intervention concerns specific aspects of a cluster's functioning and is carried out as part of programs designed to support selected areas of enterprise activity. Such instruments are embedded in programs that are not by definition intended exclusively for cluster initiative participants. For example, many measures designed to indirectly support clusters (for example, those seeking to enhance human capital, international cooperation and technology transfer) have been formulated as part of operational programs co-financed from EU structural funds (Jankowska, 2012, pp. 169–173).

Significantly, there are no legal definitions of a cluster, cluster initiative or cluster organization in Poland, and there are no detailed rules governing their operation. This flexibility is to a large extent an advantage of clustering in this country because it permits the use of different business models and public support instruments, depending on the need and context of the action undertaken. Clusters operate on the basis of legal regulations covering various areas of law, depending on factors such as the form of the cluster initiative, the sector or the type of cluster entity. In view of the absence of a dedicated, legally enshrined form under which a cluster initiative can be organized, constituent entities may choose multiple organizational forms under the Civil Code or the Code of Commercial Companies. Examples include an agreement on mutual cooperation and experience exchange, an association agreement, or an agreement on establishing a "capital group" in an advanced organizational form. The choice of legal form for an initiative determines the obligations of its participants, its functioning, the rules for cooperation between members, and the possibilities of applying for public funds as well as the way in which projects co-financed as part of cluster policy should be carried out.

Cluster-based economic development policy

Clusters are becoming an important economic policy instrument, as reflected by the cluster-based economic development policy formulated by the OECD (Roelandt,

den Hertog, 1999). This is understood as a set of activities and instruments used by authorities at various levels for improving the competitiveness of the economy through stimulating the development of existing cluster systems or creating new systems, primarily at the regional level. At the core of cluster policy is a move away from an individualistic perception of an enterprise in favor of improving its relations with the surrounding environment and a belief that channeling public support to groups of companies instead of individual companies reduces transaction costs and facilitates learning processes. Government intervention to create a network of interactions among local actors catalyzes the comparative advantages of companies and institutions and improves their efficiency (Weresa, 2014, pp. 148–156).

At the beginning of this evaluation of the use of clusters as an economic policy instrument, it is necessary to make a valid assumption that the cluster concept is primarily a business model based on the functioning of market mechanisms in which enterprises play a dominant role. The use of this model to shape public policies is a secondary issue. Various mechanisms related to the functioning of a market economy, such as agglomeration externalities, lead to the concentration of economic activity in a specific area and cluster development. Consequently, the main determinant of this process is the "invisible hand of the market." A separate issue is a decision by public authorities to lend additional support to the development of cluster initiatives.

Cluster policy stems from the assumption that attempts to spur economic development through the support of clusters should remain secondary to market-initiated development processes. Clusters built from the bottom up (bottom-up approach) are market structures in which local businesses, which are the most heavily integrated with the region's economy, have a dominant position. The role of public entities is therefore secondary in cluster policy, and the preferred instrument is selective, soft action. Under M.E. Porter's approach (1990), this includes:

- Supporting the development of clusters in free trade zones and industrial parks;
- Organizing appropriate government action with regard to clusters (for example, hiring experts in disciplines in which a cluster specializes);
- Promotional activities (such as trade fairs) targeted at a specific industry
- Focusing efforts to attract investors, suppliers and sponsors for clusters;
- Streamlining regulation in areas where individual clusters are active;
- Developing the research capacity of universities in areas of cluster specialization;
- Carrying out promotional activities to boost cluster exports;
- Supporting the collection and processing of knowledge and information in areas of interest to clusters;

– Creating specialized research, transportation, communications and other infrastructures defining a cluster's profile;
– Developing special training programs for cluster employees.

Efforts by public authorities to support clusters fit into the framework of a territorial-based policy under which both sector-specific and horizontal development measures should have a real impact at the regional and local levels. While the traditional purpose of regional intervention was to reduce development disparities between more developed and less developed regions, the new paradigm of regional policy involves attempts to tap undeveloped potential in all regions in an effort to increasing regional competitiveness (Szlachta, 2009, p. 143). This approach embraces Perroux's (1964) growth pole theory, which identifies sector-specific and territorial growth poles through which business is concentrated. The result is that economic development is polarized, which means that some areas exhibit faster growth than the economy as a whole and have greater potential to achieve an international competitive advantage. Therefore public support channeled to these areas is highly efficient. In addition, cluster policy contributes to building "collective efficiency" in the region, understood as higher, externality-based profits achieved by spatially concentrated businesses (Parrilli, 2009). At the same time, support for clusters may play an important role in the integration of institutional variety in the region, for example by promoting a common vision of development, ensuring a common infrastructure or strengthening coordination mechanisms between various local actors. This process enables cluster organizations to pool resources and combine different types of knowledge, thus contributing to innovation and cluster development. In addition, institutional integration facilitates the pursuit of common interests and coordination of collective efforts, thus leading to deeper specialization in selected market segments (Grillitsch, Asheim, 2015).

EU cluster policy as a source of cluster support instruments in Poland

The development of clusters and cluster policy in Poland is closely associated with the country being a member of the European Union. Before Poland joined the EU in 2004 the cluster concept, with a few exceptions, was not used in this country as either a business model or an economic policy instrument. At the moment, cluster policy in Poland is closely linked with EU policy, in terms of both the strategic thrust of this policy set by the Europe 2020 strategy and the financing of its tools, which is primarily based on structural funds.

Cluster policy in the European Union is shaped on the basis of what is known as multi-level governance (MLG). This means that each level of public administration has a certain degree of autonomy and tasks are shared between EU, national and local authorities at various levels. In connection with this, it is possible identify measures aimed at supporting cluster initiatives undertaken at:

– the Community level, where one of the most important types of action is stimulation of cross-border cooperation between clusters,
– national (central) level, which includes support of strong and spatially extensive cluster initiatives,
– the regional level, which covers local clusters, most of them at an early stage of development.

Most decisions regarding cluster development policy are the responsibility of individual member states, but the European Commission sets a strategic and regulatory framework and undertakes initiatives and measures to improve the functioning of cluster initiatives and to ensure their internationalization. Cluster support is part of the concept of smart specialization by regions, which is an important element of the Europe 2020 strategy, under which member states are expected "to reform national (and regional) R&D and innovation systems to foster excellence and smart specialisation, reinforce cooperation between universities, research and business, implement joint programming and enhance cross-border co-operation in areas with EU value added and adjust national funding procedures accordingly, to ensure the diffusion of technology across the EU territory" (European Commission, 2010). The use of clusters to carry out the "smart specialization" strategy is expected to make it possible to:

– concentrate resources in several priority sectors of key importance to the regional economy where regions enjoy a competitive advantage,
– increase synergies between policies implemented at the EU level and in individual member states and regions,
– ensure more effective use of public funds by achieving the necessary critical mass of investment instead of scattering funds around many different areas,
– strengthen regional innovation systems, R&D efficiency and knowledge flows.

Cluster support policy instruments in Poland from 2004 to 2013

Cluster policy is particularly important for transition economies that are in the process of continuous change in terms of their institutional setting. This also applies to Poland's national innovation system, which is classified among developing innova-

tion systems (Weresa, 2012). One of the main weaknesses of this system is poor cooperation among businesses as well as between the science and business sectors, which is a legacy of the country's former central planning system. The instability of the institutional environment could lead to institutional voids understood as missing or inadequately developed institutions (Lehmann, Benner, 2015). This has a negative effect on economic growth (North, 1990). Cluster policy, which aims to support the competitive advantage of enterprises by stimulating interaction and cooperation between different market players, can help fill these institutional voids (Lehmann, Benner, 2015).

Cluster policy is not a separate branch of economic policy in Poland. However, clusters are an extremely important instrument to combine and implement other types of policy, such as innovation policy related to regional development and the R&D sector. The most references to cluster-related issues can be found in strategic documents concerned with innovation, which is why efforts to support cluster initiatives are usually treated as an element of innovation policy.

The origins of cluster policy in Poland date back to the first years of the country's EU membership. In the 2004–2006 period, measures designed to support clusters were not yet common, but already in those days clusters could benefit from EU structural funds. A key role at the time was played by the Sectoral Operational Programme: Improvement of the Competitiveness of Enterprises, 2004–2006 (SOP ICE), in particular its Priority 1: "Developing entrepreneurship and innovation by strengthening business environment institutions." Also important to the development of clusters was a system project undertaken by the Polish Agency for Enterprise Development (PARP), called "A training program to promote clustering" carried out as part of Measure 2.3 of Sector Operational Programme: Human Resources Development, 2004–2006 (SOP HRD).

A more systematic approach to cluster policy in Poland was in evidence during the 2007–2013 programming period. The policy of supporting clusters in this period was pursued at two levels:

– the regional level, through Regional Operational Programmes (ROP) implemented by local authorities,
– the central level, primarily through Measure 5.1: "Support for development of supra-regional cooperative relations," as part of Priority 5: "Diffusion of Innovation" of Operational Programme: Innovative Economy, 2007–2013 (OP IE).

The cluster support system from 2001 to 2013 was based on the assumption that clusters at early stages of development and not extending beyond the territory of a single province were supported at the regional level, while relatively strong and spatially extensive cluster initiatives were supported at the central level. However, a closer look at Regional Operational Programmes (ROP) in terms of cluster support (Kowalski,

2013) reveals significant variations between provinces in this area. Due to the limited support of clusters at the regional level and ambiguity about promoting embryonic clusters, in 2011 separate sub-measures were singled out from Measure 5.1 of OP IE for:

– the development of technological or industrial cooperative relations at an early stage,
– the development of cooperative relations in order to jointly develop innovative products or services and place them on the market (Minister of Regional Development, 2011, item 185).

In other Operational Programmes no separate measures targeted directly at clusters were singled out, but clusters could benefit from available support on a par with other entities (indirect support of clusters). Of particular mention is Measure 2.1: "Development of human resources for a modern economy," included in Operational Programme: Human Capital, 2007–2013, whose main aim is to improve the competitiveness of enterprises through increased investment in human capital and improvement in the quality and availability of training and consulting services supporting the development of entrepreneurship. In a major advance, in 2011 and 2012 the Polish Agency for Enterprise Development implemented measures to promote clusters under the heading "Polish clusters and cluster policy" as part of a system project included in Sub-measure 2.1.3: "Development of human resources through the promotion of knowledge and the transfer and dissemination of innovation." The main objective of the project is to strengthen Polish clusters and improve their competitiveness and ability to innovate through the development of human capital and through improving the effectiveness of cluster policy in Poland.

The concept of key clusters as the basis for cluster policy in the 2014–2020 programming period

The strategic directions of cluster policy in Poland are now primarily determined by Dynamic Poland 2020: Strategy for Innovation and Efficiency in the Economy (Ministry of Economy, 2013), which provides a bottom-up approach to the development of clusters combined with: the support of knowledge transfer by strengthening cooperation between clusters and science and technology parks; the establishment of technology centers and cluster incubators; the development of physical infrastructure for the needs of clusters; and the introduction of new instruments for supporting cluster linkages within Special Economic Zones.

In the EU's 2014–2020 financial framework, Polish cluster policy is based on a system of identifying and focusing public support on:

1) Key National Clusters (KKK), which include clusters of special importance to the economy and high international competitiveness;
2) Key Regional Clusters (RKK), which include clusters of special importance to regional economies.

The concept of key clusters appeared in a Ministry of Economy report entitled *The Directions and Assumptions of Cluster Policy in Poland to 2020* (Dzierżanowski, 2012), compiled by a special working group for cluster policy. The report proposes a system for evaluating clusters based on 33 indicators grouped into six areas:

1) cluster management,
2) the economic potential of a cluster and its innovativeness and international competitiveness,
3) cooperation and the intensity of cooperative relations,
4) cluster internationalization,
5) importance to a country's or regional economy,
6) strategy and development plans.

In the first round of a competitive procedure in 2015, seven cluster initiatives received Key National Cluster status:

1) the Aviation Valley Cluster, represented by the Dolina Lotnicza (Aviation Valley) Association of Aviation Industry Entrepreneurs;
2) the Interizon cluster, represented by the Interizon Foundation,
3) the Metalworking Cluster, represented by the Center for the Promotion of Innovation and Development,
4) the Mazovian ICT Cluster, represented by the Wiedza (Knowledge) Association for Socioeconomic Development,
5) the Polish Aluminum Cluster, represented by City Consulting Institute Sp. z o.o.,
6) the Eastern Construction Cluster, represented by the Polish Advisory and Consulting Association,
7) the "Zielona Chemia" (Green Chemistry) Cluster of West Pomerania, represented by the Zielona Chemia West Pomeranian Chemical Cluster Association.

Under the EU budget for 2014–2020, cluster policy is financed on two levels:

1) the national level, from funds available under Operational Programme: Smart Growth (OP SG) and Operational Programme: Eastern Poland (OP EP), designed to integrating public support around specific clusters that have competitive potential, are of key importance to the economy, and embrace national smart specializations;
2) the regional level, as part of Regional Operational Programmes (ROP), with a goal of integrating public support around specific clusters that are of key importance to the economies of individual provinces and embrace regional smart specializations.

Assessment of the importance of cluster policy to the competitiveness of enterprises: methodological aspects

The growing popularity of clusters as a tool of government economic policy and the considerable amount of public funds spent to support cluster initiatives demand a closer look at the effectiveness of cluster policy and at its impact on the competitiveness of enterprises. Those evaluating cluster support programs often combine an assessment of the effectiveness of efforts designed to achieve specific intervention objectives with an evaluation of their impact on businesses and the economy as a whole (Aranguren, *et al.*, 2014). In our assessment of the importance of cluster policy to the competitiveness of enterprises, it is necessary to highlight the multidimensional nature of cluster support programs. This is associated with factors such as:

– varying objectives and scopes of cluster policy intervention, depending on the type of cluster, the kind of public program, and the involvement of public authorities in clustering processes,
– focus on supporting so-called soft factors related to the use of intangible resources, learning processes and the flow of tacit knowledge, elements that are difficult to precisely identify and measure,
– difficulties in setting an appropriate time frame for evaluating the long-term effects of cluster policies, especially as some clusters may prove to be relatively short-lived initiatives,
– the need to separate economic policy effects from factors associated with the usual market effects and bottom-up processes taking place in a regional economy.

Regardless of the multiple aspects of cluster policy and its impact on the competitiveness of enterprises, it is worth noting that its effects should generally be evaluated in the context of its importance to the competitiveness of the regional economy, because support for the development of cluster initiatives is not a goal in itself. It is important to assess just how realistic public intervention goals are in terms of responding to actual problems encountered by local actors and in terms of being consulted with them. According to a study funded by the European Commission (Technopolis Group & MIOIR, 2012), an evaluation of cluster policy should:

– combine qualitative and quantitative research methods, for example a combination of statistical analysis with surveys of cluster initiative participants and interviews with beneficiaries and stakeholders that can be used to prepare case studies examining the quality of interaction within clusters,
– be based on participation and use the experience of cluster practitioners, researchers and policy makers,

– look at the development of specific clusters in the context of other clusters at a similar stage of development, both at home and abroad,
– reflect, through a realistic budget and timetable, the complex aspects of how the impact of cluster intervention should be assessed with regard to the applied methodology and research tools.

C. Schmiedeberg (2010) has compiled a list of methods for assessing cluster policy. These include:

– reporting methods, which are the least demanding instrument in terms of the time frame, statistical requirements and complexity,
– case studies, which have the advantage of being flexible and offer the possibility of analyzing clusters in depth, but do not offer broader possibilities for generalizing results,
– econometric methods, which enable quantitative studies of cluster policy effects, which increases the reliability of results. Their weakness, however, is that they do not take into account soft factors and difficulties in obtaining data,
– a systemic approach that focuses on the impact of public intervention not on individual members of a cluster initiative, but on the entire structure of the regional economy; this impact is analyzed, for example, with the use of the so-called input-output method,
– an approach based on a profit-and-cost calculation in order to determine the net effect of cluster policy.

The sustainability of cluster support policy projects

An evaluation of a program operated as part of cluster policy in terms of its long-term usefulness largely depends on the sustainability of projects financed with public funds. This criterion means that positive changes resulting from the support provided will continue after external financing ends. In European practice, sustainability means that beneficiaries of EU funds should ensure the sustainability of a project's results for at least five years after the project is completed and for a minimum of three years in the case of small and medium-sized enterprises (Council of the European Union, 2006, Art. 57). Ensuring that a project is sustainable is especially important for the long-term benefits of supporting clusters. To this end, project beneficiaries should ensure:

– the organizational sustainability of a project by identifying the owner and method of managing and using assets created due to the project, for at least five years after the project is completed,

– the institutional sustainability of a project by identifying those responsible for using and maintaining assets created as a result of the project (it is assumed this will normally be done by the coordinator of the cluster carrying out the project),
– the financial sustainability of a project, by ensuring that the use of its products during the sustainability period will not be compromised for reasons related to the beneficiary's financial liquidity, in particular by stipulating the planned method for financing the costs associated with the maintenance and operation of the project's products for at least five years after the project is completed,
– the technological sustainability of a project by ensuring that technologies worked out as part of the project meet changing technology trends and forecasts and do not require higher maintenance costs than existing solutions.

For the sustainability of projects carried out under cluster policy it is crucial that project consortium participants continue to work together after the projects are completed, and that the cooperation also covers other bodies belonging to cluster initiatives as well as external actors. Continued cooperation will mean that a project contributes *de facto* to the emergence and strengthening of stable cluster structures in a region and that it produces a long-term improvement in the competitiveness of the economy. It is important to recognize that the sustainability of cluster policy projects depends on a combination of factors, including:

– action taken by cluster initiatives (in particular coordinators) that will determine the effectiveness and intensity of cooperation and the effectiveness of organizational and investment projects, as well as the appropriate use of infrastructures created;
– external factors beyond the control of beneficiaries, for example technological change on the market, so that planned technologies can be replaced by more efficient solutions. However, if cluster policy projects aimed at strengthening the development potential of clusters produce the expected results, their participants should become capable of carrying out new projects from their own funds.

Conclusion

This chapter has examined the issue of cluster policy, which is becoming one of the most important policies impacting on the competitiveness of enterprises. The cluster-based development policy is a compromise between the neo-Keynesian and neo-liberal doctrines because it is based on government support for market-initiated processes (bottom-up approach). The effectiveness of cluster policy is influenced by the fact that it leads to a concentration of resources necessary for the development of

key sectors of the economy, thus enabling the achievement of an appropriate critical mass of intervention. The analysis has found that the basic direction in which cluster policy is developing in Poland today is the support of key clusters, meaning cluster initiatives with the greatest development potential selected in a competitive procedure. At the core of this approach is a belief that focusing support instruments on entities that are able to compete in the global economy, and are likely to succeed in the long term, will contribute to rationalized and more efficient public spending.

This analysis shows that cluster policy in Poland is an important tool for implementing the concept of smart specialization, as set forth in the Europe 2020 strategy. This is mainly due to the fact that the most important attributes of the cluster structure are geographical and sector specialization, which develops in a specific region in one or several related sectors. In connection with this, clustering is an effective way of strengthening smart specialization in regional economies, which should concentrate human, financial, and knowledge resources in several key areas and sectors in which they enjoy a competitive advantage. One of the main shared characteristics of cluster policy and smart specialization strategies is their focus on strengthening R&D infrastructure and building ties between industry and academia.

An important role of cluster policy is to promote the competitive advantage of enterprises by stimulating interaction and cooperation between different market players, which contributes to filling institutional voids, particularly in transition economies. A positive impact of cluster policy on the competitiveness of enterprises in the long term depends on the sustainability of projects supported by public authorities. This means that cluster cooperation should continue even after public funding ends, a model that was missing from many projects co-financed from structural funds in the 2004–2013 period. Meanwhile, the sustainability of projects means that a project contributes *de facto* to the emergence and strengthening of stable cluster structures in a region, thus leading to a long-term improvement in the competitiveness of enterprises and of the economy as a whole.

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Summary and Conclusions

An Overall Assessment of Poland's Competitiveness in 2015

Marzenna Anna Weresa

How competitive was the Polish economy in 2015 and how has Poland's competitive position changed in the last five years compared with other European Union countries, in particular its Central and Eastern European peers (EU11)? These two questions will be answered below by synthesizing the results of the research presented throughout this book. These research results provide the basis for a concise assessment of the current competitive position of the Polish economy in the European Union and make it possible to explain the changes in Poland's competitiveness in 2010–2015. Competitiveness is understood here as a broad category embedded in the level of a nation's prosperity, taking into account not only economic factors but also so-called sustainable competitiveness based on social and environmental pillars (Blanke *et. al.*, 2011; Rosselet-McCauley, 2011; Aiginger *et al.*, 2013; Corrigan *et al.*, 2014; Weresa, 2015). This broad definition includes:

– The current standing of the economy measured by the "magic pentagon" indexes: GDP growth rate, inflation, unemployment, the public finance balance, and the current-account balance relative to GDP;
– Changes in the standard of living reflected in the level of GDP per capita (in purchasing power parity terms);
– The social dimension of competitiveness, measured by the scale of income inequality as well as other indicators of socioeconomic development, such as the Human Development Index (HDI) and the Social Progress Index (SPI);
– Poland's position in external economic relations determined by its capability to sell goods and services on the international market and its ability to attract foreign direct investment.

In addition, the overall assessment of Poland's competitiveness will take into account environmental issues, which constitute one of the pillars of sustainable competitiveness (Corrigan *et al.*, 2014; Weresa, 2015).

Poland's economic competitiveness has been evaluated with a focus on its changes in 2015 and in comparison with other European Union countries, in particular those in Central and Eastern Europe with a similar level of economic and institutional development. These countries are both Poland's major trading partners and direct competitors

in attracting foreign factors of production such as capital and technology that Poland needs to accelerate its economic development.

The "magic pentagon" indexes show that the competitiveness of the Polish economy in 2015 was comparable to that of the Czech Republic, Slovakia, and Hungary. It can therefore be said that, from the point of view of the main indicators of competitiveness, the position of the Polish economy was similar to that of these three countries, which together with Poland form a regional alliance known as the Visegrad Group (V4).

This does not mean that all four countries occupy similar places in competitiveness rankings (as discussed later in this chapter). In 2015, all four economies reported GDP growth, which stood at 3.5% in Poland and Slovakia, 4.5% in the Czech Republic, and 2.9% in Hungary (compared with 1.9% in the EU28 as a whole, 1.7% in Germany, and 0.8% in Italy), according to preliminary estimates by the European Commission. Poland saw its average annual unemployment rate decrease to 7.5% in 2015, according to preliminary estimates, a level lower than the EU's average unemployment rate of 9.5%, but higher than the Czech Republic's 5.1% and Hungary's 6.7% (European Commission, 2016).

In 2015, Poland was among a group of EU countries that reported slight deflation. Poland's consumer price index was –0.7%, while the EU average was 0%. Among the V4 countries, the Czech Republic and Hungary recorded a slight increase in prices, while Slovakia, similar to Poland, recorded some deflationary trends. If these deflation trends continue, they may prove to be a barrier to economic growth in the future.

Apart from the GDP growth, unemployment and inflation rates, the "magic pentagon" of competitiveness includes two other components: the general government balance and the current-account balance, both relative to GDP. In 2015, Poland's general government deficit accounted for about 3% of its GDP and was higher than in other Visegrad Group countries though much smaller than in France (–3.7%) or Spain (–4.8%). Most EU28 countries reduced their general government deficits from 2010 to 2015 on average. The average general government deficit level in the EU was lower than Poland's, at around –2.5% of the GDP in 2015. Poland's general government deficit is likely to increase in 2017 and 2018, according to the latest forecasts (European Commission, 2016, p. 106), chiefly due to the government's expansionary fiscal policies, including its extensive Family 500+ child benefit program combined with plans to increase tax-free earnings.

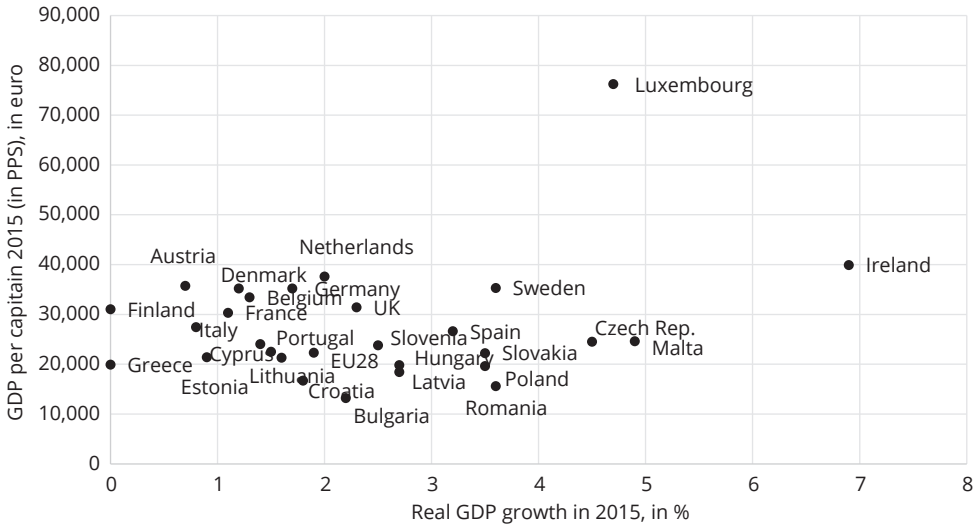
When it comes to Poland's foreign trade balance from 2010 to 2015, a positive trend was noted based on a gradual decrease in the country's current-account deficit. In 2015, Poland's current-account deficit was close to zero. This was due to a growing import-export ratio in the trade of goods, coupled with a surplus in the trade of

services. As a result, Poland managed to balance its current account in 2015. Among V4 countries, a similar situation was noted in Slovakia. In both Poland and Slovakia, the current-account balance in relation to GDP hovered around zero. Hungary posted a foreign trade surplus (at around 5% of GDP), while the Czech Republic recorded the greatest deficit among Visegrad Group countries (–2.4% of GDP).

Despite its relatively fast GDP growth in 2010–2015, Poland's position in the European Union in terms of economic development, measured by GDP per capita in purchasing power standards (PPS), remained relatively weak. Although Poland managed to maintain a GDP growth rate far above the EU average, and its GDP per capita in PPS terms reached EUR 19,600, it was ranked among the least developed EU28 countries, outperforming only Latvia, Croatia, Romania, and Bulgaria. The average GDP per capita in the EU28 was EUR 28,600 (see Figure 1 below and also see Figure 1.1 in Chapter 1).

Taking into account these two criteria (i.e. the level of GDP in PPS terms and real GDP growth), it turns out that Slovakia achieved results close to Poland's in 2015. Slovakia's GDP per capita PPP amounted to EUR 22,200, compared with Poland's EUR 19,600, and the rate of real GDP growth in both countries was 3.5%. To some extent, Spain also had comparable results, with a GDP per capita of EUR 26,600 and GDP growth of 3.2% (Figure 1).

Figure 1. Relative development measured by GDP (in PPS terms) and GDP growth: Poland and other EU members compared



Source: Own calculations based on data from Figure 1.1 in Chapter 1 and estimates by the European Commission (European Commission, 2016, p. 1).

In assessing the level of prosperity, apart from comparing the value of GDP per capita, one should also take into account the scale of income inequality and the level of poverty. According to Eurostat data (2016), income inequality in Poland remained at a relatively high level in 2014 (with a Gini coefficient of 30.8), though near the EU average (30.9). However, a positive trend has been observed in Poland since 2005 based on a gradual reduction in inequalities, while the EU average increased slightly.

Furthermore, Poland has a relatively low poverty rate. The risk-of-poverty rate after social transfers in Poland was slightly below the EU average. Nevertheless, this rate was higher than in the Czech Republic, Slovakia, and Hungary. However, the wealth of the country's citizens is also reflected in the progress made in improving the quality of life. Quality of life can be measured by indicators such as infant mortality, life expectancy, and school enrollment. Seen from this angle, Poland's international competitive position improved from 2010 to 2015.

Poland's position in the EU and the global economy as a whole as measured by the Human Development Index (HDI) was slightly better than if measured solely by GDP per capita. Poland was in 20th position in the EU in terms of the HDI, while ranking 24th in terms of GDP per capita.

An important element of the international competitive position of countries is their ability to compete on international markets as well as their attractiveness to foreign direct investment, which supplements often inadequate domestic capital resources. Poland's goods and service exports showed dynamic growth throughout the 2010–2015 period. In 2015, the country's exports continued to grow faster than its imports. As a result, the current-account deficit decreased gradually until it approached zero in 2015. These positive changes are attributable to an improved competitiveness of Polish exports.

The structure of Poland's foreign trade has been stable during the last five years, with four groups of goods responsible for more than half of Poland's total goods exports: machinery and mechanical appliances; vehicles, aircraft, and watercraft; base metals and articles of base metal; and chemical products. The same groups of goods dominated among Poland's imports. Food, beverages, alcohol, and tobacco were also important export items, especially on EU markets, while mineral products played a significant albeit decreasing role in Poland's imports.

How did Poland's foreign trade competitiveness change from 2010 to 2015? To answer this question, we first have to identify the goods in which Poland had a comparative advantage in 2015. These were: live animals and animal products; vegetable products; food, beverages, alcohol and tobacco; wood and articles of wood; articles of stone, plaster and cement; leather and leather products; vehicles, aircraft, and watercraft; and instruments and optical equipment. In most of these commodity groups

Poland not only had a trade advantage, but also improved its revealed comparative advantage (RCA) indicators compared with 2010. Poland lost its comparative advantages in the trade of the following groups of goods in 2010–2015: machinery and mechanical appliances; wood and articles of wood; pulp, paper or paperboard; as well as base metals and articles of base metal. It should be noted that Poland's loss of a comparative advantage with regard to machinery and mechanical appliances may have an adverse effects on its economy in the future as this group of goods was relatively prominent among Poland's exports, accounting for almost 20% of the total in 2015.

When discussing trends in the competitiveness of Poland's trade in services, measured by the revealed comparative advantage (RCA) index, it should be noted that Poland had an advantage in the processing of different components and in the export of construction, transportation, telecommunications, information technology, and information services. Poland had a comparative disadvantage in the trade of services related to the use of intellectual property as well as in the trade of insurance and financial services. However, the 2010–2015 period marked a slight improvement in comparative advantage indicators in the trade of financial services and telecommunications, IT, and information services, accompanied by deepening disadvantages in the trade of insurance services.[1]

Another sign of the international competitiveness of the Polish economy is the country's attractiveness as a location for foreign factors of production, in particular foreign direct investment (FDI). According to the National Bank of Poland, the country's central bank, the flow of foreign investment to Poland increased significantly in 2014, accompanied by increased Polish direct investment abroad (NBP, 2015). This means that, after a considerable decline in FDI inflows in 2012–2013, Poland regained its leading position among EU member states in Central Europe. However, preliminary data for 2015 is less optimistic, pointing to a renewed slowdown in both FDI inflows and Polish investment abroad (NBP, 2016).

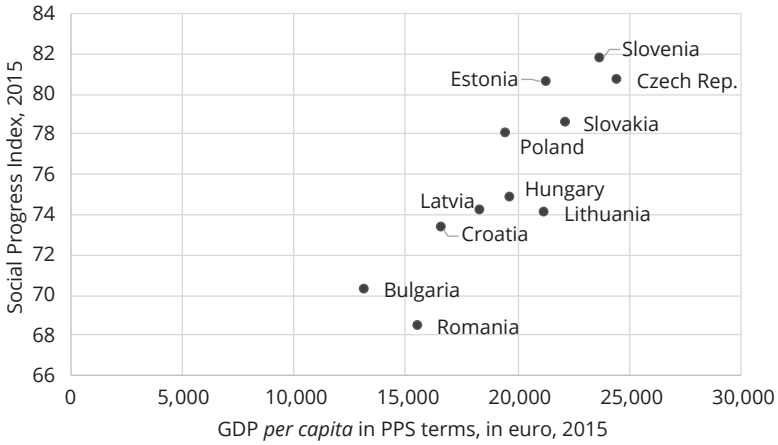
A breakdown of FDI inflows by sector reveals that manufacturing was the most attractive sector for investors in Poland in 2014, followed by information and communication. The mining and quarrying sector recorded an outflow of foreign capital from Poland, resulting from losses and repayment of debt to direct investors (NBP, 2015). In order to establish whether a country is attractive to investors, it is necessary to look at reinvested profits. In 2014, investors reinvested about 40% of income earned in Poland, a relatively high level showing that Poland remains attractive to foreign investors.

As indicated in the first part of this chapter, the overall assessment of Poland's economic competitiveness, including its sustainable dimensions, should take into account

[1] For more on Poland's foreign trade, see Chapter 4.

social and environmental factors. Social issues can be summarized by the so-called Social Progress Index (SPI), which reflects the advancement of social development through three dimensions: basic human needs, foundations of wellbeing, and opportunity for personal development (Porter *et. al.*, 2015, p. 15). In 2015, Poland was in 27th place among the 133 countries for which the index was calculated, while in terms of GDP per capita it ranked 36th. Among the 11 EU member states in Central and Eastern Europe, Poland was only surpassed by four countries: Estonia, Slovakia, Slovenia, and the Czech Republic, in terms of the Social Progress Index, while in terms of GDP per capita Lithuania and Hungary were also ahead of Poland (Figure 2). It should be pointed out, however, that economic progress and social progress have been found to be correlated. Such a correlation has been observed for the whole group of 133 countries (whose correlation coefficient is 0.78 – see Porter *et. al.*, p. 18), and it also holds true for the EU11 countries (Figure 2).

Figure 2. A comparison of the social and economic dimensions of competitiveness: the Social Progress Index (SPI) and GDP per capita in Poland and other EU countries from Central and Eastern Europe

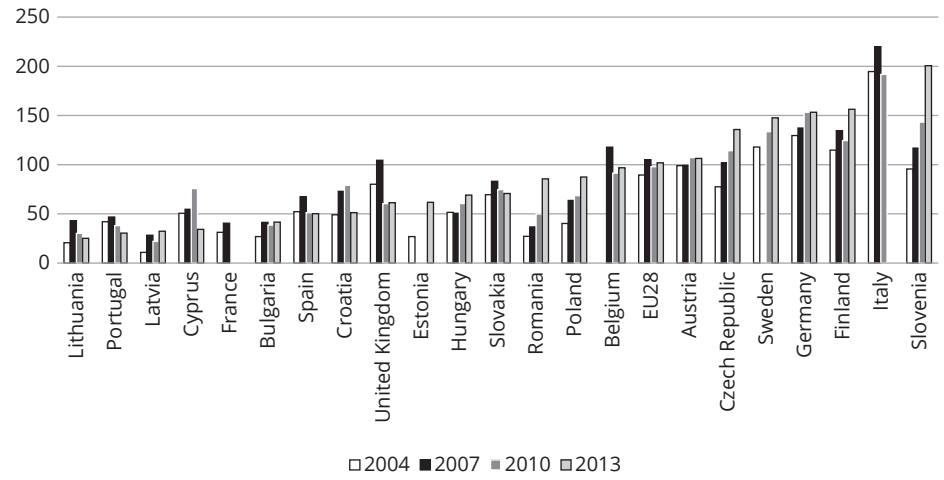


Source: Own elaboration based on data from Figure 1.1 in Chapter 1 and Porter *et. al.*, 2015, p. 17.

The environmental pillar of sustainable competitiveness has not been discussed in detail in this book, so it will be presented here. The position of the Polish economy against the EU can be discussed using expenditures on environmental protection as an indicator. Since the latest available data are for 2013, statistics for the entire period of 2010–2013 will be presented here for a broader perspective (Figure 3). In terms of environmental protection expenditure per inhabitant, Poland was in the middle of the ranking list among EU member states, with expenditures of EUR 87.45 per capita

in 2013. While this was still below the EU average of EUR 101.91, the expenditures have been growing rapidly. They have doubled since 2004 (Figure 3). Poland performed better than most other EU11 countries, being surpassed only by the Czech Republic and Slovenia (Figure 3). This means that this dimension of sustainable competitiveness has significantly improved in Poland during the last decade, although it has yet to reach the EU average. Poland is still far behind European leaders such as Sweden, Germany, and Finland.

Figure 3. Environmental protection expenditure per inhabitant (in EUR): Poland compared with other EU countries

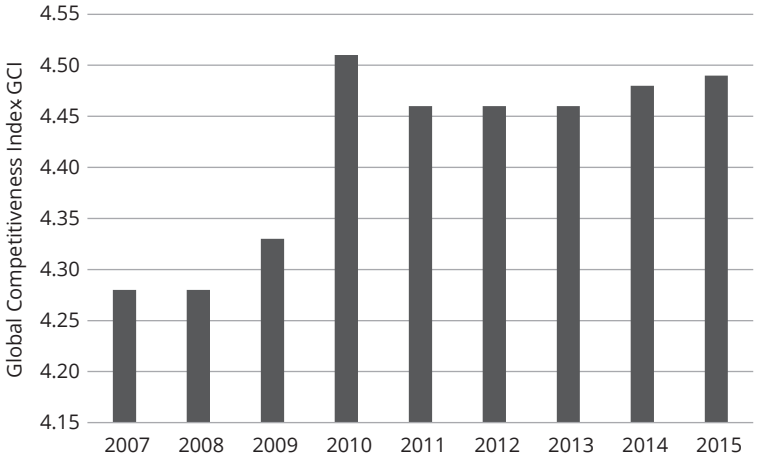


Note: The figure does not include Denmark, Ireland, Malta, Luxembourg, and the Netherlands due to the unavailability of statistical data. No data for France and Italy in 2013.

Source: Own elaboration based on Eurostat data, http://ec.europa.eu/eurostat/data/database, accessed April 4, 2016.

Summing up this book's assessment of Poland's economic competitiveness, it can be concluded that Poland's competitive position improved slightly in 2015 over 2014. The country moved up by two places, from 43rd to 41st position, in an international competitiveness league table compiled by the World Economic Forum (WEF). In terms of the whole five-year period of 2010–2015, Poland's competitive position improved markedly in 2010 over 2009 (to No. 39 in the WEF ranking) and then deteriorated significantly in 2011 only to rebound in 2014. Overall, Poland's competitiveness index (GCI) has yet to return to the kind of performance it recorded in 2010, when it hit a several-year high. The first signs of improvement were noted in 2014, a positive trend that continued into 2015 (Figure 4).

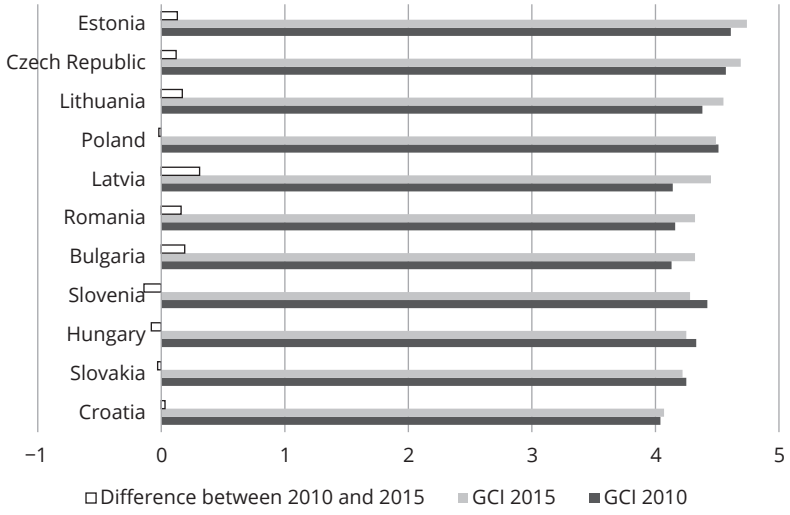
Figure 4. Poland's Global Competitiveness Index (GCI) according to the WEF, 2007–2015



Source: Own elaboration based on data from the World Economic Forum: WEF, 2011, 2014 and 2015.

Among EU member states in Central and Eastern Europe, Slovenia, Hungary, and Slovakia echoed a trend in Poland's competitiveness based on a weaker competitive position in 2015 than in 2010 measured by the GCI index. Slovenia experienced the strongest drop in competitiveness from 2010 to 2015 among EU11 countries, while Latvia and Lithuania showed the greatest improvements (Figure 5).

Figure 5. Changes in competitiveness, 2010–2015: Poland and other EU member states from Central and Eastern Europe compared



Source: Own elaboration based on data from the World Economic Forum: WEF, 2011, 2014 and 2015.

In 2016, Poland will probably maintain its current competitive position, achieving moderate GDP growth and staying on a path of economic convergence with the EU average. However, some signs of the country's weakening attractiveness to foreign investment seen in 2015, coupled with low domestic investment and low propensity to save, may cause economic growth to slow down and adversely affect Poland's economic competitiveness in the future. Other key challenges that Poland will have to face in 2016 and beyond include insufficient innovativeness and negative demographic trends.[2]

It is therefore crucial for Poland to maintain fast economic growth and improve its institutional environment, including economic policy, if it wants to improve the framework conditions for the functioning of the economy. Poland needs to carry out structural reforms and increase expenditure in sectors such as healthcare, education, and research and development, and it should also boost human capital development. Only in this way will it be able to switch to a model of competitiveness based on innovation.

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[2] For more about these and other challenges facing Poland, see Chapter 11.

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Competitiveness is usually understood as a broad category embedded in the level of a nation's prosperity, taking into account not only economic factors, but also so-called sustainable competitiveness based on social and environmental pillars. How competitive was the Polish economy in 2015 and how has Poland's competitive position changed in the last five years compared with other European Union countries? The research presented in this book provides the basis for a concise assessment of the current competitive position of the Polish economy in the European Union and makes it possible to explain the changes in Poland's competitiveness in 2010-2015.

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