LABOUR IN THE AGE OF INNOVATION

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The study used data from representative individual surveys provided by Eurostat, European Commission and Central Statistical Office of Poland. Eurostat, European Commission and Central Statistical Office of Poland are not liable for the findings and conclusions contained in the publication.
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INTRODUCTION

We are pleased to introduce the report, "Employment in Poland 2014. Labour in the age of innovation". The publication was initiated by the Ministry of Labour as part of the system project Analysis of the labour market processes and social integration in Poland in the context of economic policy, commissioned by the Human Resources Development Centre and prepared by the Warsaw Institute for Economic Studies.

The development of new technologies has been the catalyst of a new phase of social and economic transformation that is progressing at a previously unheard of pace throughout the entire world. This on-going process has not bypassed any part of the economy and strongly affected the labour market by changing the rules by which it functions and deepening internal polarization. Such changes and tensions affect public institutions, which must carry out their missions whilst simultaneously adapting to continuously progressing changes in the digital economy. In this report, we also address the role that innovation plays in today's constantly evolving labour market.

The first part of the "Employment in Poland 2014" report is a link between all other parts. Its aim is to discuss the main issues concerning development and economic growth from the perspective of developing countries. The key concept is the middle-income trap, which means the threat of economic slowdown and the halting of the process of catching up in countries which are neither poor nor rich. This section also presents three possible scenarios for Polish development until the year 2055.

The second part is devoted to the links between industrialisation and economic growth. We show the process of building a modern industrial economy in countries that have reached medium and high levels of economic development. We examine both of these elements using the historical experience of Western Europe, as well as contemporary examples from Asia. The report concentrates on Central European countries, including Poland, which are experiencing periods of intensive development of modern industrial economies.

The third part focuses on presenting a multidimensional picture of the development of the modern business services sector in Poland, Europe, and the rest of the world. The subject of the analysis has been the structure of the branch and its significance in the economy and the labour market, including the identification of economic conditions and mechanisms conducive to the development of its most productive parts. The Polish market survey was conducted in relation to processes and trends in the global markets, making it possible to both assess progress in the Polish sector, as well as forecast the future trajectory of its development.

The fourth section explains the impact of digitisation on economic growth, analysing it in terms of geography and productivity, and examining the reasons behind differences between Europe and the United States. It describes new opportunities that can bring the economy access to large data sets, indicating differences between Open Data, Big Data, and Open Access. The analysis also explores the impact of digitisation on the emergence of new phenomena involving both the economy and the labour market, such as the sharing economy. In this section we review new digital tools, we present the impact of digitisation on contemporary HR, and we point out that competence is becoming increasingly important in the digital job market. Finally, we analyse factors that lead to the risk of digital exclusion, in particular in the most vulnerable groups – like the elderly, and that thus directly affect the labour market.
# Introduction

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INTRODUCTION

The first part of the Employment in Poland 2014 report is a link joining the remaining parts together. Its objective is to discuss the main themes of the issue of development and economic growth from the perspective of catching-up countries and to draw general conclusions for public policy aimed at economic convergence with the most wealthy countries of the West. The key notion, which we mostly focus on, is the middle income trap, meaning the threat of economic slowdown and ceasing of the catching-up process in the countries that are neither among the poorest, nor among the wealthiest ones in the world.

The first chapter starts with an overview of the most important changes on the economic map of the world that took place over the last sixty years. Even though there were many ups and downs, ultimately only a few countries managed to get promoted to the group of the most developed countries. This fact is the main reason for creating the notion of “middle income trap” in the relevant literature, the analysis of which, in the context of Poland, is the main subject of further parts of this chapter. In Part I, we make an attempt to reframe the hypothesis of the middle income trap in terms of productivity slowdown, further avoiding references to GDP, which could have been slightly misleading in this context.

The second chapter includes an overview of five, most important in our opinion, theories explaining the economic growth phenomenon, thus a fortiori, also the middle income trap. They are as follows: institutional theory, the theory of technological leap, the theory of innovative growth, world-system theory, and cognitive skills theory. Some of them are illustrated with the examples of countries whose development or stagnation is particularly well described in the presented theories. We also try to make a comparison of each of them with the situation of Poland, and more extensively, Central Europe, by verifying which of its assumptions and conclusions specifically match the countries of the region.

The third chapter is a confrontation of theory with empirical evidence, and presents, based on relevant data, the most essential factors influencing the productivity growth rate at the level of enterprises and in the macroeconomic sphere. It seems that the discussed theories are mutually complementary and each of them is supported by relevant studies. Thus, the resultant recommendations are deemed to be valid for Central Europe and Poland anytime when the theories correctly reflect the economic characteristics of the region. Based on those, we build an econometric model aimed at quantitative operationalisation of the middle income trap notion and determination of factors that could potentially substantiate it. The model clarifies the observed differentiation in the global productivity growth through a structural and institutional differentiation of particular economies. We point out that the level of ca. 60% of the United States’ productivity is the upper limit of development for a country with average values of these indicators. Only the countries that managed to build an above-standard institutional governance, significantly raise the level of investments in physical and human capital, and increase the complexity of their industry, are likely to avoid the middle income trap defined in such manner. This observation explains why, within the last half-century, only a few countries in the world managed to exceed that limit.

To complete the research work carried out in the first part of the report, three scenarios of Poland’s development until 2055 have been designed. In the base scenario – reflecting the current institutional and structural status quo – Poland will need approximately forty years to catch up with the productivity of the moderately affluent, but not the richest countries of Western Europe: Spain and Italy. Nevertheless, the level of economic development of the United States or more developed Northern countries will still be out of its reach. This is a moderately optimistic conclusion – Poland will avoid the middle income gap but the pace of convergence in comparison with the past twenty five years will slow down markedly. We show that maintaining the historical growth rate of productivity and its full convergence by 2055 with the United States, Germany or France, will require the implementation of numerous institutional and structural reforms. The third possibility, which still raises concern, is the implementation of a populist scenario, in which a part of already introduced reforms gets reversed (among others, in the field of education and social security) and the efforts to improve the quality of institutions and economic structure in Poland are abandoned. Moreover, the populist scenario will lead to the middle income trap and stop the development of Poland at the level similar to Portugal, Malta and Greece.
1. MIDDLE INCOME TRAP

1.1. STABLE WORLD ORDER

The growth rate in developing countries has been exceeding the one enjoyed in the developed countries for years. This fact does not seem to be far from tautology – after all, the term "developing country" indicates an economy that is indeed technologically backward, but precisely for the same reason it develops rapidly. Already on the basis of the canonical model of economic growth created by Robert Solow and Trevor Swan (1956) it has been evidenced that higher, ceteris paribus, return on investment in the countries with no capital should lead to gradual catching up with the initially wealthier and better capitalised countries. This conclusion, called the convergence hypothesis, is justified by a number of theories (Box I.1.). It seems natural that not only China or India but also much wealthier, although still catching up with the West, Central and Eastern European countries experience fast economic growth. In other words, it does not seem surprising in any way that the Polish economy has grown at an annual rate of 6.3% for the past twenty years, based on calculations in US dollars and taking into account purchasing power parity. However, historical experience shows that fast economic convergence is not a natural phenomenon, and that catching up with the developed countries is an exception rather than the rule. As presented in Figure I.1., the economic growth rate in developing countries in post-war history was, except for the last decade, lower than in developed ones. The term "developing country" itself used to mean a country with an economy based largely on agriculture, with an alarmingly fast growing population and high (open or hidden) unemployment. This inevitably raises a doubt, whether the fast economic growth rate noted after 1990 in several countries of Central Europe and Asia, is a sign of their long-term economic success, or rather a result of a short-term coincidence of extremely favourable circumstances.

**Box I.1. CONVERGENCE**

Theoretically speaking, convergence should occur as a result of the operation of three factors (Diagram I.1.) – transfer of knowledge, transfer of capital, and participation in the international division of labour. Unless the prevailing institutions are not in such bad condition to make effective industrialisation impossible, the economic growth of poorly developed countries should be quite easy to achieve. According to Summers (2003) “the rate at which countries grow is substantially determined by three things: their ability to integrate with the global economy through trade and investment; their capacity to maintain sustainable government finances and sound money; and their ability to put in place an institutional environment in which contracts can be enforced and property rights can be established. I would challenge anyone to identify a country that has done all three of these things and has not grown at a substantial rate”.

**Diagram I.1. Source of convergence**

1. KNOWLEDGE
   - Copying of the technologies proven abroad

2. CAPITAL
   - Access to foreign capital frees from the growth being restricted by domestic savings

3. MARKET
   - Access to foreign markets allows treating quality as a priority regardless of the domestic market limitations

Source: Own elaboration
Box I.2. European Economic Miracle

The terms “Wirtschaftswunder” and “il miracolo economico” refer to the period of ca. 30 years between the end of the Second World War and mid-1970s. This was a time of enormous, but at the same time stable, economic growth for Western Germany, Italy and other Western European countries. The so-called “European economic miracle” enabled a part of the countries of the continent not only to reconstruct after war damage but also to bridge a significant part of the development gap between themselves and the United States. The „miracle” was based on effective absorption of technological and organisational innovations originating from the United States, in combination with consistent restructuring of Western European economy and reallocation of labour resources from the agricultural sector to industry and services. More than 50% (Easterly and Levine, 2001) of the production growth within that period is claimed to be the result of the growth of the Total Factor Productivity, which was possible due to fast diffusion of solutions developed during the Second Industrial Revolution of 1880-1929.

These technologies proliferated in Western Europe only several decades later than in the United States, primarily due to the protectionism of the interwar period and acts of war in the 1940s. A wide opening to trade and capital flows after 1945 facilitated the implementation of American solutions in the Old Continent, for example in steel, automotive, machine and chemical industry, as well as in the financial sector, thus, significantly increasing the potential growth rate in the 1950s and 1960s. The economic integration within the EEC, as a result of which particular countries could specialise in the manufacturing of goods whose production was their competitive advantage on the open European market, also facilitated the increase in production and trade.

Since the end of World War II until the outbreak of the oil crisis in 1973, Western Europe not only rebuilt its lost physical capital, but also underwent numerous structural changes. Germany – once a country with 24% of workers employed in agriculture, turned into an economy with a large share of highly innovative industry and services (Figure I.3.). This change was possible also due to the transformations of the workforce structure – in so far as only 2.8% of Germans had a higher education in 1950, that number grew to 6.9% in 1980. Similar processes could be observed, among others, in France (decrease in share of agriculture from 25% to 8.4% and increase in the percentage of population with higher education from 1.6% to 8.5%) and in Spain (decrease of the number of people employed in agriculture from 44% to 17% and increase in the number of people with higher education from 1.3% to 7.1%). However, this was not the case everywhere. For example, Portugal, due to strong protectionism safeguarding the local agricultural sector and definitely less impressive achievements in the field of public education, experienced the above mentioned processes only to a limited extent.

**Figure I.3. Sector specific share of the employed in 1950 (on the left) and in 1980 (on the right)**

Relative income growth was achieved in all of the European countries open to trade with the United States, however, in some of them, after the period of about thirty years, such income growth was hampered or even reversed (Figure I.2.). Germany, France or Ireland, where the GDP per capita in comparison with the USA increased from ca. 50% in 1950 to ca. 80% in the first half of the 1990s, could be pointed out as the instances of full convergence. On the other hand, apart from already mentioned Portugal, also Greece and Italy can serve as another example of an unfinished economic miracle. In the first of those countries structural transformations stopped halfway before full industrialisation took place, which prevented it from occupying the fully productive niche in the global market. The situation of Italy is particularly specific because this country successfully built a strong competitive position in the world economy during the post-war boom. However, in subsequent years it experienced a decline so that a significant economic distance between Italy and USA and Northern Europe grew again.

Source: Own elaboration based on Timmer et al., 2014
Despite the economic successes of the past quarter of a century, the wealth gap between Central Europe and the most developed economies of the West is still significant. In 2014, GDP per capita in Poland calculated according to the purchasing power parity equalled 55% of the Germany level and 46% of the USA. In the case of Slovakia, it was 61% and 51%, and in the case of the Czech Republic – 65% and 54%, respectively. As presented in Figure I.4., only a relatively small group of countries was able to achieve higher income. That group includes mainly Western European countries, which experienced the so called European economic miracle (Box I.2.) in 1945-1975, and the "Asian tigers" which transformed from agricultural countries into technologically advanced industrial economies during the post-war period. Apart from those two groups, only small countries with oil deposits managed to raise their GDP per capita above 60% of American average. There is also the third group, important from the point of view of economic perspectives of Central Europe and Poland, whose members are countries that experienced an interrupted European economic miracle, i.e., Greece, Portugal, Cyprus and Malta. After the war, they made a huge civilization leap comparable to the accomplishments of the Central European transformation, just to plunge into economic problems between 1970-1980. Despite a generally favourable external environment, they did not manage to overcome such problems until today. Their growth slowed down so significantly that convergence with the wealthier North halted. In Asia, the counterparts of the European South are Malaysia, Indonesia and Thailand, which also, despite initial success, did not manage to repeat the economic achievements of Japan, South Korea or Taiwan and join the group of highly developed countries.

Other regions of the world also face difficulties with stabilisation of economic growth at the level sufficient to catch up with the developed countries. As shown in Figure I.5., the countries of Latin America and Africa, considered as a group, did not manage to improve their position at all in comparison with the USA over the past sixty years. Only 11 out of 42 countries have some achievements in this respect, but the improvement was scarce in most cases. It is difficult to find any of economic miracle in that group, except for Trinidad and Tobago (TT0) – a country with the population of one million and rich oil deposits. Impressive growth in Tunisia, Egypt or Dominican Republic started from a very low initial level and quickly lost its impetus. The sole example of a relative success may be Chile, however, also in its case, faster economic growth has been observed in the last dozen years or so and has been largely dependent on the condition of the markets of raw materials – i.e., copper, silver and other non-ferrous metal ores. In South America, it is much easier to indicate countries that were losing their economic position instead of catching up. Venezuela seems to be the most striking example; in 1950, it was the only outpost of South America among the highly developed countries (88% of the US’ GDP), and now, with its income reaching 34% of that of the US, it is remarkably poorer than Poland. Also Argentina and Uruguay experienced a similar drop in relative prosperity, though to a much lesser extent, i.e., from 50% to 30% of the American GDP in the case of Argentina and from 46% to 38% in the case of Uruguay.

Source: Own elaboration based on GGDC data

FIGURE I.4. GDP per capita weighted by the purchasing power parity globally in 1950 and 2014 in relation to the United States

Interrupted European economic miracle
European economic miracle
Eastern Europe
Interrupted Asian economic miracle
Asian economic miracle
Other countries
Many Asian countries are also developing very slowly, still remaining poor. The income of Myanmar (Burma), Pakistan, Yemen, Afghanistan, Bangladesh and Philippines has been around a dozen or so per cent of the US income for decades. The term “poverty trap”, often used with respect to the above mentioned countries, as well as the countries in Sub-Saharan Africa, has become an inspiration for the concept of the “middle income trap”, which was formed later. Over the past 65 years, only 19 out of 43 poorest countries have noted an improvement of prosperity in relation to the USA\(^1\). Meanwhile, the transition from the income ranging between 20-40% of the American GDP to a higher one was successful in the case of 22 out of 28 countries, almost 80% of the sample. Smaller percentage of countries improved their situation starting from the level of 40-60% of the American income (9 out of 13 countries), which may indicate that being promoted to a large group of highly industrialised countries is much harder than joining the big circle of middle income economies. On the other hand, all five countries whose prosperity was within the 60-80% range in 1950, improved their relative position, which may lead to a conclusion that the road to a very high level of prosperity is relatively easier after overcoming the difficulties of the initial and second stage.

\(^1\) In reality the percentage of countries that still have the lowest income is much higher than 50% due to the fact that for some of the poorest countries, such as Afghanistan or Chad, an attempt of reconstruction of income from 1950 was not made.
Likelihood analysis with respect to transition within respective income groups presented in Table I.1. leads to similar conclusions. The probability of staying in the poverty trap reaches 80%, while exceeding the threshold of 20% of the American GDP already gave 43% chance for promotion and only a minimal chance for degradation in the last 65 days. The biggest threat at this stage is a relative stagnation experienced by as many as half of the countries. The threat of stagnation is, however, much smaller within the 40-60% range, to which Poland can currently be assigned; history has taught us that countries which reached such a level of income either caught up with the leaders, or fell back to the group of poorly developed countries. In this sense, the middle income trap seems to be experienced by few – the rest either overcomes the barriers on the way to prosperity, or again loses distance with respect to the world’s leaders.

Nevertheless, it is worth noting that the above mentioned historical analogies refer to changes that cover three generations. The fact that Poland, statistically speaking, has 38% chance to catch up with the highly developed countries during the next 65 years and 56% chance during another 130 years, does not mean that a faster catch-up is impossible. As Table I.2. points out, if Poland developed as fast as it had been for the past twenty years, it would take us less than thirty years to reach the position occupied now by Germany in relation to the USA. On the other hand, if the growth rate of Poland would match the forecast made recently by the European Commission, the level of 80% of the US’ GDP could only occur in 90-130 years and only provided that America would develop slower than in the past. Which of the two scenarios is more likely to happen?

One can attempt to answer this question also with the help of historical statistics, now covering shorter periods of time. However, depending on which of the historical moments we refer to, we may draw different conclusions. The 1950-1975 experience, including the European economic miracle, makes us look to the future more optimistically (Table I.3.). As much as 38% of the countries with an income within the range attributable to Poland, managed to get promoted to the group of the wealthiest countries. The promotion to the 60-80% group was also very probable, and relative degradation was rather infrequent. The situation was, however, completely different in a more recent period, after the oil crisis. Two in three countries who had income within the range of 40-60% of that of the USA in mid-1970s, had the same or lower income in 2014. In addition, there is also a clear, previously unknown, trend of reversing convergence in the countries that reached high income. 91% of the countries from the 60-80% group did not change their position in relation to the USA to an extent allowing their promotion to the highest income group. The last decades of the 20th century and the beginning of 21st century brought the phenomenon of stagnation/regress of the countries from the 40-80 group (currently placed somewhere between Chile and Finland), which was previously unnoticeable in the whole 1950-2014 period. The very occurrence of this phenomenon led to the formulation of various theories referring to the notion of the “middle income trap.”

### TABLE I.3. Matrices of transition between different GDP per capita levels (USD PPP), 1950-1975 and 1975-2014

<table>
<thead>
<tr>
<th>GDP per capita with respect to the United States</th>
<th>1975</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-20%</td>
<td>20-40%</td>
</tr>
<tr>
<td>0%-20%</td>
<td>91%</td>
<td>7%</td>
</tr>
<tr>
<td>20-40%</td>
<td>7%</td>
<td>46%</td>
</tr>
<tr>
<td>40-60%</td>
<td>0%</td>
<td>15%</td>
</tr>
<tr>
<td>60-80%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>80%+</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on GGDC data

1.2. **MIDDLE INCOME TRAP AS A PRODUCTIVITY TRAP**

As we have shown in the previous subchapter, only a few countries managed to maintain fast economic growth long enough to guarantee a convergence of quality of life to the countries of the so called technological frontier. More often the development impetus was lost already at the low or middle income level, and relative level of prosperity in many countries was subject to either long-term stagnation or even gradual erosion. This regularity was referred to in literature as the low or middle income trap, respectively (Gill and Kharas 2007). However, there is no consensus as to where the distinction between those two terms should be made, what are the ranges for the middle and low income, and when a temporary slowdown becomes a development trap (Felipe et al. 2012, Im and Rosenblatt 2013).

In general, middle income may be categorised in absolute or relative terms (Box I.3.). In the first case the classification of the World Bank is commonly used, and in the second one, we choose a reference point e.g. the income of an average American citizen. The trap generally means maintaining the average income for too long. For this to occur, a decrease of the existing high growth rate has to be noted. And here again, the criteria defined by particular researchers vary.
According to Eichengreen et al. (2011), a slowdown is a situation where the growth for 7 consecutive years exceeds 3.5% annually, and then over the next 7 years it slows down by at least 2 pp. Aiyar (2013) formed a definition grounded more firmly on the growth theory – the trap is when the actual growth materially differs from the theoretical value calculated based on available information about the production factors for at least a decade. Some of the researchers, like Bulman et al. (2014), question the very existence of the middle income trap, not being able to find evidence for any specific risk of slowdown. On the other hand, the same authors uphold the hypothesis that the growth sources differ with levels of development, indirectly confirming that it is possible for dynamics of development in a given country to decrease, if its development model is not changing fast enough.

The study of Felipe et al. (2012) is an example of the systematised approach to the middle income trap analysis based on its absolute definition. The authors, based on the ranges analogous to those of the World Bank, define two traps: middle-low and, being more of interest to us, middle-high income. They assume that the country is in a trap if it stays in a given income range for more than a median for the countries that got promoted to the higher range. In the case of countries with a middle-high income, this means a promotion within a period longer than 15 years. In 2014, since 15 years had passed from the moment when Poland joined the group of the middle-high income countries, this is the right moment to check whether it managed to escape the threat zone. To avoid the middle income trap, of 2010 to 2014, the annual economic growth in Poland should be maintained at an average level of at least 3.1%. That is the exact growth dynamics that Poland managed to achieve until 2014, and thus according to this methodology, it left the group of countries threatened with the middle income trap. China, Thailand, Bulgaria and Turkey also have a chance to avoid the trap, just as Poland did. However, Hungary, Mexico and Oman have probably fallen into the trap defined in such manner.

**BOX I.3. MOST COMMON ATTEMPTS TO DEFINE MIDDLE INCOME**

Most common absolute definition of the middle income is the one based on the World Bank classification. According to this definition the countries are divided into four categories based on the Gross National Product value (Table I.4.). Poland with a GNP per capita at the level of USD 13,730 (in American dollars from 2014) since 2011 is placed in a group of high income countries (Diagram I.2.). World Bank classification can be controversial in a sense that many countries included in the high income group by this institution are still far behind the world leaders. Moreover, the World Bank employs the so called Atlas method for conversion into dollars, so it does not take into consideration purchasing power parity, but an average 3-year nominal exchange rate of the national currency, which is why the list becomes considerably inaccurate, when the country’s currency is over- or undervalued. Another commonly applied division is the classification of the International Monetary Fund, which, apart from the basic prosperity characteristics, i.e., the GNP per capita, broken down into developed and developing countries, also takes into consideration the poverty rate, life expectancy, the share of agriculture in GDP, the size of the financial market, or the condition of public finance. According to the IMF, Poland’s neighbouring countries, i.e., the Czech Republic and Slovakia (in 2009), Estonia (2011), Latvia (2014) and Lithuania (2015), have joined the group of developed countries in the recent years. Poland, according to the IMF methodology, is classified as one of the developing countries (Diagram I.3.).

**TABLE I.4. Income classification per capita according to the World Bank 2015**

<table>
<thead>
<tr>
<th>Income (USD 2014, Atlas method)</th>
<th>Low</th>
<th>Middle-low</th>
<th>Middle-high</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income as compared to the United States</td>
<td>&lt;2%</td>
<td>2-8%</td>
<td>8-23%</td>
<td>&gt;23%</td>
</tr>
<tr>
<td>Number of countries</td>
<td>31</td>
<td>51</td>
<td>53</td>
<td>80</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on the World Bank data
A third important classification, observed with particular attention by investors, is the classification of markets prepared annually by, among others, S&P Dow Jones Indices. It divides countries into: developed markets, emerging markets and frontier markets. The developed markets are characterised by the biggest freedom of access for foreign investors, equal treatment of investors, regulatory and legal support, and universal access to information. Their GDP per capita amounts to at least USD 15,000 PPP. On the other hand, emerging markets have a lower scope of regulatory support for the equal treatment of investors and public access to information, however similarly to the developed economies, they are quite open to foreign investors. As regards the frontier markets, they are definitely less accessible for foreign investors and are subject to significant regulatory and operational limitations. According to this classification, the Polish financial market matches the emerging economies most (Table I.5.)

**TABLE I.5. Classification of financial markets according to S&P Dow Jones, June 2015**

<table>
<thead>
<tr>
<th>Developed countries</th>
<th>Emerging markets</th>
<th>Frontier markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>North and South America</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada, United States</td>
<td>Brazil, Chile, Columbia, Mexico, Peru</td>
<td>Argentina, Trinidad and Tobago, Panama, Jamaica, Ecuador</td>
</tr>
<tr>
<td><strong>Asia and Pacific</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia, Hong Kong, Japan, New Zealand, Singapore, South Korea</td>
<td>China, India, Indonesia, Malaysia, Philippines, Taiwan, Thailand</td>
<td>Bangladesh, Kazakhstan, Pakistan, Sri Lanka, Vietnam</td>
</tr>
<tr>
<td><strong>Europe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom</td>
<td>Czech Republic, Greece, Hungary, Poland, Russia, Turkey</td>
<td>Bulgaria, Croatia, Cyprus, Estonia, Latvia, Lithuania, FYR Macedonia, Romania, Serbia, Slovakia, Slovenia, Ukraine</td>
</tr>
<tr>
<td><strong>Middle East</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>Qatar, United Arab Emirates</td>
<td>Bahrain, Jordan, Kuwait, Lebanon, Oman</td>
</tr>
<tr>
<td><strong>Africa</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt, Morocco, South Africa</td>
<td>Botswana, Kenya, Mauritius, Namibia, Nigeria, Tunisia, Zambia, Ghana, Côte d’Ivoire</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration based on S&P Dow Jones, June 2015
In this study we decided to take a different path than that of Felipe et al. (2012) and adopt a relative approach. There are three reasons for this. First of all, absolute analyses lead to a conclusion that even the richest countries were the middle income countries several decades ago (Im and Rosenblatt 2013), even though many of them were also the technological leaders of that time; historical analogies are useless in such a world. Secondly, an income of 12,000 dollars per citizen is easier to achieve for any country when the average income of developed countries, its potential trading partners, equals 40,000 dollars than when it equals 20,000 dollars, as it was the case several decades ago. Thirdly, the middle income gap defined in such a manner does not refer to Poland or other Central European countries anymore, but only to much poorer ones, thus, it is not useful from the point of view of development problems of our region, which still lags far behind (ca. 50-70% gap) the global leaders. Our approach arises from the assessment of the experience of Southern Europe – Portugal, Greece and Southern Italy, in the case of which the development gap with respect to wealthier North over the past several decades did not change. This led to a situation, where an average citizen of these countries now lives at the level comparable to that at which the citizens of Northern Europe lived one generation before.

The relative development gap may be measured by comparing the GDP per capita of respective countries to that of the technological leader, which, in the post war period, is undoubtedly the United States. That kind of approach may be associated with the convergence hypothesis (Box I.1.) assuming that the pace of convergence does not depend on the absolute but relative income level. Our definition of the middle income range is slightly different from the one of Robertson et al. (2013), who optimistically assume that the middle income zone is between 8% and 36% of the American GDP per capita, implicitly assuming that wealthier countries (including Portugal and Greece) are beyond the zone threatened by permanent slowdown of growth. Our definition is also different from the one set forth by Bukowski et al. (2012), according to which the middle-high income is a zone from which a country would need 20-40 years, so a period of one or two generations, to fully converge to the USA provided that it would start growing at American rates and America itself would not grow at all. The income distance implied by this definition is equivalent of ca. 50-70% of GDP per capita in the USA.

Our approach is an attempt to balance relative and absolute concepts. We do not assume ex-ante that there is some special relative or, even more so an absolute prosperity level overcoming of which would be particularly difficult. We rather assume that such a level can appear ex-post from case studies and econometric analysis, at the same time accepting that the observed difficulties of some of the European or Southern American countries with achieving the prosperity level comparable with the countries of the developed North, may be structural or institutional in nature. Thus, in the next chapter we present the most important theories explaining the observed cases of growth slowdown, treating them as a sort of guidance for the empirical analysis carried out further in this part. Another feature of our analysis is that we shift from the GDP per capita as a main indicator serving to assess the relative economic position of respective countries. We justify this by the fact that even though the income per citizen is a pretty good factor for measuring the country’s wealth, it poorly reflects the effectiveness of its resources management. From this point of view, labour productivity is a better measure. It is most often expressed by the added value generated during one hour. As it is shown in Figure I.6., presenting the productivity growth to GDP growth ratio over the past thirty four years, those two methods of measuring the economic success are not identical. Even though in the majority of countries, the productivity growth to GDP growth ratio is close to 1 (its average value is 0.98), and the productivity growth is most often fully reflected in the GDP growth, there are many exceptions.

First of all, in some of the countries (including but not limited to France, Finland and Spain) a significant shortening of the working time occurred during the analysed period, which is why the value of the product decreased. Secondly, some of the countries (mostly Japan) experienced the effects of demographic changes causing a drop in the share of people in the working age group in the total population, which decreased the amount of manufactured goods and services provided per citizen, despite maintaining the existing efficiency dynamics. Thirdly, all of the countries were affected by the fluctuations of the economic activity of working-age men – in the USA the most – from 78% to 69%. In many cases, although not in all of them, this phenomenon was offset by the growth in economic activity of women (mostly in Spain and in Chile). Fifthly, some of the countries (including Denmark and Sweden) made an effective effort directed at occupational activation of the elderly, contributing to the GDP growth and not to productivity growth. And this is not the end - a thorough analysis of each of the examples would have to prove that these processes occurred in each of the examined countries with different intensity and in different directions. Their conclusion for three characteristic countries is presented in Figure I.7. Most often the productivity and GDP growth was more like in the case of Sweden than Spain or Japan. At the same time, public policy with respect to economic activity of the groups traditionally placed at the margin of the labour market – young people, the elderly and women – was definitely important. What is worth noting is the indirect connection between the employment level and productivity – the more people in a given society work, the smaller the burden they have to bear to provide for the rest of the population, thus more resources can be channelled to investments directed at increasing the productivity.
Further on we focus mainly on the productivity growth for two reasons. Firstly, from the point of view of prosperity and catching up with the richest countries, it is much more significant than the employment growth. If Poland rose its rate of employment for people aged 15–64 from the current level of 60% to the level of the OECD countries with best statistics in this respect (the Netherlands, Sweden – both 74%), at the same time not undermining labour productivity – its GDP per capita would increase by 23%. Nevertheless, since economically inactive people usually have lower qualifications and professional experience than the groups more tightly connected with the labour market, in reality this effect would be by several or dozen or so percentage points lower. Raising the economic activity to Scandinavian levels – although desired – would reduce the total prosperity gap with respect to the developed countries by only 5 to 10%. Secondly, it is the permanent drop of the productivity growth rate that is deemed to be the main cause of the risk of falling into the middle income trap – Eichengreen’s decomposition (2011) proved that the drop in the productivity growth rate is responsible for 85% of the slowdown among the countries said to have fallen into the middle income trap.

Further on, we discuss alternative methods of explaining the reasons for great diversification of the economic achievements of respective countries, using labour productivity as a key variable, the long-term changes of which need to be explained. We start with an overview of the most important theories attempting to explain the reasons for the differences in the economic growth in the world. Their explanatory value is tested by means of empirical illustrations in the form of current examples of growth slowdown in different countries in the world. These examples mainly help in understanding the respective theories better, and are not to be used for direct assessment of the economic perspectives of the Central European countries and Poland, which will be presented by us in the next chapter.
2. THEORIES OF ECONOMIC GROWTH AND CONVERGENCE

2.1. INSTITUTIONAL THEORY OF GROWTH

The question concerning the causes of economic growth assumes a kind of explanatory space. The analysed event must be contrasted with some standard situation in which it could not occur or its occurrence would be less likely. If we ask about economic growth then the said the standard would be the lack of such growth, the situation typical for the world until the end of 17th century. As part of the assumed explanatory space, it is important not to confuse the cause of the studied event with the event itself. As it was pointed out by the creators of the new institutional economics: “the factors we have listed (innovation, economies of scale, education, capital accumulation, etc.) are not causes of growth; they are growth.” (North and Thomas 1973). Thus asking for the sources of prosperity is asking about what made the technological and organisational progress enabling the mass production and consumption of goods to occur.

A fully comprehensive answer to a problem formulated in such manner has not been elaborated so far. For now, when studying the chain of causes we must stop at its first links, at the same time maintaining a certain margin of uncertainty when drawing conclusions. According to institutional economy a precondition for the occurrence of economic growth is the formulation of appropriate institutional framework. Broadly defined, it means formal and informal rules defining whether and how people work, invest and behave in economic, political and social life. On the one hand, economic growth is thus caused by intentional human activity supported by the willingness to enhance one’s own well-being and inherent creativity, which are all natural to humans. On the other hand, this creative activity needs exceptionally favourable circumstances to bear as much fruit as possible. This means, in particular, that the best possible alternative from individual perspective should be a more effective organisation of work, saving and investment. Such state is nevertheless difficult to achieve, because it not only requires determination from each of the individuals, but also coordination of individual efforts. For economic development is of a collective nature – the initiatives of even the most creative and diligent units will not increase the economic productivity level, if taken up rarely and in isolation. Institutions (“humanly devised constraints that shape human interaction” North (1990)), including also economic institutions, are needed for such coordination of the productive human activity to be probable.

Institutional economy at the same time emphasises that for the economic growth to start and persist, not any, but only appropriate economic institutions are necessary. Acemoglu et al. (2005) define them as “those that provide security of property rights and relatively equal access to economic resources to a broad cross-section of society.” Good economic institutions enable the development of key markets – starting from the labour market, through the land and capital goods market, and ending with the financial market. The emergence of the intellectual property rights market is also sometimes deemed as significant, even though this element of institutional theory of growth is most often questioned, especially with respect to the initial stages of economic growth (for example Clark (2008)). However, markets themselves are not sufficient – their participants are also necessary, both willing to and capable of exchanging goods and services. If majority of means of production is controlled by a narrow elite, the motivation of the rest of the society to conduct transactions will significantly drop. A small, but very privileged group will always be able to take away from the others the fruit of their work by raising the fees from rare resources controlled by them. Thus, it is difficult for economic growth to occur in a situation, when the majority of production capital of a given country (e.g. land or enterprises) is owned exclusively by several very wealthy families or by the state, controlled by the privileged social class. Institutional economy thus indicates the causes due to which a fast and stable economic growth was not possible either in Southern American kleptocracies or centrally planned economies of Central and Eastern Europe.

Institutionalists claim that the establishment of the so called inclusive institutions (as opposed to extractive institutions), is not only a precondition but also actually a sufficient condition to initiate long-term prosperity. The market for products which may be sold for profit drives the entrepreneurs to search for the best manufacturing methods. The freedom of dismissing and hiring employees together with circumstances favourable to their spatial mobility enable effective distribution of labour and use of comparative advantages of respective companies and regions. Unrestricted land turnover gives the control of the land to the people that are able to use it most effectively. Efficient financial market enables the intertemporal transfer of resources from those that have it in excess to those that need funds for investments. Then, intellectual property, if not abused, makes it profitable to be innovative – for introducing a new invention to the market the innovator receives a prize in the form of temporary monopolistic rent. Institutions of the market economy mentioned above obviously do not constitute a mere set of simple rules. They are complicated structures, deeply embedded not only in the social and political background, but also in technological foundation of the economy. Along with technological progress there is growing importance of institutional elements strengthening trust and directing public policies at effective methods of resolving specific social and economic issues. Together with popularity growth of the New Institutional Economics, many indices were formed in an attempt to synthetically assess the quality of institutions across the globe. The list and overview of the most important of them is presented in Box I.4.
The oldest indicator is the one published from 1970 to 2012 by the Fraser Institute – Economic Freedom of the World index. Its authors assumed that the circumstances in which citizens can independently decide on what they produce, what they invest in and where they work, combined with the protection of property rights, are the key to a prosperous economy. Thus, the countries deemed as free from the point of view of the economy are characterised by a free movement of labour, capital and consumption goods, narrow scope of regulation of economic activity, low taxes and marginal share of governmental sector in GDP. Index of Economic Freedom elaborated annually by the Heritage Foundation is similar in its methodological assumptions to the Fraser Institute index. It is more popular nowadays due to its more specific nature: each country is granted some points based on ten independent variables grouped into four categories of economic freedom – the rule of law, government interventions level, regulations effectiveness and economic openness. Countries are divided into four groups according to the level of freedom – free, mostly free, moderately free, mostly unfree and repressed. Since the creation of this ranking the first place has continuously been awarded to Hong Kong and the second place to Singapore.

The ease of starting and conducting a business activity are particularly important aspects of economic freedom. Legal standards should not serve as barriers to entry for the operation of enterprises. Ease of Doing Business ranking developed by the World Bank is an attempt to capture such barriers. The countries placed high in the ranking are characterised by better and more transparent provisions of law regulating the process of starting and conducting business, and also by enhanced protection of property rights. For example, in New Zealand, which is located in first place in the „Starting a Business“ section of the ranking, the process of setting up an enterprise takes half of a day on average, requires only one procedure and the official cost is only 0.3% of GDP per capita. Also, there are no requirements referring to the initial contribution. On the other hand, in Myanmar (previously known as Burma), which closes the ranking, as many as 11 procedures have to be performed to set up a business, which usually takes about 72 days. The associated costs are 156% of GDP per capita, and the initial contribution exceeding sixty times the GDP per capita is also required. Apart from assessing the ease of the procedure of setting up a business, the ranking also evaluates the ease of conducting of such business based on the ease of access to electricity, loans, tax rates and winding up procedure.

Aside from the assessment of legal barriers to setting up and conducting a business, the assessment of the environment in which the newly created enterprises are supposed to operate is also important. Only sufficiently competitive, effective and innovative environment gives a chance for fast development. The Global Competitiveness Report elaborated by the World Economic Forum assesses the ability of these countries to maintain such conditions. The competitiveness measurement is based on twelve pillars divided into three groups – basic factors (including: institutions, infrastructure, macroeconomic conditions, health), factors enhancing the effectiveness (e.g. higher education, financial development, size of the economy) and factors of innovation (business and innovation environment). Based on the fulfilment of the above-mentioned criteria, countries may be divided into those whose main economic drivers are cheap manufacturing factors and natural resources, those whose development of which is based on investments and innovation diffusion, and the last group of countries whose development is based on innovations. It is not possible to get promoted to this last group without creating an appropriate environment favouring innovation. This in turn is assessed with the use of the Global Innovation Index, which evaluates the level of property rights protection, research and development expenditure and general quality of the innovations sector.

The following figures illustrate the average position of Poland, Greece and Central Europe in the most important rankings of institutions:

**Figure I.8:** Average position of Poland, Greece and Central Europe in the most important rankings of institutions

**Figure I.9:** Poland’s position in the respective areas of the Doing Business indicator

CONT. BOX I.4. MOST IMPORTANT INDICATORS OF THE QUALITY OF INSTITUTIONS

According to institutionalists’ thesis, the level of economic institutions is essentially dependent on political institutions which should also be of inclusive nature. Meanwhile, in many countries, the fact of holding a political office is commonly abused to bring benefits to politicians themselves or their own interest groups to the detriment of the rest of the society. The measure attempting to capture the frequency of this kind of behaviour is the Corruption Perceptions Index prepared by Transparency International. This index shows the level of corruption in a given country as perceived by business people and analysts all over the world, including the experts residing in the studied country. Each country is evaluated on a scale from 100 (highest transparency) to 0 (highest level of corruption). Scandinavian countries, USA, Australia and New Zealand have been the leaders in this ranking for many years.

The most general indicator of the inclusiveness of political institutions is the Democracy Index elaborated by the Economist Intelligence Unit. It is based on 60 indicators grouped into five different categories: election process and pluralism, civil liberties, administration operation, participation and political culture. Countries have been divided into “full democracies,” “flawed democracies,” “hybrid regimes” and “authoritarian regimes,” based on the index values. Scandinavian countries are placed among the leading positions in this ranking every year, and the last places are taken by North Korea, Guinea Bissau, Chad and Syria.

The shape of the democracy in a given country is to a great extent dependent on the government in power at a given moment. Its impact on the economic development may vary, depending on the degree of interventionism. Government effectiveness level all over the world is examined by the Center for Government Competitiveness (CGP) that has published the Government Competitiveness Ranking since 2011, prepared separately for OECD countries and non-members. The ranking assesses the efficiency of funds allocated by the governments to education, health care, agriculture and food, information technologies, energy and environment, and economy.

In institution quality rankings, Poland’s position matches its current economic development level, as it is usually placed above ca. 70% countries of the world (Figure I.8). Better positions are usually held by Baltic states, Czech Republic and Slovakia, and worse by Hungary, Bulgaria and Romania, although in some cases (e.g. Global Innovation Index), they also rank pretty well. The biggest gap between those countries and the developed countries is in the field of competitiveness, innovation and government spending effectiveness. At the same time, a good or bad position in a given ranking does not automatically translate into a relatively good or bad quality of all of the institutions covered by this ranking. Thus, although Poland’s mere 30th position from among 34 OECD countries in the government spending effectiveness ranking should be associated with generally worse quality of public institutions, a relatively good position in the Ease of Doing Business (Figure I.9.) ranking should be associated with uneven quality of regulations in different spheres of companies’ activity. On the one hand, easy access to loans and business-friendly law regarding liquidation of a company act to the benefit of Poland. On the other hand, the tedious process of obtaining construction permits and unfriendly law with respect to the payment of taxes, is superseded not only by the ranking leaders but also by many marauders – in both rankings Poland ranks at 137th and 87th position among 189 examined countries.

FIGURE I.10. Poland in comparison with EU-15 and countries in the region in the Heritage economic freedom ranking

FIGURE I.11. Poland in comparison with EU-15 and countries in the region with respect to government effectiveness

Source: Own elaboration

Source: Heritage Foundation
Source: Center for Government Competitiveness

—EU-15 — Central and Eastern Europe — Poland
General diagnosis of the World Bank index for Poland and Central and Eastern Europe is also confirmed by the Heritage Foundation economic freedom index (Figure I.10). There are good results reported in our region wherever the institutions are shaped by external instruments, i.e., mainly the common European market rules. In the case of Poland, the exception is the monetary independence and fiscal rules grounded in the Polish constitution, which give us a result no worse than that of Western Europe. However, where detailed national legislation or law enforcement practice (property rights protection, business regulations and corruption) are decisive, Central Europe as a whole and Poland in particular, are definitely far behind the West. On the other hand, the region compares favourably in terms of government spending, although it should be noted that Poland has much bigger problems, than, for example, Estonia, when it comes to keeping it under control, which results, among others, in a higher budget deficit and a lower investment rate at an aggregate level. The Heritage Foundation economic freedom ranking also suggests that Poland differs from Northern Europe when it comes to labour market regulations, which resemble a dysfunctional Italy much more than European leaders such as Denmark, Austria or the neighbouring Czech Republic.

Poland ranks much better in a less detailed economic freedom ranking developed by Fraser Institute, whose publication was terminated in 2012, but which, due to a long data series, is still used in empirical studies. Basically, the quality of public services is the only aspect that makes us different from Western European countries in this ranking. The Government Competitiveness Index created in 2014, examining the effectiveness of public activity in the issues most significant for the quality of life of the citizens, might be helpful in determining the reasons for that. It shows that Polish public institutions in comparison with Western European countries stand out negatively when it comes to effectiveness and quality of their functioning in many key areas [Figure I.11]. A particularly large gap may be indicated in the activities supporting economic entities’ investment in ICT technologies, innovation development support by means of encouraging investment in R&D, and in the health care and social protection quality. The average level of effectiveness of the Polish public sector ranks somewhere around the average for the Central and Eastern European countries. A low level of government support or low effectiveness of government spending on many issues significant for the society seems to be a common feature for young democracies. Only in the field of education and support for agriculture Poland stands out positively not only in comparison with the countries of the region but also with respect to Western Europe. A high rating for public policy in those two fields is not however sufficient to reach even the average rating of the public institutions quality. Taking into consideration all of the components of the Government Competitiveness Index Poland ranks at a distant 30th place (after Hungary) among 34 OECD countries being subject to the rating.

**TABLE I.6. Poland in popular rankings of institutions quality**

<table>
<thead>
<tr>
<th>Area</th>
<th>Indicator</th>
<th>Value for Poland</th>
<th>Value for the leader</th>
<th>Percentile</th>
<th>Percentile in the first study</th>
<th>Number of deviations from the leader</th>
<th>Number of countries included in the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic freedom</td>
<td>Economic Freedom of the World 2012</td>
<td>7.3</td>
<td>9</td>
<td>68</td>
<td>10 (1985)</td>
<td>2.0</td>
<td>152</td>
</tr>
<tr>
<td></td>
<td>Index of Economic Freedom 2015</td>
<td>68.6</td>
<td>89.6</td>
<td>76</td>
<td>57.9 (1995)</td>
<td>1.9</td>
<td>178</td>
</tr>
<tr>
<td>Economic competitiveness</td>
<td>The Global Competitiveness Report 2014</td>
<td>4.5</td>
<td>5.7</td>
<td>70</td>
<td>55.9 (2003)</td>
<td>1.8</td>
<td>144</td>
</tr>
<tr>
<td>Conditions for innovation</td>
<td>Global Innovation Index 2014</td>
<td>40.6</td>
<td>64.8</td>
<td>69</td>
<td>68.8 (2012)</td>
<td>2.1</td>
<td>143</td>
</tr>
<tr>
<td>Corruption</td>
<td>Corruption Perceptions Index 2014</td>
<td>61</td>
<td>92</td>
<td>80</td>
<td>55.6 (1995)</td>
<td>1.6</td>
<td>174</td>
</tr>
<tr>
<td>Development of democracy</td>
<td>Democracy Index 2014</td>
<td>7.5</td>
<td>9.9</td>
<td>76</td>
<td>58.9 (2006)</td>
<td>1.1</td>
<td>167</td>
</tr>
<tr>
<td>Effectiveness of government expenditure</td>
<td>The Government Competitiveness Ranking 2014</td>
<td>0.47</td>
<td>0.84</td>
<td>33</td>
<td>33.3 (2014)</td>
<td>2.9</td>
<td>93</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on the data from Fraser Institute, The Heritage Foundation, World Bank, The World Economic Forum, World Intellectual Property Organization, Transparency International, Economist Intelligence Unit, Center for Government Competitiveness
Even though institutional shortfalls of Central European countries distinguish the region negatively in comparison with Western Europe, there has been an undeniable improvement in the condition of the business institutional environment over the last decade. Poland’s promotion in many of the above-mentioned rankings is particularly worth noting. Still in 2005-2007 the position of Poland in the economic freedom ranking qualified it as one of the “mostly unfree” countries, however, after 2009, there was a rapid increase in the index value, which resulted in a promotion of 40 places up the ranking and joining the group of “moderately free” countries from the point of view of the economy. A similar improvement of Poland’s position also took place in the World Bank Doing Business ranking. These measurements – although far from perfect – illustrate an important aspect of the institutional theory of economic growth, according to which the shaping of good regulations and standards for the functioning of public institutions is a process in which the current condition of economy, society and institutions, determines to a great extent their future condition. External factors – such as accession to the European Union and acquis communautaire adaptation to the national legal order – may accelerate the institutional convergence of Central Europe and Poland with the countries of the West, however, not to 100%. Local legal traditions, the ability of administration to absorb the best solutions from most developed countries, political class quality or citizens’ expectations may accelerate or hamper the process of institutional convergence. Thus, it is hardly surprising that despite 10 years’ membership in the EU, the quality of economic regulations in Poland and other countries in the region, as well as the actual operation of public institutions still shows a large area for improvement. Indicators applied most often, used for the measurement of economic and political institutions quality, listed in Table I.6., should be treated as general guidance facilitating the identification of the areas of relative institutional deficits of the respective countries, rather than as a detailed diagnosis of their legal or organisational nature.

The forming and changing of economic institutions is a very complex process, which should be looked at more closely (Diagram I.4.). In society, we constantly observe some distribution of resources and some sort of political institutions. The latter determine the de iure power – a legal and systemic ability to trigger certain behaviours in the society. De iure power, although important, does not however exhaust the whole scope of the power exercised in the society. Because there is also a de facto power associated with controlled resources and pure physical strength. Only on the combined ground of de iure and de facto political power, economic institutions and future political institutions show up. In other words, the groups that exercise actual power have critical influence not only on the current shape of economic rules, but also on the form of formal rules for exercising of political power. On the other hand, the shape of economic institutions determines both the current economic conditions as well as the future resources distribution. According to Acemoglu and Robinson, economic institutions are thus dependent on political institutions. Those, in turn, change as a result of impact of the main egzogenic element of the model – de facto political power. In other words, political institutions are created based on social interactions. The increase in the impact of a given group leads to a situation where it reaches for political power, which is later sealed by the change in constitutional principles and reconstruction of economic institutions. A new power can be maintained, if there are appropriate resources and de iure power – however, relying only on the de facto power is usually only short-term.

**Diagram I.4. Evolution of economic and political institutions**

Source: Acemoglu et al., 2005
A very enlightening – from the perspective of Central Europe and Poland – example of dynamics discussed by the proponents of institutional economy, seems to be the history of Greece over the last forty years. Over several years after the fall of the regime of the black colonels in 1974, Greece managed to build a liberal and pluralistic political system. The government of Konstandinos Karamanlis called back from emigration brought the stabilisation of political arena and at the same time set forth courageous reforms liberalising the economy, as a result of which Greece managed to maintain the GDP growth supported by the productivity growth also during the 1970s, which were quite difficult for most of the countries (Figure I.12). The Pro-Western political and economic course had already resulted in January 1981 – before Spain and Portugal – in joining European Economic Area. This period was to a great extent the sign for similar transformations that reached Central Europe (including Poland) between 1989-2004. Inclusive economic institutions newly established in Greece proved to be insufficiently well grounded. There were no social groups interested in their existence and improvement. Immediately after joining the EEA there was another event that changed the dynamics of the institutions in this country for a long time. In October 1981, Andreas Papandreou, using the slogan of change, won the elections. A populist politician that took power for another eight years, to a large extent wasted the reform effort of Karamanlis' government. Even though many of the most radical promises from the first election campaign were not fulfilled (including withdrawal of Greece from NATO and EEA), those that he managed to perform were enough to break the fragile institutional order.

Over subsequent years, pensions, minimal wage and unemployment benefits were significantly increased, salary and benefits indexation were introduced and employment protection was expanded. There were also subsidies for different areas of the economy, e.g., family tourist businesses. At the same time the fees for health care and tuition payments at the universities, the management of which was partly given to the students, were cut. Such actions, as new institutional economics would have predicted, distorted the structure of economic stimuli in Greece, changing the behaviour of respective persons and companies, which in a short time translated into an economic slowdown (Figure I.12), drop in the economic freedom index and unprecedented, at least as at that time, increase in public debt (Figure I.13). However, growing public debt enabled Papandreou's government to successfully finance the short-term expectations of its voters. That ensured a resounding victory in the 1985 elections. Papandreou lost power only four years later as a result of a corruption scandal but only for a very short time, as in 1993 he regained it. The opposition party – New Democracy, had learned a lesson from subsequent election failures and prevailing popular support for Papandreou's party (PASOK). They understood, that the populism of the Prime Minister in office can be tackled only with the use of his own weapon – specific material promises directed at the people from many social groups. As a result, on a wave of competition of the two main political groups, numerous interest groups formed in Greece. They supported one or the other political party which then rewarded them with financial benefits and other intangible privileges detrimental to the economic prosperity of the whole society. Obtaining those privileges would not be possible if not for the omnipresent regulations created by the politicians to discourage competition from entering the market and to fulfil the promises given to the stakeholders.

On the other hand, those politicians who were not keen on cooperating with these groups but were willing to break the existing status quo, were usually severely punished at the ballot box (Pappas 2013). A number of small, although well-organised groups, from notaries, lawyers, trade unionists, to lorry drivers or workers of maritime ports, could easily count on obtaining benefits in the form of tax credits, additional remunerations, protection from dismissal or closing the access to a given profession. All of this of course in return for the support of the ruling group. Those siding with the opposition party could reasonably count on being abundantly rewarded after it came to power.

**FIGURE I.12. GDP per capita and productivity in Greece after 1974**

![GDP per capita and productivity in Greece after 1974](image)

Source: Own elaboration based on GGDC data

**FIGURE I.13. Public debt and economic freedom in Greece from 1980**

![Public debt and economic freedom in Greece from 1980](image)

Source: Own elaboration based on Heritage Foundation, Fraser Institute and IMF data
Ironically, Greek interest groups benefited a lot from being small. There were not many so-called free-riders, who could undermine the operational program of a given group or only to a minor extent support it in achieving the set goal. This goal was mainly to get or defend new privileges and easily achieved income, even at the cost of many hours spent on creating alliances and understandings with politicians. At some point many Greeks abstained from starting any job that was not dependent on the agreement with the authorities, perceiving them as not sufficiently financially attractive. A peculiar dualism in the labor market occurred—the division into the privileged posts and less attractive, purely market ones. Thus, it became reasonable to devote one’s own time and effort to influence the profitable, from the point of view of a given group, administrative or political decisions. Those were in turn characterised by less and less transparency and bigger scope of engagement of the state, both in the labor market and economy as a whole (Theocharis and van Deth 2013). Along with the annually decreasing quality of the legislative process not many years passed before the privileges began to be obtained due to the corruption common throughout the country, and Greece became the most corrupt country among all of the European Union members (Mitsopoulos and Pagonidis 2007). Due to its unofficial nature (e.g., no organisational form) Greek groups of interest did not fear the consequences of their practices, especially that they had an informal consent from the authorities, which for example regularly granted tax amnesties and turned a blind eye to illegal construction of buildings on public land.

Political institutions in Greece at the beginning of the 1980s changed easily, because they had no proper formal or actual legitimacy, and no de facto strong power stood behind them. Economic competitiveness was not defended by the constitution, nor was it recorded in the voters’ minds critically perceiving, for example, the economic inequalities and entrepreneurs as such. Structural funds did not help to see the connection between the conducted policy and long-term economic growth. Later the drop in the actual interest rates obtained owing to the country’s accession to the Eurozone and credit expansion connected with it caused a consumption bubble lasting several years (Bitner and Bukowski 2015). Structural funds and euro adoption temporarily increased economic indicators and the comfort of life in a manner detached from institutional foundations. The corruption, exploitation of the state by interest groups, and ineffectiveness of the Greek economy progressed year by year, and the comfort of life in a manner detached from institutional foundations. At some point many Greeks abstained from starting any job that was not dependent on the agreement with the authorities, perceiving them as not sufficiently financially attractive. A peculiar dualism in the labor market occurred—the division into the privileged posts and less attractive, purely market ones. Thus, it became reasonable to devote one’s own time and effort to influence the profitable, from the point of view of a given group, administrative or political decisions. Those were in turn characterised by less and less transparency and bigger scope of engagement of the state, both in the labor market and economy as a whole (Theocharis and van Deth 2013). Along with the annually decreasing quality of the legislative process not many years passed before the privileges began to be obtained due to the corruption common throughout the country, and Greece became the most corrupt country among all of the European Union members (Mitsopoulos and Pagonidis 2007). Due to its unofficial nature (e.g., no organisational form) Greek groups of interest did not fear the consequences of their practices, especially that they had an informal consent from the authorities, which for example regularly granted tax amnesties and turned a blind eye to illegal construction of buildings on public land.

From the perspective of Central Europe, the Greek experience is instructive mainly because it shows that even in a reforming and fast developing country a temptation of early consumption of the fruits of growth and deficit-financed populist politics might win over, in the long-run, public good. What is more, the inertia of the economic processes results in the fact that both positive and negative changes of the institutional framework are not usually reflected immediately in the economic outcome on a macro scale. Verification of the negative effects of political populism by economic reality is postponed, which makes self-regulation through democratic mechanism less effective in its blocking. The example of Greece has shown that it happens because the populist politicians may create a network of dependencies cross-penetrating many social groups and economic spheres, and thus hampering any attempt to stop the adverse evolution of the whole institutional system at its early stage.

### 2.2. TECHNOLOGICAL LEAP THEORY

Institutional theory of growth explains the low economic growth in the countries trapped in the snares of extractive institutions. It is hard to question its main thesis—the economic growth in its gist is a realisation of an unconstrained human creativity embodied in an economic sphere, and it cannot function if the environment is particularly adverse. However, in three areas related to the economic growth an institutional theory may seem insufficient. Firstly, it does not provide practical guidelines on how to change the prevailing rules beyond the general instruction to imitate the countries with the best institutions. Secondly, it does not focus sufficiently on the situation of developing countries which, due to the use of modern technologies, do not have to follow the path of the developed countries. Thirdly, institutional theory does not properly explain why the countries with a similar institutional level significantly differ when it comes to economic growth. The technological leap theory attempts to address these three issues.

Its representatives point out that in the world in which industrial revolution has already taken place and enabled many countries to get out of the Malthusian trap, economic growth is not based on a single pillar but on two pillars (Rodrik 2014). The first one is formed by the above-discussed institutional foundations enabling efficient functioning of market economy. The second one is a technological leap consisting in the reallocation of the workforce from poorly productive agriculture, crafts, and informal economy to other, more productive sectors. This way of thinking is attractive for emerging economies at different development levels—those potentially still at risk of the poverty trap and those threatened by the middle-income trap. A technological leap may be helpful to both a country which is still forming the foundations of its own industry and services as well as a country, which like Poland, already has its industrial culture and relatively developed services sector, which are nevertheless more technologically backward in comparison with the countries of the technological frontier and which still co-exist with a big farming sector employing a dozen or so percent of all the workers.
What is important, is a technological leap may – as a rule – happen even in a situation when a given country does not have optimal institutions. In such a case the ultimate effects of the reallocation process will probably be worse than in the imitated country, however, the pace of progress will still be very big. The industrialisation that occurred in the USSR between 1930-1960 in particularly adverse institutional conditions of the communist economy and Stalinist terror reflects this way of thinking in its extreme (Part II). The imitation of the Western technological concept combined with the mandatory reallocation of the partially involuntary workforce led to a significant growth of the industrial potential of the Soviet Union, and finally to the enhancement of the living standard of an average USSR citizen on a scale still notably smaller than in the West, but definitely exceeding the capabilities of the agrarian economies. The paths of the technological leap as part of the centrally planned economy model was taken by socialist countries of Central and Eastern Europe, including Poland, between 1944-1989. Under market economy conditions, a similar path was followed by the Asian tigers, in the case of which an essential component of changes was still also the institutional reforms and investments in innovation. Technological leap attempts can be found in many countries of South America and Africa, as well as in India or Indochina. The majority of those attempts failed, as a result of which simple correlations between the GDP level and growth rates are not noticeable in a wide data set (Rodrik 2011a).

Easterly (2005) shows that the lack of material convergence is maintained, even if we control the variables responsible for macroeconomic policy. In fact, in a sample of 123 countries of the world, one can talk about nothing more than a very weak correlation between the GDP per capita relative to the USA and the growth rate. This correlation though, explains only 2.5% of the GDP growth rate volatility over the last six and a half decades (Figure I.14.). What is worse, if we exclude the countries that in 1950 had a GDP exceeding half that of the USA, it would be impossible to prove even a weak convergence. On the other hand, a statistically and economically significant convergence may be observed within OECD countries (Figure I.15.), which makes us suspect that this phenomenon is dependent on the fulfilment of a number of conditions. In addition to the standard causes of a lack of convergence provided by institutional economics such as: overregulation of economy, bureaucratisation, excessively high taxes, corruption, strict labour law, financial repression, uncertainty of the property rights, difficulties in enforcing the contracts and economic instability, Rodrik (2014) lists another two. Firstly, reforms aimed at removing the above-mentioned obstacles are deprived of deeper social roots and in fact do not introduce changes that are meant to be introduced, even if they arise from legal regulations. Second, the weakness of market institutions aggravates market failures, which become too difficult for the private sector to overcome. Those are mainly coordination and demonstration failures.

The first of those result from the fact that the profitability of some of the economic processes, especially those being technologically advanced, requires long production chains and thus, many enterprises operating simultaneously. The construction of a single industrial plant in a given country will often not be profitable, if it does not find local suppliers and customers, and properly qualified staff. Thus, entrepreneurs are not willing to invest in the sectors which have not been functioning yet in the country. This problem is superimposed by the demonstration failure stemming from the fact that the total benefit of the first investment is to a large extent public and potential losses are solely private. Starting a business activity in the underdeveloped sector is a high risk, but it brings potentially large benefits to the economy connected with signalling to other entrepreneurs the possibility to obtain profit and workforce training (learning by doing), etc. Bukowski et al. (2014) emphasises that a different estimation of coordination and demonstration problems may be the cause of the diverse success of Central European countries in encouraging foreign investments. Those that managed to attract the sectors of a given type (e.g. automotive industry) have an advantage in encouraging subsequent investments in a given sector. Over a long period of time, this leads to geographic clustering of respective industrial and services sectors, which may potentially translate into diversification of macroeconomic consequences, including the level of relative prosperity.
The proponents of the technological leap theory claim that instead of focusing on the enhancement of institutions, which in the face of multidimensional social, political and economic underdevelopment is a Sisyphean task, it is necessary to remove the key barriers to technological convergence, and only afterwards, when economic growth accelerates, deal with the improvement of institutions. Their main argument is sectoral convergence. As Rodrik (2012) argues, a strong unconditional convergence can be observed at the sector level – a correlation between the productivity level and its growth rate is clearer than when calculated for the whole economy. What is more, it occurs also in relatively unsupportive institutional circumstances. The fact that certain countries stop on the path to prosperity, even though the companies operating in these countries reduced to a large extent the sectoral productivity gap, arises from insufficient development of naturally productive sectors in emerging economies and the inability to raise the efficiency in remaining sectors, including also (Figure I.16.) the failure to fully reallocate labour resources from agriculture to industry and productive services.

Thus, Sectoral convergence does not mean that good institutions are not capable of accelerating the economic growth on a macro scale, but that the fast economic growth in a relatively poor country may be started despite its institutional drawbacks. And those, as Rodrik claims, may be addressed later on, when the economic and political strength of social groups most interested in the reinforcement of market economy increases. One of the many conditions for the technological leap to succeed, is directing the resources from agriculture to industry and productive services. Although this sector produces very diverse goods, the question of how a given product should look like may be initially answered thanks to developed imports and then finally verified through exports. Since it is the customers who ultimately decide on the efficiency of the industrial processing – the more willing they are to purchase a given product, the easier it is to achieve a large scale production and to lower unit costs.

And beyond it internationally, USD 2013

Source: Own elaboration based on WDI data. Each country has two points corresponding to labour productivity in agriculture and beyond it.

Those results, obtained from the panel regression model with fixed effects and decade effects control, may be explained in the following manner. The sectors with best defined product and demanding customers – most often foreign ones, are the ones that converge most easily. Raw materials and agricultural products and media are to a large extent homogeneous goods (this trait is also shared by transportation and telecommunications), as a result of which it is easy to assess the result of the process of their production and to apply the best available technology. A similar situation occurs with respect to industrial processing. Although this sector produces very diverse goods, the question of how a given product should look like may be initially answered thanks to developed imports and then finally verified through exports. Since it is the customers who ultimately decide on the efficiency of the industrial processing – the more willing they are to purchase a given product, the easier it is to achieve a large scale production and to lower unit costs.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Average annual productivity growth over a decade (domestic currency in prices of 2005)</th>
<th>Current position of Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>5.6%</td>
<td>0%</td>
</tr>
<tr>
<td>Other sectors</td>
<td>5.2%</td>
<td>20%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>6.1%</td>
<td>60%</td>
</tr>
<tr>
<td>Trade, restaurants and hotels</td>
<td>4.9%</td>
<td>80%</td>
</tr>
<tr>
<td>Community and personal services</td>
<td>4.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>5.6%</td>
<td>0%</td>
</tr>
<tr>
<td>Transport, storage and communication</td>
<td>5.2%</td>
<td>20%</td>
</tr>
<tr>
<td>Trade, restaurants and hotels</td>
<td>6.1%</td>
<td>60%</td>
</tr>
<tr>
<td>Community and personal services</td>
<td>4.9%</td>
<td>80%</td>
</tr>
<tr>
<td>Construction</td>
<td>4.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Own elaboration with the use of econometric model estimated based on the GGDC data.

2 The estimation technique used was a panel regression with permanent effects and effects for decades examining the correlation between the productivity growth in a given sector and a productivity of the whole economy (measured in comparison with the USA).
At the same time, the more demanding the customers are, the stronger the pressure which is exerted upon the producers in the area of product innovation and quality improvement. Such easily replicable product designs or on-hand demanding customers from the developed countries are scarce in case of other sectors, especially services. Foreign competitors in the sectors of trade and recreation, construction or social and personal services are also much weaker, and usually there is no possibility to export products and services. A similar situation occurs in the public and financial sector and – until recently, it has been the case with business services (Part III), which is still reflected in the efficiency of the sector.

Since sectors which under quick and natural convergence are the same in particular countries, the differences in their economic growth must to a large extent stem from inappropriate allocation of workforce between them and the sectors, in which there is no such natural convergence. Productivity growth in sectors quickly raising their productivity is not translated in employment growth in those sectors, unless the volume of their production does grow sufficiently fast, e.g. as a consequence of sales into foreign markets. In many countries caught in the low or middle income trap, the companies from developing sectors increased their physical capital and restructured by shrinking their workforce. However, their former employees go to social and personal services sectors that are less productive and incapable of efficiency growth due to institutional barriers. Rodrik (2011a) argues that this is exactly the reason for the slow growth in the countries of South America. Their industry becomes more and more modern, however, it still remains too small in comparison with the total economy to significantly increase overall prosperity. In his analysis, a central role is played by industrial processing, which is confirmed also by the analysis of relations between economic growth and industrialisation presented in Part II. The remaining sectors, indicated by Figure I.16, as characterised by fast convergence, do not fit in the role of a “lift” pulling the whole economy. The mining sector depends on supply factors (natural resource deposits), whereas utility providers and agricultural farms quickly hit the barrier of internal demand resulting in the growth of their productivity being almost always accompanied by the drop in employment. On the other hand, the transportation sector develops only if there are goods to carry, so it is dependent on industrial processing, unless specific geographical conditions of the given countries enable its specialisation in that sector – Poland and Greece could both be examples here.

The situation in China may display the advantages and drawbacks of growth based on a technological leap. Economic growth has been maintained there since 1978 at an average level of almost 10%, owing to which more than 600 million people managed to get out of poverty and the country managed to get promoted to second position in the category of the biggest world economies. If they managed to maintain such a rate, then at the beginning of the next decade China shall be granted, according to the World Bank Classification, the status of “developed country”. High growth between 1978-2014 was obtained by the Middle Kingdom, despite an adverse institutional environment. Because there are still no basic economic institutions such as land property rights, and a large part of the economy, including the financial sector, is still state-owned, or de facto controlled by the members of the Communist Party of China. According to a technological leap theory, deep institutional reforms were not needed at all to start the process of convergence in the Chinese economy, for years trapped in Maoist dogmas.

3 Such a high growth rate is questionable (Wu 2014a). Inappropriate use of price indices by Chinese statisticians is pointed out here among other issues. Wu (2014a) estimates that between 1978-2012 China developed at a 7.2% annual rate, and not 9.8% as was stated by the authorities. Even if this revision is well-grounded, Chinese growth over the last three decades still is one of the highest in history.
Reforms started in 1978 were relatively limited and introduced gradually. China was opened to the export markets and enabled the freedom of economic activity in agreement with authorities and the party, and a peculiar, although limited privatisation was carried out. As Rodrik (2011b) argues: "Ownership in Township and Village Enterprises was typically held by local governments, but private entrepreneurs were effectively partners with the government. (...) Private entrepreneurs felt secure not because the government was prevented from expropriating them, but because, sharing in the profits, it had no interest to expropriate them." According to the author, such solution was more effective in Chinese conditions than normal privatisation, because it linked economic interests of entrepreneurs and the authorities, as a result of which the latter one hampered the economic activity to a lesser degree than it would happen if a private entrepreneur relied on a defective and corrupt law enforcement system. In this sense, China drew conclusions from the previous, failed attempt to reallocate the resources from agriculture into the industry, i.e., the Great Leap Forward between 1958-1962 (Figure I.18.). This coercive Beijing-controlled project performed according to the logic of a centrally-planned economy failed completely. Employment in agriculture actually dropped, but only for a short period of time, because simultaneously, there was a dramatic decrease of productivity (Figure I.19.), which returned to the level of 1957 only in the 1920s. As a result, hunger erupted and the whole operation had to be reversed.

The situation was different in 1978. Owing to the limited but continuously introduced changes, a 13 times productivity growth occurred in manufacturing in 2010. This fact combined with reallocation of workforce from agriculture to industry is directly responsible for one third of the spectacular economic growth of China over the last 35 years. Pettis (2014) divides the period of economic development of China after 1978 into three stages. The initial stage was the First Liberalisation (1978-1989) that took place and lasted up until the demonstrations in the Tiananmen Square were bloodily repressed. After this event, Chinese authorities, also drawing conclusions from the course of political processes in the USSR and Central Europe, decided to stop and even withdraw some of the economic reforms fearing the loss of political power. Instead of continuing the reforms, a large program of infrastructural investments was implemented, which was indicative of the so called Gerschenkron Era (1990-2000). Within this period there was a significant improvement in the quality of infrastructure constituting beforehand a material limitation to growth. However, later on, it also reached its limit, so it was necessary to work on something new. Instead of deepening regulatory reforms and privatisation of ineffective state enterprises, the government, and the banking system it controlled, decided to further expand the scale of investment activity. And that is how the third stage, namely, the Overinvestment (2001-2014) started. China came back to the path of high growth, but at the price of increasing the share of investment in GDP (Figure I.20.), notably above the standards and values known not only from Europe and USA, but also from the experience of the countries that underwent intensive industrialisation earlier or simultaneously with China (including Poland). The decision to use the investment growth as a basis for the economic growth aggravated the macro- and microeconomic imbalances.

Firstly, the high share of investments accompanying stable government spending (Figure I.21.) had to lead to a drop in the share of private consumption (Figure I.22.) in GDP growth. In the long run, private consumption is the only guarantee that produced goods meet the needs of citizens, which means that they will be purchased probably in the future as well. The investments undertaken at present have a share in the GDP, but it is not their ultimate goal. For future income to grow, someone has to be interested in the goods manufactured as a result of those investments. For some time those might be the enterprises acquiring the products created as a result of previous investments to build new ones. However, in the end, it is the consumer that has to decide to buy, or not, the final product.

4 This name refers to American economist of Russian origin – Alexander Gerschenkron, who instructed (1962) poorly developed economies to make great savings directed at the investments in infrastructure.
The longer the economy develops on the base of expected preferences instead of the actual, real consumers’ preferences, the more fragile are the constructed value chains. Another example here would be socialist countries of Central and Easter Europe (including Poland), the economies of which were to a large extent directed at creating investment goods and not consumer goods. The implementation of rules of the market economy in those countries painfully verified the choices of central planners – consumers declined to buy a large part of manufactured goods, which, at the beginning of the 1990s, led to a recession in the whole region lasting from two (Poland) up to even ten years (Russia). A high share of investments in GDP practically guarantees a multitude of allocation errors. A high availability of capital results in its use for the purpose of satisfying consumer needs that are more and more uncertain and more and more distant in time. Postponing the verification of investments also increases the percentage of bad investments, because it leads to a duplication of projects.

Secondly, in Chinese circumstances – just as in the Eastern bloc in the years preceding the transformation – there is still the problem of central planning. Planners deciding on the investment policy of state companies and agencies do not have as much knowledge concerning consumer needs as private entrepreneurs. Their work is often only aimed at keeping their positions, which is most easily done by just planning such an amount of investment to reach an annual economic growth rate level set by the political party. The quality and future profitability of the planned projects remains less important. As a result, according to Dollar and Wei (2007), in China, approximately one third of the funds earmarked for investments is wasted.

Thirdly, new infrastructure projects and boom on the real property market were financed mainly with the use of loans granted to state enterprises on favourable terms. The level of interest rates in China has not matched the nominal economic growth rate for years (Figure I.24.). Such strategy, even though having a reviving effect on the level of investments financed by loans in the short term, may result in a significant increase in the debt burden in over a longer perspective. This was clearly visible after 2007, when the global economy slowdown reached China. In 2009, the total debt increased from 165% GDP to 205%, and the nominal debt in dollars quadrupled between 2007-2014. Even though the public debt remains at a safe (but not low) level, the debt of enterprises exceeds the values observed for most of the developed countries, including those in Central Europe (Figure I.25.). In the face of lower quality of financial intermediation than in the EU and USA and politicisation of banks, the loans that are de facto nonperforming, constitute probably percentage large chunk of the whole portfolio, which intensifies the accumulation of risks in the Chinese financial system.

A strong positive trade balance maintained for the last twenty years in China is an important sign of inefficiency of the Chinese economy and the fact that it is not targeted at meeting the needs of the society is (Figure I.23.). It coexists with the inflow of foreign capital, which is natural for a poorly developed country. China would not even be close to a “global factory” without foreign investments. In 2001, the share of foreign enterprises in China’s exports exceeded 50% for the first time and still remains at a similar or higher level (Financial Times 2012); so it is only slightly lower than in Poland (60%). With the inflow of foreign capital, maintaining an export surplus is nevertheless possible, but at the cost of manipulating the yuan exchange rate by purchasing dollars by the People’s Bank of China, a side effect of which is the accumulation of 3.8 trillion of dollars in currency reserves by June 2015. The policy of subsidising exports aims at enabling domestic companies and workers to learn about modern solutions through exposure to foreign consumers. But in such a big country as China it quickly loses its sense. As opposed to much smaller countries such as Ireland, Czech Republic or Poland, China may not rely on the assumption that the growth of export volume itself will ensure reaching the industrialisation level of the developed countries. In their case, maintaining the volume of export at such a high level (23% of GDP in 2014, while the not much smaller Japanese economy reached 16% and slightly bigger one – USA - 13.5%) resulted in a global market share as big as Japan’s in the 1990s., when it ran into a demand barrier for their products.
2.3. INNOVATIVE GROWTH THEORY

Technological leap theory clearly explains the fast growth in the countries with low or middle income, however, it is tacit on the subject of growth in highly developed countries, which already underwent the construction of elementary market institutions and intersectoral reallocation. Thus it is to a lesser extent suitable for highlighting the problem of the middle income trap, understood as a set of development difficulties occurring in Central European countries which stand between middle and high income zones. The truth is that some of them, like Poland, have a certain reallocation reserve which was more than twice as low as in 1990, when one fourth of 11.5% of the total workforce (in comparison with ca. 1% in Germany), but it was more than twice as low as in 1990, when one fourth of the working population was employed in agriculture, nevertheless, its potential is significantly lower than at the beginning of transformation, because a material part of the technological leap defined in such a manner has already occurred. For example, according to OECD, in 2014, the employment in agriculture in Poland was at the level of 11.5% of the total workforce (in comparison with ca. 1% in Germany), but it was more than twice as low as in 1990, when one fourth of the working population was employed in the first sector mentioned. For the countries being at the same development level as Poland, a potential growth of GDP per capita that would result from moving people from the first sector to the second and third sector is notably smaller than the sectoral productivity gap in comparison with fully developed countries. Nevertheless, if the employment in agriculture could be lowered to 1.5% over the next two decades, then, based on a careful assumption that the reallocated workers will be as productive as the employees now hired in sectors other than agriculture, and the productivity in agriculture would not grow as a result of these changes, this would give us economic growth higher by 0.4 pp annually and GDP higher by 8%.

A theory of growth focusing on intrasectoral productivity growth and economy innovation rather than intersectoral transformation is supplementary to the technological leap concept. Its main observation is that the optimal development strategy is dependent on the distance to the technological frontier.
The countries separated by a very large gap from the most developed countries may apply the imitation model. They can both introduce changes of the sectoral structure like in the case of the technological leap, and gradually engage in technological changes within respective sectors, by carrying out organisational adaptations and transformations in the technology park, making them similar to imitated models of more developed countries. Imitation model enables emerging economies to achieve fast economic growth, sometimes over several decades. However, relatively simple factors lay at its roots (e.g. collapse of communism, reallocation of the labour resources from agriculture to industry and services, transfer of know-how and technologies by means of direct foreign investments, increased competition owing to openness to trade, etc.). They enable the development of products of advanced technology, placed in the middle of the value chain, provided that the institutional conditions are moderately favourable. As the country approaches the global technological border, the impact of these factors decreases, and the space for imitation is shrinking as well.

The companies operating in the developed countries protect their own competitive edge against their immediate competitors from emerging economies by limiting their access to the market and the latest technologies. Maintaining the current growth rate in a country where the productivity gap drops to 20-30% requires reconstruction of its own development model and its transformation into a model based on innovations (Aghion, Howitt 2005; Acemoglu et al. 2006). This translates into lesser dependence on physical investments, shorter relations between companies, younger companies in the market, more competitive business models and greater quality selection among enterprises and managers (Acemoglu et al. 2006). The change of the imitation model into an innovative one is also associated with overcoming once again the coordination and demonstration failures, however, this time not in relation to whole non-agricultural economy, but solely in the sectors that are most advanced technologically. In other words, an averagely developed economy more or less at the development level of Poland, Slovakia or Czech Republic nowadays, has to – if it wants to join the group of developed countries – begin building the manufacturing potential in the most productive sectors of the global economy. These changes are often associated with breaking of the existing status quo (among other things, halting the support in those fields that were indicative of the economic strength in the past, but which start to become a burden at higher stages of development, withdrawal of counterproductive privileges of selected professional and social groups, etc.)

Therefore, the basic mechanism of avoiding or leaving the middle income trap pointed out by the innovative growth theory is the construction of a diverse economy with innovative industry and developed sector of knowledge-based services. However, this process has just barely started in Central Europe and the public statistics data indicate fundamental deficits of the region in the field of innovations. Poland looks particularly poor in this respect. In the Innovation Union Scoreboard 2015 ranking prepared by European Commission, Poland ranked close to the bottom (24th place out of 28), being clearly behind the Czech Republic (14th place), Hungary (20th place) and Slovakia (22nd place). Among 25 composite indices, the above average was obtained only in the case of education and spending on innovations other than R&D (Figure I.26.). Basically, only a few areas of Polish innovation have reported improvement in the recent years (among others, the registration of industrial pattern in the EU and exports of mid-high technologies). Meanwhile, in many areas affected by deficit, a regress was observed (e.g. research and development cooperation, venture capital). Over the past eight years Poland has improved its innovativeness only slightly, and the positive changes taking place in other countries of the region resulted in the worsening of its relative position.

5 A situation where governmental regulations hamper the change of the development model based on investments into the one based on innovations came to be called a convergence trap, and when the interest groups block the change of regulations, we talk about the political economy trap (Acemoglu et al. 2006).
Low innovation of the Polish economy is to a large extent determined by limited investments in this area – both public and private – and its unfavourable structure. In 2013, spending on research and development activities in Poland amounted to 0.87% of GDP, that is less than half of the EU-28 average (2.01%). The fact that the public sector is still both the main founder and manager of R&D activities (1st place in 28 and 30 countries respectively) is an exceptional feature of the Polish economy. Significant involvement of the state in the process of building the innovation system in Poland is admittedly characteristic for many countries at the development level similar to Poland – including those that are nowadays perceived as innovative (Finland in the 1980s, Israel in the 1990s) – but even from this perspective, it is still relatively high (Figure I.27). This alarmingly resembles the situation in Portugal, which only recently has begun to recover from stagnation in that field, which lasted for thirty years. Moreover, (Table I.7) the government sector in Poland provides more funding for R&D activities conducted in its own centres than it is the case in the EU. At the same, it offers limited financing for such activities undertaken at universities, which are underfinanced. Foreign funds available in Poland reach mainly government sector entities and higher education institutions, which differs from the European model, where they are transferred to a much greater extent to the companies. Polish enterprises, on the other hand, usually show much lower innovation activity than their counterparts in Western Europe.

![FIGURE I.27. Financing structure of R&D expenditure](image)

Source: Own elaboration based on OECD data

### TABLE I.7. R&D expenditure structure according to the origin of funds and sector conducting the research in Poland (left panel – 2013) and in EU-28 (right panel – 2012)

<table>
<thead>
<tr>
<th>Financing</th>
<th>Implementation</th>
<th>Companies</th>
<th>Government</th>
<th>Universities</th>
<th>NGO</th>
<th>Foreign fin.</th>
<th>Total financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies</td>
<td>35,3%</td>
<td>4,3%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>4,0%</td>
<td>43,6%</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>1,2%</td>
<td>21,6%</td>
<td>0,1%</td>
<td>0,0%</td>
<td>4,0%</td>
<td>27,0%</td>
<td></td>
</tr>
<tr>
<td>Universities</td>
<td>0,9%</td>
<td>21,3%</td>
<td>2,0%</td>
<td>0,0%</td>
<td>5,0%</td>
<td>29,2%</td>
<td></td>
</tr>
<tr>
<td>NGO</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,1%</td>
<td>0,1%</td>
<td>0,2%</td>
<td></td>
</tr>
<tr>
<td>Total implementation</td>
<td>37,4%</td>
<td>47,3%</td>
<td>2,1%</td>
<td>0,1%</td>
<td>13,1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration based on Eurostat data
What is the reason for such limited interest of Polish companies in innovations? According to Hoelzl and Friesenbichler (2010) fast developing enterprises based in countries lying close to the technological border invest in innovations or R&D, whereas authors did not find any significant differences with respect to innovative activities among companies in less developed countries. This research conducted in sixteen EU countries suggests that in more technology backward countries the enterprises have permanently smaller motivation for innovations, at the root of which insufficent deregulation and decentralisation usually can be found (Mahmood and Rufin 2005), as well as underdevelopment of the national innovation system (Bukowski et al. 2012). This conclusion is supported also by the findings presented in Part II of this report, where we argue that the countries that are innovative are mainly the ones with significant share of high-tech sectors in their industrial structure. Since the share of pharmaceutical, electronic and biotechnological industry in Polish industrial production is relatively small, also the companies’ spending for innovations in this respect is limited. As we point out in Part II, the second factor adversely influencing the innovation of the Polish industry is the average size of industrial companies, which is smaller than in Western economies, both as regards the turnover and employment. Since big companies have larger financial potential than small and medium-sized ones, they accept bigger exposure to risk with respect to R&D activities financing. Data presented in Part II of the report shows that the emergence of a sufficient number of sufficiently big companies in the sectors in which the technological progress is the fastest is a prerequisite for an increased involvement of Polish enterprises in research and development activities. Economies that search for their comparative advantage in technologically mature sectors will naturally be less innovative than those in which modern branches are dominant.

However, the problem of low innovation of Polish companies is much more complex. If we limit the sample to companies-innovators (Figure I.28), their characteristics are also deviate unfavourable in comparison with those from highly developed economies. In 2012, among the companies undertaking innovative activities, 16.7% were involved in constant R&D works, which constitutes a percentage similar to the one recorded in Greece and precedes only several of new member states. Innovation-related training, where Poland ranks above average, and the purchase of machinery, equipment or software are an exception in this respect. In Poland, the purchase and implementation of foreign technologies is a more frequent activity targeted at innovations than development of own technologies. This is confirmed by the structure of enterprise spending on innovations. In the whole European Union, 49% of costs are those incurred on research and development works performed by the same company, and 26% is used for the purchase of equipment and software. In Poland those numbers are reversed: for each PLN 100 spent on innovations by the company, PLN 62 is allocated to the purchase of external technologies in the form of equipment and software, and only PLN 22 is used for internal R&D. Probably, the reason for such reluctance of the Polish entrepreneurs to introduce innovations is the fact that they attach too little weight to the increase in margins – it was rarely indicated as a very important objective of the company (33% of companies, 2nd lowest result in 20 EU countries), and often even an irrelevant one (13%, 1st place). This may result from the fact that so far the enterprises have focused on increasing the scale of their activity. The second potential reason may be an insufficient level of intersectoral competition for labour, land and capital resources. According to the arguments presented in Part II, the wage level is determined by the median productivity of the company in a local economy. If in a given country the share of innovative companies, achieving bigger margins from their production and willing to pay higher market rates for high qualifications of their employees, begins to increase, then the wage pressure exerted by them on other enterprises also grows. This forces the whole economy to focus on raising labour productivity, and companies to search for niches enabling them to achieve the profitability allowing for an effective wage competition (Part II).

As a consequence of these phenomena, the public sector plays a significant role in financing and implementation of R&D activities. However, the share of governmental funds provided to enterprises is lower in Poland, just as is the share of enterprises that perform contracts awarded by the public sector, which is indicative of deficits in cooperation between the research sector and manufacturing companies. Their percentage in the total number of companies engaged in manufacturing and market services is merely 9%, while in majority of the EU countries it exceeds 20%, and is higher than 30% in Finland and 34% in Austria. Here we can also note the deficits of public policy, among others, in the fields of contract policy. Government purchases may stimulate innovation especially when innovative activities are required in the contract. In Hungary, almost 84% of enterprises engaged in government contracts are required to conduct innovative activities. In majority of the member states, this share amounts to approximately 10% (the Netherlands 12.5%, Germany 8.8%), whereas in Poland, it equals 3.4% – the least among 19 EU countries (2012), for which data is available. The domination of the price criterion in tendering procedures, thus, in fact, lack of interest of the state in the innovative nature of the products it acquires hampers the development of the companies, whose products are ordered mainly by the public sector.

As a consequence of low general expenditures on science and innovation, the R&D sector in Poland employs ca. 0.6% of the workforce (93,800 of people, including 71,400 of researchers). This percentage constitutes approximately half of the value for the EU-28 (1.2%) and three times less than in Finland (2.1%). Researchers are mainly employed by universities (44%), while in Europe by enterprises (54%). Thus, if the intensity of the innovation activity in Poland equalled the EU-28 average, the R&D sector could employ more than 200,000 people. The 100,000 high quality job gap in the economy (or 200,000 if Finland is assumed as the point of reference) may be treated as a synthetic measure of the difference between the Polish market and the markets of the developed countries, and also as an estimation of the scale of phenomenon of the waste of talents, which is now experienced by the Polish economy as a result of limited innovation and technological advancement of its own industrial production and service activities. The lack of a sufficient number of jobs in the R&D sector makes it impossible for the talented individuals to fully use their potential, which reduces the rate of the productivity growth in Polish companies and encourages most talented employees to search for new opportunities in foreign markets.
Even though Western European models remain distant, a certain improvement occurred in Poland in the recent years. Research and development activity increases (from 0.54% GDP in 2003 to 0.88% GDP in 2013 – Figure I.29), and the financing structure slowly improves. While in 2003, enterprises financed 30% and performed 27% of R&D activities, in 2013, the respective numbers were 37% and 44%, and the share of foreign sources in R&D financing grew from almost 5% to more than 13%. The gap between Poland and Western European countries, and also OECD (including USA, Korea and Japan) still remains high. In the Europe 2020 Strategy, the financing objective for Poland is 1.7% GDP. To achieve that level, it is not only necessary to maintain but rather to accelerate the existing growth rate of R&D spending. The EU Council (2014) also recommends modification of the innovation support system, improvement of effectiveness of tax stimuli supporting innovations in the companies and their better adjustment to the phases of the innovation cycle in the industry. Bukowski Halesiak and Petru (2014) present similar arguments suggesting the introduction of significant corporate income tax incentives for innovations in the Polish tax system and – in combination with the higher education reform – gradual increase of public spending on basic research so that the scientific quality of Polish universities can be enhanced.

2.4. OTHER THEORIES OF GROWTH

The theories of economic growth discussed in previous chapters share one optimistic feature: all countries usually can join the richest club provided that they make appropriate institutional and structural changes or increase their innovation. Individual authors differ only with respect to the type of policy that they deem necessary to implement the changes. But there are also authors that see developmental differences as an inherent feature of the world economy and thus, with the use of public policy, they may rather be restricted than effectively changed. What is the cause? Here the explanations part significantly. The world-system theory says that it is the logic of the global economy inevitably leads to the division in which the countries may only swap places between rich centre and poor periphery. According to the cognitive skills theory, individual competences of the citizens that change relatively slowly (also under the pressure of public policy) are the main factor determining a country’s wealth, which is why only in exceptional circumstances we may speak of a shortcut to prosperity.

2.4.1. WORLD-SYSTEM THEORY AND BRAIN DRAIN

The leading propagator of the world-system theory – Immanuel Wallerstein defines this key notion as: “systemic unit with unified division of labour and different cultural systems” (1974). In other words, it is an international trade and monetary economy, in the area of which a number of countries exist. If there was only one country, we would talk about the world-empire. On the other hand, autarkic regions not included in the division of labour as part of the system are the subsistence economies constituting an external area of the world-system. A hyphen in the name “world-system” means that we deal with theoretical category (generic type), and there can be many world-systems existing on a parallel basis. At present – according to the proponent of this concept – we only have one world-system, including practically the whole globe. However, one day before the dissemination of modern communications technologies there were many world-systems, and the external area was much larger than today. But why would we distinguish such a unit of analysis? Mainly because the “dynamics of the world-system development is largely internal” (Wallerstein 2011).
This means that the operation of the world economy may not be understood by analysing only the situation in respective countries (e.g. their institutional framework, absorption capacity and capability to create innovations, or the pace of structural changes). Only the analysis carried out based on systemic categories, that is according to Wallerstein, the division of the regions of the world-system into centres (the core) and periphery, may enable the assessment whether a given country will achieve economic success in the long run (joining the centre) or will it fail (remaining on the periphery or the semi-periphery).

In the world-system concept, the centres are the wealthiest regions that are strongest politically and economically, with diversified economic structure, having strong governments and efficient bureaucracy. The countries that are part of the core are capable of shaping the economic life together both from the inside, by providing appropriate institutions, infrastructure and support for enterprises, and from the outside, by exerting the political power for them in the peripheral countries. Central areas are highly industrialised, which is why they flood other countries with processed goods, importing mainly raw materials and simple products. At present, the countries of the core begin to specialise mainly in high-tech sectors and in modern services, however, they also maintain the dominant position in the “old” sectors such as automotive or chemical one, or financial services. Peripheral countries are a complete opposite of the core – they have simple economies, weak governments and societies consisting mainly of unqualified workers and peasants. Nevertheless, in the case of the world-system, a third category, namely a semi-periphery, is important. The countries from this group laying between centre and periphery have already begun the industrialisation process, but they carry out exports mainly to the peripheral countries, importing the most highly processed products from the core. Their external economic and political impact, if any, focuses on weaker regions, since semi-periphery is in the economic and political impact zone of the centre.

Chirot (1986) enumerates the following benefits of being the core country and related domination over the peripheral countries. In the first place, the countries of the core capture the biggest chunk of added value, by buying raw materials cheaply and selling highly processed products at a high price. Secondly, in peripheral countries, the wages are low, as a result of which the products manufactured there are cheap and the core countries may buy a lot of them in exchange for their own export. Thirdly, the core countries may gain profits from the investments conducted in the periphery, which enables them to maintain economic domination (interception of the added value) even when the production physically takes place outside of their territory. Fourthly, the most educated and highest paid workers migrate from the peripheral countries to the core countries, due to which the processes that are most advanced technologically, and thus also the manufacture of the most desirable products, remain under the control of the economic centre. All of the above benefits are of permanent nature and the internal dynamics of the system leads to their expansion rather than weakening. It is because attractive goods and services requires high investment. According to Wallerstein, both the physical and human capital are very expensive, thus only the core countries can afford to invest in new machines, technologies and qualifications. Moreover, global companies from the centre countries, striving to take the monopolistic position, are not interested in the transfer of key skills beyond the core countries. Especially international corporations who avoid transferring the most technologically demanding elements of the production process to peripheral countries. As part of these measures, they are limiting the conduct of their own research and development to the core countries. Additionally, the brain drain (Box 1.5.), being an indirect effect of the necessity of performance of certain activities only in the centre, makes it more difficult for the peripheral regions to achieve economic success. As a result, it is not economically viable to either start attractive investments in a peripheral country, or to undertake an activity that is highly-specialised by nature, as the whole necessary context (workers, partners, sales markets, financing, etc.) is located in the centre. Moreover, no political mechanism prevents unequal distribution of benefits. A peripheral country is too weak to gather appropriate resources and an international political being, which could improve the situation at the level of the world-system, does not exist. This means that according to the proponents of the world-system theory, both the low- and the middle income trap is nothing more than a reflection of the sustainability of the world-system order in which we have to function. Although the change of roles between the centre and periphery may occur in the long run, this would be a consequence of lucky constellation rather than intentional operation of public policy. What is more, this will translate into the formation of a new world-system with a specific division into the core and peripheral countries.

The concept of the world-system still allows some dynamics in the long run. For example, Spain and Portugal which were in the core group in the 15th–17th centuries, later on fell out of it, becoming a semi-periphery, but they maintained some influence on the peripheral countries of South America and Africa. Moreover, the modern world-system also has its own beginning – the core and peripheral countries had to somehow become what they are now. According to Wallerstein (2011) who subjugated whom has been in fact accidental, coming down to a small initial difference in the strength of the state apparatus. As we read: “The state apparatus comprises of an amplifying mechanism. There is a point in which the strength yields greater strength. Tax income enables the country to maintain greater and more effective bureaucracy and army, which in turn allows for increasing the tax income. This process takes the shape of a spiral. The amplifying mechanism also works in reverse direction – weakness yields greater weakness.”
Box I.5. Brain drain, centre, periphery and semi-periphery

Upon the accession of Poland into European Union the phenomenon of emigration sharply increased. After a temporary drop in the number of people leaving Poland between 2009 and 2011, as a result of recession in many EU countries and a relatively better economic situation in Poland in that period, the wave of emigration got stronger again. It is estimated that in 2014, ca. 2.2 million Polish citizens stayed abroad for a period longer than 3 months (Figure I.30). A large number of emigrants, even though it brings the reduction of the demographic potential, is not necessarily a negative phenomenon. These individuals leave Poland voluntarily, and the country’s prosperity does not depend on the number of citizens after all. From the point of view of the people staying in the country, however, the emigration of the best educated people, i.e., the so-called brain drain, is considered unfavourable.

Grubel and Scott (1966) have already shown that if we drop the assumption of perfect competition, the emigration of a skilled employee will cause a drop in the salary level of unskilled workers. Apart from the costs connected with the loss of human capital, fiscal costs incurred by the country of origin are also important. Emigrants up to a certain age used public goods such as education, health care, transportation and others financed from the taxes paid by all working citizens. After leaving the country they are excluded from the tax system and do not co-finance public goods that they used previously. Additional anxiety connected with the brain drain is the fact that educated citizens in a new place will not find the professions adequate to their qualifications that they obtained in their country of origin (so called brain waste).

The analysis of statistical data leads to a conclusion that the phenomenon of brain drain refers to Poland to a limited extent. According to the data of the Central Statistical Office (Figure I.31) ca. 23% of Polish emigrants had a tertiary education, a fraction higher than in the general population (approximately 19%). However it is worth noting that the main group leaving our country nowadays are men aged 25-34. The percentage of people with higher education in this age group significantly differs from total population and equals 42.6% according to Eurostat data. Therefore, it is not true that mainly highly qualified people leave Poland. Quite the opposite – we experience a reversed brain drain leading to the increase in wages of people with lower qualifications. Also the problem of brain waste concerns Polish emigrants to a minor extent. Insofar as people with an elementary and secondary education are most often occupying the positions relatively poorly remunerated, based mainly on physical work, the emigrants with university diploma often find job in positions actually corresponding to their level of education.

The above information does not, however, imply that the problem of brain drain is irrelevant. The fact of outflow of a large number of specialists from Poland is particularly alarming, including the qualified health care workers (physicians, nurses, physiatrists, dentists and pharmacists), the number of which in the country per 1,000 inhabitants is still the lowest among OECD countries. For example, if not for the emigration of physicians, their number in Poland would be higher by 4%. The phenomenon of emigration of specialists is also common in the countries relatively wealthier than Poland in the United Kingdom, Germany, Sweden, Italy, France or Spain, except that these countries often compensate this loss with an inflow of specialists from the countries being relatively less wealthy. Within 10 years accepted only ca. 1.5 thousand of specialists from other EU countries, which is mainly a result of relatively lower paid positions for highly skilled persons in Poland.

Source: Own elaboration based on the data from the Central Statistical Office [GUS], 2014

6 This term was first used by the Royal Scientific Society in the 1950s and was connected with waves of mass emigration of British scientists and technicians to the United States and Canada (Cervantes and Guellec 2002).
Even though the outflow of specialists from the EU countries to a large extent correlates with their prosperity, a number of exceptions to that rule may be indicated (Figure I.32). One of them is Cyprus, not much wealthier than Poland, which admitted several thousand specialists from Greece affected by a crisis and the Czech Republic, which as the only country of the Central and Eastern Europe has a positive balance of inflow of specialists. On the other hand, Germany, Denmark and Sweden, despite being in the group of the wealthiest EU countries, for some reason lose their qualified workers. Closer analysis of the legal provisions in these countries could reveal which of them hamper the inflow of specialists and remove them also from the Polish legislation. Irrespective of the activities taken up in order to improve the balance of migration of specialists within the EU, Poland should facilitate the immigration of the workforce from relatively less wealthy countries outside the European Union. According to Eurostat data, only 0.56% of inhabitants of Poland are of foreign origin, out of which only 0.19% of the foreigners are from the countries other than EU members.

**FIGURE I.32. Migrations of specialists in the EU countries, 2004-14**

The researchers analysing world economy today in the paradigm of the world-system divided the countries into three groups. Classifications made by Chase-Dunn et al. (2000) and Babones and Alvarez-Rivadulla (2007) differ slightly from each other, but based on them, it is possible to enumerate the core countries. Those are countries of at least average size characterised by the prosperity level of at least Israel (GDP per capita as calculated using purchasing power parity at the level of approx. USD 30,000), the economies of which are not dominated by the export of raw materials. This group comprises: Anglo-Saxon countries (4), EU-15 countries (except Greece and Portugal), Japan, South Korea, Taiwan, Hong Kong, Singapore, Switzerland, Norway, Iceland and Israel. Poland with an income per capita as calculated using purchasing power parity at the level of USD 25,000 is not listed in this group. However, one may wonder how much different our country is from the typical representative of that group. In other words, we will try to investigate whether Poland is a peripheral country, a semi-periphery or maybe it is only the income that makes us different from the core countries. Table I.8. will attempt to answer the above question.

The conclusions drawn from this comparison are as follows. Firstly, Poland is definitely not a peripheral country, at least in the meaning of the world-system theory. Secondly, with respect to some of the indicators, we resemble the core countries, and in terms of others – the semi-peripheral ones, but the biggest difference is visible in property (more than threefold) and in income (almost twofold). Fourthly, we still have a lot to catch up with when it comes to economic structure and quality of institutions, including, in particular, the effectiveness of the public sector. This might mean that, contrary to the concerns expressed by Babones and Babcicky (2012) – Poland (similarly to other Central European countries) has a chance to move over time from the periphery to the group of the core countries. In purely economic areas, and also in education, despite still a large gap, we may observe a gradual convergence to the core countries. On the other hand, the deficits in the institutional sphere still remain a big challenge. Because insofar as Poland has undoubtedly stronger bureaucracy than the peripheral countries, it is still significantly less effective than in the core countries, which impacts not only the quality of the established law, but also the level of public services provided by the state. One of the symptoms of this phenomenon is a selective brain drain affecting for example physicians – the profession remaining under a great influence of the fiscal and regulatory policy of the state.
TABLE I.8. Is Poland a peripheral country?

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Indicator</th>
<th>Average value for the countries of the core</th>
<th>Value for Poland</th>
<th>Verdict</th>
</tr>
</thead>
<tbody>
<tr>
<td>State apparatus strength</td>
<td>Government income in relation to GDP / VAT gap</td>
<td>19.9%</td>
<td>18.1%</td>
<td>Poland’s tax income is similar to the core countries, however, at the same time the tax gap in VAT is clearly higher (PWC 2014). This points to semi-peripheral nature of Poland.</td>
</tr>
<tr>
<td>Economic diversification</td>
<td>Economic Complexity Index</td>
<td>1.347</td>
<td>1.154</td>
<td>The Polish economy is less complex than the economies of the core countries, but the difference is not very significant. This gap is also systematically diminishing, which points to the vanishing semi-peripheral nature.</td>
</tr>
<tr>
<td>Foreign investments</td>
<td>Foreign investments/GDP</td>
<td>6%</td>
<td>2%</td>
<td>There are less investments on average inflowing to Poland in comparison with the core countries, but this indicator is high with respect to the world average, which indicates its semi-peripheral nature in relation to the world capital system.</td>
</tr>
<tr>
<td>Capital resources</td>
<td>Financial assets to GDP</td>
<td>268%</td>
<td>84%</td>
<td>Polish capital resources are much lower than in the core countries, which points to it being on the periphery.</td>
</tr>
<tr>
<td>Labour force education</td>
<td>Percentage of persons with tertiary education in relation to population</td>
<td>41% 25-34 years old; 38% 25-64 years old; 43% 25-34 years old; 27% 25-64 years old</td>
<td>Percentage of persons with higher education among young people in Poland does not deviate from the core countries, even though it is lower in the whole working population. This points to the vanishing semi-peripheral nature of Poland.</td>
<td></td>
</tr>
<tr>
<td>Export of raw materials</td>
<td>Contribution of raw materials export to total export</td>
<td>12.9%</td>
<td>4.7%</td>
<td>Poland exports much less raw materials than the core countries, which places it in this respect in the middle of the world-system.</td>
</tr>
<tr>
<td>Export direction</td>
<td>The percentage of peripheral countries among five main export recipients</td>
<td>0.92</td>
<td>2 (Russia and Czech Republic)</td>
<td>-mainly the core countries, border countries (Czech Republic) and half-periphery (Russia) dominate in Polish export, which also places our country in the centre.</td>
</tr>
<tr>
<td>Prosperity</td>
<td>GDP per capita PPP</td>
<td>ca. USD 47,000</td>
<td>ca. USD 25,000</td>
<td>When it comes to income per inhabitant, Poland significantly differs from the core countries, being placed among the half-periphery countries.</td>
</tr>
<tr>
<td>Institutions</td>
<td>a) Economic Freedom</td>
<td>a) 7.69</td>
<td>a) 7.31</td>
<td>Institutional level deviates negatively from the core countries in a manner corresponding to the prosperity level. Poland ranks the worst in terms of effectiveness of public institutions – which indicates to the functional weakness of state institutions, characteristic of periphery and half-periphery.</td>
</tr>
<tr>
<td></td>
<td>b) Transparency corruption</td>
<td>b) 76.9</td>
<td>b) 60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Fraser’s property rights</td>
<td>c) 85.62</td>
<td>c) 60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Government Competitiveness.</td>
<td>d) 0.55</td>
<td>d) 0.35</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration

2.4.2. COGNITIVE SKILLS THEORY AND EDUCATION

Cognitive skills theory also called the human capital theory is another approach identifying the barriers for economic growth in the sphere which is only under the indirect control of public policy. The later name seems to be even more appropriate, since it draws attention to the fact that cognitive skills – including among others mathematical reasoning, patterns recognition, reading comprehension and using the knowledge obtained from natural sciences in economic and social practice – are specifically human and their acquisition is a long-term process similar to accumulation of physical capital. However the notion of “human capital” comprises also the social element, not closely connected with individual skills, and which is not the subject of the cognitive skills theory as a side effect of the fact that it is going backward in the chain of causes a few links further.

This theory assumes that cognitive skills constitute a foundation for economic growth, supporting or hampering a number of key economic processes. At the most fundamental level, greater cognitive skills lead to the limitation of use of violence as a method for resolving the conflicts. This favours the formation of the private property system in which disputes are solved by law not by force. They also strengthen what Hofstader (1983) calls “superrationality” that is basing one’s actions on the assumption of rationality of others and on the common awareness that everyone acts rationally. Superrationality is expedient because it constitutes an environment in which cooperative behaviours, in particular economic activity, become profitable. However, the impact of cognitive skills does not end with the establishment of conditions for the emergence of the market. It also includes the increasing of economic efficiency, among other things owing to the fact that in a society with a greater ability to acquire, select and process information, it is easier to find candidates for good workers and competent clerks. A competent labour force makes it much easier for domestic or foreign investors to establish and run a company.

Benefits of a wiser population do not end here. As Caplan (2011) shows more competent citizens are less prone to populism and vote for better politicians, who choose to implement more sensible public policies aimed at increasing the openness of economy and improving its competitiveness.
There is also evidence (Grinblat et al. 2011) indicating that a higher level of cognitive skills leads to a greater acceptance of reasonable level of financial intermediation, which is crucial for the volume and quality of domestic investments. Generally speaking, it may be stated that higher cognitive skills constitute a foundation for rationality of public choices and public trust, whose positive impact on the economy has been emphasised by political scientists for a long time (e.g. Banfield 1958). For almost twenty years this issue has also constituted an important area of research for the economists. The proponents of the cognitive skills theory indicate that trust, good regulations, effective public institutions and proper state policy can rarely evolve in a country whose citizens do not have adequate intellectual potential (Diagram I.5).

**Diagram I.5. Skills of the citizens in comparison with economic growth determinants**

Empirical studies suggest that individual skills play a crucial role for the long term economic success. The model presented by Hanushek and Woessman (2009) takes the average economic growth rate between 1960-2000 in 50 countries of the world as a dependent variable. Only two independent variables are enough to reach the economic growth rate between 1960-2000 in 50 countries of the world as a dependent variable. Only two independent variables are enough to reach the

For example, Japan, despite excellent PISA test results, is one of the countries that grew at the slowest rate over the last twenty years. It resulted, among other things, from a fast process of the ageing population, which (Figure I.7) reduced the dynamics of the economic growth, without influencing the productivity dynamics at the same time. Sweden is at the opposite end of the spectrum. It is one of the growth leaders among the highly developed countries. However, it is also ranked outside the top thirty in the cognitive skills ranking, and remains at a level similar to Russia. Nevertheless, one should remember that not only fifteen year olds add up to the cognitive potential of the country’s inhabitants – Sweden is still among the EU elite as regards the overall percentage of population with higher education.

The cognitive skills theory may, however, be charged with a much more serious allegation. It is because the theory is affected by the problem referred to in the literature as the Matthew effect - wealthy countries can boast of high values of numerous indicators and in the case of poor countries, each of the indicators is low. That is why finding an indicator characterised by high correlation with economic growth as such does not prove anything, because we do not know what is the cause is and what is the effect. Hanushek and Woessman (2010) claim, however, that the relation between the competences and the growth is a causal one. What are their arguments?

Firstly, the model gives similar estimations in sub-samples. Both the limitation of the number of countries (removal of the poorest or the richest ones from the sample) and the limitation of the investigated scope from two to four decades do not significantly impact its results. Secondly, the model estimated with the use of data from the years 1980-2000 best reflects the observations when the values of the competence indicators used come from the preceding period, i.e., the years 1960-1980, and not the whole period of 1960-2000. This points to an appropriate time sequence of the phenomena. Thirdly, if economic growth triggers the growth of competences, and not the other way round, then it is not happening in an obvious way.

7 Standard deviation in PISA tests measuring the results on a scale from 100 to 900 with an average of 500 amounts to 100. For IQ tests, discussed below the typical scale is from 40 to 160 with an average of 100 and standard deviation of 15.
TABLE I.9. Average PISA test results in 2012 in twenty selected countries (except the cities and city-states) and estimation of the economic growth potential connected with the improvement of this result

<table>
<thead>
<tr>
<th>Place in ranking among 60 studied countries</th>
<th>Country</th>
<th>Average PISA test result in 2012</th>
<th>Economic growth improvement potential when increasing the results to the level of South Korea (in percentage points GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>South Korea</td>
<td>543</td>
<td>Upper limit: 0.05 Lower limit: 0.03</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>540</td>
<td>0.05 0.03</td>
</tr>
<tr>
<td>3</td>
<td>Taiwan</td>
<td>535</td>
<td>0.15 0.09</td>
</tr>
<tr>
<td>4</td>
<td>Finland</td>
<td>529</td>
<td>0.27 0.17</td>
</tr>
<tr>
<td>5</td>
<td>Estonia</td>
<td>526</td>
<td>0.34 0.21</td>
</tr>
<tr>
<td>6</td>
<td>Canada</td>
<td>522</td>
<td>0.42 0.26</td>
</tr>
<tr>
<td>7</td>
<td>Poland</td>
<td>521</td>
<td>0.44 0.27</td>
</tr>
<tr>
<td>11</td>
<td>Germany</td>
<td>515</td>
<td>0.55 0.34</td>
</tr>
<tr>
<td>12</td>
<td>Ireland</td>
<td>515</td>
<td>0.55 0.34</td>
</tr>
<tr>
<td>16</td>
<td>United Kingdom</td>
<td>502</td>
<td>0.81 0.50</td>
</tr>
<tr>
<td>18</td>
<td>Czech Republic</td>
<td>500</td>
<td>0.86 0.53</td>
</tr>
<tr>
<td>19</td>
<td>France</td>
<td>500</td>
<td>0.87 0.53</td>
</tr>
<tr>
<td>24</td>
<td>USA</td>
<td>492</td>
<td>1.02 0.63</td>
</tr>
<tr>
<td>26</td>
<td>Italy</td>
<td>490</td>
<td>1.07 0.66</td>
</tr>
<tr>
<td>27</td>
<td>Spain</td>
<td>489</td>
<td>1.07 0.66</td>
</tr>
<tr>
<td>28</td>
<td>Portugal</td>
<td>488</td>
<td>1.10 0.68</td>
</tr>
<tr>
<td>31</td>
<td>Lithuania</td>
<td>484</td>
<td>1.18 0.73</td>
</tr>
<tr>
<td>33</td>
<td>Sweden</td>
<td>482</td>
<td>1.22 0.75</td>
</tr>
<tr>
<td>34</td>
<td>Russia</td>
<td>481</td>
<td>1.24 0.76</td>
</tr>
<tr>
<td>36</td>
<td>Slovakia</td>
<td>472</td>
<td>1.42 0.88</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on OECD data and the results of the Hanushek and Woessman model, 2009

For example, no correlation between the financial expenditure on education and the results of competence exams is observed. Fourthly, the direction of the causality confirms the resilience of the results to the use of instrumental variables influencing the quality of education (such as external exams). Fifthly, the direction of test results change is in most cases comparable with the direction of the trend when it comes to economic growth. Sixthly, the direction of causality confirms individual experience – the employees with a higher level of cognitive skills earn more and it is not dependent on the country in which they stay.

Another explanation of the strong empirical connection between economic growth and education was proposed by Lynn and Vanhanen (2002). In their opinion, competence tests in fact, firstly, measure, and then the effects of education as such. If the population is more intelligent, the citizens learn faster, acquiring new skills that are manifested in PISA tests for example. As Lynn and Meisenberg (2010) show, the results of the competence studies and IQ tests are almost identical. Indeed, the correlation between the measure prepared by Hanushek (2009) and IQ tests results carried out in respective countries gathered by Lynn and Vanhanen (2006) and supplemented additionally by Wicherts amounts to 0.826. A slightly higher result may be obtained by comparing the countries that, on average, conducted the tests in schools more carefully, eliminating the problem with the selection of students that decided to take them. Correlation between PISA tests of 2012 and the IQ test results equals 0.842 [Figure I.34.].

It may be assumed that the measurement of intelligence grasps to a much larger extent the component of cognitive skills of a given population that is independent from the acquired education than the competence test. That is why a good IQ test result, when combined with low cognitive skills, points to the structural weakness of the education system, in which the students’ potential cannot flourish. Italy is a particularly striking example: the Italians achieve the best results in IQ tests in Europe, and at the same time their results in PISA, TIMMS and PIRLS exams are average at most. On the other hand, in countries like Ireland or Taiwan, a reverse phenomenon is observed. However, apart from these minor differences, the following claim is well grounded: IQ tests and cognitive skills tests measure nearly the same thing internationally. This statement has important implications for the questions that should be asked at the moment – is it possible to increase the level of competence in the population and how?

Obviously, the issues connected with the improvement of the public education system are the most important ones (Box I.6.). The quality of the system of education undoubtedly influences the divergence of the human resources internationally. Nevertheless it is not the only factor. The studies conducted on the so-called Flynn effect (1987, 2007) – a systematic growth of the general intelligence level (thus also the cognitive skills) in the world over the last 100 years at a rate of 0.2 point per year – helped to discover a number of other factors. Insofar as the IQ tests are always calibrated so that the average level of intelligence in a given population equals 100, their difficulty level systematically grows – not only in the developed countries but also in developing ones.
Younger cohorts when solving the same tests as their predecessors obtain measurably better results, which may be interpreted as a gradual intelligence / cognitive skills growth in the world (Figure I.35). In a sense, the fact that Central Europe (except Hungary) quickly caught up with the OECD countries could also be the manifestation of the local Flynn effect (Figure I.36.).

A significant increase in the results of standardised IQ tests over the course of only one century is indicative of the strong impact of environmental factors on the level of cognitive skills of respective populations, and thus – if Hanushek and Woessmann (2009) are right – also the perspectives for economic growth in the long run. For this period is too short for the respective populations to be subject to selective evolutionary pressure favouring more intelligent individuals. It may be doubted if such pressure would have had such a universal character as an actual Flynn effect. This is important because the public policy may have an impact exactly on the environmental factors such as the shape of the system of education, calorific value of children’s meals or a stimulating character of the environment of the children of a preschool age.

Distinguishing the factors that may be controlled by politics and public institutions activity out of the range of factors that can influence the level of cognitive skills of respective societies is not an easy task and requires considering a number of environmental variables. Such an attempt was undertaken by Hanushek and Woessmann (2009) and its result was an estimation of the production function the effect of which is the level of education development measured with PISA, TIMSS and PIRLS competence tests.
The study was carried out at both individual and national level so that depending on the availability of data it analysed the impact of educational policy, controlling the variables such as: age, sex, socioeconomic factors, education of parents and environmental factors\(^8\). Matching the model with empirical data proved to be much better at national level (87%) than at student level (39%), which means that even though the researchers did not manage to include fully individual characteristics, the findings with respect to the effectiveness of education policies at the aggregate level should be deemed as reliable. Main conclusions from Hanushek and Woessmann’s work and from the results of similar studies quoted by them are presented in Diagram I.1., which is included in Box I.6. In that box, we present the evaluation, based on empirical studies results, of the output of educational reforms in Poland from the perspective of their impact on the shaping of cognitive skills of Polish students.

Even though education at elementary and secondary level is more important in terms of shaping cognitive skills of the society than tertiary education, the latter requires more urgent changes, which certainly do not consist solely of an increase in the financial inputs. As we have shown earlier (Figure I.26), Polish universities are visibly distant from the Western European countries in terms of research works they conduct (measured by the citations of Polish scientists), which is why they constitute a less attractive offer for foreign doctoral students. Bitner and Kamińska (2014) state that it is advisable in the first place to depart from the financing of public universities based on the number of students, which causes the adjustment of educational programmes to the skills of the worst performing student. Another idea for improvement would be to create central doctoral studies with the best lecturers from abroad at some faculties across the country. This would enable concentration of the national resources on education of the future academic staff. Its aim would be to build-up public spending on education in selected centres conditional on setting clear quality objectives for them in a five- and ten-years horizon (contracts).

**BOX I.6. HOW EDUCATION IMPROVES COMPETENCES AND COGNITIVE SKILLS?**

The monitoring and checking of the skills of students at subsequent levels of education is the most important quantitative factor determining the results of competence tests. The studies of Woessmann et al. (2009) indicated that the very presence of external exams raises the competence level from 0.2% to 0.4% of standard deviation, that is 20 to 40 points on PISA scale. These findings show how important and still underestimated element of education reform in Poland was the introduction of external mandatory exams and upper secondary schools, along with an obligation for additional intermediate exam for 16 year olds. Apart from external exams, an important role in increasing the general level of competence is played also by the presence of internal verification tests, which help the teachers in monitoring the progress of a student. An important factor positively influencing cognitive skills of respective populations is the duration of education in the formal system. An additional year spent in school positively impacts cognitive skills and this is irrespective of the country in which the child is learning. Noticing this fact, the majority of the European countries, including but not limited to Germany, the Netherlands, France, Norway and nineteen others, many years ago already introduced compulsory education for six year olds or even for five- and four-year olds (Figure I.37.). Poland also up to this year was a part of the shrinking group of EU countries (Bulgaria, Lithuania and Baltic states, and Finland and Sweden), where only seven-year olds are covered by compulsory education.

Also the substitution of public schools with private ones positively impacts cognitive skills. Such institutions, provided that they have an appropriate level of autonomy (including the freedom of hiring and dismissing teachers), and the progress of their students is evaluated at external exams, prove to be a favourable element of the system of education. Allowing for their functioning by introducing the system in Poland, in which the education subsidy follows the student, was the right step in this respect. We should continue to follow this path, trying to further level the opportunities between private and public schools, increasing the competition between them through an increase of systemic stimuli to be a good school (measurements of educational added value are certainly helpful in this regard).

**DIAGRAM I.6. Impact of educational policy on competence tests results in Hanushek and Woessmann’s model**

\[\begin{align*}
\text{POSITIVE} & \quad \checkmark \\
\text{NEGATIVE} & \quad \times \\
\text{NEUTRAL} & \quad 0
\end{align*}\]

Source: Own elaboration based on Hanushek and Woessman, 2009

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\(^8\) The number of books at home is used by the authors as an indicator measuring the latter of the components. During the study, their positive impact on competence tests results was observed. For example, in the United Kingdom enriching the home library with an additional category of books results in the growth of the average test result by 1.15 percentage point.
Fourthly, the raise of salaries of teachers introduced between 2008-2011 should be deemed as a positive element of Polish educational reforms. Hanushek’s research (2011) indicates that the salaries in this profession should be above the average for the whole economy, because a well-paid teacher will return it many times over by increasing the competences of its students. However, for it to happen, not only the amount of teacher remuneration should be changed, but also the method of their allocation and method of selection for this profession. The undeniable deficit of the Polish system of education is the fact that the system of remuneration of teachers does not reward the individuals who are particularly talented, committed, or obtaining the best measurable results. What is more, the interviews carried out by us with the education experts indicate that the system of external exams is not adjusted to that either, and it could serve to pick up individuals achieving the greatest educational successes (provided that it will be designed properly, i.e., when it comes to the comparability of the results between the age groups).

According to the Hanushek-Woessman’s model the introduction of autonomy in salaries increases the competence tests results by 21 points on PISA scale on average, provided that external exams are carried out at the end of each stage of education, which is the case in Poland. However the trade-union provisions and privileges constitute barriers for the use of teachers’ remuneration as a tool for attracting talent and motivation. The salaries in the profession depend mainly on seniority and freedom of their shaping in public schools is very limited. Due to high degree of the protection of teachers against dismissal it is also hard to talk about the effective selection for this profession9. Thus, in our opinion, the increase in salaries should be associated with the change of this system, especially with a far-reaching reform of the Teacher’s Charter increasing the freedom of shaping of salaries, dismissal and hiring of teachers and evaluation of school management on the base of the teaching results of the institution it leads.

9 Starting from the post of appointed teacher termination of employment becomes possible mainly for disciplinary reasons or in case of school’s liquidation; assigning a negative grade, even though legally possible, is practically rare.
3. EMPIRICAL EVIDENCE ON GROWTH

Growth theories discussed and illustrated in the previous chapter demand empirical verification. Even though each of them is supported by some arguments, their ultimate usefulness should be determined by experience. Thus, the third chapter of this part of the paper starts with the presentation of the most important, stylised facts concerning the productivity growth. Their choice is based on empirical evidence gathered by the economists investigating the dynamics of productivity of enterprises over the last two decades. The overview of the micro- and macroeconomic factors stimulating productivity growth will enable critical reference to five theories presented in the previous chapter. Further, based on the gathered theoretical and empirical material, we will choose explanatory variables for econometric study, the aim of which will be the operationalisation of the notion of middle income trap and more detailed analysis of its causes and importance for the development of Poland and Central Europe.

3.1. WHEN DOES THE PRODUCTIVITY GROW?

Before we move on to presenting the empirical regularities connected with the productivity growth, one should clarify the very notion slightly more, because otherwise it will be difficult to properly interpret the evidence. As we mentioned in the first chapter, “productivity” means economic output relative to inputs, which for its most popular measure refers to GDP per hour of work (in international comparisons expressed in dollars using purchasing power parity). Nevertheless, it is not the only method of measuring productivity. Depending on the objective of the study, available data and aggregation level we also use other indicators, both in terms of measured inputs and results (Box I.7). However, it appears that the most important considerations with respect to productivity do not significantly depend on the assumed measure. We will take a closer look at them in the subsequent subchapter, attempting to answer the question, what is the source of efficiency growth in companies and thus, what is the main driving force of economic growth on the aggregate level.

Productivity growth is a total result of three processes (Diagram I.7), out of which only the first one directly refers to the increase in the efficiency of a single company. It consists of the following elements:

- The increase in capital input
- Quality improvement of the products owing to product innovations;
- Change of the market power of the company, e.g. by means of vertical integration, distribution and marketing allowing for the increase of prices.

This last element is controversial, because as only one of the above mentioned does not result in the company producing more, better or cheaper. However, if we consider the companies operating in open economy, then from the point of view of interests of this economy, high margins achieved on export markets are favourable. Moreover, in practice, it is hard to differentiate between the price growth occurring without the quality improvement and the one associated with such improvement, especially that the latter may occur also in a situation of dropping unit prices (the example here may be the data storage technologies, in the case of which the technological progress led to a very large reduction of the cost of storage of information unit).

The second process, namely, the selection and transfer of resources within the industry is as important for productivity in the whole economy as the productivity of particular companies. Since the companies with the same specialization differ materially when it comes to efficiency, the elimination or reduction of activity of these less efficient and expansion of the more efficient may increase the general level of productivity. Syverson (2004) claims that in the USA, a company in the ninetieth percentile of multi-factor productivity distribution counted for a given industry is on average almost two times more effective than the company from the tenth percentile. In less developed countries such differences are even bigger – Hsieh and Klenow (2007) conducted a similar study for China and India and observed a fivefold difference.

At a sectoral level, we encounter a similar situation as at the industry level. Therefore intersectoral reallocation of workforce constitutes a third source of aggregate productivity growth. The ratio of added value per employee between the least and the most productive sector in the USA equals 4 to 1, and in majority of countries, it is much higher. The difference only partially results from the diversification of capital inputs in respective sectors, and thus from technological diversification of labour equipment of the respective industries. What is more, there is a possibility that capital will not be transferred to the sector because of the low productivity of that sector, for example due to overemployment and highly labour-intensive methods of production. Along with the development of the economy and the outflow of workforce to more productive sectors, the differences in productivity between the sectors should be narrowed, which later also results in recapitalisation (value calculated per employee) of those less productive ones.

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10 “Stylised facts” are a set of statistical regularities concerning the economy. They are usually uncontroversial – i.e. confirmed by many researchers irrespective of the measure used.

11 If we use productivity measure based on company’s revenues, we do not capture this element.

12 If we use a measure presenting multi-factor productivity, we do not capture this element.
Aggregate productivity is nothing more than the sum of productivity of respective enterprises because it is the efficiency of resources management at the micro level that determines the efficiency of the whole economy. Sector, industry or enterprise productivity reflects its capability to transform limited resources – labour, capital, energy and materials - into a valuable (i.e., such that will be acquired by external customers) final product. Added value generated in the company may be perceived in two ways. On the one hand, it is a difference between the company’s revenues from the sale of its products, and the costs of components necessary for the production (including but not limited to energy, materials or external services). On the other hand, added value is a sum of profits achieved by the enterprise constituting an element of remuneration of production capital and salaries paid out to the employees directly or indirectly involved in the manufacturing process.

Productivity is a measure relating the result of the production process (generated added value or amount of manufactured goods and services) to the incurred inputs. Thus, labour productivity may be measured by the ratio of the generated added value to the number of workers employed in the company or to the total amount of work performed in the manufacturing process. By contrast, capital productivity may be expressed as a relation of added value to the production capital value, and the productivity of energy by the relation of the added value to the value of the energy consumed\(^{13}\). The advantage of basing the productivity measurement on added value rather than revenues is its immunisation to the problem of division of vertically integrated companies and outsourcing, which themselves are the cause of growth or drop in the revenues, regardless of their impact on the efficiency of companies. On the other hand, it is also associated with the problem of identification of sources of efficiency growth at the level of respective entities or industries. If a company from one industry elaborates a cheaper technology of production of components used in another industry, the increase in the added value will be observed in both sectors, even though nothing in fact changed in the other one (Cobbold 2003).

At the same time, the measures of productivity based on added value reflect not only the technological, organisational end economic efficiency of the enterprise, but also its market position decisive for portion of the consumer’s surplus it is able to intercept. In particular, a non-intuitive situation may occur in which productivity grows through price increase. Thus, sometimes instead of added value the amounts of the manufactured goods or provided services are used. If the investigated product is of homogenous nature, it is difficult to indicate a better measure of effectiveness of its production than its quantity referred to the inputs. For example, productivity of one miner expressed in the amount of the coal extracted by him per unit of time. On the other hand, the majority of goods differ from each other not only in space but in time as well. So if in some industry there is a quality improvement of its products, then we may also talk about productivity growth of respective inputs. In such a situation a reasonable compromise is the use of measure based on unit value of sold goods and services. Such measures are based on an assumption that higher prices are followed by the improvement of quality, provided that these prices are accepted by customers.

Productivity measure taking into consideration more than one production factor is called a multi-factor productivity (MFP). Total factor productivity (TFP) is also used often, but this term is not precise, because it suggests that in a given measurement we have distinguished all the factors involved in production, which in practice is never true. Insofar as it is relatively easy to measure the volume of physical capital, amount of energy, or labour involved in production, the same cannot apply to intellectual, organisational or human capital. The increase in involvement of the inputs which were not taken into account when estimating MFP in the production process, will be noted as its increase.

Transition from labour, capital, energy or materials productivity to multi-factor productivity has another advantage. If we control capital inputs, the apparent source of labour or energy productivity growth, such as provision of the company with additional capital, disappears. At the aggregate level, this is less relevant, because new investments usually translate into changes in technologies and it is difficult to separate those two things, however, with respect to respective companies, multi factor productivity constitutes a better measure of effectiveness of their operation (Bartelsman and Doms 2000). The above considerations lead to the determination of three main measures of productivity. The differences between them are presented in Table I.10.

**TABLE I.10. The most important productivity measures used in the study**

<table>
<thead>
<tr>
<th>Name of the measure</th>
<th>Method of measurement</th>
<th>Unit</th>
<th>Typical use</th>
<th>Measurement difficulties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labour / capital / energy productivity, etc.</td>
<td>Added value (possibly the amount of produced goods) per number of employees/ value of the capital employed in production/ the amount of used energy</td>
<td>Number of currency units (alternatively number of goods) per unit of expenditure (e.g. the number of employees or unit of energy)</td>
<td>The measurement of the aggregate labour/capital/energy productivity, comparison of the expenditure of respective sectors and companies in economy</td>
<td>Small</td>
</tr>
<tr>
<td>Value added-based multi-factor productivity</td>
<td>Added value in relation to labour/ capital/energy input</td>
<td>Index units interpreted only relatively</td>
<td>Comparison of productivity between industries of the same sector</td>
<td>Large</td>
</tr>
<tr>
<td>Revenue-based multi-factor productivity</td>
<td>Revenues in relation to labour/capital/energy input and expenditure on components</td>
<td>Index units interpreted only relatively</td>
<td>Comparison of productivity between industries or companies</td>
<td>Very large</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on OECD, 2001; Cobbold 2003 and Syveron, 2010

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\(^{13}\) We often talk more about energy intensity, which is the reciprocal of the energy productivity indicator, than about the productivity of energy.
Now it would be reasonable to ask a question, which of the three elements of the productivity growth are the most important. An attempt to answer this question was made by Lentz and Mortensen (2008), who used the data from Danish companies. Their estimations suggest that three quarters of productivity growth is attributable to the reallocation of employees and capital between the companies, and only one quarter to the productivity growth in the companies themselves. Thus, the last two factors presented in our Diagram have a key importance, namely, the reallocation of resources within the industries and sectors, and between them. Within this framework, the process of selection of companies should specifically be considered, which according to the researchers is responsible for one fourth of the overall productivity growth.

3.1.1. PRODUCTIVITY GROWTH CAUSES AT A MICRO LEVEL

Each of the discussed processes has to be ultimately reflected in the productivity growth at the company level. After some time, dismissed employees from inefficient enterprises find jobs in more productive organisations, and productivity in sectors affected by the outflow of workers increases (either directly due to mechanisation and organisational changes, or indirectly as a result of the increase in prices). Otherwise, the companies from these industries would not be able to satisfy the demand for their products or to compete with imports. At the sectoral level, the decline of a certain activity in a given country may sometimes occur, e.g. as a result of loss of its international or internal competitiveness[14]. Still, on the more aggregate sectoral level, it does not happen in practice. For example, even in the most developed countries in the world, the textile industry is still present, however, usually only in selected market niches with exceptionally high added value (e.g. haute couture) or as part of selected elements of the value chain (design, brand management, logistics, etc.).

[14] Internal competitiveness of a sector or firm is the capability to raise the productivity to the level enabling effective competition for a customer or wage competition for workers (of a given type) on the internal market.
The change in the index of managers’ competences with a specific advantage of respective companies (management, the factors which are difficult to acquire on the market, connected 9%. The authors of the study interpret this result by claiming that inductive companies, the overall productivity would increase by ca. of all the workers to the level of those employed in the most productive companies from the most and the least productive decile. Approximately, this means that if we raised the competence level will thus give us an overview of the processes which ultimately constitute the basis for the economic growth and convergence. Syverson (2010) prepared a list of the most recent research findings with respect to company productivity, distinguishing the most important factors leading to its increase. They include:

**New investments.** Investments not only increase the amount of capital in the economy, but also raise the multi-factor productivity. Sakellaris and Wilson (2004) estimate that even two thirds of the multi-factor productivity growth in American companies between 1972-1996 were a consequence of new investments. This result is probably overestimated, because it does not include a number of other activities taken up by the companies, which were complementary to new investments. Moreover, there is a problem of selection – the companies whose productivity increased due to other reasons, are more eager to invest. More conservative estimations (Cummins and Violante 2002) indicate that the impact of new investments on the productivity may be half that much, which, nevertheless, still means that they are responsible for at least one third of productivity growth.

**Human capital.** Even though qualifications of employees influence the productivity of the companies, this gain is hard to capture. According to Fox and Smeets (2009), competences, measured by education and salary level, explain merely 18% of the differentiation between the companies from the most and the least productive decile. Approximately, this means that if we raised the competence of all the workers to the level of those employed in the most productive companies, the overall productivity would increase by ca. 9%. The authors of the study interpret this result by claiming that the factors which are difficult to acquire on the market, connected with a specific advantage of respective companies (management, product idea, technologies, patents, etc.) are responsible for the productivity advantage. Hiring better skilled workers does not automatically lead to their occurrence.

**Managers.** The change in the index of managers’ competences⁴ from the first to third quartile of competence distribution in the sample, results in the multi-factor productivity growth from 10% to 23% (Bloom and Van Reenen 2006). Managerial competences are positively influenced by competition on the product market, and negatively by the inheritance of the company by the eldest son (even though the fact that the company remains the family property has a positive impact) – those two factors explain more than half of the variability of the skills in the sample of more than 700 companies from Western Europe and USA. Extension of the study to include developing countries (Bloom et al. 2011) enables us to see how Poland performs (Figure I.40). Average results of Polish managers ranks in the first quartile of the distribution of competence of American managers. Based on the previous estimation, it may be stated that the increase of their competence up to the American level would yield the productivity growth from 5% to 12% to the Polish economy. This result is, however, probably underestimated, because the study covers only the middle-sized companies (from 50,000 to 10,000 employees), where the competence level of managers is relatively high also due to the fact that they are less numerous in Poland than in the USA. Another interesting fact is that the differences in managerial competences in international companies (except for domestic companies with an international activity profile) in respective countries (Figure I.41) are very small, and the competences themselves are much higher.

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⁴ Competences of managers are measured by means of a telephone survey in which managers answer the questions of researchers concerning the working practices of their company.
Moreover, there is a strong (0.6) positive correlation with the competences in domestic companies, which is indicative of the transfer of managers between companies and related diffusion of competences to the domestic sector. From this point of view, the presence of multinationals is a factor supportive of productivity growth.

**ICT technologies.** They influence productivity in many ways: increase the scope of products offered, allow better adjustment to customers’ expectations, and also better management of the production process, providing the managers with additional monitoring techniques or enabling them to more effectively manage reserves. Investments located in the ICT area have constituted a key factor of growth for the last two decades. Their contribution to the labour productivity growth is estimated at the level of at least 40% (Figure I.42.) with only partial consideration of their impact on multi-factor productivity. Van Ark et al. (2008) argues that the higher productivity growth rate in USA than in Europe in the last decade of the 20th century and the beginning of 21st century arises from better use of IT technologies, particularly in market services, which, according to the authors, include business services, financial services, trade and distribution. The results of a study carried out by Bloom et al. 2011. (2007) also seem to confirm this hypothesis – American companies have introduced the ICT solutions faster and more effectively, not only acting in their own environment, but also in their branches located in Europe.

**R&D and innovations.** Relying on a study covering Spanish companies, Doraszelski and Jaumandreu (2013) prove that enterprises which conduct research activity are responsible for 60% to 90% of the productivity of growth. However, it does not mean that the expenditure on research and development is the main factor leading to that growth, because the impact of self-selection is a significant although difficult to assess factor (more productive companies are also more eager to get involved in research activities enabling them to maintain their position or expansion to the new markets, and less productive ones avoid unnecessary spending) which. Nevertheless, other studies also show a positive impact of R&D expenditure on the productivity. For example Parsi et al. (2006), based on the data from Italian companies, have attempted to measure the impact of R&D spending on innovation, earlier proving that product and process innovations (the latter to a much greater extent) translate into productivity growth. Their study shows that R&D expenditure increases the probability of occurrence of product innovations in the company, however, they do not have a material impact on process innovations. The latter are in turn supported by investments in fixed capital, whose impact grows along with the increase in the R&D spending. It leads to a conclusion that internal research favours better absorption of technologies acquired outside of the company. At this point, it is worth noting that similarly to ICT technologies, the rate of return on investments in R&D is much more volatile than in the case of investments in physical capital, which increases the role played by liquidation costs in the case of failure of research projects.

As we have mentioned in the previous chapter, the economy of Central Europe – and Poland, in particular, – is still not innovative enough. Box I.8. enlists possible causes of such a situation.
PART I. BETWEEN IMITATION AND INNOVATION

**Box I.8. Possible Causes of Low Innovation of Enterprises in Central Europe and Poland**

- **Defective financial intermediation and/or too strong reliance of the companies on their own capital** – in the context of financing of investment projects, it is necessary to efficiently process hidden information and their communication. Low competitiveness and concentration of the banking sector result in the preference of only safe projects as compared to risky innovative ones and thus in the decrease of share of technologically advanced sectors in the economy. In extreme cases, even by 15% (Hombert and Matray 2012).

- **High risk aversion and/or lack of proper risk management** – short-term financial results which constitute the basis for remuneration of managers, poorly reflect long-term innovation of the enterprise (Makri et al. 2006). Its growth may be induced e.g. by the openness of enterprises to external sources of information (Laursen, Salter 2005).

- **Barriers in interinstitutional and intersectoral transfer of knowledge** – presence of foreign and transnational enterprises contributes to the transfer of know-how, provided that not only labour intensive activities (Mahmood i Rufin 2005) but also departments using advanced knowledge are located in developed countries (e.g. R&D departments). However, if as a result of FDI, only goods intended for export are produced and the cooperation with local subcontractors is negligible, looking for the source of innovation in FDI loses its sense. Similar situation occurs when the cooperating parties have an insufficient level of technological advancement (Varblane et al. 2007). Specific role in the transfer of knowledge may also be played by domestic conglomerates, however, their positive effects accumulate in the imitation phase (Mahmood and Rufin 2005), especially when they constitute a substitute for innovative institutional infrastructure – in such cases, they support the dissemination of knowledge – and here, with certain limitations, e.g. the diversification of activities (Chang et al. 2006).

- **Reluctance to cooperate and share risk** – the above-mentioned dissemination of knowledge takes place to a large extent through the channel of social networks – relations between enterprises and innovators. Thus, the bigger the social capital (especially trust), the easier it is to exchange knowledge and experience, which serve to create and develop new ideas (Mahmood and Rufin 2005). The merging of companies is a channel that facilitates the transfer of knowledge, which also requires trust and readiness for cooperation between initially independent entrepreneurs. In this context, post-communist countries characterised by low level of trust and weakened networks remain far behind (Varblane et al. 2007).

- **Competence and knowledge deficits** – deficits refer to scientists and engineers, but also managers. Technological competences are deemed as one of main sources of success of the Finnish (Georgiou et al. 2003), Korean (Sohn, Kim, Lee 2009) and Israeli (Getz, Segal 2008) models. By contrast, managerial competences, including among other things, the decisions whether, when and how to take up research and development activities, are not generally available, particularly in small-sized enterprises. Despite the awareness of potential benefits, there is little enthusiasm and incentives to learn (Varblane et al. 2007), which is why the companies do not engage in R&D to the detriment of their own efficiency (Leiblein and Madsen 2009).

- **Insufficiently modern/creative, underfinanced sector of science and/or barriers to cooperation between science and industry** – scientific institutions, depending on social and institutional conditions, may play different roles: from the research and development units and a source of innovations for the companies to being the supplier of qualified employees for the industry (Sohn, Kenney 2007). Deficits in the sector of science may be the demand barrier for the companies willing to invest in innovative activity, making it impossible for them to find properly qualified scientific staff or ideas adequate to be implemented in production.

- **Domination of cost-intensive scale industries in the economic structure** – i.e., the industries in which the competitive position is conditional on the decrease of unit costs of production. In their case, a reasonable strategy is not to invest in R&D but to purchase licences – one of the problems of the new EU member states is withdrawal from pro-innovative activities in traditional industries (Varblane et al. 2007). In practice, they do not create foundations for long-term development, as it is shown by the examples of the timber, furniture and paper industry in Finland and Sweden, i.e., the countries whose joining the group of highly developed countries was enabled by investments in the sectors with a higher degree of processing and technological advancement, like automotive, machinery and electronic industry.

- **Weakness of the demand side** – pro-innovative policy in Central and Eastern European countries focuses on the strengthening of the demand side (support of the increase in R&D expenditure and activity in companies, attracting foreign companies, creating public research institutes or infrastructure). However, if the consumers are guided in their choices by the low level of prices instead of the advancement of products, it is necessary to efficiently process hidden information and their communication. Low competitiveness and concentration of the banking sector result in the preference of only safe projects as compared to risky innovative ones and thus in the decrease of share of technologically advanced sectors in the economy. In extreme cases, even by 15% (Hombert and Matray 2012).
CONT. BOX I.8. POSSIBLE CAUSES OF LOW INNOVATION OF ENTERPRISES IN CENTRAL EUROPE AND POLAND

- **Too low and/or non-complementary effort of the public sector** – repeating of the past solutions is one of the worries in this case (e.g. the maintenance of low public spending on R&D and failure to reform the domestic system of innovations despite the growth of prosperity of the country). Automatic transfer of solutions from other countries without adapting them to domestic conditions is another object of concern. A frequent mistake is a wrong allocation of support within an industry (not within the fields of specialisation), reluctance to develop long-term plans and preferring a short-term approach, promoting thriftiness instead of investments (Varblane et al. 2007). Very often, countries choose a linear model of innovation which assumes that investments in research and development automatically translate into innovations and their commercialisation, whereas, in reality, it happens rarely if the outlays made by companies do not grow along with public spending on R&D, which usually requires a policy supporting the creation of knowledge in companies and its dissemination (Varblane et al. 2007). The concentration of support provided under governmental programmes on enterprises which conduct R&D activity, thus limiting the possibilities of companies undertaking other innovative actions to use that aid, should also be perceived as a deficit (Arundel et al. 2008). A systemic problem of many countries is a lack of evaluation of their own actions, among others, within the scope of effectiveness of respective instruments (CPB 2014a, CPB 2014b).

- **Undervalued currency** – a favourable exchange rate deprives local entrepreneurs of a stimulus for innovation, because foreign customers are interested in their less advanced goods despite relatively low productivity from their manufacturing and small added value of the manufacturing process. The cause for this interest is the price, which is attractive to foreign recipients, and possible to achieve owing to the undervalued currency (Eichengreen et al. 2011, 2013). As an example we can mention the Chinese currency (2009-2015) but also Polish zloty (2009-2015), and in the past (1980-1999) Italian lira.

Source: Own elaboration

**Knowledge spillover.** Geographical proximity of manufacturers yields often unintentional transfers of knowledge and technologies. As it is stated by Moretti (2004), qualified employees working in other companies in close vicinity increase the productivity of the investigated company. Also Griffith et al. (2007) observed that maintaining an R&D department in a US company increases the productivity of British companies, which is attributed to the transfer of knowledge from American R&D departments being usually close to the technological edge in their fields. On the other hand, Bartelsman et al. (2008) noted that in normal conditions (without overseas R&D outpost), the convergence of productivity is stronger with respect to the local leader than the global one. What is more, convergence with the global leader seems to show a tendency to vanish when the technological distance is sufficiently high. Imitating the local leader in turn, takes place all the time. The fact of productivity growth owing to investments of global corporations documented by Keller and Yeaple (2009) is also attributed to the spillover of knowledge.

**Access to funding.** The development of banks and capital markets gives a chance for a bigger mobilisation of household and enterprise savings and targeting them at more profitable investment projects. Even though some of the areas of activity of banks and capital markets overlap, there is a number of substantial differences between them. Since banks significantly limit (or completely eliminate) the liquidity risk and credit risk of depositors, it encourages to entrust them with any even temporary financial surplus, as a result of which the scope of financial intermediation significantly increases. Moreover, as Diamond (1984) notes, the bank has a comparative advantage (over capital markets) in monitoring debtors – it has adequate motivation for this, because it bears full credit risk, and tools, as, among other things, it often has an ability to screen through a multiannual bank account history. Despite these advantages banks do not perform equally as well when it comes to financing of all the investment projects.

In typical situations applying proven, standard procedures and models appropriate for banks is expedient, because it is effective and cheap (gathering of information is not duplicated). However, according to Allen and Gale (2000), whenever it is difficult to assess the value of investment and there is no good collateral, capital markets turn out to be necessary because they provide the banks with plurality of opinions unavailable for to banks. Only the share price allows the aggregation of the pieces of information on perspectives of the company, which are held by a number of people at the same time. It enables the company to obtain financing on the conditions matching the valuation of its investment projects – best obtainable at the moment. Additionally, the banks are not able to finance high risk projects, because prudential regulations do not allow them to do so. These in turn are necessary because under deposit guarantees provided by the state, the banks are obliged to ensure that customers’ funds are not exposed to excessive loss. The financing of risky projects from the venture capital funds also requires proper operation of capital markets. They create an environment fostering the training of specialists in the areas of investing and risk, and enable the fund stakeholders to sell the company through the stock market to cash in the gains from successful investment.

There is a lot of evidence gathered on the company level documenting the impact of the financial condition on of their situation (Levine 2005). However, it does not give direct insight into productivity growth. Regardless of that, such evidence is worth mentioning. Demirgüç-Kunt and Maksimovic (1998) show that the development of the capital market and banking services market allows for a faster growth of the companies than if they relied solely on accumulated profit. Such accelerated expansion allows interception of larger resources by more profitable, so usually also more productive enterprises, which increases the aggregate productivity. On the other hand, Beck et al. (2005) notes that external capital sources to the greatest extent foster the development of small-sized enterprises.
This is another argument in favour of the claim that the financial system expedites the selection of companies – enabling faster growth both to productive leaders and new players. Such conclusion is also confirmed by the study conducted by Wurgler (2000), who showed that a better developed financial sector results in more investments occurring in fast developing sectors all over the world, and less investments in the sectors of a declining nature.

**Competition.** Competition increases productivity through two channels. Firstly, it leads to the elimination of less profitable enterprises and take-over of their resources by those that are more profitable and productive. Secondly, it exerts pressure on all the enterprises, which imposes the activities mentioned before, such as new investments, research activity, innovations, etc. that support productivity growth. Empirical grasp of the first type of influence is relatively easy, because productivity is very clearly correlated with the likelihood of survival of a given company. The stimulating impact of competition also finds confirmation in the data, both at the sectoral level (Svyterson 2004) and at the level of respective companies. Schmitz (2005) describes an interesting case study. He analysed the productivity of American iron ore mines. Until 1980, over several decades, it was maintained at basically the same unchanged level of 2 tonnes per man-hour. At the beginning of the 1980s, however, there was a significant drop in prices of Australian and Brazilian iron ore, as a result of which for the first time, their imports to the USA became cost-efficient. This caused a very fast adjustment in American mines – until 1985 the amount of ore extracted in one hour increased to 4 tonnes, which allowed continued operation of the mines. Quantitative share of competition in overall productivity, not only in this case, is very high. Cincera and Galgau (2005) investigating European companies estimated that the growth in the fraction of companies entering the market (or alternatively the percentage of those leaving the market) by one percent, leads to faster productivity growth in a given sector by as much as 0.6 percentage point.

While analysing the impact of competition on productivity, it is hard not to mention the frequently stated hypothesis concerning the positive impact of export competition. It assumes that an enterprise which carries out sales to foreign markets has to compete there with a larger number of manufacturers without natural local market knowledge, which yields stronger pressure on the growth of productivity than domestic competition. Such hypothesis is not, however, confirmed by data. Indeed, it is easy to show that exporters are more productive than companies that do not enter foreign markets, but it can be entirely justified by the selection effect. De Loecker (2007) conducted an interesting study of Slovenian companies, which brought a slightly different result. It showed that the productivity of exporting companies grows when they sell products or services in the most developed markets. This conclusion is compatible with the lack of impact of export on productivity, observed in most of the studies. This is because it may happen that the export to less developed countries influences productivity negatively, and to more developed ones – positively.

**Relevant regulations.** It is hard to overestimate the meaning of institutional framework for the behaviour of companies. Even though in the developed countries, the most important rules are similar – private property dominates and the property rights are respected – even there, the scope and methods of governance have impact on productivity. Also the ownership form of companies is significant. The study of Brown et al. (2008) shows that the majority privatisation of enterprises from Central Europe increased their multi-factor productivity by 2% on average (Ukraine) to 15% (Romania). But if the company is sold to a foreign investor, productivity growth is even several times bigger – from 18% to 35%.

**FIGURE I.43. Regulations and productivity**

![Figure I.43. Regulations and productivity](source: Arnold et al., 2008)

**FIGURE I.44. Regulations and ICT investments**

![Figure I.44. Regulations and ICT investments](source: Arnold et al., 2008)
From the point of view of economic growth over the last twenty years, a particularly interesting question is the impact of regulations on the dissemination of ICT technologies in companies. Bartelsman et al. (2009) show that the high costs of limiting a company’s activity decrease its inclination to invest in innovations in the ICT area. As an example of such costs, they mention administrative protection against dismissal of employees, which, on the one hand, discourages experiments that are prone to failure (it will be necessary to dismiss those that implemented them), and, on the other hand, punishes for success (it is necessary to dismiss those employees that were substituted with new technologies). The United States, where the labour market functions basically with no protection against dismissal, constitute thus a more attractive location for conducting experiments in the ICT area than the majority of European countries. Smarzynska-Javorcik and Spatareanu (2005) draw attention to another cost of excessive protection of employment. They note that high employment protection is discouraging for direct foreign investments, especially in the services sector.

Not only the market of production factors, but also a badly regulated product market may constitute an obstacle to the absorption of ICT technologies. Arnold et al. (2008) attributes a special role to the regulations in the network services sector (telecommunications, transportation, media provision) and professional services sector (accountants, architects, lawyers, engineers) and retail trade. These industries, which may be collectively referred to as business services, provide important contribution to the industry and modern services. Therefore, they play an important role in the productivity of the whole economy. If as a result of activity of state monopolies or inadequate regulation of natural monopolies or the creation of additional entry barriers of administrative nature\(^{16}\), the restriction of competition in the business environment services shall occur, the companies operating there will not have sufficient motivation for implementing ICT innovations. This is exactly how Arnold et al. explains a strong correlation (-0.72) between the number of regulations and acceleration of the labour productivity growth in some OECD countries after 1995. Greece is the only country that clearly does not fit in the regularity illustrated by Figure I.43., however, the acceleration of productivity experienced by this country in the investigated period was not long-lasting, as it turned out not long after that.

Such a conclusion could be visible already then if one had taken a look at Figure I.44. illustrating the relationship between the level of regulations in network industries in the latter period and relative level of investment in ICT capital. It is clearly negative, which is indicated by one of the main channels of impact of the regulations on productivity – they lead to the reduction of risky investments in new technologies, i.e., ICT technologies in the investigated period. Arnold et al. (2008) states that a more detailed study at industry level shows that the regulations explain 20% of the fluctuation of investments in ICT capital. A study conducted at the corporate level yields similar conclusions. Regulations lower the productivity in the industries intensively using ICT. Fast developing enterprises and those whose productivity is at the level close to global leaders are the ones that are most affected. Arnold et al. explains this phenomenon as follows – unrestrained competition and its active promotion leads to a larger differentiation of productivity owing to the emergence of very productive leaders, who after some time, take over more and more resources, leading to the growth of aggregate productivity. On the other hand, the regulations take away leaders’ motivation to implement innovations, by raising their costs and reducing the benefits. As a result, those leaders do not develop without squeezing out companies with low productivity.

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\(^{16}\) Indicators from the OECD International Regulation Database applied in this study take into account the regulations constituting in fact a restriction of competition, and which are also in their opinion basically redundant or their underlying purposes could be achieved by other means. Detailed description of respective regulations may be found in Conway and Nicoletti (2006).
Due to the material role of regulations in the creation of the conditions for productivity growth, now, it is worth taking a look at how Poland ranks among OECD countries (Figure I.4.5). Unfortunately, our country is significantly distant from the average in almost every industry which in the future will negatively impact the economic growth. The only regulations that we are praised for concerns electricity and telecommunications markets. There are many causes for us being so far behind, and the most important ones include: high level of public property in network sectors, market entry barriers in professions essential for the economy (including restriction on the pursuit of professions by immigrants which is unique among the developed countries), discrimination of supermarkets or monopolisation of the gas market. In each of the mentioned areas and in many others, it is easy to find a country worth replicating, which elaborated solutions stimulating competition and at the same time expedient for the customer. United Kingdom, Sweden and Denmark stand out positively in comparison to the rest of OECD countries.

3.1.2. CAUSES OF PRODUCTIVITY GROWTH AT A MACRO LEVEL

Understanding what shapes the productivity of particular companies and industries is helpful in diagnosing the obstacles to domestic productivity growth. However, to get the whole picture, it is necessary to take a look from the perspective of the total economy. That is because some of the factors cannot be well captured at the micro level. One of the examples may be human capital that seems relevant for productivity growth on many levels, which does not necessarily mean that employment of better qualified employees in itself, significantly raises productivity. The situation looks similar in the case of certain types of R&D activity that may improve the condition of all companies, which may also be measured only at the level of the total economy by means of conducting international comparisons. Presentation of macro-factors of productivity growth shall begin with quoting the conclusions from a recently conducted panel study of the developed countries, which will be followed by the presentation of findings of the econometric survey we have carried out.

Westmore (2013) investigated a number of countries, mainly OECD members or similar ones between 1985-2008. The findings from his model are presented in Table I.11. It transpired, among other things, that multi-factor productivity is greater, the higher is the spending of enterprises on R&D and the higher the number is of patents owned by them. At the same time, it was noted that the latter significantly increases when foreign R&D departments located in the country. Also governmental policies positively impact the number of patents, however, this channel does not ultimately lead to productivity growth, similarly to the research and development activity in governmental institutions and government-led academic centres. It probably stems from the fact that governmental spending on education may stimulate innovations which do not increase productivity or may be expensive from a taxation point of view. Westmore also draws attention to the possibility that tax incentives may discriminate new players, who do not have profits yet and thus tax incentives are of no help to them.

Westmore’s study confirmed that strict regulation of the product market negatively impacts productivity. Restrictive law concerning bankruptcy with strong privileges for creditors is also unfavourable. This last fact is well explained by the a micro study performed by Maksimovic and Phillips (2001), showing that when a company buys an asset it usually causes its productivity to grow. Thus, postponing bankruptcy and the sale of assets connected with it, provoked by the law unfavourable for the shareholders, leads to the extension of the period in which the assets remain in the hands of people who manage them in a wrong manner.

At the macroeconomic level, the meaning of financial development may also be better captured than in the case of sectors or companies. Both the banks and the capital markets prove to be statistically and economically significant in this case. Levine and Zervos (1998) show that the growth of bank loans in relation to GDP by one standard deviation leads to the growth of GDP per capita by 0.7 percentage point. A similar result (0.8 pp.) is obtained with the growth of stock exchange turnover in relation to the capitalisation of the domestic stock exchange. What is important, capitalisation itself does not matter – placing the company in the public market, if this market is not in fact functioning or is poorly functioning, does not matter from the point of view of economic growth. On the other hand, Rioja and Valev (2004a) note that the impact of financial sector development is different in poor and wealthy countries. In the former countries, the banks and capital markets mainly mobilise savings, by increasing the capital resources, while in the latter, they lead to multifactor productivity growth resulting from a more accurate choice of investment projects. This confirms the thesis of Alan and Gale (2000), which has been indirectly mentioned already. According to them, at the higher level of development, well developed capital markets are necessary to finance productivity-increasing innovative projects.

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<th>TABLE I.11. Factors influencing the productivity in the developed countries</th>
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<td><strong>R&amp;D expenditure</strong></td>
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<tr>
<td><strong>Owned patents</strong></td>
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<tr>
<td><strong>Openness to foreign trade</strong></td>
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Source: Westmore, 2013
The position of Central Europe and Poland can be compared by looking at a selection of indicators showing the level of financial development (Figure I.46). As regards to the availability of banking services we basically do not have anything to be ashamed of. There are as many bank branches per inhabitant in Poland, as on average, in the OECD countries and more than in other countries of the region. The higher indicator of saturation with branches in PIGS countries (Portugal, Ireland, Greece, Spain), points rather to an excessive expansion of banks in Southern Europe (especially in Spain) than their shortage in the remaining OECD countries and in Poland. The Polish banking sector is not only developed but also competitive, which is the result of, on the one hand, a large number of banks and minor market concentration, and on the other hand, active policy supporting competition pursued by the Office of Competition and Consumer Protection and the Polish Financial Supervision Authority. The fact foreign and domestic entities enter our market quite frequently in comparison to the general tendency observed in that sector, also proves the good condition of banking services in Poland.

The Polish capital market also compares well in comparison to other countries in the region. Nevertheless, this comparison looks much worse with respect to the countries of Western Europe. Capitalisation of the Warsaw stock exchange is on average two times lower than in OECD countries, which to a large extent is most probably the result of the smaller size of the economy – a wealthier country owns more capital, thus also more capital is listed on the stock exchange. However, the turnover, which in relation to capitalisation is half as low as in OECD countries, is a visible weakness of the Polish stock exchange. In this respect, Poland looks much worse than the PIGS countries, but it is closer to Greece and Portugal rather than to Spain and Italy. As regards GDP, the turnover of the Warsaw stock exchange is three times lower than in OECD countries and twice as low as in the South of Europe. Among the reasons for this fact we may indicate, on the one hand, little willingness to save money in financial institutions – only every fifth Pole declares it, as compared to every second German and two in three Swedes. On the other hand, the Poles save very conservatively, are unwilling to use the services of investment funds whose assets are low with respect to deposits in Poland. TFI (Fund Managers) in Poland have minor assets, even if we make a comparison with the countries of the region, with no, as noted before, significant domestic capital market. It may thus be concluded that overdevelopment of our stock exchange resulted from other factors, including but not limited to, active contribution of OFE (open pension funds’ assets in 2010 were two times higher in Poland than in the other countries of the region). The limitation of their role that began in 2011 requires searching for other methods of supporting the development of the Warsaw stock exchange (Capital Strategy 2013, 2015).

The above considerations are summed up in Table I.12., in which the theories discussed in chapter 2 were confronted with the evidence presented so far. The general conclusion from this comparison is that the theories are complementary to each other, and evidence may be found with respect to each of them. The only exception is the world-system theory, which clearly contradicts the transfer of knowledge and technologies between the core and the periphery. We may then draw conclusions for Poland from each theory.

**Figure I.46. Selected indicators characteristic for Polish financial system as compared to OECD countries**

Source: Global Financial Development Database
3.2 ECONOMETRIC ANALYSIS OF CONVERGENCE AND SCENARIOS FOR POLAND

In an attempt to synthesize the theories discussed in the previous chapter and empirical studies referring to the problem of economic growth we elaborated an econometric model. In the model, we tried to identify the most important factors, which over the last several dozen years supported or hampered the real convergence of the countries being relatively poorer than highly developed countries of the West. This model allows for better, in our opinion, operationalisation of the notion of the middle income trap than the one already suggested in the literature. When developing the model, we did not assume an arbitral level of prosperity, above which some of the countries would encounter difficulties with maintaining the existing convergence rate. Just the opposite – such a threshold was identified ex-post by means of model generalisation of the experience of many countries. The model was estimated on the basis of a sample of fifty countries with the use of data from the years 1960-2014 and the GGDC forecast for 2015. Due to the cross-sectional nature of the sample with a certain time span, the estimation of its parameters was performed with the use of panel regression with random effects. Apart from seven explanatory variables of fundamental nature, the model also comprises binary variables taking into consideration the impact of single events – characteristic of respective decades, which additionally improve its adjustment. When developing the model we have tested fifteen variables, which according to the expectations of the theories discussed in previous chapters, should have an impact on economic growth in a medium- and long-term.

![Table I.12. Assessment of growth theory in the light of empirical studies on productivity](image)
Their description with a short reasoning justifying their inclusion in the model is presented in Box I.9. Since the process of selection of variables was multi-stage, many conclusions were revealed in its course. In addition to the results of the final version of the model, such conclusions are also worth mentioning. Table I.13. presents the details of estimations for ten alternative specifications verified by us. We will briefly discuss the conclusions arising from each of them.

The first version of the model revealed convergence of productivity that was statistically significant, although still not of much economic importance. Each 10 percentage points of US productivity less at the beginning of a decade, yields a GDP growth in the next ten years lower by 0.2 pp. This simple model explains 16% of variability of productivity. Another specification enables us to make use of the panel property of data (the same country corresponds to a few observations from different years), owing to which we obtain better estimation of the parameter responsible for convergence, which turns out to be almost four times stronger than in the first estimation. The analysis of panel data also allows decomposition of and distinguishing of variability within the scope of particular countries and between the countries. The study including only x variable enables us to explain more than one third of the variability of the first type, but it explains the differences in the productivity growth between the economies to a lesser extent. Thus, a conclusion arises that the convergence is a real and economically significant process, but occurring mainly within the country but its pace matches its specific conditions. The above conclusion is strengthened by two other specifications. Adding the square of the x variable and binary variables responsible for the effects of the decade slightly improves the estimations of the model, but differences between the countries are explained only to a minor extent.

This problem is addressed only by the fifth specification of the model, being the result of the selection of variables according to their statistical significance. Apart from variables controlling the process of convergence and effects of a decade, five other explanatory variables were chosen (Box I.9.). The first of them – Freedom – has clear institutional connotations. The second one – Cognitive – is responsible for the level of human capital. In an alternative specification, an IQ variable, strongly correlated with the former one, was also significant but it was excluded from final specification, because the model in which it was included (in place of Cognitive variable) was weaker. The variable called Investments was also significant; it combined the aspects of theory of technological leap and innovative growth. It has a simple economic interpretation – the increase in the share of investments in the GDP by one percentage point on a scale of a decade shows that the productivity growth within this decade is higher by 0.07 pp. The fourth considered variable – Asia – was initially supposed to reflect the specificity of the Asian economic miracle. Meanwhile, it turned out that positive aspects of that miracle were reflected by the first three variables, and the Asia variable assumes negative values as a result of which it adjusts its effects downwards. It is statistically relevant in each specification verified by us, and its quantitative impact is surprisingly high – thus, Asian countries develop as compared to the rest of the world (on average) by 1.28 percentage point slower than as suggested by other factors included in the model. It would appear that this happens because of the countries such as Bangladesh or Vietnam, which almost did not reduce the distance between themselves and the US in the investigated period, however, subsequent specification indicates something completely opposite – after removal of the poorest countries from the sample, the Asia variable is still relevant, and it is still negative and has even greater absolute value. Thus, it may be presumed that in this manner, negative characteristics of the Asian growth model connected with either oligopolisation of the economy or excessive role of the state, were captured. Discussion on this issue in the context of Korea is included in the second part of the report, and in the context of China – in one of the previous chapters. The last of five variables characterising the country – Complexity, i.e., an index of economic complexity, was included in the model following the innovative growth and world-system theories. More comprehensive discussion on the relations between the economic complexity and industrialisation is included in Part II of the paper.

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<th>BOX I.9. DESCRIPTION OF VARIABLES USED IN THE PRODUCTIVITY CONVERGENCE MODEL</th>
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| A variable explained by the model, i.e., y, is an annual average productivity growth rate reported in a given country within a given decade. The first decade included in the study begins on 1 January 1951, so it covers the years 1951-1960. The last “decade” begins in 2011 and lasts until the end of 2015 (we include one year of the GGDC forecast available in the data base), thus its duration is five years. To diagnose the factors influencing the y, the following fifteen explanatory variables were used:

**First block of explanatory variables** are the variables controlling the starting point – they reflect the general expectation of an economic growth theory according to which initially poorer countries may develop faster owing to the so called gap rent (renta zapóźnienia):

- **x** – basic variable present in each of the alternative specifications. According to the version of convergence hypothesis assumed by us it is the productivity calculated as GDP per one hour of work at the end of the year preceding the given decade referred to the US productivity at the same time. The source of data is: Total Economy Database, 1950-2015.
- **x²** – variable being the square of the x variable. Introduced in the study due to the assumption that productivity convergence is not linear.
Another five specifications illustrate a number of interesting phenomena, although they proved to be side paths of the process of estimation not leading to the final version of the model. The sixth specification shows that the model is quite robust to the removal of countries outside of OECD from the sample, for which the Empprot indicator, measuring the degree of employment protection in the member states of this organisation, is not available. This variable proved to be statistically relevant at the level of 5%, but its sign does not correspond to our predictions. The significance of remaining variables of the model was diminished, especially regarding to the Freedom variable. This is probably an effect of correlation of employment protection with Freedom variable – this is because European developed countries are in Emmprot and Freedom rankings at the same time. On the other hand, the seventh specification attempts to identify the impact of the capital market on the productivity growth rate. However, it was captured only after the exclusion of other explanatory variables from the study, which is why this result should be treated with caution.

Source: Own elaboration
Similar reservation may be necessary with respect to the eighth specification including the product market regulation – also in this case we had to narrow down the sample to OECD countries, which considerably decreased the significance of estimation of other parameters. However, if the 7th and 8th specifications were to be treated as binding, then the conclusion could be that if stock market turnover in Poland (18% of GDP) could be increased to the level of Spain (98% GDP), our economic growth would be higher by 0.2 pp. annually. Similarly, if the regulation of the product market was improved to match the level of Spain it would yield an additional 0.17 pp. of total growth annually. In the sample covering the whole investigated population (and not only the OECD data), the role of Empprot and PMR is taken over by the economic freedom index of the Frazer’s institute (Freedom).

Interesting conclusions may be drawn based on the last two specifications. If we exclude the variable x controlling convergence from the model and we include an Agriculture variable (identifying an actual degree of industrialisation of the economy) and Cognitive variable (significantly improving the adjustment in each of the specifications) instead, it will transpire that the share of people employed in agriculture positively impacts the economic growth. This is compliant with the technological leap theory: high employment in the first sector means ample space for increasing productivity through reallocation. However, if we control the convergence again, the Agriculture variable does not lose its significance but changes to negative. Thus, the employment in agriculture as such does not favour convergence but merely reflects the size of the technological gap of a given economy; its drop is usually associated with a convergence within the logic of a technological leap. This could, however, be faster if the employment in agriculture was lower. Referring this conclusion to Poland we may calculate that the reduction of employment in agriculture from 13% to 3% GDP would increase the productivity growth rate by 0.3 pp annually on average.

### TABLE I.13. The results of the econometric model explaining the productivity growth

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<th>X</th>
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<td>-14.52***</td>
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<td>-6.62**</td>
<td>-11.10***</td>
<td>-14.93***</td>
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<td>2.6**</td>
<td>6.44***</td>
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<tr>
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<td>.27</td>
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<tr>
<td>Cognitive</td>
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<td>2.11***</td>
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<td></td>
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<td>-2.3***</td>
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<tr>
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<td></td>
<td></td>
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<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Panel f. e.</td>
<td>Panel f. e.</td>
<td>Panel r. e.</td>
<td>Panel r. e.</td>
<td>Panel r. e.</td>
<td>Panel r. e.</td>
<td>Panel r. e.</td>
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<td>Number of countries</td>
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<td>59</td>
<td>59</td>
<td>59</td>
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<td>21</td>
<td>57</td>
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</tr>
<tr>
<td>Number of observations</td>
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<td>312</td>
<td>312</td>
<td>312</td>
<td>211</td>
<td>101</td>
<td>162</td>
<td>103</td>
<td>188</td>
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<td>R² in the country</td>
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<td>0.37</td>
<td>0.39</td>
<td>0.50</td>
<td>0.59</td>
<td>0.82</td>
<td>0.21</td>
<td>0.70</td>
<td>0.03</td>
<td>0.42</td>
</tr>
<tr>
<td>R² between the countries</td>
<td>0.04</td>
<td>0.06</td>
<td>0.07</td>
<td>0.66</td>
<td>0.29</td>
<td>0.25</td>
<td>0.36</td>
<td>0.50</td>
<td>0.60</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration. Asterisks indicate the significance degree: from 10% (*), through 5% (**) to 1% (***)
After selecting the model specification (V), we may move to the analysis of its conclusions. The model based on the characteristics of a given country enables identification of the level of productivity, as compared to the United States, that should be achieved provided that the character of its institutions, complexity level, human capital resources or investments will not change. In the investigated sample this is, on average, 60%. This threshold may be thus identified with an empirically confirmed upper limit of the middle income trap. Such definition complies with intuition connected with this notion, present also in some of the analyses mentioned in the first chapter: middle income trap is a zone, which is impossible to pass for a typical country without an above-average reform effort or specifically favourable circumstances. The model presumes that the country with average (on a global scale) institutions, not distinguishable in terms of complexity of industrial production, human capital resources or investments level, will probably get stuck on its development path, somewhere around 60% of the US productivity level.

According to this definition neither Poland nor any other Central European country has fallen into the middle income trap, but Greece and Portugal are stuck there. To see this, we will take a look at the development trajectory determined by the model for a country, whose institutions and other characteristics of the economy are at an average level in the sample (Figure I.47). The fact that after the period of fast growth a country finishes the process of convergence at the level of 60% of US productivity may be interpreted as a reflection of a traditional theory of economic growth, according to which countries should strive for a similar level of development insofar as the parameters of their production functions (e.g., institutions, human resources capital, etc.) are similar. If the improvement of the quality of economic regulations or education system above the average is a task so complex that the average country needs much more than several decades, for which we have gathered observations, then the convergence of prosperity to a level still distant from the position of a leader is not surprising anymore. Economic successes in this interpretation would reflect either exceptionally favourable external circumstances or good economic policy or a remarkably high complexity of one’s own industrial production or rarely encountered quality of education. A similar concept is promoted by Pritchett and Summers (2014), who indicate that the phenomenon of growth slowdown is mainly caused by the mean reversion rule – the same factor that causes fast convergence in the initial stages, subsequently makes the country develop more slowly, which according to the same authors has universal meaning, irrespective of the income level.

This conclusion is illustrated in the figure by the green dotted line with a straight line corresponding to an average productivity growth rate of the USA in the investigated period. Apart from model trajectory, Figure I.47 also illustrates the actual development paths for different countries, including Poland. It is notable that the countries that manage to avoid the middle income trap developed faster than the trajectory for an average country predicts and that is why they overcame the barrier of 60% or are on a good way to do it in the future. On the other hand, Malaysia, throughout the investigated period, and Poland during the period of Polish People’s Republic, were basically stuck, not even reaching the threshold of 60%, as a result of exceptionally bad economic institutions. More examples of failures are illustrated in Figure I.48, where we can follow the fate of Argentina, Chile and Portugal, which developed below the model trajectory, remaining notably below the 60% threshold, for most of the investigated period. The development of Poland in the years 1990-2000 is located near the model trajectory, which reflects the fact that the economic institutions and structural factors (human capital, complexity) in the first half of this period were not much different from the world average. Low values of the case in 2010 result from the negative effect of the decade (and more specifically 2010-2015), which started with a great financial crisis lowering the economic results of particular countries, including Poland.

**FIGURE I.47. Development path of an average country as compared to actual development paths in chosen economies, 1970-2015**

![Graph showing the development path of an average country as compared to actual development paths in chosen economies, 1970-2015](image-url)

Source: Own elaboration based on model projection and GGDC data
It should be emphasised that the past economic results do not determine the expectations of the future convergence rate and target level as such. This is because they also depend on the changing institutional and structural factors. Even though the explanatory strength of the model is relatively big, other factors are still responsible for ca. 40% of variability. It is also not possible to predict the shocks characteristic of respective decades – insofar as the average productivity growth in Poland in a current decade is lowered by the effects of the financial crisis, the growth in the subsequent period may be higher. What is more, a low level of economic growth between 2000-2015 refers also to the developed countries – including USA – and thus, the point of reference changes, which cannot be fully illustrated on a static image such as Figure I.47. It is worth noting here that the model elaborated by us accurately forecasts not only the development failures (Figure I.49. and Figure I.50.), but also successes. Figure I.51. indicates that the fast growth in Singapore, Japan and Ireland in the following decades was based on the level of investments, human capital, economic complexity and institutional environment quality observed at the beginning of subsequent decades. Above-average productivity growth dynamics predicted by the model is in case of those countries fully compliant with observations. Thus, the above-average economic growth and avoiding the middle income trap was not a surprise. For similar reasons, the model predicts that the development reefs will be bypassed by South Korea.
Good properties of the model with respect to the past encourage the formulation of a forecast for the future. Figure I.52. presents such a forecast for several selected countries. Its subject is a target productivity level, which they would be able to achieve, if their economies had the same institutional and structural characteristics as they had for the past three years. – In light of available data, the countries marked with an asterisk seem to be stuck in the middle income trap, converging to the productivity level lower than 60% of the US level. Based on this, we assume that the two European countries (Greece and Portugal) visible in the figure, and also Russia, Turkey, Malaysia and nine countries of Latin America are currently in the middle income trap, and leaving it will not be possible without significant institutional and structural reforms of their economies. On the other hand, Central European countries are not directly threatened by such a trap, which is reflected by favourable effects of the EU accession for the whole region. This not only allowed a significant improvement of the institutional environment in relation to the years 1990-2004 discussed above, but also enabled these countries to join the European economic system and integrate within its chains of values. This has notably increased the complexity of Central European economies, which, in combination with better institutions and the level of human capital, usually not much distant from the Western one, increases the chances for convergence in the region.
However, this does not mean that their target productivity level is 90%-100% of the US level, the level enjoyed today by France or Germany. A typical Central European country has a chance to be ranked at the level currently held by Spain, with current characteristics of its economy. Only in the case of the Czech Republic – the most developed country in the region, with not only the highest level of Complexity indicator, but also with one of the best institutions – and for Estonia, which has a very high share of investments in GDP and is a global leader in terms of economic freedom, the model predicts full convergence. Probably also Slovakia and Hungary will be placed relatively close to the leaders. The complexity of their economies over the recent years have risen notably mainly due to investments in advanced industrial sectors. The chances for a full convergence of Poland – the country with comparable institutions, but the economy less complex than it’s neighbours – are smaller. The model expects that in the conditions of institutional and structural status quo, the probable labour productivity level in Poland will not exceed 76% of the US level. What is more, in the forthcoming decades, the productivity growth dynamics shall be notably lower than after 1990. Hence, reaching the level mentioned above will take us more than 40 years. A similar threshold and expected dynamics of developments can be observed in the case of Slovenia, Latvia and Romania, and a slightly slower one in Lithuania. Despite these differences, the region today is already better predisposed to the growth than the countries of South America, which are at a similar level of development, i.e.: Argentina and Chile, Asian countries (Malaysia) and European ones (Portugal, Greece and Russia).

Also Table I.14. indicates little probability of Poland being at risk of middle income trap in the long run, with the trap being defined as the lack of capability to exceed 60% of the US productivity. The table compares the average key values of indicators characteristic for economies of the countries that – in our opinion – already fell into the trap and those that managed to leave the middle income zone between 1970-1990. It is clearly visible that Poland surpasses the countries that stumble on their development path in all respects apart from the investments in GDP. To a large extent, this is a result of the last decade, when all the measures, which according to the conducted estimation are material for a long-term economic growth, increased: economic freedom, human capital, diversification of domestic production and network of is trade connections abroad. Poland – just as the whole of Central Europe – owing to the integration with the European Union developed much better institutions, better qualified workforce and specialised in more technologically advanced sectors than the average country stuck in the middle income trap. On the other hand, if we want to compare Poland, Romania, Latvia or Lithuania not only with the countries that effectively avoided the development reefs in the past, i.e., Iceland, Ireland, Spain, Japan, Finland, Cyprus, Hong Kong and Singapore, but also with the countries of the region such as Czech Republic or Slovakia, which used the last decade of integration with the EU more effectively, it is visible that the potential for changes is still significant.

The largest gap between Poland and the leaders is in the area of investment inputs. Their low level is partially reflected by lower, than, for example, in Germany and Czech Republic, industrialisation level (Part II) and much higher share of agriculture in the economy. At the same time, it may be the reflection of other institutional or structural parameters limiting the domestic savings rate or expected investment return. More favourable predictions for the future productivity in Czech Republic, Hungary and Slovakia, result to a large extent from the level of complexity of their economy. This in turn was achieved owing to the investment attractiveness, large degree of diversification and joining the industrial chains with higher added value than those in which Poland specialised. The change of this situation in the future, would also change the conclusion concerning the convergence perspectives in comparison with the USA and the most developed countries of Europe. What draws attention here is that for example, in the Doing Business ranking, Poland lags behind exactly with respect to those institutional elements that are associated strictly with the confidence and the cost of investment process: construction permits or power supply connection. Low level of investments is definitely the weakest prediction for the future prosperity of the Polish economy – without its increase the time needed to achieve the target level of relative efficiency must be counted in decades.

**TABLE I.14. Characteristics of the economies of the countries that handled the middle income trap and those that fell into that trap**

<table>
<thead>
<tr>
<th></th>
<th>Freedom</th>
<th>Cognitive</th>
<th>Investment</th>
<th>Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Countries stuck in the trap (14)</strong></td>
<td>6.9</td>
<td>4.1</td>
<td>21.6</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>7.3</td>
<td>4.8</td>
<td>19.8</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Countries that crossed the middle income zone in the years 1970-1990 (8)</strong></td>
<td>7.0</td>
<td>5.0</td>
<td>28.3</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Central Europe</strong></td>
<td>7.3</td>
<td>4.9</td>
<td>22.3</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Source: Own elaboration*
To illustrate the potential for growth laying in institutional reforms and structural transformations, we compare the status quo scenario for Poland and two alternatives. In the first scenario, the characteristics of our economy does not change with respect to the status quo, except for the Cognitive indicator, which refers to the whole population, and thus will probably be gradually rising when a bigger role on the labour market will be played by the cohorts educated already during the transformation period, and specifically those that went through the process of public education after the reforms of the years 2000 (Box I.6). Spontaneous improvement in the quality of human capital will not, however, significantly change the perspectives of Poland’s development in the long run – because the gap in this area is smaller than the institutional and structural one – the model projects that owing to the improvement of the quality of human capital already embedded in the current form of the education system, Poland may increase its productivity level by 4 percentage points at most. Due to the specificity of educational phenomena this effect will be distributed over many years – and the target productivity level of 80% of the US one will be reached only in about fifty years. This also illustrates the limitations of maintaining the institutional and structural status quo. Even though, according to the predictions of the model, it creates a chance for significant convergence of the economic level with respect to the USA and other developed countries, this is not a full convergence, and the time period required for that convergence is relatively slow – positive stimuli already embedded in the Polish institutional system are distant from the ones that influence the economies of other countries in the region such as the Czech Republic or Estonia, in which the scope of structural and institutional reforms is deeper and the complexity of economy is much higher today. They should, according to the predictions of the model, reach the American level of productivity, even if they maintain the current status quo, and potential institutional reforms would mainly serve to accelerate them.

In the case of Poland, their potential is much deeper – further reforms of structural nature (complexity and human capital growth) and institutional nature (deregulation and privatisation, increase of the quality of operation of public institutions) constitute not only the prerequisite for a full convergence, but also a process allowing for a much faster increase of prosperity than in the base scenario. The model indicates that owing to their implementation, Poland would have a chance for full convergence already in the horizon of forty years. This would mean raising the average growth rate by ca. 0.9 percentage point within the first decade and 0.7, 0.6, 0.5 percentage point respectively in the following decades. In the institutional reforms scenario, we assume that current consistent and successful educational reforms will be continued (while maintaining the ones that proved effective). As a result, Poland will catch up with South Korea in terms of the Cognitive indicator. The scenario also assumes that owing to an effective adaptation of Western European patterns, both in the regulatory layer (economic freedom) and in the practice of operation of public institutions (quality of judiciary, treasury, etc.), the index of economic freedom will rise to the level of Germany (7.55). These changes together with the modification of priorities of the industrial policy (such as departing from sectoral professional privileges, change of special roles of economic zones and directing them to the search of highly productive and not labour intensive investments, tax incentives supporting innovative and technologically advanced industries, increase of public spending on education, etc.) and the improvement of the infrastructure condition and privatisation restricting the role of the state to a regulator, will also favour the increase of the ratio of investment expenditure to GDP and to levelling of the complexity of our economy with that of the Czech Republic (to 25% and 1.6 respectively). These are all feasible levels, however, impossible to achieve without a coordinated public policy directed at constant critical verification of the quality of regulations and operation of public institutions in accordance with the objective of economic effectiveness.

The reform scenario can be compatible with the construction of the welfare state, nevertheless, it must be tailored to our financial capabilities. On the one hand, we will not attract enough good investments, if we do not have a competitive level of taxation. On the other hand, the financing of social spending through the growth of budget deficit will strike the accumulation of private savings, so much needed in Poland. Finally, there is a problem of brain drain manifested in the international competition for specialists and the resultant increase in the prices for their services. Currently, this problem mainly refers to health care, but in the future it will probably affect higher education and education as well. The best source of financing quality improvement of the public goods provided by the state, would be the increase in employment and curbing of the grey market. This, however, may prove insufficient, so in the reform scenario, it is worth thinking about co-financing of health care services and tertiary education, and about encouraging the citizens to independently save money for their pensions.

An element which has to be included in the programme of institutional transformations is pro-productive reforms on the labour market. Thus, the effectiveness of the process of adjustment of employees and employers, among other things by supporting the development of e-recruitment, should be improved. Moreover, the reforms increasing the openness of public professions are also necessary, including the regulations mentioned in chapter 2.4.2 concerning teachers and specialist professions, including regulations limiting the access to the profession of architect, accountant, lawyer and engineer (Figure I.45). The Civil service also requires changes. In its case, the sensible concept of protection of clerks against dismissal due to political reasons transformed into excessive protection against dismissal at all (Szczepański 2011). An important element favouring the productivity growth is also the change of the social security system in such a way that it does not prolong the attachment to less productive sectors such as agriculture and coal mining. From this perspective, it is advisable to include all the professional groups into the general pensions system.
The European Commission has recently conducted a simulation of acceleration of the growth rate similar to ours (Figure I.54). Varga and Veld (2014) assumed that the member states will reduce their distance by half within the next fifty years, the distance separating them from the leaders in the field of cognitive skills, innovations, structure of the tax system (lowering of relative labour taxation), regulations of the goods market and services and the regulations on the labour market. Implementation of these reforms would lead to a productivity growth of 10%, so half of what we assume in our reform scenario. The difference in these results, apart from slightly different methodology, stems from the fact that Varga and Veld, contrary to what they write, rather assume a quite modest reform variant. For example, in terms of barriers to market entry, Poland ranks last but one, directly after Greece. We think that the assumption that as many as fifty years are needed to overcome only a half of the distance between us and the leaders (i.e., to achieve the position currently taken by the Czech Republic), is overly pessimistic as for the prediction variant, in which the determination in the pursuit of good changes prevails. Moreover, the reforms on the labour market in the study of Varga and Veld (2014) are limited mainly to the employment growth as a result of an increase of the economic activity indices of people aged 55-64 and younger groups of women (Figure I.55), excluding the changes of the labour market institutions included by us that favour productivity growth. Nevertheless, the simulations of the European Commission indicate that the retirement pension reform consisting in the increase of retirement age level for women is a key institutional reform allowing the translation of productivity growth into the final macroeconomic effect – GDP per capita.

However, the future reformist orientation of the Polish public policy is not certain. In addition to the scenario of institutional and structural reforms, an opposite scenario, named by us as the “Populist path” is also possible. It is not a strategic choice – its implementation would rather be a consequence of a free adaptation of economic institutions to the challenges of the country at the average level of development, and consequently – in face of rising social expectations – the victory of populist solutions. In this scenario Poland would duplicate the general pattern of institutional choices made by Greece between 1980-2000, mainly at the times of Andreas Papandreu (chapter 2.1). Sectoral and professional privileges would thus deepen, effectiveness of public institutions would decrease, and salaries would rise as a result of administrative requirements above the level reflecting labour productivity. Protection against dismissal\(^{17}\) would also rise, limiting the stimuli to change the profession or industry. In the populist scenario, privatisation would remain on hold to a great extent, and the public funds would cyclically be transferred to loss-making state enterprises or unrestructured agriculture. As a result, the quality of economic institutions would significantly drop to the Greek level (6.87). Moreover, industrialisation would be put on hold and even a relative erosion of the domestic industrial base as a result of the drop in investments to the level of somewhere between Greece and Italy (15%) could occur. The complexity of the economy would also lower as a result of the take-over of the Polish position in the global chains of values by other countries (lowering of Complexity to the current level of Bulgaria, Romania and Baltic states). Effects of this scenario are unambiguous – it means a stagnation of the relative position of Poland at the level close to the current one.

\(^{17}\) For example through simple linear dependency of the period of notice on the working time as part of one of the variants of the so called the uniform contract (contratto unico).
CONCLUSIONS

Economic growth and productivity growth in the long run are determined by the number of factors of institutional (regulations quality, effectiveness of public institutions, scope of state intervention in economy, etc.), as well as structural nature (gathered human capital, geographical position, degree and type of industrialisation, etc.). The ultimate economic effect – including the chance to catch up with the world technological leaders by the countries that are falling behind – is a resultant of the effect of all these factors. A typical country of the world – equipped with an average set of institutional solutions and structural conditions – has to take into consideration the serious risk of falling into the middle income trap defined by us as 60% of the US productivity level. It is different in Poland and other countries of Central Europe.

In light of presented analyses, current institutional order and achievements of the transformation do not make falling into the middle income trap a probable course for the region. Even though many countries after leaving the poverty trap, do so after exceeding 20% of American GDP, stopped somewhere on the way to development or even went back, Central Europe – including Poland – is much too different from them to be expected such a fate. The biggest asset of the region is educated workforce, the competence of which will further increase in time, especially in Poland owing to market entry of the age groups benefiting the positive effects of educational reforms of the past twenty years. Also a more complex economy and better institutions than in the countries of South America, Portugal or Greece will protect Central Europe and Poland against the middle income trap. At the same time however, only in the Czech Republic and Estonia may expect a full convergence as compared to Western countries with the maintenance of current institutional status quo. This is rather unlikely in Poland. Thus the recommendations stemming from this part focus mainly on the implementation of the reform scenario which would give us a chance for catching up with the wealthiest countries of Western Europe within four decades, instead of ceasing at the level of Spain, as it is presented in the base scenario.

Even though only one in three analysed scenarios includes Poland falling into the middle income trap, the presented base scenario is not so far from the populist path. This is because for the permanent departure from the growth path, only relatively minor scope of unfavourable institutional changes with material consequences and risky dynamics would be sufficient. A reformist scenario in turn, requires not only the maintenance of existing achievements, e.g. in the field of education, but also the continuation of institutional reforms in numerous areas including among other things, the quality of operation of public institutions (including employment agencies), deregulation of the labour and product markets (in the fields referring not only to the industrial sector, but also services, construction industry and energy) and privatisation. The analysis presented in the previous chapters indicates that institutionally Poland (but also the countries of the region such as Romania, Latvia, Lithuania, or to a lesser extent – Slovakia) is still inferior, although less than a decade ago, to a small group of countries with a particularly high level of labour productivity.

A limited number of examples of the countries that implemented structural transformations within the past forty years, allowing for the convergence of their labour productivity in relation to USA (e.g. Finland and Ireland) or are on the way (South Korea, Czech Republic, Estonia), and also large number of countries that turned back from the reform path and remained in the sphere of a middle income (including but not limited to Portugal, Greece and countries of Latin America) shows that the continuation of high economic growth in Poland over the next 25 years will be more difficult than in the years 1990-2015. The current status quo predisposes Poland to its dodging, however, if there is a long period with no institutional changes, this, in the spirit of the institutional economy, increases the risk of implementation of the populist scenario.

It is worth noting that even in this most pessimistic variant the nearest decade will be the continuation of the convergence process. We estimate that labour productivity, and also GDP along with it should still, only as a result of inertia of economic processes, grow by ca. 20%. The real problems will appear later on, also due to the decrease in employment as a result of demographic processes that will start to be felt at the end of the next decade. The Econometric model elaborated in this chapter and the simulations performed with it indicate the institutional and structural reforms will increase the potential of the Polish economy. However, the effects of many of them (e.g. in education or innovation policy) will be noticeable no sooner than after a decade from the moment they were taken up. Making a reformist effort around 2025 could prove too late, and then following the populist path – towards simple and fast, although dramatically ineffective solutions – will be much more probable than today.
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# Poland Industrialised Anew

Maciej Bukowski, Jan Gąska, Piotr Koryś

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INTRODUCTION

This report is focused on the relationship between industrialisation and economic growth. We analyse the process of the construction of a modern industrial economy by countries at the medium and high level of economic development. We take a look at both the historic experience of Western Europe and more contemporary Asian examples. However, the report is mostly devoted to Central European countries, including Poland, which have been going through a period of accelerated construction of the modern industrial economy.

In the first chapter we focus on the identification of main patterns of industrialisation in the modern world. We define both the notion of industrialisation and its antonym – deindustrialisation, indicating the causes for which the economic role of the manufacturing sector in the developed economies gradually decreases, despite volumes of industrial production still growing fast. We also analyse the process of construction of the post-industrial economy, and specifically the importance of industry to productivity trends and to the overall innovation of the economy.

In the second chapter we focus on how identified industrialisation patterns were implemented in the past. We discuss the experience of peripheral countries, both in Europe and in Asia, comparing it to the case of Central Europe in the last quarter of a century. Following the first part, we point to the structural and institutional aspect of the economic transformation, analysing the successes and defeats on the path to industrialisation of the countries of Eastern Asia, and also Southern, Central and Eastern Europe. Finally, we identify the main characteristics of the transformations in the Polish industry before and after the country’s accession to the European Union, paying particular attention to the issue of the creation of the foundations of the new industrial culture and common resources (so called industrial commons) at the point between companies with Polish and foreign capital.

The last part of this chapter is devoted to the relations between the industrialisation and the labour market. In that chapter, we analyse how structural changes in the Polish industry impact the structure of the entire economy, including the labour market. We are interested, among other things, in the economic mechanisms influencing the level of productivity and wages in the economy. We also investigate unobvious relations between the industrial and services sectors, raising the question of how the complexity of the industrial production influences the services sector and vice versa: how internal advancement of the services sector impacts the industry.

Part II of the report concludes with a discussion on industrial policies that could potentially support Poland and other Central European countries in shaping their still developing industrial sector to respond best to their social and economic interest. The framework issue highlighted in this part is about whether Poland needs changes in its industrial policy and labour market with respect to structural transformations in the European industry and the form of industrialisation. We also analyse the significance of industrial policy in relation to the development of industry and the appearance of new high quality job positions. We are interested in what manner it may be integrated with economic policy in the broad sense including the modern labour market policy. The final section presents our final conclusions.
1. BETWEEN INDUSTRIALISATION AND DEINDUSTRIALISATION

1.1. INDUSTRIALISATION AND ECONOMIC GROWTH

Historically speaking, industrialisation is a process of the transformation of the agriculture- and services-based economy into an economy mainly based on industry and services, with a minor agricultural sector. Traditionally, industrialised economies were the countries located mainly in Western Europe and North America where the expansion of industry had already begun in the 19th century and which belonged to a group of the several wealthiest countries in the world in the middle of the 20th century. Over time, the countries of Southern Europe, whose industrialisation began only in the 20th century also joined that group. They were followed by some of the Eastern Asian countries, which entered the path of industrialisation later on, but whose economic growth was so fast that at the end of the century, they did not materially differ in terms of GDP per capita from Western Europe or North America. The manufacturing value added (MVA) per capita is a useful indicator allowing the assessment of a relative degree of industrialisation of respective countries of the world. The bigger it is, the higher the level of industrialisation may be attributed to a given country, manifested by a better use of labour resources for the production of tangible goods.

In 2013, only a dozen or so countries of the world were industrialised to the extent comparable to or higher than the United States, which, due to the global scope of their industry (17% of the global production) and the degree of technological advancement, may serve as a useful point of reference. The biggest producer of industrial goods in the world – China – is only ranked 50th in this list. This is because the Chinese economy, in proportion to the population, manufactures remarkably less goods than the majority of developed countries. Czech Republic and Slovenia are said to be the most industrialised countries of in Central Europe, as their industrial production per capita equals that of the UK and Italy. The economies of Slovakia, Poland and Hungary, which rank between Portugal and Spain in terms of industrialisation, are slightly less advanced in this process.

The ranking of the top fifty most industrialised countries in the world is dominated by the economies of Europe and North America, just like in the 19th century. But there are also a few countries from the Asia and Pacific region (South Korea, Japan, Australia and New Zealand) and several oil countries in that list. Five countries from the European Union hold positions outside the first fifty ranked: Romania (51st place), Croatia (52nd), Greece (53rd), Latvia (64th) and Bulgaria (75th).

FIGURE II.1. Manufacturing value added (MVA) per capita in most industrialised countries of the world in the years 1970 and 2013 (USA = 100) and the structure of the world industrial production

Source: Own calculations based on UNIDO data
Note: small countries from the list of tax havens were excluded from this list. Lichtenstein, San Marino and Monaco. Association of Southeast Asian Nations (ASEAN) includes: Philippines, Indonesia, Malaysia, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar and Cambodia
Russia (62%), which allocates resources into the mining industry rather than the processing industry, did not make it to the first fifty either. On a global scale, we may talk about a strong geographical concentration of industry, as the leading fifty countries account for as much as 83% of the global industrial production, out of which 24% is attributable to China, 22% to the EU and EFTA and 21% to North America, respectively. Japan, South Korea and Australia are also significant manufacturers of goods.

**BOX II.1. FIRST AND SECOND INDUSTRIAL REVOLUTION**

The first industrial revolution was initiated in the 18th century in England and gradually covered a part of Western Europe: the Netherlands, Belgium and northern France. There were several technological innovations at its roots, often elaborated by individuals with no formal education (including John Kay, Richard Arkwright, Samuel Crompton, Thomas Newcomen, and James Watt). An important feature of that period was the relative simplicity of the emerging improvements, which enabled market competitors to implement them easily in their own plants without the need to overcome the competence barrier that was difficult to tackle. This accelerated the proliferation of new ideas in Western Europe and yielded the rapid reduction of prices of industrial goods that were subject to this, to a large extent spontaneous, innovation. On the other hand, scientific inventions and formal institutions, such as universities, did not have any practical meaning for the economic changes of that period. Thus, mainly for this reason, the scope of the first industrial revolution was limited to only a few spheres of the economy: weaving, textile industry, mining and steel industry. In fact, mainly the first one had a direct impact on the living standards of the inhabitants of the United Kingdom and other countries of Western Europe that were participating in the early phase of industrialisation. Technological innovations in the mining and steel sectors referred mainly to investment goods, and as such, they created the foundation for the next industrialisation phase, which started in the second half of the 19th century.

**FIGURE II.2. The first and second industrial revolution in light of technological development (left diagram) and new forms of organisation of enterprises (following Google Ngrams)**

![Graph showing technological development and organisational changes](image)

Source: Own elaboration based on Google Ngram data

Note: The numbers in the figures mean the percentage of the general number of phrases with a given number of words in the books published in English in the years 1800/1860-1960 containing the terms highlighted in the legend (e.g. "Corporation" or "steam power")

The second industrial revolution differed from the previous one in terms of strong relations between science and innovation. They became possible primarily because the continuous development of physics, chemistry, biology and mathematics in the second half of the 19th century led to the creation of numerous technological innovations: combustion engine, gas engine, electric motor, dynamite, synthetic colorants, fertilisers, machine gun, telephone, light bulb, sewing machine, typewriter, bicycle, camera, oil lamp, tramway, car, etc. Unlike in the earlier period, self-taught inventors had a much smaller share in their creation. This time, professional scientists and technicians assigned at the universities or by companies creating specialised “invention factories”, which functioned on the basis of a systematic experimental method (e.g. Thomas Edison Menlo Park), definitely contributed to a larger extent to the creation of such innovations. Industrialisation was no longer limited to several spheres of economic activity, leaving its mark on the whole economy – from agriculture, which was more and more mechanized, through transportation (decline of the era of sailing ships) and construction (steel structures), to the sector of utility services (electrification, waterworks, etc.). A symbolic conclusion of the second industrial revolution was the development of the concept of the assembly line and standardised mass production by Henry Ford (Fordism) at the beginning of the 20th century, and the emergence of new methods of management based on scientific method (Taylorism). As a result of such concepts, labour productivity in the industry of the 20th century could grow notably faster than one century before.

Source: Own elaboration
The dominant position of the European and North American countries among the most industrialised and at the same time most developed economies of the world is not a coincidence. Most of them had already taken the industrialisation path in the 19th century – during the so called second industrial revolution (Box II.1), when, on the one hand, the scientific rationality rules were intertwined with the economy, and on the other hand, gradual domination of institutional players was observed, including mainly business entities operating in the form of joint-stock companies. This led to the construction of new, technologically complex sectors of the economy, i.e., chemical, machine, and electrical industry, and simultaneously initiated a number of innovations in the field of production organisation and management (Taylorism). In that period, the model of unified mass production was also popularised, with an increased use of the assembly line (Fordism). Meanwhile, important technological and process innovations were introduced in traditional sectors (agriculture, timber, textile and mining industry, etc.), which contributed to a significant growth of efficiency. The fast-developing financial sector – banking and capital – was not far behind. As a result, Western countries could quickly raise the level of their investments. Moreover, ownership could be separated from management in larger and more complex organisational structures, namely, corporations. All these processes enabled a spectacular growth of not only the quantity but also the quality and variety of the manufactured industrial goods, and what follows, major improvement of the living standards in Western Europe and North America. When compared to the rest of the world, this success was, however, a unique phenomenon, as the industrialisation attempts made at the same time at more distant peripheries, including South America and Central and Eastern Europe, ended up in relative failure, becoming a foundation of the still present division between the developed and developing countries. The complex industrialisation process in peripheral countries, including Poland, which was particularly diversified in this respect, is detailed in chapter 2.2.

The relationship between industrialisation and the level of prosperity established in the 19th century has prevailed until today. In other words, the countries that are industrialised are wealthy, and wealthy countries are usually industrialised (Figure II.1). Moreover, the path to wealth also leads through industrialisation, and only in exceptional cases, the GDP per capita convergence does not require the levelling of the volumes of industrial production with the industrialised countries. Such exceptions may be either raw material-based countries (among others: Kuwait and Brunei), or city-states such as Hong Kong, which serve as harbours and financial centres for bigger economic entities. However, even they have a significant (30-40%) relation of industrial production per capita to the USA, which places them among the sixty most industrialised countries in the world. What is also worth noting is that the economic achievements and defeats of the past several decades were directly dependent on the success of industrialisation. This refers both to countries that were deemed as developed already in 1970, and countries that were classified as emerging economies at that time.

**FIGURE II.3. Manufacturing value added (MVA) per capita in 1970 and 2013 (MVA, USA = 100)**

Source: Own calculations based on UNIDO data

Note: UN statistics do not mention Taiwan, which is one of the most industrialised countries in the world. In the figure positioned on the left panel, Switzerland was left out intentionally for exposure purposes. Switzerland exceeds the American level by two times with respect to industrialisation.
Between 1970-2013, the added value of industrial production per capita rose remarkably fast in Western European countries, including, in particular, Austria, Finland and Sweden. Already at the beginning of that period, they were not far behind the United States when it comes to relative industrialisation, and at present, they have definitely outpaced the USA (Figure II.2). Among the developed countries, similarly to Germany, they entered the niche of economies which specialized in technologically advanced industrial production. The industrialisation of Ireland, Singapore and South Korea progressed even faster. In the course of the past forty years, they moved from the group of medium- and low-developed economies to the group of industrialised countries. On the other hand, Greece and Portugal may serve as an example of the OECD countries, in which the interrupted industrialisation resulted in stopping or slowing down the GDP per capita convergence after 1970. Most probably, these two countries specialized in relatively low productive products (including, among others, food or shipbuilding industry) and services (e.g. tourism) prematurely.

It is worth emphasising that the strong link between industrialisation and growth of wealth is independent from the income level. For example, Egypt – one of the African countries in which economic growth was relatively high (as compared to the rest of the continent) over the past half century – also belonged to countries where industrialisation was accomplished exceptionally fast (Figure II.3). On the other hand, Egypt still shares the problem of imbalanced growth in prosperity at sectoral level with many developing countries (Part I). Even if at the moment, industrial production per capita in Egypt is close to the Polish one of 1990, the GDP per capita level is lower. It arises from a significantly lower labour productivity in the whole economy – and particularly in the services sector and construction industry. Hence, it may be concluded that even though industrialisation is a precondition for prosperity growth in countries with no remarkable natural resources, it is not a sufficient condition. This also refers to the countries which, just like South Korea or Puerto Rico, achieved great success in the field of industrialisation. GDP per capita in these countries is, however, still lower by ca. 20-40% than in the most developed countries of the West. This happens because the economic development of these countries was uneven, and rapid industrialisation was not followed by equally rapid productivity convergence – not only with regard to industry but also other branches of the economy, and services, in particular. Figure II.3. shows that Poland seems to be on a similar path, which means that also in its case, the economic growth is not an effect of even productivity growth in all the sectors. We will analyse this issue more thoroughly in subsequent chapters.

**Figure II.4. MVA and GDP per capita growth in the years 1970-2013 (USD, fixed prices 2005)**

**Source:** Own calculations based on UNIDO data
During the past 200 years, the industrialisation process covered almost the whole world. Industrialisation became one of the key engines for revolution that changed the nature of the global economy by triggering social and political transformations that are shaping the contemporary world. And it was not a single event, but rather an intermittent process occurring in several subsequent waves, as a result of which consecutive regions of the world were entering the path of industrialisation. Due to the evolution of the technology of production (usually referred to as subsequent “industrial revolutions”), ongoing globalisation processes, local social and political conditions, economic structure and relations between the peripheries and the centre, this process was highly differentiated both in terms of space and time.

**BOX II.2. INDUSTRIALISATION OF THE DEVELOPED COUNTRIES FROM A HISTORICAL PERSPECTIVE**

The first wave of industrialisation – at the turn of 18th and 19th century – covered mainly the United Kingdom, parts of Western Europe, and the USA. The second one, which started in the 1930s and lasted for approximately 100 years, spread across Northern and Central Europe, Australia and New Zealand, as well as Japan. The intense industrialisation at the turn of 19th and 20th century culminated in a period of two world wars. During those wars, industrial production in the West served to a large extent the needs of the military sector and was excluded from the area of market exchange. This resulted in further development of production opportunities (especially in the heavy industry), the entering of the labour market by women, the growth of production efficiency and rapid increase of the manufacturing potential (for example, until the outbreak of the World War I, 250 aeroplanes were built in the United Kingdom, while in 1918, their production level reached 600 per week). In relative terms, the importance of industry for Western economies reached its peak in the middle of the 20th century. At the time, employment in the manufacturing sector reached almost 40% of the workforce, and the share of industry within GDP was even higher. After World War II, along with the development of the services sector, progressing globalisation and automation of industrial production, as well as the demand for tangible goods being gradually satisfied, relative importance of industry for Western economies started to diminish, even though production was still growing rapidly in absolute terms.
1.2. DEINDUSTRIALISATION OF THE DEVELOPED COUNTRIES

Currently, the term “highly developed economy” is used much more often than “industrialised economy”. Such a terminological change arises from an observed gradual loss of the relative significance of the industrial sector in the economies of the OECD countries. Such a process is sometimes referred to as deindustrialisation. Deindustrialisation may be understood either in absolute or relative terms. In the first case, we deal with a drop in the volume of industrial production, whereas in the latter one, the GDP growth is associated with a decrease in the share of processing industry in the creation of added value and employment structure. The first phenomenon occurs in fact very rarely and is of a transient nature. Within the past two decades, among the OECD countries, only in the case of Australia, New Zealand, United Kingdom, Greece and Italy, we may talk about deindustrialisation in an absolute sense, i.e., the shrinking of the volume of industrial production per capita. When referring to the period 1970-2014, only Australia remained in that group. In this country, the domestic processing industry was partially weakened by Chinese competition, and replaced to a certain extent with the mining industry that experienced an export boom at that time. In most of the developed countries, the value of industrial production per capita grows systematically, at an annual rate of ca. 0.5%-1.5%. In the case of emerging economies, including Poland, Czech Republic and Slovakia, as well as previously Ireland, Taiwan and Korea, that pace is even faster – after 1990, their industrial production grew at an average annual rate of 5-9% (Figure II.6.).

The fact that the industry creates increasingly higher added value both in emerging and developed economies, does not mean that its share of total GDP and total employment also grows. It is in fact quite the opposite, as in the majority of Western countries, it reached the maximum level between 1950-1960, when the direct effects of expansion of process and technological innovations forming the second industrial revolution started to fade away (Box II.2). Since then we have observed a gradual decline in the importance of the processing industry in developed countries. We may even talk about certain regularity, according to which, after exceeding the middle level of prosperity corresponding to the GDP per capita of ca. USD 25,000-30,000 (in 2013 prices), relative deindustrialisation begins. It is manifested by the reduction of the share of industry in employment and GDP. Thus, this empirical correlation takes the shape of an inverted letter U with the maximum located between the level of prosperity observed currently in Poland and the level of Slovenia and the Czech Republic. This line is gradually moving downwards, as for each income level, a typical share of industry in employment is notably lower today than 10 or 20 years ago (Dadush 2015). For example, the share of the processing industry in the GDP of China – the most important emerging market – has remained at the same level for a decade, despite a dramatically fast growth rate of the production volume. This means that industry develops at a similar pace to the entire Chinese economy, thus contributing to a convergence with respect to the developed countries, however, without increasing its role significantly in the production and employment of the Middle Kingdom.

Relative deindustrialisation in the OECD countries results first and foremost from changes in the structure of demand of the society that accompany the gradual growth of its wealth. According to the so called Engel law, spending on food and other articles of prime necessity grow along with prosperity, but the rate of that growth is much lower than the rate of the income growth in general.

FIGURE II.7. Share of the processing industry in employment vs. GDP per capita according to PPP in selected countries of the world

![Graph](image-url)

Source: Own elaboration based on UN and World Bank data
As a result, their share in the total household budget is reversely proportional to the level of that household’s wealth. A similar relation may refer to all industrial goods. The demand for such goods, being initially high, becomes saturated over time as the wealthier customers reach the desired level of possession of durable goods: furniture, electronic equipment, or home appliances. New items they purchase do not give them the same satisfaction as those bought earlier, which hampers the growth of global demand that stabilises or increases at a rate notably lower than before reaching the saturation point. It seems that now many durable consumer goods sold in developed countries are the object of renewable demand, which is determined by the size of the population and depreciation rate of fixed assets. For example, in the United Kingdom, for which multiannual time series are available, the percentage of people owning household appliances grew until the mid 1980s, when some of the market segments (such as fridges and freezers, and automatic washing machines) started to become saturated. Soon afterwards, the same situation happened in the case of the market of electric kettles and stoves, as well as microwaves (Figure II.7). A similar pattern may be observed in all OECD countries with respect to the number of active mobile phones, which is reflected in the number of mobile network subscribers (Figure II.8). Thus, the research confirmed that the income flexibility of services is usually higher, and of industrial goods lower, respectively, than one (EC 2013). Thus insofar as to the number of mobile phones used stabilises with time, this is not equivalent to the saturation of demand for telecommunications services (phone calls, text messages, data transfer). Only some of the sectors are not subject to that rule. For example, between 2000 and 2011, the share of production of pharmaceuticals in GDP increased notably. It was caused by an increased demand stemming from demographic changes and subsidies for medications increasing their consumption. However, due to the growing mechanisation of pharmaceutical production the employment in this branch of industry did not change (EC 2013b).

Secondly, relative deindustrialisation is enhanced by the change in the relation of prices between industrial goods and services. Such change results from uneven development of labour productivity growth in various segments of the economy. In particular, industrial processing is characterised by a relatively faster growth of efficiency than services. According to Baumol (1967), if one sector prevails over another in terms of labour productivity dynamics, over time, the amount needed for it to produce a GDP unit in each of the sectors starts to differ significantly. Due to technological progress, the efficiency of production of industrial goods is now much higher than in the past, whereas in the case of many types of services, the changes of productivity are negligible. Since services and goods are not perfect substitutes of one another, this leads to a drop in the relative prices of industrial goods and an increase in the prices of services. As a result, employment decreases in the industrial sector and grows in the services sector. If the share of industry and services does not change in terms of quantity (or in fixed prices) over time, then in view of a faster increase in the prices of services their share in nominal GDP is growing (Rowthorn, Ramaswamy 1997). Simulations show that approximately two thirds of the deindustrialisation is due to changes in the relative prices of industrial goods and an increase in the prices of services. As a result, employment decreases in the industrial sector and grows in the services sector. If the share of industry and services does not change in terms of quantity (or in fixed prices) over time, then in view of a faster increase in the prices of services their share in nominal GDP is growing (Rowthorn, Ramaswamy 1997). Simulations show that approximately two thirds of the decrease in employment in industry in developed countries arises from the difference in productivity dynamics in industry and services. The remaining part results from changes in the production structure (Rowthorn, Ramaswamy 1997).

Moreover, since the 1990s, relative deindustrialisation in highly developed countries has been strengthened by moving certain production activities to developing countries and emerging economies. Rowthorn and Ramaswamy (1997) identified a limited impact of international trade on the industry of the developed countries. In their opinion, this process is responsible for the drop in employment in the USA by one percentage point between 1970-1994, and even less in the EU.
According to a different study, 40% of employment growth in foreign branches of international US companies between 1977-1999 contributed to the decrease in the number of employees in the American industrial sector by 15%. On the other hand, Nordhaus (2005) claims that the decline in employment in the USA results primarily from the growth of productivity in industry, however, not in the USA, but in China and other developing countries. Its pace is faster there than in wealthier countries, which makes China increasingly competitive on the international markets, thus limiting the opportunities for growth of the industrial production volume in developed countries. From the perspective of Western European countries, their Central European neighbours may play a similar role to China, as some of the production is moved from the developed countries to Central Europe, mostly due to favourable terms of trade: low unit costs of labour, land and capital are confronted with relatively high productivity. Moving the production (Nordhaus (2005) due to the differences in terms of trade refers mainly to simple finished goods, such as textiles or household appliances, or components and spare parts, which constitute elements of the production chain with a relatively low value. In fact, the production of these types of goods developed first in Central Europe, including Poland, after the region re-entered the European market after the fall of the Iron Curtain. It means that offshoring, which contributes to the industrialisation of emerging economies, may be treated as the beginning of the long-term process of developing their competitiveness. In most advanced sectors, such as the automotive industry, as well as a specialized chemical or pharmaceutical industry, the comparative advantage of the developed countries is maintained for a longer period of time, which is why these branches were moved to the developing countries to a limited extent (Pilat et al. 2006). However, it does not refer to those emerging economies which, just like Central Europe, are relatively well equipped with human resources, and at the same time managed to sufficiently improve their institutional environment (Part I).

Relative deindustrialisation of highly developed economies provoked a discussion among the economists on the significance of this phenomenon. Until the 1970s, a prevailing view was that the industry was a key driver of growth, and a precondition for the overall economic development. When empirically observed tendencies changed, arguments were raised that the services, including especially ICT, financial and business services were able to guarantee highly paid job positions and GDP growth, because the industry is not the only sector, in which efficiency may grow as a result of better work organisation, mechanisation, and widespread use of computers. Australia, Canada and USA, as well as India, one of the non-industrialised developing economies, were given as the examples of countries developing despite a fast drop in importance of the industrial sector for GDP growth. However, over time, and especially after the financial crisis of 2008, more and more arguments in support of the importance of industry and votes for „reindustrialisation” were raised (Andreoni, Gregory 2013). The European Commission also expressed its opinion on this matter in 2012. It was then noted that insofar as due to the development of IT, services may also experience considerable efficiency growth, industry remains the sector with the most significant growth, so, consequently, a drop of its share in GDP and employment must inevitably lead to the weakening of the combined labour productivity growth and GDP (Gordon 2012). From the perspective of emerging markets, including Poland, these conclusions are less relevant as these countries still undergo rapid industrialisation in absolute terms. Nevertheless, in the medium term perspective, the relations between efficiency growth in industry and services as well as the whole economy of such countries will gain in importance similarly to other developed countries, and the phenomenon of relative deindustrialisation will become a more significant question.
1.3. INDUSTRY IN POSTINDUSTRIAL ECONOMY

The falling share of industry in the creation of added value and employment in developed countries is sometimes perceived as the economic beginning of the post-industrial era. If the deindustrialization trends continue at a pace similar to the current one, in several decades, only a few percent of the population will work directly in industrial sectors in the most developed countries of the world. This will lead to a change of the labour demand structure and professional skills that are most valued in the market. Direct impact of technological progress in industry on the combined GDP dynamics will also drop. This will happen even in the case of following the historical rule according to which the internal productivity growth in the industrial sector is higher than in agriculture, construction or services. A decline in the economic growth in the post-industrial economy, observed one decade after another, may be one of the consequences of such state of affairs (Table II.1.). Gordon (2012) claims that we are dealing with such a situation already today, and the fact that since the 1970s the labour productivity dynamics in the USA and developed countries has been lower than previously, results to a great extent from a gradual decline in the importance of industry in the economy. The exhaustion of simple quantitative reserves in the form of e.g., the opportunities of increasing labour supply among groups that were relatively poorly connected with the labour market in the past, like women, or older workers, must lead to an inevitable drop in the growth of GDP per capita.

Hypothetically speaking, technological progress in industrial processing could be substituted in its economic role with technological progress in services, as a result of which the rate of the economic growth in the post-industrial economy would not have to be lower than in the 19th or 20th century. However so far industry has remained the main source of innovations. Industrial companies in OECD countries are responsible for approximately half of the business costs on research and development, and in the most industrialised economies of Germany, Korea, Austria or Switzerland, they account for even 70-80% (Figure II.10.). In fact, innovation and industrialisation are closely intertwined. As shown in Figure II.11., the costs incurred by companies on innovations are around 02-05% of GDP as long as the country does not exceed ca. 50-60% of its US income, which was identified in Part I as a level differentiating middle- and high-income countries. In the countries that managed to cross this line and avoid the middle income trap, the involvement of companies in innovations grows. The causality is most probably mutual. On the one hand, it is easier for the countries in which there are companies capable of innovative activity to reach an above-average (on a global scale) productivity level and GDP per capita. On the other hand, in a country with sufficient wealth, the level of wages is also relatively high – it exerts greater cost pressure on enterprises, forcing them to seek methods of improving their profitability. One such method is a larger involvement in innovative activity in search of product innovations thanks to which they could increase the complexity of their own production and process innovations leading to the reduction of employment and efficiency growth.

### TABLE II.1. Indicative pathway of the GDP growth in post-industrial economy

<table>
<thead>
<tr>
<th>Share in economy</th>
<th>Contribution to economic growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>Industry</td>
</tr>
<tr>
<td>t 20.0 31.0 49.0</td>
<td>0.4</td>
</tr>
<tr>
<td>t+1 15.0 29.0 56.0</td>
<td>0.3</td>
</tr>
<tr>
<td>t+2 10.0 27.0 63.0</td>
<td>0.2</td>
</tr>
<tr>
<td>t+3 5.0 25.0 70.0</td>
<td>0.1</td>
</tr>
<tr>
<td>t+4 3.0 22.0 75.0</td>
<td>0.1</td>
</tr>
<tr>
<td>t+5 2.0 18.0 80.0</td>
<td>0.0</td>
</tr>
<tr>
<td>t+6 1.5 15.0 83.5</td>
<td>0.0</td>
</tr>
<tr>
<td>t+7 1.0 10.0 89.0</td>
<td>0.0</td>
</tr>
<tr>
<td>t+8 0.8 9.0 90.2</td>
<td>0.0</td>
</tr>
<tr>
<td>t+9 0.7 8.0 91.3</td>
<td>0.0</td>
</tr>
<tr>
<td>t+10 0.6 7.0 92.4</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Own elaboration

Note: subsequent periods correspond to approximately ten-years-long changes in the economic structure of the USA from the 1940s to the present times (t+6) and until the mid 21st century. In brief it was assumed (as opposed to the facts) that the internal efficiency growth rates in each of the sectors are stable and equal to 3% (agriculture), 3% (industry), 1% (Services and construction) respectively.
Accordingly, the percentage of innovative companies increases along with productivity growth (Figure II.13). This refers to both large (employing more than 250 persons) and small- and medium enterprises. The model of their involvement in innovations is also subject to changes, as the percentage of enterprises conducting their own research and development works or outsourcing them is growing (Figure II.13). This results in modifications of the structure of R&D expenditure. While mechanisation of production processes is a priority in medium-income countries, wealthier countries focus on their own or ordered research. In both medium- and high-income countries, the advantage of large companies over smaller ones is a universal model of the innovation process. The enterprises hiring more than 250 employees are not only more innovative than small- and medium-sized companies, but also the percentage of innovative companies among large enterprises notably grows along with the income. In countries ranking above the threshold of medium income (60% of the US income) it is approximately 80%, whereas in the countries that are twice as poor - ca. 50%. In the case of smaller companies there is a similar connection, but on an adequately lower level (Figure II.14.). This phenomenon is however related to another component of industrialisation processes, namely, the higher the level of labour productivity in a given economy or sector, the greater is the role of large companies in creating added value in the industry.
In other words, insofar as GDP per capita calculated according to the purchasing power parity at the level of ca. USD 25,000-30,000 (in 2013 prices) may be assumed as the threshold of relative deindustrialisation processes in the industry, then, at the same time this phenomenon is superimposed by the consolidation of manufacturing activities. This is related to the increasing returns to scale (IRS) – as larger companies are capable of maintaining lower unit costs, and thus, raising their competitiveness in comparison to other market players. It does not mean that smaller companies do not operate on the market, but rather that their role in creating added value to the industrial sector decreases along with the income.

The growing role of large companies in the industrial sector of developed countries also leads to an increase in their share of R&D expenditure. The higher the level of prosperity of a given country, the larger the percentage of business expenditure on R&D attributed to large companies. It arises from the fact that the small- and medium-sized companies have the same level of expenditure (in relation to GDP) on innovations in underdeveloped and wealthier countries, whereas the expenditure of large enterprises grow dramatically after they exceed the above-mentioned threshold of 50%-60% of the US’ GDP. In the most developed countries, they account for 80%-90% of total expenditure on innovations incurred by industrial companies. This is also associated with the fact that large industrial companies hold a particularly strong market position in sectors undergoing the fastest technological change, i.e., high- and mid-high technology sectors such as pharmaceutical, machine, or the automotive industry. In countries with a higher industrialisation level (which is not equivalent to a higher level of employment in industry) – such as Germany, Austria, Switzerland or Finland – ca. 60%-70 all R&D spending in the business sector is attributable to industrial companies from high and mid-high technology sectors. In less prosperous or less industrialised countries, such a dominant position is held by service providers, mainly from the telecommunications and financial industry. This is, however, usually associated with respectively lower R&D spending in general.

In conclusion, it may be said that in the modern post-industrial economy of the developed countries, the industrial sector is still the source of innovations and technological progress. Services – and especially business services – are an important innovation centre, but their role – as a carrier of innovations – is relatively smaller. Business services in developed economies are an important carrier of innovations, provided that the international comparative advantage of a given country is not focused on technologically advanced industrial production. As a result, the services sector is more important in terms of innovativeness in France or the United Kingdom than in Germany or Austria. Among the countries of Central Europe a similar division may be noticed. Strongly industrialised Slovenia or Hungary, which has a smaller but technologically advanced industry, depend to a much larger extent on the innovative potential of their industry than Poland, which is based on a more traditional structure of industry branches, or a relatively low-industrialised Bulgaria (Figure II.15.).
2. ACCELERATED INDUSTRIALISATION OF EMERGING ECONOMIES

2.1. POST-WAR INDUSTRIALISATION OF EASTERN ASIA

Among catching-up countries the link between economic growth and industrialisation is still very clear (Figure II.1). South Korea and Taiwan are particularly spectacular examples of successful industrialisation leading to significant prosperity growth. In the last half of the century, they transformed from poor agricultural economies into modern industrial ones. Their example is especially relevant for Poland and other Central European countries, because, next to Ireland, Finland and in part Spain, it shows one of the possible paths of effective economic growth based on multilevel industrialisation. Before World War II, both countries remained under Japanese control, and the beginnings of industrialisation (light industry, especially food production) were connected with Japanese investments. Although structural conditions of their development were different than in Japan (low level of urbanisation on the verge of industrialisation, very large share of agriculture, unfavourable geographical location), the general pattern of the process of their industrialisation resembles the Japanese case for three reasons (Box II.3).

First of all, just like in Japan, the industrialisation of Taiwan and South Korea was based on local resources. Moreover, in Korea, the key role was played by large industrial conglomerates – chaebols, structurally resembling the pre-war Japanese zaibatsu, and to a lesser extent modern keiretsu. On the other hand, the example of Taiwan, whose development was based on smaller industrial organisations, indicates that the construction of large financial and industrial conglomerates is not a sine qua non condition for effective industrialisation. Secondly, the development of the Korean and Taiwanese industry was, as in the case of Japan, an evolutionary process. Initially (until the 1970s) it was based on a lightweight industry: textiles and food, and later on, other branches began to develop along with ongoing accumulation of capital, acquisition of production competences by companies, and improvement of the quality of education and human capital. Machine, chemical and transportation industries with an average technological level was the first to develop but subsequently, it gradually gave way to highly advanced products of consumer electronics, both with regards to the structure of production and exports.

FIGURE II.17. Structure of industrial production in Korea (left panel) and Taiwan (right panel) in the years 1963-2012 according to the level of technology

Source: Own elaboration based on UNIDO data
Box II.3. Industrialisation of Japan 1860–1970

The Japanese economic miracle, that is, the construction of the first industrial economy outside Europe and North America, began around 1860 following the fall of Tokugawa shogunate, Meiji revolution and Japan’s economic opening to the world. Initially, its nature was an imitative one, with an important role played by the state in the process of industrialisation, both as an importer of technologies and organiser of production, and the recipient of the manufactured goods. Japan’s strategy in the 19th century resembled the strategies of Western countries, which entered the industrialisation path a little bit earlier (e.g., Germany).

Lightweight industry, including, in particular, textile (silk and cotton), became the basis for industrialisation, and on the verge of the industrialisation, ca. 4% of the net domestic product was generated by factories, but after more than a decade of growth, at the beginning of the 20th century, that level reached ca. 8-10% of the net domestic product. The industry remained under control of the Japanese capital, but the technologies and forms of organisation of production were imported from the highly developed economies (initially, the American and British economies, and then also from Germany).

The economic development of Japan, at the time when the modern sector was still quite small and domestic capital resources were limited, depended on the rate of development of traditional sectors (crafts, services, agriculture, construction) and their capabilities of generating the surpluses necessary for development (in the form of cheap workforce, public sector income, savings, and export products). However, the structure of production was changing gradually (in 1868 the food industry generated ca. 66% and textile industry 28% of total production, whereas in 1905 it was 39% and 28%, respectively).

Such a model of development and industrialisation faced natural barriers after World War I when the Japanese economy underwent another phase of industrialisation. It was characterised by both significant growth of the industrial production volume and structural changes. The importance of the heavy industry was growing while the role of the textile industry was diminishing. It was associated, among other things, with a targeted economic and imperial policy, as well as growing relative costs of labour. The textile industry played the leading role in exports until the 1930s, and its development was supported by the national monetary policy, which, due to competitive devaluation of the yen during the period of the Great Recession, enabled Japanese manufacturers to force out British exports to South-East Asia.

After World War II, the Japanese economy was largely destroyed. Added value generated by industry between 1941 and 1946 dropped more than six-fold, and came back to pre-war levels only in 1955. The war in the Korean Peninsula helped in the reconstruction of the Japanese economy – its companies began to supply the elements of armament (e.g. ammunition), food and uniforms to the US army. Following US institutional patterns and political stability ensured by the presence of American military bases (which, among others, reduced necessary expenditures on the army) was also important. Since then, an almost twentyfold production growth has occurred. However, the structure of industrial production was changing to a large extent as a consequence of export-oriented industrialisation strongly supported by the state, which did act as a direct investor but instead, promoted exports (JETRO agency), supported the development of industries with the best outlook (Ministry of International Trade and Industry), and provided financial and organisational support for science and R&D.

In the whole period of post-war industrialisation, which transformed Japan from a peripheral country into a global industrial power, local capital was key (which was influenced in the beginning by such factors as the level of investment risk and location of Japan, and then by easy access to local capital). Another characteristic feature of the Japanese development model was the domination of the industry by large industrial conglomerates based on banks that financed the development of enterprises and were related to them in terms of ownership structure. Despite organisational changes made over several decades, the model of strong integration of the financial and manufacturing sphere remained a permanent feature of the Japanese economy.

Source: Own elaboration
Thirldly, the state pursued a policy of targeted development, via specialised agencies, in which certain families, business groups, but also branches of industry were promoted. Again, this referred to Korea rather than Taiwan, in which the scope of state planning was minor. The economy of Korea was developed for a period of several decades according 5-year plans. However, the nature of these plans evolved from direct planning, through indicative planning to strategic choices. The leading development concept was changing as well, from industrialisation that substituted imports in the 1960s to export-oriented industrialisation in the later period. The involvement of the state in the economic policy brought mixed effects. On the one hand, it lead to common cronyism (although its scale and consequences in Korea and Taiwan were smaller than in other Asian economies), contributing to overinvesting and bankruptcy of several conglomerates in the wake of the financial crisis of 1997. On the other hand, the state partially substituted the deficiencies of capital in the initial phase of industrialisation by building infrastructure according to the interests of the leading business groups and providing them with adequate institutional solutions to facilitate their expansion to foreign markets, like in Japan. The implementation of this model required, however, the compression of prices and internal consumption\(^\text{20}\), to an extent higher than in the West, which was necessary to mobilise the funds for public investments, as well as cheap investment and export loans for industrial companies cooperating with the state.

It seems that the reorientation towards the support of export companies, which occurred between 1960-1970 was a factor mitigating the ineffectiveness of public intervention in Korea.

Policy of export-orientated industrialisation exposed industrial conglomerates established in the earlier period to international competition by forcing them to enhance the quality of their production and develop capabilities allowing effective competition on the demanding US, Australian and Western European markets. Not all of the industrial groups survived that confrontation. In the wake of the financial crisis of 1997-1999, one third of the greatest Korean industrial groups went bankrupt, causing temporary, although major, economic downturn in the region. This happened mainly due to the large scope of unsuccessful investments in a period of credit boom. Their consequence was not only the interim drop of the gross domestic product value, but also a permanent reduction of the economic growth rate, which never returned to the levels recorded in the period of credit expansion in the years 1970-1997.

Despite the experience of the Asian crisis, the model of industrial organisation functioning in a symbiosis with the state, but verifying its competitiveness through sales to foreign markets proved to be effective enough in the subsequent stages of modernisation and development of the Korean industry to become a pattern for other countries of the region attempting to repeat the economic success of Korea in a later period. China is undoubtedly a leading example of imitation of the Korean model. The accelerated industrialisation of that country carried out under public control in the conditions of sudden credit expansion, has taken even greater proportions. As we have proven in Part I, China suffered from considerable overinvestment, whose market verification began at the turn of 2014 and 2015 (Part I). In this context, it is worth noting that the Taiwanese economy, which developed in a much more similar way to the Western model, achieved similar economic success, avoiding the build-up of great internal imbalances and an absolute drop in GDP per capita not only in 1997 but also during the period of the global financial crisis between 2008-2011. In Taiwan, there were no big industrial companies, similar to those in Korea, but the level of production of industrial goods per capita, R&D intensity, and branch structure of the manufacturing sector are very similar today (Figure II.16.).

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\(^{20}\) When industrialisation reached its climax in East Asia its investment rates grew significantly over the level characteristic for the countries of Western Europe (Part I). At the same time the region – as a consequence of the exchange rate policy – noted a surplus in the current account balance. However, this meant the decrease of the purchasing power of salaries (imports became more expensive) and the drop in the share of private consumption in GDP.
Taking into consideration the smoother course of the industrialisation process, one may risk a statement that strong presence of the state in the economy in Korea was rather a burden than accelerator of the economic growth in East Asia.

Obviously, we have to keep in mind that in the case of these two economies, factors explaining the fast economic growth and industrialisation success in the post-war period are both of exogenous and endogenous nature. Among the major external factors, we can mention staying in the sphere of US influence, as in the case of Japan, which included development aid (largely American), maintenance of American military bases in both countries, and the imports of a number of institutional solutions from the United States. Among essential internal factors, mainly educational success of both countries connected with very high public and private expenditure for education should be indicated, reaching, in case of Korea, 8% GDP in 2000. This factor combined with demographic bonus (population growth with simultaneous fast growth of the share of persons in the working age group) facilitated the expansion of exports as a result of maintaining relatively low salaries and favourable terms of trade, with a simultaneous rapid growth of innovation in the private sector. Moreover, large national savings have expanded investment opportunities of Taiwanese and Korean companies since 1970, allowing a fast growth of the scale of their production and expansion to the global markets.

In the last three decades, the growing competitiveness of the industry in both countries became strongly dependent on its internal innovation – not only in terms of process but more and more often in terms of product innovation. In the middle of the 1980s, the government of South Korea began to introduce policies promoting innovation, however, without abandoning the protectionist policy. Thus, insofar as up to the end of the 1970s the technology was imported, after that time, public research institutes were established, which along with private Korean enterprises (Sohn, Kenney 2007), including Samsung, LG or Hyundai, became increasingly involved in the creation of technology, being responsible for a vast majority of R&D investments.

One of distinctive features of the Korean model is the role of universities. Unlike in, among others, Germany or the USA, the provision of knowledge and new technological solutions as well as creation of cooperation networks were of secondary importance. The primary goal of the Korean universities is to provide a qualified workforce for the industrial and financial sector. Other functions are performed by research and development centres of large enterprises, established with governmental support in the form of, among others, tax incentives promoting research activity of the production sector. It was assumed that the development of universities outside Seoul was to serve sustainable development and the establishment of relations between enterprises and universities (Sohn, Kim, Lee 2009). Despite certain deficits (e.g. lack of incentives for scientists to commercialise research), this system was successful, and universities contributed largely to that success through the education of engineers and scientists. Nowadays, Korea has begun to change that system, by increasing public spending on basic studies and encouraging universities to cooperate with business sector (Sohn, Kenney 2007), as well as significantly raising its own spending on innovation.

Taiwan also made a considerable effort within the scope of strategic design of innovation policy, its integrated planning and decentralised implementation, with the National Science Council to be in charge of them. At the same time, research and development departments were also established in other governmental agencies. However, the support is of a selective nature (semiconductor technology) and consists of the financing of research with public funds, liaising between domestic and foreign companies, as well as creating training centres and research facilities for selected technologies (including nanotechnology, synchrotron radiation). R&D activities are financed mostly by enterprises, even though the government promotes cooperation with the use of fiscal tools (tax incentives). An essential element of the Taiwanese system of innovations are informal relations. Their strength stems from two factors: firstly, the majority of scientists have graduated from one of several best universities or worked in research institutes, which fosters the establishment of a network of connections. Another factor is interpersonal relations that play a big role in a local culture.

FIGURE II.21. GDP per capita in PPP, USA=100%

Source: Own elaboration based on Penn World Table
As a result, informal contacts help in the cooperation between enterprises and in dissemination of knowledge. The professional mobility of the Taiwanese is another essential factor. Many of them migrate between research institutes and enterprises, and those working abroad often contribute to the transfer of technologies. This specifically relates to the R&D staff that, after completing studies abroad, financed by the state, are obliged to work in Taiwan for some time (Chang and Shih 2004).

The success of South Korea and Taiwan, with a much lower starting point of both of the countries than in the Western Europe, and the scope of social and economic transformations that occurred in a life-course perspective of one generation, may be deemed as at least comparable with the Japanese. As in the Country of Cherry Blossoms, it does not stem from a single economic policy, but rather from a conjunction of many factors gradually building competitive advantages of both of these economies. Initially, mainly the development of production capabilities, acquisition of industrial competences by the domestic companies, and a technological leap (Part I), consisting of the transfer of the surplus workforce from agriculture to industry, were of greatest importance. In the later period, the development of infrastructure (harbour, transportation, energy and urban infrastructure) and quick accumulation of human resources arising from mass public education, as well as exposure of enterprises to competition on foreign markets, have become substantial. Finally, over the last thirty years, innovations have become the key element of the development strategy. Their foundation was created by, on the one hand, an already existing strong industrial basis, and on the other hand, active state policy encouraging (among others, through tax incentives and organisational and financial support) enterprises to establish research institutes and significantly raise their R&D expenditure, and at the same time targeted at the provision of highly qualified personnel through the system of public education and universities.

2.2. INDUSTRIALISATION OF THE EUROPEAN PERIPHERY IN THE 19TH/20TH CENTURY

The process of industrialisation of the peripheral countries in Europe continued almost throughout the entire 20th century and cannot be described as a linear process. Towards the end of the 19th century, the centre of the European continent was already industrialised and the next stage of that process was to be continued after World War II, along with the imports of the American technologies and organisational solutions. However, in the peripheral countries, including in particular the Southern Europe, the industrialisation process only started to gain momentum. It covered various areas at various times, starting from Northern Europe, expanding through Southern, and finally reaching Central and Eastern Europe. Industrial policy pursued by particular states and the degree of their direct involvement in investment projects varied in each case. The governments of the European peripheral countries tried to play the role of the industrialisation agent as it was the case in Eastern Asia. Nevertheless, except for socialist countries, the state played the role of a facilitator in relation to market forces. One may distinguish several peripheral areas, whose industrialisation followed different scenarios. The first are Scandinavian countries, the second Southern Europe, and the third – Central and Eastern Europe (including Poland). These processes had substantial influence on the present structure of industry in particular countries, their competitive position and wealth levels.

Industrialisation of the Scandinavian countries was based on a long tradition of manufacturing in the pre-industrial era (timber industry for the needs of sailing and industry, as well as production of iron, Broadberry 2008), use of local resources (iron ore, wood and charcoal produced of that wood), as well as an inexpensive and available workforce in agriculture. A high level of human resources (it is proved for instance by the level of literacy in Sweden, which was then the highest in the world) and close economic relations with the United Kingdom were another advantage, in addition to natural resources. As a result, Scandinavian countries with their low population density level and unfavourable geographical conditions kept up with continental Europe as far as the development of industry was concerned already in the second half of the 19th century. Sweden achieved the greatest success as, at the beginning of the 20th century, it joined the group of the most industrialised countries in Europe. In 1900, industrial production per capita in that country reached 40% of the British level, ⅓ – of the Belgian and German level, and was fully comparable with the French level. By 1938, the Swedish industry still developed rapidly in comparison with the European industrial powers and in 1938, the industrialisation in Sweden reached over 85% of the British level (the second position in Europe). That level was also maintained in the post-war period (78% and the third place in Europe in the 1950s, and over 125% and the first place in 1980) (cf. Bairoch 1982). Other Scandinavian countries also followed the same path of development staying slightly behind. Denmark gained benefits from trade relations with Germany, Finland, Sweden, Russia, Norway and United Kingdom, and, in the later period, also from the development of the oil and gas industry in the area of the North Sea. The fact that this region stayed far from the main theatre of war in the first half of the 20th century, with a concurrent high potential for development of production for the purposes of the German economy was its unquestionable economic advantage. As a result, Scandinavia was able to create high industrial competences and at the same time avoid destruction of production capital, from which many continental countries suffered.

Unlike the Northern European periphery, economies of Southern countries (Spain, Portugal, Italy, Greece) entered the path of industrialisation only in the 20th century. Since then they have developed to a large extent complementarily to the continental centre of Europe. It referred, in particular, to the period after World War II when that region became, to an extent larger than Northern Europe, a beneficiary of the accelerated implementation of the American innovations in the field of processes and products created during the period of the second industrial revolution: unified mass production, mechanisation based on electric energy, Taylorism, Fordism, etc. The sudden technological progress (Part I) resulting from a very quick reallocation of workforce from agriculture to industry was reinforced by a rapid growth of productivity in industry and services, which was possible thanks to the adaptation of American production technologies. As a result, between 1945-1975, the whole region experienced a spectacular economic growth thus considerably reducing a development gap in relation to the United States or United Kingdom.
As in Asia, in initial phases of the post-war industrialisation of Southern Europe, labour-intensive industries competing in terms of workforce costs and benefitting from the first phases of “outflow” of the industry from the core countries played a significant role. In the second stage, all countries of the South encountered a problem with the transition from labour-intensive to capital-intensive branches of industry. Spain and Italy, and, more precisely, their local regions in which the industrialisation was carried out first (northern Italy, Catalonia, Basque country) dealt with that challenge relatively most effectively. The industrial potential of Western Europe was quickly rebuilt, and the entire continent quickly started competing with the USA, which induced convergence on the poorer South.

Meanwhile, industrialisation in Eastern Europe progressed in waves. The industrialisation at the turn of the 19th and 20th century did not cover the region to the extent comparable with the western countries. The present Polish territory may be a good example of successes and defeats of the region as it was a part of the territory of three countries in the 19th century (Russia, Germany – and earlier Prussia and Austro-Hungary) with different degrees of industrialisation.

In the 19th century the German provinces that owing to natural resources or geographical location underwent the phase of early industrialisation already in the first half of the 19th century and by the end of that century joined the western European second industrial revolution, were developing at a their fastest pace. Those provinces were Śląsk (with its capital city in Wrocław) and Pomorze, with its capital city in Szczecin. Śląsk in particular was an area with a high level of urbanisation and a significant share of the manufacturing (and mining) sector in GDP even before the industrial age. From the second half of the 19th century it experienced rapid development of heavy industry (especially in Górny Śląsk, but also in the Lower Silesian Basin), but also in the mechanised light and chemical industry (in Dolny Śląsk). The development of Pomorze was to a lesser extent associated with industrialisation (in that region and in part of Brandenburg, which found itself within the borders of Poland, light industry, especially the textile sector, was developing fast), and to a much greater extent it resulted from the industrialisation process of the Odra valley and its river basin, for which Szczecin was a natural port.

The remaining part of German territories, except for part of Górny Śląsk, where mining and metallurgy was developing strongly, was much less industrialised. This was associated with an unfavourable location [Poznań province or Western Prussia were located far away from the main trade routes, development of infrastructure also occurred later], and targeted state policy. These provinces were treated as agricultural backyard for industrialised Germany, their strategic location at the border with Russia was unfavourable, and by the end of the 19th century growing tensions between the Polish majority and Germans led to a relative (in comparison to the rest of the Reich) drop in investment attractiveness of these areas. Industrialisation and urbanisation of Wielkopolska was then supported by an inflow of the rural population only to a small degree – migrations, if occurred, more often were of international nature, and the law of succession contributed to growing fragmentation of arable land (a similar situation took place in Austrian Galicia). As it is shown by the example of Western Prussia, which also remained a non-industrialised region of Germany, location factors rather than political issues were of key importance. German heavy industry aimed at concentration developed mainly in the West of the Reich or in the areas with a comparative advantage in the form of coal or iron resources [Górny Śląsk is an example]. On the other hand, in central (not only in Wielkopolska, but also Brandenburg for example) and western (Prussia) provinces mainly the food industry developed (sugar companies, distilleries and breweries) along with the mechanical industry producing farming machinery for the needs of local economy. Gdańsk and Elbląg remained the industrial enclaves, nevertheless not matching the western German regions.

Under Austrian partition the industrialisation process was very slow. The industry was concentrated in Śląsk Cieszyński, which, nevertheless, with respect to industrialisation was behind the Czechs and Western Galicia, strongly integrated with the German economy. Lwów remained the industrial centre on a local scale, concentrating the capital acquired owing to the extraction of crude oil in Galicia. However, Austrian provinces up to the outbreak of World War I remained one or two, next to the so called Western Krai (western governors of the Russian Empire), least industrialised areas of today Polish territory (Jezierski, Leszczyńska 2003). Their function was close to that of the Poznań province in the German Empire, except that due to the location (mountain range separated it from the rest of Austrian land), the conditions for the development of agriculture and food industry were much less favourable (Misztal 1970).

The process of industrialisation of the Kingdom of Poland took place in leaps. In the period before the 1831 November Uprising the state enjoying large autonomy back then in shaping the economic policy, attempted to plan and finance industrialisation. As a result of which, industrial districts in the Świętokrzyskie Mountains and in the Dąbrowskie Basin started to develop. The mining industry and metallurgy were priorities there, which was intended to become the driving force for development. In a country with no road infrastructure, in a situation when the demand for products manufactured in those districts was minor, the centrally planned industrialisation had to fail. However, in the 1840s, when the level of public subsidies was reduced, and the region underwent the process of deindustrialisation, and the most modern plants became profitable only several decades after being built when they were already privately-owned (Jedlicki 1964). Industrialisation of the future Łódź district followed another path. In this case it was assumed that for the development of light industry applicable incentives, attracting entrepreneurs and craftsmen from abroad, will be sufficient. Owing to state support the countries of the district started to develop, mainly due to the wool processing industry, and then – together with the increase in the importance of Łódź – also to the cotton one. On the other hand, the metal and food industry was developing in Warsaw (Pus 1987).

Despite these attempts up to 1860 industry played a minor role in the economy of the Kingdom of Poland. Apart from the local food industry, the region had little metallurgy (as compared to Western Europe), and also – in the Łódź district – textile industry, and metal and food industry in Warsaw district. Local enterprises conducting business activity for the needs of land owners (ironworks, forges, plants for farming equipment) functioned also in the biggest land properties, however, they were not of general economic importance.
The turning point in the process of industrialisation of the Kingdom of Poland took place after the 1863 January Uprising and was related to the removal of customs barriers between Russia and the Kingdom (implemented after the November Uprising and removed after the January Uprising in combination with significant limitation of political autonomy and increase of the military contingent permanently based in the Kingdom). A substantial factor fostering the industrialisation of this part of Polish territory after 1860 was the acceleration of the industrialisation of Western Europe in this period (Germany in particular) and the beginnings of the so called First globalisation. That is when the outflow of traditional, labour-intensive branches of the economy from the most developed regions in Europe searching for geographically nearby locations but offering cheap workforce, occurred. One of the beneficiaries were mainly the western governorates of the Kingdom of Poland (Łukasiewicz 1963). The development of industry in these regions after 1860 progressed according to the standard sequence: light industry development, especially cotton (the Kingdom manufactured more than 1% of the world production in the 1 decade of the 20th century), food industry (sugar industry, brewing, milling) and apart from that subsequently the development of heavy industry (metallurgy based on local coal and imported technology in Dąbrowskie Basin – mostly controlled by French and German capital; steel, mechanical and chemical industry mainly in Warsaw) (Puś 2013). Despite considerable growths of industrial production between 1860-1910, on the eve of World War II the Kingdom of Poland was remaining distant from the countries of Western Europe.

War efforts and considerable changes in the boundaries after World War I led to the relocation of industry to Germany and Austria, with a concurrent outflow of capital. This referred not only to Poland but also, among others, Romania and Hungary. In the face of markets' shrinkage, as a result of break-ups of 19th century empires and retreat from globalisation and free trade, that the companies located there could rely on, a common phenomenon in Western Europe was an absolute deindustrialisation (i.e., a drop in the volume of industrial production per capita) and partly a re-growth of the share of agriculture in the general structure of the working population became a common phenomenon across Eastern European countries. The efforts of particular governments focused on the maintenance and reconstruction of the industrial base which was affected by a long-term regress as a result of war losses, outflow of capital, and the Great Depression. They were also an attempt to respond to the collapse of the 19th century’s political order on the continent, as well as economic problems of the Western world, which reached the highest point during the Great Depression of the 1930s. Industrialisation concepts formulated in that region during that period (like the project of Eugeniusz Kwiatkowski in Poland or the views presented by Mihail Manoleascu in Romania) were to a large extent a reference to the contemporary experience within the state-driven policies in Western Europe and Japan, and at the same time preceded South-American concepts of industrialisation substituting the imports of the second half of the 20th century. Hence, the economic policy of Central and Eastern Europe of the interwar period was based on the national investment programs and protection of national production from foreign competitors. Its main goal was to maximise the volume of industry considered the major, or even the sole driving force of development. Such measures were taken, among others, by Poland, Romania, and, to a certain extent, Hungary. These countries tried to make a rapid technological progress based on the models similar to those applied by, among others, Japan since the Meiji era. As a result, before the outbreak of World War II, they were able to rebuild the industrial potential up to the levels comparable with those achieved in the period preceding the Great Depression, however, with noticeable changes in the structure of the industry branches and geographical allocation of production. It doesn't mean that the industrialisation attempts undertaken under the guardianship of the state turned out to be a success. As a matter of fact, the relative level of development of Poland or Romania in comparison to Western European countries did not change much during that time, which resulted, among others, from their limited access to Western technologies and selling markets, low level of urbanisation and substantial human capital deficit. Another reason for the failures was that the state had an ambition to develop heavy industry from the ground up in spite of the fact that in such conditions the most convenient choice would be to develop industry branches in which the degree of complexity is rather low (light industry). Since that period was concurrently the time of retreat from globalisation and drop of international trade exchange volumes, manufacturing companies could not, in view of the limited domestic demand, develop the scale of production leading to the reduction of their unit costs, and the verification of their competitive advantage by demanding Western customers became more difficult. It may be stated that the industrialisation of Central and Eastern Europe in the interwar period was relatively early confronted with the limitations of the model of technological progress that took place in unfavourable external conditions with concurrent serious structural and institutional internal limitations (Part I).

Between 1944 and 1945, the war front swept through Central and Eastern Europe, including, in particular, the territory of the future Polish People's Republic, causing another dramatic, in terms of its scale, deindustrialisation. The majority of the machine fleet was removed or destructed. A large part of the transportation infrastructure was a decapitalised event though the moving of Polish boundaries far to the West contributed to the fact that the country gained territories with a much better infrastructure than the one located on the lost territories. Since the reconstruction of industry was conducted on the basis of the existing resources: buildings, machinery, infrastructure, both regional and international discrepancies in the level of industrialisation observed along the gradient running from the South-West to the North-East were fixed. After approximately 5-6 years following the end of the war, Central Europe, including Poland, was again able to achieve the level of production (and employment in the industry) similar to that recorded at the turn of the 1920s and 1930s. The end of the three-year plan of reconstruction and Stalin's industrialisation plan indicated the moment of exceeding that level. The industrialisation of the region in the 1950s was conducted according to Soviet models: the accumulation of investment resources was made mainly at the expense of rural areas, by means of taking over any surpluses they generated through collectivisation and/or mandatory purchase of food products at low prices, whereas the investments were targeted at the development of heavy industry. The structure of production in the Polish People's Republic and other countries of the region was even more inclined towards heavy industry and investment assets.
PART II. POLAND INDUSTRIALISED ANEW


Source: History of Poland in figures, Central Statistical Office of Poland

It was accompanied by an intersectoral growth of productivity (technological progress manifested by moving employees from agriculture to industry) and a slight improvement of living standards related to urbanisation. However, the intrasectoral effects of the Stalin’s industrialisation plan were rather scarce (Misztal 1970, Jezierski and Petz 1988), and the labour productivity in particular sectors was considerably lower than in Western countries.

If Stalin’s industrialisation plan led to the concentration of industry in certain regions, the political thaw of the second half of the 1950s allowed reorientation of the industrial policy and its targeting towards a model that would satisfy social needs to a greater extent. In most countries (among others, in Poland), the investment efforts focused on light industry which was also conducive to a more balanced, from the geographical point of view, impact of the industrialisation process on the economies of particular socialist states. In the 1960s, Poland underwent a process of an intensive urbanisation and migration of the excess of agricultural population from rural areas. Concurrently, however, social structure transformations accompanied by the growing aspirations of urban dwellers led to an increase of tensions. Using the language of Marx, one may talk about social contradictions of socialism that were more and more visible: the growth of the share of the working and urban population that was supposed to form the foundation of the regime in the society posed a threat to the stability of the system, which turned out to be unable to improve the quality of life of new urban dwellers to a degree that would satisfy them. According to assumptions, those were the workers who were supposed to constitute the political foundation of the socialist system. However, their satisfaction with that system was declining. As a result, in every decade, social protests were organized in Poland (1956, 1968, 1970, 1976, 1980-81, 1988-89). The attempts to counteract such phenomena included, among others, the suspension of urbanisation processes by means of limiting the possibility to acquire the status of permanent resident in the largest cities, actual limitation of the supply of new flats, and development of industrialisation on the basis of farmers employed in factories. Already in the 1960s, the state tried to balance the negative social mood with the development of industry sectors that would manufacture consumer goods (household appliances, cars, electronic goods, food products, detergents, etc.).

Such activities were intensified in the 1970s as an attempt to build the socialist consumer society. Unlike in the earlier period, investments were not financed with funds derived from rural areas but foreign loans, which helped to avoid immediate impact on the social mood. The obtaining of such loans was easier owing to high oil prices on global markets, which led, on the one hand, to a slowdown of growth in developed countries, and on the other hand, to the creation of considerable capital surpluses in Arabic countries, which were seeking new investment opportunities through the global banking system. However, still many solutions leading to the increase in the system-related risk were repeated or introduced, for example, the imports of technologies instead of developing their own, debt-financed investments instead of FDI, lack of market incentives optimising the directions of development and admission of private property to manufacturing activity and services only in certain, licensed niche segments of economy [crafts, horticulture, etc.]. The limited availability of loans on global markets, over-investment, worsening of the condition of raw materials markets (including the falling prices of coal being, in the case of Poland, one of few export commodities), as well as reduction of the intra-sectoral reallocation by means of stopping the outflow of population from agriculture to industry and, still underdeveloped, services, played an important role in the deepening of the economic crisis accompanied by the political and social crisis in the countries of the Eastern bloc, including, in particular, Poland and Romania.

Actually, the crisis at the turn of the 1970s and 1980s closed the period of socialist industrialisation in the region. At that time, the employment in industry, which can be treated with a certain reserve as a measure of the industrialisation, reached the highest levels in the history (comparable with the levels achieved in the countries developed several dozen years earlier), however, with a definitely lower level of urbanisation and development of the service sector. Both, the productivity and the quality of workmanship, as well as the degree of technical advancement of industrial goods, were very low and did not match Western standards.
The model for centrally planned industrialisation, most consistently implemented in the Soviet Union, and, after the war, in other states under the socialist regime, considerably differed from the model successfully introduced in the countries of South-Eastern Asia. In that region, industry was developed under the auspices of the state, but by private entities facing market competition, which carried out sequential investments – from light industry to the most modern industrial sectors, which was accompanied by the policy of improving the quality of human capital and support for companies involved in exports. Meanwhile, the states of the Eastern bloc – including the Polish People’s Republic – rather strived towards the production of substitutes of foreign goods for non-demanding domestic consumers than towards the achievement of export advantages and capability to compete on the global market.

Industrialisation during the period of a centrally planned economy can also be perceived as an unsuccessful attempt to repeat the civilisation achievement of Western countries from late stages of the second industrial revolution. That project had, however, small chances of success, first of all, because of the failure to understand the basic source of effectiveness of the Western model, which is the ongoing verification of the results of production activity by consumers having continuously growing demands (Part I). State-owned enterprises operating as part of the socialist economy were designed to meet the expectations of the authors of plans, which, in combination with the lack of competitive pressure, resulted in very low quality of products and their failure to match the needs of consumers as well as permanent deficiencies requiring in some cases the introduction of additional methods for rationing consumer goods, in the form of a ration card system. Hence, the success of the structures and organisational solutions imposed by the Soviet Union was apparent. Even though the share of population employed in industry reached the levels observed at a peak time of the industrialisation process in the Western economy, and the industrial production was much higher than 30 years earlier, already in years 1960-1970, it has become evident that Eastern European economies developed according to a centrally planned model were far behind Western economies with regards to their capability of producing a large volume of high quality goods, creation and absorption of organisational and technical innovations, as well as effectiveness of the use of resources in the economy. Towards the end of the 1980s, on the verge of a system transformation, even the Czech economy, which was the most developed in the region, had lower per capita production and efficiency than the least technologically advanced Western economy, i.e., Portugal.

2.3. DELAYED INCORPORATION OF CENTRAL EUROPE INTO THE GLOBAL ECONOMY
The fall of communism and reintroduction of the principles of market economy in Central Europe, as well as making it subject to globalisation processes became the turning point for economic growth and industrialisation of that region. Initially, it revealed low competitiveness of the state economy, whose products were to a large extent rejected by consumers – both domestic and foreign. Not only the effectiveness of production had to be changed. The same applied to the quality of manufactured goods, product structure, distribution channels, management methods and, finally, work discipline and organisation. Deficiencies in each of these fields contributed to an initial drop of the production volume in all countries of the region. However, in most of them, that phenomenon did not last long, and the volume as well as value of the produced goods started to grow quickly. Owing to the progressing privatisation and liberalisation of the internal market, which stimulated private initiative, the region entered the path of quick industrialisation and accumulation of wealth. Today, the added value in the Polish production sector per capita is (in fixed prices for the industry) almost five times higher than in 1988 (Figure II.9). A smaller, although still very high growth of the industrial production volume was recorded in the Czech Republic (373%), Slovakia (291%), and Hungary (165%), which were, however, more industrialised than Poland even during the period of a centrally planned economy. The slowest pace of industrialisation was observed in Bulgaria and Romania, i.e., countries where restructuring and privatisation processes were also delayed.
The average, annual rate of growth of the added value generated in industry per capita in Poland, Czech Republic, and Slovakia after 1989 was one of the highest in the world (Figure II.10.). During the whole post-war period, only the Asian tigers, i.e., Japan, South Korea and Taiwan, as well as China after 1989, managed to achieve comparable results. What is important, in Central Europe, the productivity of work in the industrial sector even outpaced the growth of the production volume (Figure II.12. Industrialisation and economic growth in Europe in the years 1993-2013 (average annual growth rate, fixed prices 2005.)). This task was much easier thanks to the fact that in the period of the centrally planned economy, employment in industry was definitely higher than the needs of the production process. As a consequence, at the beginning of the 1990s, relatively simple changes in work organisation resulted in a great increase in productivity with concurrent, relatively low capital expenditures. On the one hand, it led to unemployment, which was only partly absorbed by the service sector, whose pace of development was too slow. On the other hand, it enabled those countries in which the rationalisation of production processes was conducted at the fastest pace to return to the path of economic growth. The largest growth of efficiency was recorded in Poland, Slovakia, and the Czech Republic, which definitely outpaced Hungary, Romania and Bulgaria (Figure II.12.). The same three countries experienced the most intensive industrialisation, with a reservation that the relative growth of efficiency in comparison with the volume of the industrial production was particularly high in Slovakia, which must be associated with exceptionally high concentration of foreign investments in that country in the most technologically advanced industry branches, including, in particular, automotive industry. A similar path was followed by Romania, however, in its case, the rate of development of the industrialisation has been, so far, considerably lower, and, what follows, the general economic impact of the reviving industrial sector was less noticeable.
Intensive industrialisation of Central European countries after 1989 left a visible mark on economic growth in the region. It can be estimated that every additional percentage point in the industrial production growth rate was equivalent to ca. 0.7 percentage point of economic growth. The Central European economies that grew at their fastest pace between 1993-2014 included Poland, Slovakia, Lithuania and Estonia, which at the same time had the highest industrialisation growth rate. However, in that group, only the Baltic states fully used the economic potential of the industrialisation process. The GDP growth rate in Poland, Slovakia, and the Czech Republic was by ca. 1-2 percentage points lower than the one expected on the basis of the growth rate of the industrial production value in those countries. The reason for that was a slow increase in the efficiency in other sectors of the economy: construction industry, mining, agriculture, services provided to the community, and public services. Following the arguments presented in Part I, it may be stated that these countries managed to develop institutional order, which sufficiently well supported the natural convergence of productivity and the growth of the production volume in the industrial sector, but which could not fully initiate the economic potential of service-based sectors, agriculture and construction industry. Meanwhile, in Latvia, a reverse process occurred – a relatively slow industrialisation was compensated by a quick increase in the effectiveness of services. In both cases, the following structural reasons could become an obstacle: low urbanisation and dispersed structure of land ownership and agricultural production in Poland, small scale of the Latvian economy, and traditional structure of its industry, as well as (in both cases) the deficits in human resources.

FIGURE II.27. Industrialisation and growth of productivity of the industrial production in Central European countries (1988 = 100)

![Graph showing industrialisation and productivity growth in Central European countries.]

FIGURE II.28. Industrialisation and economic growth in Europe in the years 1993-2013 (average annual growth rate, fixed prices 2005)

![Graph showing industrialisation and GDP growth in Europe.]

Source: Own elaboration based on UNIDO data
The analysis of sectors casts an additional light on the transformation of the industry in Central Europe after 1989. Spectacular growth in production and labour productivity in the whole region were related to the transformation of a twofold nature. First of all, as a result of the exchange of the machine park and adaptation of the Western organisational standards, a considerable, even though incomplete, convergence of labour productivity inside particular branches of industry took place. Second, certain structural changes occurred simultaneously. For example, certain industry branches developed faster than the other ones, having diversified impact on the aggregate level of efficiency. Especially the accession to the European Union in 2004 was a trigger of such changes, as a result of which the industrial production volume in Poland and in other countries of the region started to grow at the annual rate of 7%. It also meant the adaptation of the structure of production to the needs of the internal market – the major destination of exports. Bukowski and Śniegocki (2014) note that comparative advantages of Poland were particularly visible in the machine industry, which recorded as high as 16% average annual production growth. Among others, the metal industry (on average, 13% per annum) and transportation (9%) also considerably benefited from the export orientation. Meanwhile, the internal market (the construction of infrastructure) created favourable conditions for the development of mineral industry (average annual growth rate of 10%), whose share in the entire growth of the industrial production between 2003-2013 was, however, limited owing to a relatively low share in the generation of added value.

Transformations in the structure of production and exports of industrial goods in Poland and other countries of the region are synthetically illustrated by the economic complexity index of Hausman and Hidalgo (2009) – Box II.4. It combines the average complexity of goods produced in particular countries with the degree of their popularity on the international markets. Countries which produce various, technically advanced industrial goods, and are at the same time connected through a network of commercial links with other countries producing equally advanced and rare goods have high index values. On the opposite side, there are economies whose industrial production focuses on relatively simple goods and whose trade partners also manufacture easily accessible products with a low degree of technical complexity. Changes in the index of Hausman and Hidalgo between 1990-2013 show that throughout the period of economic transformation, the complexity of the central European economies was gradually growing. Companies located in the region increased their technological advancement through continuously established trade links with a much more industrialized Western Europe. The example of such a country is Poland, in whose case the imitation of production models applied by the present major trade partners (Germany, France and the United Kingdom) led to the narrowing of the complexity gap from the level of 40% at the beginning of the 1990s to 60-70% at present (Figure II.27.). Other Central European economies, i.e., Hungarian, Czech and Slovakian, underwent an even faster integration with Western Europe, and their complexity is much higher today than in the case of Poland.

The competitiveness of Polish exports (hence, indirectly, the growth of economic complexity) is predominantly based on very large (over 1000 employees) and large (250-999 employees) foreign companies (Figure II.14.). Meanwhile, large domestic companies are rather focused towards the internal market and their involvement in the export boom observed directly after the accession to the European Union was insignificant. The main competitors on the European market are medium industrial companies with domestic capital and mixed companies being in most cases a result of privatisation or purchase by foreign entities in the process of mergers and acquisitions. Stanikć (2014) notes that the domination of foreign companies in exports leads to the specialisation of an industry in selected sectors: electronics, electric machinery, and transportation equipment. However, domestic and mixed companies have a stronger position in the area of metals and metal products, as well as in the food and mineral industry, and – which is surprising – in the production of transportation vehicles, trailers and semi-trailers. The area of the Revealed Comparative Advantage of Polish exports may be identified by indicating products whose share in total exports is on an international scale – above average21.

21 According to RCA definition – comparative advantage of the country is reflected in export, if the share of the goods of a given type in export is bigger than their share in total international trade. In other words this index assumes that the countries with comparative advantage in what they export with above-average intensity.
An index specifying the degree of complexity of economy (Economic Complexity Index) was developed in 2009 by Ricardo Hausmann and Cesar Hidalgo. It measures the average complexity of goods produced by particular economies in the world and the degree of their ubiquity in international markets. The high value of the index in the case of countries like Japan or Germany is a result of not only the technical advancement of their industrial production but also a network of links with major trade partners, whose economies have an equally high degree of complexity. On the opposite side, there are poorly developed countries like Angola or Zambia, whose trade partners mostly produce easily accessible goods with a low degree of technical complexity.

Hausmann and Hidalgo (2014) argue that the citizens of countries whose economies are more complex owing to a high degree of diversity and uniqueness of the goods produced, hence a small number of other countries capable of producing their substitutes, usually also enjoy a higher level of wealth than the inhabitants of countries that produce only unprocessed goods (e.g., raw materials, agricultural products) or simple finished or semi-finished goods produced globally (Figure II.29). The relation between the level of GDP per capita and the economic complexity index arises from the fact that technologically advanced products are usually rarer and thus more desired on the international markets than unprocessed goods. This fact determines the possibility of intercepting a larger part of added value, which constitutes consideration for the rare skills of creation of exceptional finished goods using more common basic components.

**FIGURE II.31. Economic complexity and GDP per capita, 2014**

Source: Own elaboration on the basis of data provided by The Observatory of Economic Complexity and the World Bank. Poland is marked with a red dot.
To a large extent it reflects the structure of domestic industrial production and exports as such, which should be associated with the fact that industry is generally targeted at exports. Hence, it transpires that Poland’s industrial potential comprises consumer electronic goods, electrical machinery and devices, transport vehicles, as well as metals and metal products, agricultural products, goods made of plastic and rubber. In this case too, large companies with foreign capital build a comparative advantage of the domestic economy. This feature is not specific to Poland but characterises the whole of Central Europe, which joined the global value chains at a relatively late stage, when globalisation, based on unlimited flows of capital and trade, was already a highly advanced process. Hence, the region could not apply the strategy of development similar to that on which South Korea and Taiwan relied in the years 1960-1970 i.e., the protection of the domestic market and construction of the domestic potential of the industry based on foreign market competition. Under the conditions of advanced globalisation and European integration, the protection of the domestic market and (indirect) subsidising of exports were not possible.

Thus, Central Europe has to build the competitiveness of domestic production companies in Central Europe on the basis of industrial commons shared with foreign companies. Such commons include the relations supplier-recipient and other “shared” assets such as specialised suppliers or qualified and remote workers.

The condition of maximising social benefits derived from their existence of common resources is the clusterisation of the industry, both in geographical and sectoral terms. A considerable concentration of similar investments – domestic and foreign – in a given area contributes to the transfer of know-how between them, among others, through direct trade relations, transfer of employees and cooperation with the same suppliers. In this context, a large scale of foreign investments in the Central European industry may be conducive, in the long run, to the development of capabilities of domestic companies, too, as these may follow the patterns not only as a result of technological imitation or purchase of similar machinery and equipment but also as a result of the transfer of human resources and diffusion of knowledge immersed in the components acquired from the common (local) sub-supplier. On the other hand, the industry in the region is, with regards to the production and the export level, globally orientated. It means that its production is intended either for the domestic market or the export market through participation in global value chains being integrated with other countries of the region and Germany. In the case of exports, a clear division between the companies with domestic and those with foreign capital can be observed. As noted by Stanilko (2014), Polish companies with foreign capital export more technologically advanced goods than domestic companies – it is characteristic for economies being wealthier by up to USD 4,000 per capita. In his opinion, it may denote a gap in the capabilities between both categories of enterprises, whereas the potential of diffusion between them is mainly limited to the migration of workforce or cooperation.
In the context of the findings made in Part I, it means that the ability to import technologies and know-how in a manner that permanently builds competitive advantages of production companies plays a vital role in the development of industrial competitiveness of a country like Poland. At the same time, it should be emphasised that in the globalised economy, one may not talk about technological self-sufficiency. However, if the companies with domestic and foreign capital share a number of industrial similarities the development of their technological potential should occur in a similar way in the long term. However, foreign investments per se do not guarantee such a scenario. Should they exist in parallel to the domestic capital, i.e., operate in other sectors, taking advantage of highly extended, international value chains, and cooperate only marginally with domestic companies supplying technological solutions to other customers, the transfer of know-how and innovations from the foreign sector to the domestic sector will be limited. In this case the imports of innovations through direct foreign investments will become a specific substitute of the domestic innovations.

The fulfilment of that scenario may be counteracted in many different ways. Firstly, the creation of positive feedback between the domestic and the international sector is facilitated by common resources in the form of qualified employees highly educated in public educational institutions. It refers to both university degree specialists and technicians as well as qualified workers who complete industry integrated vocational schools. Another shared resource whose development can be facilitated by the state is industrial clusters, i.e., geographically integrated areas gathering companies from a given sector together with a network of their sub-suppliers and cooperating partners. However, it is vital to keep the economy diversified, with the presence of various industrial sectors, and ensure an unrestrained transfer of managers, which is facilitated by geographical proximity especially when the emerging industrial clusters are diversified internally (on a sectoral level). It allows diffusion of know-how not within one particular sector but also between such sectors. In this context, it is worth referring to the regional policy – the concentration of industry and population in selected regions of the country may be more advantageous than its dispersion in a larger area. It refers in particular, to a technologically advanced industry sector focused towards export markets. Industry based locally (e.g. food industry) does not have such a feature. However, it means that in a country striving towards the development of an internationally competitive processing industry, an inevitable division will be created into relatively more and less industrialised regions with a very different share of sectors with a high degree of technological advancement. Paradoxically, in such a situation, internal migration becomes a chance for the less prosperous regions. It allows the improvement of productivity in less technologically advanced regions through the reduction of the workforce surplus and making other inhabitants specialise in a locally based industry (for example, food industry) and services provided to the rest of the country (for example, tourism). The allocation of resources within the scope of the public sector, e.g., public education, or health care, may become a partial alternative to migration. In order for that measure to be effective and harmless to the combined level of productivity, the scale of interregional transfers of that type must be, however, limited and the quality of public services must be treated as one of the priorities.

The diffusion of knowledge between the companies having various levels of know-how (e.g. foreign and domestic) will be easier if such companies are technologically similar to each other. However, Staniłko (2014) notes that in the Polish reality, foreign companies are relatively more capital-intensive whereas Polish companies are relatively more labour-intensive. It can mean that they operate in different market niches (industries) and the diffusion of innovations between such companies will be limited. The sectoral and organisational structure of industry in particular countries of the region influences the perspectives of growth of its competitiveness in the long term. As we have shown in the preceding chapter, the innovative nature of the industry depends on two factors – the degree of the technological advancement of a given sector (hence, it depends on whether an intensive technological change takes place in such sector) and on the size of entities operating in a given sector. In view of the fact that on average, domestic companies are smaller and are located in less technologically mature sectors, with a less intensive innovation cycle, the perspectives for the growth of innovation of the Polish industry are not guaranteed.

In this context, further changes in the sector structure will be highly important (i.e., overcoming informational obstacles and coordination problems – Part I) as well as the growing scale of operation of industrial companies, including, in particular, domestic companies. Industrial policy may stimulate both these processes through institutional regulations and solutions creating an incentive for the development on a scale of activity and investing in technologically advanced sectors, as well as by supporting the creation of cooperation networks with domestic sub-suppliers. As we have shown in Part I, the increase in the complexity of the economy is, in addition to human resources and regulation quality, the key factor decisive for the long-term development perspectives. The convergence of complexity of the Polish economy to the level similar to that of the European leaders (Germany, Sweden, Austria, etc.) seems to be a much more difficult challenge in the forthcoming two decades than the achievement of the present level. It will not only require the maintenance of the present pace of development of the industry branches, which contributed to the industrialisation success of Poland in the last decade (among others, machine and transportation industry), but also the shifting of focus onto sectors that so far have been on the margin of domestic industry (e.g. manufacture of pharmaceuticals, advanced chemical industry, selected segments of electronic industry). Currently these sectors are in the initial phase of development in Poland in comparison to the countries that specialised in advanced industrial manufacturing. For example, pharmaceutical sector manufactures ca. 0.7-1% GDP in Poland as compared to 9% in Ireland. Then, the value of production of chemical products (26 billion euro) is two times lower than in Belgium (ca. 50 billion euro), which is a few times smaller than in Poland, and almost ten times lower than in Germany (221 billion euro), which is a country two times larger. In the next chapter, we will show that without a breakthrough in the structure of the Polish industry branches one cannot expect a full convergence of the living standards in Poland and in the technologically advanced countries of the European North.
3. INDUSTRY AND LABOUR MARKET IN THE AGE OF CHANGES

3.1. STRUCTURAL CHANGES IN INDUSTRY AND WAGES

The last 40 years brought significant changes in the global industry. One of the important global trends was a significant prolongation of the industrial value chains. International corporations, trying to fully use even minor differences in comparative advantages of particular countries and the effects of scale, which are related to the production of large amounts of a given product in a single location, are ready to import its components from various regions worldwide. Hence, their combination giving a valuable final product is a result of not only an advanced production technique but also highly effective logistic, marketing, and selling channels allowing a prompt delivery of the necessary components to the end product manufacturer and an immediate distribution of end products to the customers worldwide. It had a significant impact on the international work distribution, changing the structure of employment in the industry in countries with a high and medium level of income.

A rapid drop of the employment rate in industry sectors with a low degree of technological advancement, namely, production of textiles, leather ware, wooden and paper products, and (to a smaller extent) food industry was one of the major, universal for almost all OECD member states, regularities of that period (Figure II.31). In the latter case, the main factor reducing the demand for work was the necessity to compete in terms of wages with more productive sectors. It forced the mechanisation of production and gradual reduction of employment. Meanwhile, in the case of the remaining sectors, globalisation and emergence of new manufacturers in rapidly developing Asian countries, including especially, China, had a decisive impact. In spite of that, in some medium-income countries (like Portugal or Greece), industries with lower technological advancement (among others, textile industry) still had a high share of total employment in the production sector. The reason for this was, however, not the maintenance of a large number of employees but rather the inability of these countries to construct an alternative industrial potential in sectors with a medium and high degree of technological advancement, and, what follows, inability to reallocate employees to such sectors. A relatively high quality of products manufactured in those countries was also an important factor, as it enabled the manufacturers to generate higher margins, as a result of which the productivity in these sectors is higher than in the Asian countries.

As a matter of fact, in highly industrialised countries, the share of workers employed in mid-tech and high-tech sectors, i.e., the manufacture of rubber and plastic products, metal, mineral and fuel processing, as well as production of chemicals, pharmaceuticals, electronic goods, machinery and equipment, as well as cards, trains, airplanes and other vehicles, increased considerably. What distinguishes highly industrialised countries from those with a medium income level is, in addition to the minor role of traditional industries, the role which is played in the industry by technologically advanced sectors. In countries with average income, the employment level did not increase in such sectors, whereas, in Korea, Japan, Germany or Finland the situation was different. It may be stated that after 1970, what distinguished Italy and Spain on one hand, and Germany and South Korea on the other, was the difference in their readiness to create their own competitive advantage in mid-high and very high technology industries (Figure II.31).

From that perspective, it is worth analysing structural changes that occurred in the Polish industry after 1990. In the centrally planned economy, the employment in the chemical, machine and electronic industry per production unit was definitely higher than in the countries with market economy. At the same time, the quality and efficiency of production was considerably different than in the case of Western competitors. It created the necessity to further reduce production volumes and employment in the first two years of transformation (it is manifested by the decrease of the relative complexity index – Figure II.27). However, concurrently, Poland maintained its general structure of industrial specialisation. According to the conclusions presented in the preceding chapter, Polish industry relatively quickly adapted to the requirements of the market economy, and the industrial production started to grow already in 1992.

It may be stated that at present, in terms of the employment structure (and created added value) in the processing industry, Poland starts to resemble Italy and Spain rather than Greece or Portugal. In the structure of domestic production, low-tech industries definitely play a minor role in comparison with the mid-high and high technology sectors. On the other hand, the structural differences between Poland and European and Asian industrial leaders are very noticeable. In Polish low technology industries, the share in employment is higher by approximately 20 percentage points than in Germany, which partly arises from a strong position of the timber and furniture industry. On the other hand, mid-high and high technology sectors are underrepresented in comparison with Germany and other highly industrialised countries like Austria, Sweden or Switzerland. It refers both to the machine and transportation industry, as well as electronic, optical and pharmaceutical sector. The existing Polish industrialisation model implies that gradually, the industrialization becomes similar in terms of structure and production volume to the EU countries with a medium level of industrialisation, like Italy, Spain, and France. The convergence to the European industrial leaders is, however, improbable, and what follows, the achievement of convergence of the GDP per capita level may be difficult unless Poland creates a comparative advantage in the services sector.
FIGURE II.33. Structure of employment in processing industry in countries with the finally high (left panel) and medium (right panel) level of industrialisation based on technology levels, 1970-2012

Low technology level

Medium technology level

High technology level

Source: Own elaboration on the basis of data provided by EU KLEMS, ASIA KLEMS and UNIDO

Note: Low technology level covers ISCID 10-18 i.e., the following branches of industry: food, textiles, apparel, leather ware, wood and paper (including printing and publishing) sectors; The medium level covers ISCID 22-25 and 31-33 i.e., the manufacture of rubber and plastic products, mineral products, basic metals, except for machinery, and repair and installation of machinery; High technology level covers ISCID 19-21 and 26-30, i.e., oil refining, petrochemical, chemical, pharmaceutical, transportation, electrical, optical and electronic industry.
Such conclusions are supported by the analysis of intersectoral distribution of efficiency and wages in the Polish processing industry. In spite of the structural similarity, labour productivity in the Polish industry is still lower than in Spain, and rather resembles the Greek industry (Figure II.32). What draws particular attention, is the fact that in Poland, there are almost no sectors in which the efficiency of one worker would exceed EUR 60,000. In Spain, this feature is observed in the case of ca. ⅓ of the industry. It clearly illustrates a higher labour-intensiveness of the Polish industrial production, being certainly a result of the lower level of use of machinery in production and lower advancement of Polish companies in terms of processes and products. A lower labour productivity in Poland does not arise from a less favourable structure of industrial companies. In Spain, where the number of industrial plants is similar (ca. 175,000), the number of both the large industrial plants, hiring over 250 persons (754 in comparison with 1505 in Poland) and medium industrial plants with 50 to 249 employees (4,200 companies in comparison with 6,200 in Poland).

A lower productivity on the sectoral level leads to lower salaries (Figure II.33.). The average wages per sector correspond to the productivity levels per sector. Hence, the concentration of the industrial sectors around the annual level of approximately EUR 22,000 is a determinant of the average annual wage in the Polish industry on the level of ca. EUR 12,000, whereas in Spain, it is EUR 53,000 and EUR 37,000, respectively. The difference in productivity in Poland and in Spain is, however, as high as the difference in salaries. This fact may be explained by stating that employment in the industrial sector in Spain is not only lower but also the employees are (on average) more qualified and, as a result, they receive higher remuneration.

**FIGURE II.34.** Sectoral distribution of labour productivity in the industrial sector of selected countries of Western Europe (upper panel) and Central Europe, 2012

**FIGURE II.35.** Productivity and wages in industry on the sectoral level in Western Europe (upper panel) and Central Europe, 2012

Source: Own elaboration on the basis of data provided by Eurostat
Note: In the right panel, one dot denotes one industrial sector on the 4-digit level of the NACE classification; In terms of the productivity distribution, the Polish processing industry is very similar to the industry of the Czech Republic, Hungary and Slovakia (which are not marked on the figure), which is related to a similar model and stage of development of the industrial culture of these countries
Hence, three factors are decisive for the lower wages in Poland (and in other countries of Central Europe). The first one is the above-mentioned sectoral structure of the industry. The share of low technology sectors, which is larger than in highly industrialised economies, and the share of industries with a medium and high degree of technological advancement, which is lower, has an impact on the aggregated productivity and wages in the entire economy. The fact that there are relatively more capital-intensive sectors in Northern Europe or the United States, with a higher level of efficiency per unit, and, what follows, large payment potential is reflected in the level of wages in the entire economy. This situation arises from the fact that companies compete with each other for employees having the same qualifications. The presence of a large number of highly efficient companies in the economic structure that intend to hire the best specialists increases the level of wages in general, as it increases wage pressure exerted on the remaining companies forced to seek efficiency reserves through higher capitalisation of their own production. A limited number of such companies in Central Europe, including Poland, is conducive to the wage compression. Another reason for that is more in-depth. Even in the case of a similar sector structure, the distribution of sector productivity is shifted to the left in Central Europe (Figure II.32). In other words, in the same sectors, from the nominal point of view, Central European companies hire more employees per production unit than Western companies — including Spanish, Italian or Greek companies. It is most likely a consequence of a small scale of turnover and a lower unit value of the produced goods, which can also arise from a weaker market power of the Central European producers. The reason for its weakness is most probably the lack of Central European brands that would be well recognisable and appreciated by Western consumers, the shortage of well-developed sales and distribution channels, etc. Another significant factor may be the lower product innovation of industrial companies from Central Europe, which prevents them from earning margins analogous to those achieved by Western companies. The third reason must be the generally lower capital injections provided to Central European economies — worse transportation infrastructure and machine park has an impact not only on the productivity of a given company but, indirectly, also on the productivity of its cooperating partners, which in turn, through a sequence of feedbacks, reduces efficiency of work in the entire economy. For example, the low transportation speed of Polish railways prolongs the duration of deliveries of parts manufactured by Polish producers thereby decreasing the investment attractiveness of Poland in the case of certain types of industrial investments.

It should be emphasised that the productivity in industry and productivity in services, and what follows, wages, are correlated (Part III). First of all, the services are under the influence of the so-called Balassa-Samuelson effect, according to which the growth of work efficiency in industry enables the growth of service prices; it is reflected in statistics as the growth of their efficiency. The process of moving from higher wages in industry to higher wages in services is, however, far from being automatic. Producers of industrial goods must be ready to pay more, which is also conditional upon the higher quality of the offered services and not only the competition for existing services. It is not an accident that the quality of the majority of the services, including those simple, provided in wealthy countries and cities, like New York, is higher than in the countries or regions with greater poverty. Finally, a higher degree of industrialisation allows the provision of services of a slightly higher quality and at a substantially higher price.

Secondly, we deal with a reverse phenomenon: an internal growth of efficiency in the services sector, while increasing the capability of employers to pay higher wages, directly affects industry in a manner similar to the intersectoral competition in industry. It leads to the growth of wages wherever work and human capital resources are shared, i.e., where transfers of experts between companies and sectors of economy dictated by the search for better work and pay conditions are possible.

Thirdly, industrial companies may benefit from delegating a part of their activities to external sub-suppliers, thereby increasing their own productivity. It refers to both outsourcing of routine processes that are not directly related to production, such as accounting (Part III), and the use of advanced business services that help with brand development on foreign markets (design, logistic services, marketing etc.)

In Poland, business services develop through the support of development of local industry only to a small extent. Based on social enquiries, it may be stated that it is most likely related to an organic history of Polish industrial companies, which only start the process of transforming from family businesses into corporations governed by different principles. The outsourcing in the conditions of informal structures and limited trust is not a popular solution. However, even though the microeconomic influence of services on the industry is limited, much more often we deal with a macroeconomic influence. It is so because the development of the service sector (among others, financial, logistics, distribution, marketing) supports industrial companies not only directly, but also through industrial commons22 they create. In this respect, one should not underestimate the role of financial and advisory institutions, which integrate knowledge about the development of the industry from the micro- to the macro-level.

The evolution of the Polish labour market under the influence of changes in the structure and organisation of Polish industrial companies will be equally dependent on sector-related trends as on the general economic trends. The fact that in the contemporary economy, the demand for work and level of wages is affected both by industrial and service companies, arises from the possibility of transferring the experience of numerous specialists from one sector to another. Public policy should take into account that specific feature when designing interventions in the area of employment policy — a variable nature of the contemporary economy — both with regards to the industry and services, requires that the employees are, first of all, ready to adapt and learn new things, and then absorb non-transferable knowledge specific to a given company or sector. In the context of findings made in Part I, it means that the regulations limiting access to selected professions by means of weakening the stimulants in the service sector to increase its productivity also reduce the chances for development of the local industry.

22 Standards and procedures verified for a given sector, which lead to the improvement of its effectiveness.
3.2. INDUSTRIAL POLICY VS. LABOUR MARKET POLICY

The question arises whether industrial policy may have any impact on the development of industry and creation of high quality new jobs? As noted by Bukowski, Halesiak and Petru (2014), factors that are decisive for the rate of changes in the productivity process may be present on the level of the whole state, sector, and particular companies. On the state level, where the pursuit of public policy has the largest potential, the major challenge is to shift the resources so as to enable production of more advanced goods and services on a greater scale. Greece and Portugal are the examples of the European countries, which, in spite of still having a certain productivity advantage over Poland, found themselves in a middle income trap, among others, due to the problems with intersectoral reallocation of resources. These countries did not have sufficient skills to attract investors in sectors with the highest productivity growth potential. Rodrik (2009) argues that countries in which the modernisation process is effective, attract investments in new industrial sectors in the first place for the purpose of overcoming informational barriers and coordination problems, which were described in Part I. The most effective solution is to create conditions (also Bukowski, Halesiak and Petru 2014) for both domestic and foreign investors to carry out extensive “experiments” without preference for particular types of activity. It means the reinforcement of active assistance provided in Poland to the investors by public institutions (among others, PAIIZ and local governments), first of all by making an assumption that investments opening new markets and increasing the complexity of domestic industrial production should be a priority. As we show in Part I, this is the complexity of the economy, apart from human resources and institutional framework, is decisive for the convergence as compared to developed countries. Thus, it is necessary to gradually move the load of support for investors – for example by means of Special Economic Zones – from the sectors with low technical advancement towards the mid- and high-tech sectors. Limited public funds and time that public offices spend on supporting investors should be devoted to attracting companies from sectors with a short technological cycle, and/or substantial external results (connections with cooperating partners, creation of industrial commons etc.) and a high potential of productivity growth. Hence, on one hand, it refers, among others, to the pharmaceutical, electronic, machine, motor, aviation, or chemical industry, and on the other hand, to related advanced business processes, including, in particular, advanced B+B services, and research and development.

Moreover, it means the necessity of abandoning the path of direct and indirect (i.e., financial) support for state-owned enterprises, as the state, playing a double role of the regulator and owner, does not make optimal strategic choices. Hard coal mining is an example of an industrial sector dominated by public ownership, which had a negative share in the GDP in the last decade (Bukowski et. al. 2015), but at the same time, it gets preferential treatment in public policy. While focusing on the protection of declining sectors with low productivity, the state wastes rare resources which should be used in a manner that balances the interests of particular sectors with a higher potential of labour productivity growth. Therefore, the privatisation of enterprises owned by the State Treasury should be the major element of public policy supporting the economic growth and industrialisation, so that the role of the state could be limited to a regulatory role. The state could provide assistance related to the restructuring of employment in traditional industrial sectors like mining. Such assistance can have the form of both training programs intended for raising and changing the qualifications of employees being subject to redundancy programs, and support for companies investing in the region during the restructuring period, which are interested in hiring them.

A considerable productivity gap between Poland, Spain and Italy on the sectoral level indicates that this is the place where reserves should be sought. This, in turn, depends on the ability of the market to select the most efficient companies and create conditions conducive to the development of the scale of their activity at the expense of less efficient companies. It requires a competitive economy, and, what follows, good quality market institutions creating favourable conditions for investing and shifting resources from less productive entities and types of activity to the more efficient ones. The findings of Part I indicate that even though Poland has some advantage over the European South, that advantage is not significant, especially in comparison with the large institutional gap between the South and the well-developed North. The weak point is, in particular, the quality of economic regulations and functioning of the public sector: including, especially, the fiscal authorities, courts, and supervisory as well as certifying offices. Since, as we have shown in Part I, the growth of efficiency in the long term is conditional upon the quality of institutions and human resources in the economy and its capability to achieve and maintain high complexity, among others, through a high rate of investment in production capital, these areas should be treated as a priority in the Polish industrial policy.

On the level of companies, it means the creation of capabilities for ongoing modernisation and absorption of new technological solutions and external organisational practices. It will be facilitated by the development of the system of industrial commons, comprising, as one of its key elements, the construction of industrial clusters (favouring the concentration of the industry around large and medium urban areas) and a pool of highly qualified specialists. The public policy should support the process of an ongoing improvement of cognitive abilities of the society – both through public education system and active policies of the labour market targeted to the removal of deficits of competences of the unemployed and the economically inactive population. The development of the innovative potential of Polish companies will, on the other hand, require the raising of the higher education system quality, which should lead to an increase in the scale of financing of education and the reform of the principles governing that system so as to create incentives to improve the quality of scientific research, more extensive education of doctoral students, and a wider scope of cooperation with business partners. Setting operating goals with respect to higher education and science similar to those which facilitated the improvement of Poland’s position in the international educational rankings, and then, development of a specific plan for their execution, can be the first step towards the implementation of such strategy.
The potential to continuously improve productivity is a derivative of the quality of companies operating in the economy. It not only requires the presence of big companies in the sectors with high competitive pressure and a short technological cycle, but also the capabilities of the remaining sectors to compete with them for limited work and capital resources, and, what follows, readiness to implement more effective methods of work organisation, quality control, product management, distribution, and brand. The productivity gap in that area is related to a low level of investments in Poland. Without expenditure on real capital and the readiness of the companies to undertake risk and incur expenditure on their research and development the situation will not change. The state can support it through a preferential tax treatment of the companies investing in machinery and equipment (but not buildings) and R&D (innovation relief).

The labour market policy may support the industrial policy understood in this way mainly through an increase in the mobility of the unemployed and eliminating competence gaps. It requires reinforcement of the culture of close cooperation between Public Employment Services (PES) and the industrial sector so as to ensure that the monitoring of demand for work is conducted on an ongoing basis. One of the disadvantages of decentralisation of the Polish employment services is their concentration on the local labour market. As a result, it is more difficult for the PES operating in less industrialised regions to adapt to the requirements of companies operating on the remaining territory of the country. Better coordination of actions between the minister for labour and the ministers of the remaining economic departments, and also the minister for environment especially in the context of transformation to the coal-neutral economy and changes in the structure of the Polish energy sector. Moreover, it would be justified to reconsider the instruments of the labour market policy, especially in view of supporting professional mobility / internal migrations. Moreover, counterproductive elements of the social security policy also require verification. It refers, in particular, to the sector-related retirement benefits (e.g., retirement pensions for miners, farmers and members of uniformed services). They interfere with the price signals in the economy as a result of subsidising certain sectors at the expense of others without any relation to the degree to which they contribute to the growth of efficiency and the GDP. The experience of Greece (Part I) indicates that distortions in economy caused by the policy of privileges for certain sectors are destructive in the long term for productivity and living standards.
CONCLUSIONS

In 2013, only a dozen or so countries in the world were industrialised to a degree similar to or higher than the United States. The largest global manufacturer of industrial goods – China – has been ranked 50th in this classification. In Central Europe, the Czech Republic and Slovenia should be considered the most industrialised countries, as their industrial production per capita is equal to that of the United Kingdom and Italy. The economies of Slovakia, Poland and Hungary are slightly less advanced in that process, being ranked between Portugal and Spain in terms of industrialisation.

The industrialisation and the level of prosperity are intertwined. For most countries in the world, the way to prosperity runs through industrialisation, and only in exceptional cases its achievement does not require making the industrial production volumes equal to those of industrialised countries. In the last few decades, particularly rapid industrialisation processes took place in Ireland, Singapore and South Korea. From the group of economies with a medium or low level of development, they moved to the group of highly developed countries. From among the OECD countries, Greece and Portugal, which started specialising in services with low productivity too early, may be mentioned as an example for an interrupted industrialisation, which led to the cessation of the GDP convergence.

Deindustrialisation – understood as an absolute decrease of the industrial production per capita is an exceptional phenomenon. After exceeding the average level of wealth, i.e., GDP per inhabitant ca. USD 25,000-30,000 (in prices valid in 2013), a relative deindustrialisation begins, which is manifested by a gradual decline of the share of processing industry in employment and the GDP. The industry remains, however, the central segment of the economy, also in well-developed countries, firstly, as a result of the fact that it is still the main source of innovations and growth of labour productivity on a combined level.

The importance of industrialisation for economic growth was also revealed in Central Europe after the fall of communism and re-introduction of the principles of the market economy and globalisation processes in that region. The added value per inhabitant in the Polish processing sector is today (in fixed prices for the industry) almost five times higher and, in terms of prices for the entire economy almost four times higher than in 1988. A small, even though still very substantial increase, was recorded in the Czech Republic, Slovakia and Hungary, which were more industrialised than Poland already in the period of the centrally planned economy.

The complexity of the Central European economies increased gradually as well. The companies based in the region improved their technological advancement, through gradual building of trade relations with a much more industrialised Western Europe, by means of imitating the production models applied in those, definitely more productive, countries. The example is Poland, in whose case the imitation of production standards of the present major trade partners (Germany, France and the United Kingdom) led to the narrowing of the complexity gap from a dozen or so to several dozen percentage points. Other Central European economies: Hungarian, Czech, and Slovakian, whose complexity is higher today than Poland’s, integrated much quicker with Western Europe.

During the last four decades, in highly industrialised countries, the share of persons employed in the medium and high technology industries grew considerably. This is what distinguishes them from those with a medium income level, where the percentage of the employed in that industry sector did not increase. From the point of view of the employment structure, today, Polish industry starts to resemble the Spanish rather than the Greek economy. The role of the low-technology sectors is falling with a concurrent growth of the significance of medium- and high-technology industries. On the other hand, there are also substantial structural differences between Poland and the European industrial leaders. In Poland, sectors with low technological advancement have a share in employment that is higher by 20 percentage points than in Germany, which partly arises from a high share of the timber and furniture industry in employment. Meanwhile, high technology sectors are insufficiently represented – automotive, machine and pharmaceutical industry.

In spite of the structural similarity, labour productivity in Polish industry is still lower than in Spain, resembling the productivity of the Greek industry. In particular, one should note that in Poland, there are almost no sectors in which the efficiency of an average employee exceeds the amount of EUR 60,000. In Spain, this feature is observed in the case of ca. ⅓ of the industry. It clearly illustrates a higher labour-intensiveness of the Polish industrial production, being certainly a result of the lower level of the use of machinery in production and lower advancement of Polish companies in terms of processes and products. Lower productivity on the sectoral level leads to lower wage level.
The average payroll per sector corresponds to the productivity level per sector. Hence, the concentration of the industrial sectors on an annual level of approximately EUR 22,000 is a determinant of the average annual salary in the Polish industry on the level of ca. EUR 12,000, whereas in Spain, it is EUR 53,000 and EUR 37,000, respectively. However, the difference in the productivity is not as high as the difference in wages, which is indicative of the fact that also a lower level of industrialisation in total and institutional factors mitigate the tendering power of employment.

Factors that are decisive on the productivity dynamics in the industry may be present at the level of the whole state, sector, and particular companies. On the state level, where the pursuit of public policy has the largest potential, the major challenge is to shift the resources towards the production of more advanced goods and services on a greater scale. The elimination of a big productivity gap on the sectoral level depends on the ability of the market to select the most efficient companies, which requires the presence of good quality market institutions creating favourable conditions for investing and shifting resources in the economy. Here, Poland has some advantage over the European South but it is not substantial, especially in comparison with the considerable institutional gap in relation to the well-developed North. The weak point is, in particular, the quality of economic regulations and functioning of the public sector: including, especially, the fiscal authorities, courts, and supervisory, as well as certifying offices.

On the level of companies, it means the creation of capabilities for ongoing modernisation and absorption of new technological solutions and external organisational practices. It will be facilitated by the development of the system of industrial commons, comprising, as one of its key elements, the construction of industrial clusters (favouring the concentration of the industry around large and medium urban areas) and a pool of highly qualified specialists. The public policy should support the process of an ongoing improvement of cognitive skills of the society – both through the public education system and active policies of the labour market targeted at the removal of deficits of competences for the unemployed and the economically inactive population. The development of the innovative potential of Polish companies will, on the other hand, require raising the quality of the higher education system, which should lead to an increase in the scale of financing of education and the reform of the principles governing that system so as to create incentives to improve the quality of scientific research, provide more extensive education to doctoral students, and broaden the scope of cooperation with business partners.

Labour market policy may support the industrial policy mainly through an increase in the mobility of the unemployed and elimination of competence gaps. It requires the reinforcement of the culture of cooperation between Public Employment Services (PES) and the industrial sector so as to ensure that the monitoring of demand for work is conducted on an ongoing basis. Better coordination of actions between the minister competent for the policy of the labour market and the minister competent for industrial policy and development policy, as well as reconsideration of the labour market policy instruments from the point of view of supporting the internal migrations from peripheral regions to central regions would also be helpful. Moreover, counterproductive elements of the social security policy also require verification. It refers, in particular, to the sector-related retirement benefits (e.g., retirement pensions for miners, farmers and members of uniformed services). They interfere with price signals in the economy as a result of subsidising certain sectors at the expense of others without any relation to their share in the growth of work efficiency and the GDP.
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# MODERN BUSINESS SERVICES OF THE GLOBALISATION ERA

Maciej Bitner, Agata Gierczak, Krzysztof Roman

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INTRODUCTION

The purpose of this chapter is to present a multidimensional picture that shows the development of modern services supporting business in Poland, Europe and worldwide. The structure of the sector its significance in the economy and for the labour market of this sector are analysed, identifying the economic conditions and mechanisms fostering the development of the sector’s most productive parts. We conducted Polish market research with reference to processes and trends in global markets, which gave us an opportunity to both, specify the degree of advancement of the Polish sector and predict the future direction of its development.

The most problematic and fundamental issues underlying the analysis of the modern business services is to formulate their definition. Increasingly longer supply chains in the modern economy make it difficult to determine which services can be classified as modern ones and which services cannot. For the purpose of the research, we have adopted the definition of the business services created by Eurostat. We start the analysis with a presentation of long-term trends shaping the market of modern services worldwide and in Poland, followed by an examination of their roles in the economy. In this part, we focus on an analysis of the sources of sector growth and its share in the creation of added value. We show that the level of economic development and the percentage of persons with higher education in the population are among the most important factors driving the development of business services. Concurrently, we analyse the productivity of the sector in comparison to other sectors of the economy, as well as the efficiency of particular segments of the business services in reference to analogous areas in the European Union member states. Furthermore, we review the volume and structure of the exports of business services in Poland, in comparison to the analogous values in the EU member states, which enables the outlining of the scope of specialisation of the European states in this respect. At this stage, we note that there are several important differences between the development of business services in developed and emerging countries, especially in the extent of the role of foreign investments in the process of shaping the sector.

When analysing the influence of the sector on the labour market, we examine not only its level and increment but also the quality of new jobs – for example: the required skills and pay conditions. In this area, we present a forecast of the degree to which the new jobs in the business services may constitute an alternative to the brain drain phenomenon, i.e., a migration of the most educated employees in search of better professional career opportunities. Moreover, we provide a picture of the employment structure at a regional level and examine the factors determining the choice of location made by foreign investors in the given sector and the extent to which such decisions are influenced by certain investment incentives created by the state.

The final part of the chapter is devoted to the perspectives of development of modern business services. The starting point for the creation of possible scenarios of potential development directions is the observation of the emerging global and regional trends. In that section, we examine the influence of foreign investments on the development of the sector, as well as its connections with the modern industry and financial sector. Furthermore, we review the existing tools of public policy in Poland and other countries, as well as the EU-level regulations, in order to be able to identify the most and the least effective means of supporting the development of business services, and on that basis, we formulate our recommendations for the state policy.
Business services – provided on a B2B basis – are often considered one of the modern economy sectors with the best perspectives. In particular, these services are assumed to play a key role in the process of transformation of the modern industry in accordance with the so-called serfisation, i.e., the supplementing by the manufacturing companies of their major activity with a service offer that is complementary to that major activity. In addition, business services constitute a sector with a high internal diversification whose structure depends, among others, on the quality of human capital and the degree of technological advancement of particular countries. This is a direct consequence of the main feature differentiating business services from the services sector as a whole, i.e. the need to satisfy the diverse needs of customers. Such customers are not, however, households but considerably more demanding companies and branches of large business conglomerates. In the reference literature on the subject, business services are associated with broadly-understood business activity (business-related services), production (production-related services), knowledge (knowledge-intensive services), technology (technology-intensive services) and specialised qualifications (qualified services). Therefore, in numerous studies analysing the business services sector, depending on the context, we can come across terms like services for business, business services, knowledge-intensive services or technology-based services. According to the most common definitions created by the OECD and the EU, business services include both relatively simple operational services such as cleaning, property safeguarding, or administration, and the more complex ones, knowledge-based process covering, among others, the IT consulting activity, research and development activity, accounting, marketing and advertising, business consulting, or human resources management (OECD, 2007) (Box I). The extended catalogue also covers architectural services, engineering and logistic services, and even sometimes financial and banking services.

It is the outsourcing and offshoring that dominated the way business services are perceived in Poland and other countries of Central Europe. The huge influx of foreign investments into the region and the creation of foreign business services there at a relatively early stage of development of the whole sector, led to the concept of modern business services being narrowed down, in public perception, to that segment of the market. In reality business services also cover small and medium-sized entities operating in sectors like IT, accounting, advisory services, advertising, architectural or engineering services. It does not mean though that the construction of large centres providing services to corporate clients plays a minor role in the shaping of the service sector in Central European countries. Their important feature is, among others, the raising of qualifications of persons hired in specialised service sectors, and setting new standards, as well as directions for the development of the entire sector.

### Box III.1. Classification of Business Services

Business services constitute a sector with a very high internal diversification, covering both complex services that intensively use knowledge and technology, as well as simple operational services. The systematisation can be done partly on the basis of the European Statistical Classification of Economic Activities (NACE).

1. Management and administration, including
   - advisory services within the scope of operational and strategic management
   - legal advisory services
   - accounting
   - tax and financial consulting
   - mergers and acquisition as well as restructuring consulting
2. Manufacture, including the following services
   - architectural and engineering
   - logistic
   - lease, repair, and maintenance of fixed assets
   - quality control
3. Research and development
4. Human resources management, including
   - training
   - recruitment
   - evaluation
5. Information and communication, including
   - databases and information services
   - development of software
   - computer services
   - IT system designing and implementation
6. Marketing, market research and public relations

Source: Own elaboration based on Wood, 2005

### 1.1. Origins

The origins of business services date back to the first half of the twentieth century when a “service class” started to evolve based on the Ford’s workplace organisation concept in the United States and Western Europe. People found employment in large corporations with a major economic and institutional position. It constituted the “third power” positioned between business owners and blue-collar workers (Urry, 1986, Lash & Urry, 1987). In the nineteen seventies, the declining importance of physical work and concurrently growing diversification of expert knowledge strengthened the economic and social role of those kinds of professions even further. Initially, their only clients were large companies supported by the activity of public academic centres.
As a result, the first business services reflected the needs of the entities that dominated the market. Such a situation continued until the nineteen eighties, when the rate of growth of the sector accelerated considerably in the most developed countries. It resulted from the changes in the market demands in response to intensive transformation of the structure and dynamics of commercial activities, including the growing complexity of transactions and pace of technological changes (application of computers), as well as progress in globalisation. Changes in patterns of consumption increased market segmentation, whereas the growing role of regional economic agreements, including the European Communities, increased the need for consultancy services. The privatisation of many public services was also partly responsible for the development of business services, especially in the United Kingdom (Howells, 1987; Wood, 1991).

In Western Europe, the most rapid development of business services was observed in the 1980s. Initially, they were provided by small, specialized companies to large external customers. As the years went by, companies hiring less than ten persons started to increase their headcount and, like manufacturing companies, issue shares. It happened, for example, in the United Kingdom, where the employment in the IT-based business services between 1981 and 1994 grew by 244%, thus creating 374,000 new jobs. Such growth resulted, initially, from the technological and organisational restructuring of the British manufacturing sector and the work model which dominated in that sector. This last factor required, more and more urgently, the management of the allocation of tasks and the development of expert knowledge in fields like marketing, market research and human resources management. Such new areas of knowledge gradually transformed into separate professions over time (Johnson, 1972; Perkins, 1989). The continuing division of work and its specialisation contributed to the development of a new middle class which started to create the core of the new economy (Urry, 1986; Savage et al., 1988). The increasing specialisation of large companies was the key driver of demand for professional services. Wishing to focus on their main activity, such companies began contracting out tasks they had previously performed internally to external service providers. Moreover, the changing macroeconomic environment in which the companies operated, the growing global competition, and the evolving needs of businesses had a positive impact on the development of business services. Originally (in the 1980s and at the beginning of the 1990s), the market of companies providing business services was dominated by small businesses hiring less than ten persons. However, such companies were growing quickly. Only between 1987-1990, as much as one-third of them increased their employment by 75%. Along with their growing size, British service companies more and more often decided to issue shares.

France is another European economy in which the sector of business services developed relatively early. Already in the 1970s, the French economy recorded a rapid growth of employment in consulting, education, insurance, banking and other so-called services aux entreprises (services for companies). The data provided by ASSEDIC (Association pour l’Emploi dans l’Industrie et le Commerce) indicate that between 1975-91, employment in that sector grew more than two-fold, whereas growth in the IT and organisational consulting sectors was more than ten-fold. The lowest growth was observed in the legal, insurance and financial services. The specific nature of the development of business services in France was based on three determinants: 1) specific business culture that favours the formalisation of planning processes and work organisation, 2) sector restructuring, and 3) innovation policy of the French government. Firstly, the formalisation of management processes, which is typical in the French economy, considerably influenced the dynamic growth of strategic consultancy, often in combination with the development of IT systems. Secondly, restructuring in the manufacturing sector transformed the French economy, leading to the concentration of the most technologically advanced companies in Paris, which increased the economic polarisation of the country. In several other regions of France, a growing specialisation in the field of business services was observed, e.g. in Toulouse, where a spectacular growth in services based on state-of-the-art technologies was driven by the proximity of the Boeing manufacturing plant.

FIGURE III.1. Employment growth in business services in The United Kingdom, 1981-1987

FIGURE III.2. Growth of the number of companies providing business services in The United Kingdom, 1979-1988

Source: Own elaboration based on Wood, 1991
Meanwhile, in Lille, companies started to specialise in IT and banking services. Thirdly, an important role in the growth of business services in France was played by state policy, which also covered that sector of the economy in the mid-1980s. The policy consisted of subsidising enterprises in order to convince them to invest in new technologies. Moreover, policies affecting both demand and supply for business services considerably contributed to the development of these services. Nonetheless, it quickly became evident that it was not enough and that the coordination of demand and supply also constituted a problem. Hence, a network of agencies was established. These agencies were intermediaries between the suppliers and recipients of the services, and focused on improving access to information, technologies and human capital (Wood, 2002). The growth of employment in business services between 1980-1991 reached over 70% also in Germany. Already in 1997, in Western Germany, the share of those hired in business services under total employment reached 8%, i.e., 2.2 billion persons. That tendency was maintained in the 1990s, which contrasted starkly with the stagnation in production and other services. (Czarnitzki & Spielkamp, 2003).

In Central Europe, including Poland, the development of business services, like in other economies of Central and Eastern Europe, was observed in the period when mature western economies started looking for less expensive locations for a part of their supply chain. The investments in that sector took the form of service centres. The first ones emerged in the 1990s, but the actual outburst of their development occurred in the next decade. With time, Western European companies started to outsource the services using Polish companies, which were not linked with the parent company in terms of capital. The new sector in Poland was based on simple services like cleaning and personal and property security services followed later by customer services provided in the form of call centres. Concurrently, an analogous model was adopted within the scope of repeatable corporate activities: financial services, accounting, and supplies, which contributed to the creation of the Business Process Outsourcing (BPO) or Information Technology Outsourcing (ITO) offer. The scope of outsourcing expanded quite quickly and soon covered the handling of logistic processes, database management, as well as more advanced services like risk management, tax services, consulting (prevailing in shared service centres – SSC). Subsequently, highly specialised centres emerged, including Research and Development Centres.

The achievement of an effect of scale through the concentration of activities in one centre was a prerequisite for success in the sphere of modern services in Central Europe. Another factor that attracted investment into the business services sector was the constantly increasing skills of potential employees, leading to increasingly advanced services being offered, e.g., in the IT industry. At present, as announced by the Polish Outsourcing Institute, over 90% of domestic companies outsource a portion of their activities to external providers. Nonetheless, less advanced processes such as training (84.5%) and transportation (68.5%) still account for the majority of outsourced processes. Only approximately one-third of the companies declare that they use IT services, as well as distribution and logistics services. The research results presented by the Institute also indicate that over a half of respondents plan to increase expenditure on outsourcing in coming years. However, it will be difficult to predict the effect it will have on the level of advancement of the outsourced tasks.
1.2. MODERN TRENDS

At present, the gross added value of the business services sector in the European Union reaches EUR 1.5 trillion (Plaisier et al., 2012). In the broad meaning of that concept (which takes into consideration, for example, the services related to the real estate market), the share of that sector in the whole EU economy makes up over 11% now. The business services sector is comparably large in the United Stated (12%), slightly smaller in China (8%), Russia and Brazil (6%), and India (2%) (European Commission, 2012). The sector growth rate is also high. In the European Union, the average annual rate of added value growth in the sector of modern services in the years 1999-2009 amounted to 2.38%, thus considerably exceeding the growth of the entire economy, which did not exceed 1.1% during that period. A similar discrepancy can be observed in case of employment in modern services, which grew, during that period, in the business services sector by 3.54% in comparison with 0.77% in other segments of the economy (EC, 2012).

Outsourcing is still the main driving force of the business services sector growth. The growing competition in the market, forces companies to cut costs and increase efficiency, which naturally leads to procurement of sub-suppliers for activities falling beyond the scope of core competences of the companies. Originally, outsourcing was used with respect to less advanced areas of activities which did not require highly specialised skills. With time, that situation changed – the companies had not only used external providers of complex services requiring high or specialised qualifications but also started to use the services located abroad, most often in places with lower labour costs (offshoring). A phenomenon that developed simultaneously with the growth of outsourcing among the manufacturing companies was the servitisation of industry, which means a progressing shift from the generation of products to the delivery of complex, both manufacturing and service-based, products satisfying the whole range of consumers' needs.

Source: Own elaboration based on Eurostat data
Note: Categories J, M, N according to NACE 2, which are distinguished in the diagram, have been considered business services
Globally, at least one-third of the manufacturing companies offer, in addition to major products, a package of related services including business ones to their customers. Increasing productivity in the sector is also contributing to growth in its significance, making it the most attractive source of employment for those with the relevant skills, as it offers the highest wages (see Table III.7. in section “Payroll conditions in service centres”).

In terms of supply, technological progress is a factor that supports the expansion of business services to the highest degree. Such progress not only changes their nature but also opens the sector to new opportunities and effectiveness enhancing solutions. A technological change causes gradual evolution from labour-intensive services to services that intensively use digital technology. New opportunities are created, in particular, by Big Data, which provide tools allowing precise identification of customers and their needs, as well as customisation of the business offer to their requirements. Service providers to financial institutions and HR companies are major beneficiaries of Big Data analyses. The rapid rate of technological progress means that the skills of employees in that sector need to be systematically enhanced. This applies not only to generations entering the labour market now, but also long-term employees who are forced to keep up with the changes (EC, 2014a).

Offshoring is an important trend among companies in that sector. Service companies operating in developed economies are moving part of their activity to less expensive locations in search of lower labour costs. When choosing the location for investments, they are guided by both supply and demand factors, whose significance changes depending on the given specialisation. The main choice concerns the country where the investment project is to be executed. When looking for locations for increasingly complex services, skills advantages are taken into account in addition to cost advantages. The transfer of more complex processes, such as R&D, abroad, is mainly due to a deficit of highly-qualified domestic scientists and engineers, as well as attempts to keep the entire production chain geographically close to the sales market. Companies compete for talented employees on a global scale. Due to the fact that negative demographic effects and low interest in a scientific and technological career in well-developed economies limit the number of potential employees, supranational companies more and more often move the knowledge-intensive processes to emerging economies like India, China or Central Europe. Nevertheless, the common view that India and China are an eternal source of talented people should be revised as it is increasingly the case that there is a shortage of top-class specialists in these locations. Another barrier in the case of China is having an insufficient knowledge of English (Lewin et al., 2009).
BOX III.2. INDIA AS AN EXAMPLE OF AN ECONOMY SPECIALISING IN IT SERVICES

India is the most representative example of an economy that specialises in one type of knowledge-intensive business service. Kapur and Ramamurti (2001) came to the conclusion that the competitive advantage of India does not have an identical basis as other low-cost emerging markets. Instead of competing in economy sectors that do not require qualifications, including operational services, India holds an important position on the global scale as far as advanced services are concerned, including the creation of software, supporting IT services, engineering and designing products, biotechnology, pharmaceutical industry, media, entertainment and health care.

India enjoys competitive advantage in the IT sector because that segment uses resources available in India, and at the same time, uses the resources that are unavailable in India less intensively. The creation of software is based on advanced skills. From the point of view of the number of scientists, India is ranked second in the world, just behind the United States. An extensive and advanced network of universities and educational institutions delivers high quality human capital required by the IT sector. On the other hand, such work resources are relatively inexpensive even taking into account the dynamic growth of the value of wages (12% per year) (Javalgi, Gross, Benoy and Granot, 2011). Pandey et al. (2004) point to a high level of knowledge of the English language, additionally enhanced by language courses intentionally organised by the employers, which facilitates cooperation with programmers from the USA and Europe. This language-related advantage, as noted by Kapur (2001), gives India a substantial preference over Chinese programmers who are equally inexpensive, numerous and qualified like the Indian ones, but their knowledge of English is less advanced than in the case of the inhabitants of India, which was a British colony in the past. An additional asset of India is the fact that it offers support to companies during night hours on the European and American continent.

Government policies with a positive attitude towards service exports and creation of technological parks had a beneficial influence on the offshoring of IT services. As jointly noted by Kapur and associates (2001) and Javalgi and associates (2011), the improvement of IT infrastructure, i.e., telecommunication networks, as well as aviation services, which are the basis for the relocation of the IT services, was much easier than the improvement of the Indian roads, ports, and railway systems, which were necessary for boosting exports.

Kapur et al. (2001) noticed that other knowledge-intensive services may be based on the current competitive advantages of India. They explain that the competences developed in the IT area may help in the development of other highly developed sectors like: bioinformatics, pharmaceutics, media and entertainment.

FIGURE III.9. Share of countries in the global exports of computer services, 2012 (%)
2. ROLE OF BUSINESS SERVICES IN THE ECONOMY

2.1. BUSINESS SERVICES AS THE SOURCES OF GROWTH

Modern services for business are often considered as a source of competitive advantage and is the foundation of a developed economy. In his ground-breaking study (1990), Porter noted that competitiveness of a country does not have to be the outcome of its entire economy - it is enough for some selected, highly-efficient sectors of that economy, to have a sufficiently high share in production and exports, to be highly competitive. Hence, specialisation in selected business services, especially those with the highest degree of complexity and process advancement can constitute a source of advantage on a global scale. The United Kingdom is an example of such a highly specialised country in which three main categories of business services with the highest added value make up as much as 20% of the GDP, thus creating 18% of jobs. Luxembourg, which additionally specialises in financial and banking services, is another country in Europe with the similar profile (16% of GDP and 31% of jobs, respectively). In comparison, Poland with its ca. 8% share of business services in the GDP holds a relatively low position, close to other countries of Central Europe. It reflects the general rule that a high share of business services, especially within the area of IT and professional, scientific and technical services, is related to the level of economic advancement of a country.

This is because the development of business services is related to the development of the service sector as a whole. In OECD countries (Part II), after GDP per capita has exceeded the threshold of ca. USD 25-30 thousand, the employment starts to fall not only in agriculture but also in industry, resulting in its reallocation to the third sector. It triggers the development of all types of services, including business ones. Thus, the fact that this segment plays a clearly less important economic role in Central European countries (including Poland) than in Western Europe should primarily be ascribed to the generally lower level of productivity of Central European economies, and hence the lower level of progress in constructing a post-industrial economy. In this respect, that region is similar to Southern European countries, not only Portugal and Greece but also to the wealthier countries Italy and Spain. This indicates that the development of business services is also affected, apart from income, by other factors like the labour costs per unit, human capital, high degree of urbanisation, competitiveness of the local industrial sector, as well as institutional factors.

**BOX III.3. FACTORS AFFECTING THE DEVELOPMENT OF THE BUSINESS SERVICES SECTOR**

Factors affecting the inflow of direct foreign investments into the business services sector were discussed many times in reference books. Usually, a general level of economic development, low labour costs, in particular, for labour-intensive services, high level of human capital, expenditure on research and development, as well as various agglomeration factors were mentioned as the major conditions conducive to the location of such services in a given region (Castellani, 2014). For the purpose of analysing the issue, we examined, using an econometric model, the dependence of the share of business services in the economy on the above-mentioned factors. We limited the scope of examination to the European Union countries in the period 1995-2013. We correlated the dependent variable, i.e., the share of the added value of business services in the added value generated in the economy, with a number of independent variables, including: GDP per capita in PPP, the amount of wages, expenditure on R&D, quality of human resources (percentage of workforce with higher education), population density in particular countries, level of urbanisation, economic advancement ratio (measured with the Economic Complexity Index) or the level of foreign direct investments (FDI) – expressed by percentage share in GDP. We present our findings in Table III.1.

Some of the results are intuitive, whereas others provoke second-thoughts. First of all, it turns out that the general level of economic development of a country expressed by GDP per capita is irrelevant from the point of view of development of the business services sector. On the other hand, we observe that the explanatory power is taken over by the degree of economic complexity, measured by the index published by MIT as part of the Observatory of Economic Complexity. In some well-developed countries (with high GDP), however, the business services sector is not advanced. In Europe, there are, however, few such countries. One of the examples is Norway whose wealth is based on raw materials or Germany which specialises in industry. More of these examples can be found outside Europe, namely in the countries of the Persian Gulf, which rely on raw materials, including, in particular, crude oil.

Human resource is the most important factor for the development of business services. The percentage of workforce with higher education is an important statistical variable in the conducted regression. This effect is most probably related to the nature of certain segments of the sector (IT, consulting, R&D), which require a highly specialised education. Nonetheless, even basic professional services require knowledge in the field of accounting, finance or law. The share of expenditure on research and development turns out to be significant, from a statistical point of view, but non-resistant to the changes in the model specification, which should be associated with a high correlation between the expenditure on research and development and the economic complexity, as well as a relatively low share of that category in the entire sector, which is visible especially in the example of international cross-sections.
TABLE III.1. Dependency of the share in GDP of the added value generated in business services on structural features of the economy – results of econometric model

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.62</td>
<td>-0.62</td>
<td>-0.64</td>
<td>-13.42</td>
<td>-8.58</td>
<td>-13.16</td>
<td>-0.22</td>
<td>1.80</td>
</tr>
<tr>
<td>Log (GDP)</td>
<td>-0.27</td>
<td>-0.87</td>
<td>-0.75</td>
<td>-2.42</td>
<td>-5.38</td>
<td>-5.30</td>
<td>-5.68</td>
<td>4.50</td>
</tr>
<tr>
<td>Log (remuneration)</td>
<td>1.79</td>
<td>2.70</td>
<td>2.24</td>
<td>5.38</td>
<td>4.57</td>
<td>5.30</td>
<td>5.68</td>
<td>4.50</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>-1.40</td>
<td>-2.32</td>
<td>-2.86</td>
<td>-2.16</td>
<td>-0.88</td>
<td>-2.15</td>
<td>-3.95</td>
<td>-5.29</td>
</tr>
<tr>
<td>Percentage of people with higher education</td>
<td>6.92</td>
<td>10.77</td>
<td>8.61</td>
<td>14.00</td>
<td>10.28</td>
<td>14.10</td>
<td>5.72</td>
<td>6.96</td>
</tr>
<tr>
<td>Urbanisation</td>
<td>-1.31</td>
<td>-2.69</td>
<td>-2.16</td>
<td>-0.88</td>
<td>-2.15</td>
<td>-3.95</td>
<td>-5.29</td>
<td>-0.10</td>
</tr>
<tr>
<td>Economic Complexity Index</td>
<td>4.81</td>
<td>7.77</td>
<td>8.49</td>
<td>5.35</td>
<td>8.46</td>
<td>6.96</td>
<td>9.42</td>
<td></td>
</tr>
<tr>
<td>FDI</td>
<td>0.20</td>
<td>-0.01</td>
<td>0.72</td>
<td>0.76</td>
<td>0.76</td>
<td>0.76</td>
<td>0.59</td>
<td>0.66</td>
</tr>
<tr>
<td>R-squared adjusted</td>
<td>0.69</td>
<td>0.75</td>
<td>0.7</td>
<td>0.75</td>
<td>0.74</td>
<td>0.74</td>
<td>0.57</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on the data of Eurostat, World Bank, The Observatory of Economic Complexity

The variable that shows wages is also significant regardless of the model specification. The companies intuitively make decisions on transferring business services to other countries owing to differences in labour costs. However, if we take into account the fact that the analysed variable is the added value of business services and not the direct inflow of foreign investments or employment in that sector, we will notice that the level of wages becomes to a certain extent a reflection of the degree of the technological advancement of particular countries.

Another statistically important factor that affects the ubiquity of business services is the population density, which may point to the meaning of agglomeration effects in decisions concerning the location of particular investments. In addition, many countries are too small to be able to specialise in particular areas of industry, which makes them search for a comparative advantage in the sector of services for business. As a result, it is the small, highly-developed countries that are particularly specialised in that sector. Therefore, people who have no chance of finding a new job in non-existent sectors decide on employment in the sector of business services. Meanwhile, the urbanisation ratio is irrelevant from the statistical point of view, which may indicate that such services need only several bigger urban centres in a given country, which does not have to go hand in hand with high urbanisation in general.

Source: Own elaboration
Factors that have an impact on the growth of particular business services sectors may vary considerably. Therefore, we have separately estimated models for the IT sector, R&D, professional services and other business services (Table II.2). We can see that in each case, except for Research and Development, human capital plays a vital role. The irrelevance of that variable in the case of R&D can also be misleading because even though in the case of other services, the number of properly educated employees is an important factor, in the R&D sector, not the quantity but the quality is crucial (which does not always goes hand in hand), and this cannot be judged on the basis of the ratio of the percentage of employees with higher education. The variable of economic advancement is also important in the same configuration of sectors, and, additionally, it is only slightly irrelevant for the R&D sector, which indicates that the economic development has a positive influence on the development of each of those business services sectors. The inputs in Research and Development play a vital role in only two of the most advanced sectors, i.e., IT and R&D. The higher added value in R&D resulting from higher inputs in that sector is evident and does not require an explanation. IT services are tools supporting the development of technology, and, for this reason, the expenditure on R&D also have a positive impact on that sector. The level of wages has a positive return and a statistical significance for the two less advanced areas which may imply that these sectors attract employees with higher wages than in the case of other areas of the economy, having concurrently a positive impact on the value of services generated in these sectors. Only one, the least advanced area of services has a slightly statistically irrelevant variable with respect to population density, which indicates that as a matter of fact, such services are particularly popular in countries with higher population density.

<table>
<thead>
<tr>
<th></th>
<th>IT</th>
<th>R&amp;D</th>
<th>Professional services</th>
<th>Other business services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-4.97</td>
<td>0.10</td>
<td>-18.59</td>
<td>0.37</td>
</tr>
<tr>
<td>Log (remuneration)</td>
<td>-0.55</td>
<td>-1.58</td>
<td>5.90</td>
<td>3.12</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>3.30</td>
<td>3.04</td>
<td>-0.44</td>
<td>-2.24</td>
</tr>
<tr>
<td>Percentage of people with higher education</td>
<td>7.90</td>
<td>0.33</td>
<td>10.93</td>
<td>9.84</td>
</tr>
<tr>
<td>Population density</td>
<td>4.68</td>
<td>1.80</td>
<td>18.08</td>
<td>1.32</td>
</tr>
<tr>
<td>Economic Complexity Index</td>
<td>5.04</td>
<td>1.59</td>
<td>3.37</td>
<td>9.59</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.56</td>
<td>0.17</td>
<td>0.73</td>
<td>0.60</td>
</tr>
<tr>
<td>R-squared adjusted</td>
<td>0.55</td>
<td>0.16</td>
<td>0.71</td>
<td>0.59</td>
</tr>
</tbody>
</table>

Source: Own elaboration on the basis of Eurostat, World Bank, The Observatory of Economic Complexity

It should be noted that the rapid development of the business services sector in Central Europe followed the accession of that region to the European Union. Poland, Czech Republic, Hungary and Slovakia benefitted from the delocation not only of industry but also services provided within the Community as part of “near shoring”. In the case of near-shoring, companies can transfer part of their activity to countries neighbouring the parent company’s country of origin. Although the labour costs in the Central Europe as a whole exceed the costs of labour in analogous services in Southeast Asia, e.g. in India or the Philippines, the geographical, cultural and linguistic proximity, legal community and office infrastructure, which is less expensive and more available than in the Southeast Asia, led many Western European investors to make the decision to locate their activity in Central Europe. After 2004, Central European countries became the target location for investment, in particular, in the area of marketing, accounting, and IT consulting. These, relatively more advanced and requiring knowledge, business processes, are rarely moved to developing countries, which favours emerging economies located in the geographical proximity to the head offices of companies. At the same time, however, the relocation of business services in Europe refers in the first place to big companies. In the case of customers from the small and medium-sized enterprises, the possibility of remote working does not compensate the loss of profits from a direct contact with the local service provider. Even if the distance is not so important from the point of view of IT or consulting, it becomes the key factor on which the choice is based on simple operating processes, intended for the local market.
As a consequence, Poland’s main competitors in the area of business services are not Asian (in particular, Indian) service centres, but other Central European markets, including, primarily Romania, Bulgaria, Croatia, and Serbia, which win the competition with Poland by offering, initially, lower labour costs. As a result of rising wages, Poland, Czech Republic, Hungary and Slovakia must search for competitive advantages by specialising in more advanced and more sophisticated, in terms of education, sector segments.

**Box III.5. Samuelson – Balassa Effect**

The Samuelson – Balassa effect is a hypothesis, according to which the differentiation of prices between countries arises from differences in the labour productivity. The reason for the differences in prices between countries is the fact that the growth of productivity in the sector of non-replaceable goods occurs slower than in the manufacturing sector. A relatively higher growth of efficiency in industry results in higher prices of consumer goods and payroll in that sector. This in turn leads to the growth of the payroll pressure in sectors generating non-trading goods (services) based on the assumption of the mobility of work between particular branches – the employees of the service sector will strive towards employment in the industrial sector, which will limit the supply of their work and cause the rise of wages in those areas in spite of the lack of adequate growth of productivity. It causes inflation in the service sector, and raises general level of prices in the total economy as well as appreciation of the exchange rate. For developing countries in which a higher growth of productivity than in wealthy economies is a characteristic feature, it also means a higher level of inflation than in the developed countries and the appreciation of the nominal currency rate.

**Figure III.12. Proceeds and price convergence in the countries of Central and Eastern Europe, 1995-2014**

Source: Own elaboration based on Eurostat data
PART III. MODERN BUSINESS SERVICES OF THE GLOBALISATION ERA

In Poland, work related to software, advisory, and legal and taxation services creates the highest added value. Advertising and market research services also have a relatively high share of GDP. The next position in the ranking is occupied by more simple operational services, which include human resources management, administrative, and safeguarding services, as well as those related to housing and land development. Research and development activity has the lowest share in the production of the sector, but at the same time, that segment has the highest productivity within the services sector. When compared to the EU, the Polish sector of business services has rather low efficiency, surpassing only a few countries of Central and Eastern Europe. The main reason is probably the so-called Samuelson – Balassa effect, which relates the level of prices in the service sector to the productivity of the industrial sector. The more efficient the industry in a given economy, the higher the prices that can be expected by service companies operating in that economy. It directly affects the added value created in particular segments of the service sector, including, those within the sphere of services for business. The gradual improvement in labour productivity in Central European industry should also lead in time to a growth in the efficiency of services. However, in the case of business services, this can be supported by a change in their internal structure aimed at focusing on more technologically-advanced and knowledge-intensive services: R&D, professional services, and IT.

It is worth emphasising that contrary to the average results of the EU-27, business services in Poland are a little more efficient than services in general. The current level of labour productivity places the sectors above industry and other services. This tendency is opposite to the average in the EU where the average productivity of business services is lower than in general services and lower than in industry, which constitutes the most productive segment of the economy. Such state of affairs may partly be due to the fact that the services in general also include the financial sector which is at the same time excluded from the segment of business services. As a consequence, the sector of financial services, being highly developed in the countries of Western Europe, considerably raises the productivity of the whole sector.

**TABLE III.3. Productivity of business services in Poland when compared to the total economy (economy = 100)**

<table>
<thead>
<tr>
<th>Service Area</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publishing activity related to software</td>
<td>141.8</td>
<td>148.5</td>
<td>148.3</td>
<td>121.4</td>
</tr>
<tr>
<td>Programming and related services</td>
<td>129.4</td>
<td>133.3</td>
<td>120.9</td>
<td>126.2</td>
</tr>
<tr>
<td>Legal services</td>
<td>91.0</td>
<td>105.1</td>
<td>81.0</td>
<td>76.7</td>
</tr>
<tr>
<td>Services related to management in consulting</td>
<td>94.4</td>
<td>110.1</td>
<td>118.5</td>
<td>126.7</td>
</tr>
<tr>
<td>Architectural and engineering services</td>
<td>95.5</td>
<td>93.4</td>
<td>81.0</td>
<td>77.2</td>
</tr>
<tr>
<td>Employment-related services</td>
<td>50.8</td>
<td>52.5</td>
<td>52.6</td>
<td>52.4</td>
</tr>
<tr>
<td>Safeguarding services</td>
<td>44.6</td>
<td>41.9</td>
<td>56.4</td>
<td>62.1</td>
</tr>
<tr>
<td>Industry</td>
<td>106.2</td>
<td>104.0</td>
<td>107.1</td>
<td>107.8</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on Eurostat data
On the other hand, in Central Europe, business services may be more distinct, in terms of exports, from the rest of the services in the West. The exports enable the countries to obtain better prices thanks to attracting customers from more productive, and thus wealthier, economies. Thirdly, business services, just like the services sensu largo are a segment with substantial internal diversification. A major difference in the efficiency is between the services complex business processes and more simple operational services. Among the first ones, specialised publishing services and those related to advertising and market research have the highest efficiency. The high labour productivity is also characteristic for the research and development activity, production of software, and IT consulting. In recent years, a significant drop in efficiency was observed in the case of legal and taxation services in Poland, which can be explained by the dynamic development of that sector in terms of new entities and jobs. Such development resulted, among others, from the liberalisation of access to legal professions. It resulted in a relative reduction of prices and growth of accessibility of legal and taxation services, and the outsourcing in that area has been extended covering not only big companies but also smaller entities leading to the observed drop of efficiency. Again, the least productive market segment were the services within the scope of human resources management, as well as simple services related to housing, including those covering land development and property protection. This model in Poland does not differ to that of other European countries, where that particular market segment is also relatively the least efficient due, among others, to the limited ability to increase productivity by virtue of automation.

The success of business services is an important factor that contributes to the country’s economic growth. The growing share of that sector in the creation of added value of the services in general, observed in the recent years, is the best evidence. It cannot be stated that the economic development of the entire country depends only on supply and the degree of advancement of business services. On the one hand, a positive correlation can be seen between the growth of added value of business services and the general growth of the GDP (Figure III.15). On the other hand, it may be stated that economic growth based mainly on services is not advantageous for a country. European Union countries that relied to the greatest extent on business services for their growth (GDP growth explained by a growth in added value in business services) grew at the slowest pace in the period 2002-2011 (Figure III.15). This observation strongly supports the argument, which has been advocated in the European Union recently, that a strong, growing economy should be based on the developed stable industry. The most developed countries of the European Union, including, in particular, the United Kingdom, Germany and the Netherlands, are an exception to that rule, as they developed at a lower rate in the period 2002-2011, during which their general economic development was not dominated by growth in business services. Such an observation indicates that business services, like other areas of the economy developed in those countries slower than in poorer countries with a similar dependence on the economic development of business services.

The clear relation between the level of development of business services (expressed by the ratio of added value created in the services and the total added value in the economy) and their share in economic development is also worthy of note. That dependence is, however, more subtle than one would expect. The business services sector in the European Union has a greater share in the economic development of the region than it could be estimated on the basis of its natural share in economy. Poland, however, differs from similar countries in that the comparable added value created in services leads to a lower share of business services in overall economic growth.

FIGURE III.15. Relation between the rate of GDP growth and the share of business services in the economy, 2002-2011 (%)
This should be linked to particularly rapid industrialisation (Part II), as productivity and the scale of production in the industrial sector, and, as a consequence, its share in economic development, are definitely higher than in the business services sector in Poland.

In nominal terms, when compared to other European Union countries, the Polish business services sector has still one of the lowest levels of productivity, and surpasses only several countries of Central and Eastern Europe. It happens both in the area of advanced business services, such as activity related to software or Research and Development, and in the area of simple operational services, for example, those related to employment. This is connected with a generally low level of efficiency of the economy as a whole, including industry, whose productivity affects the productivity of the service sector, according to the Samuelson-Balassa theory.
Without doubt, the modern business services with the best outlook include all IT activities. This applies to both programming and consulting within the scope of IT services and other support-related activities. The productivity of that segment was growing systematically, excluding 2009, when, as a result of the global crisis, the Polish zloty weakened, which was reflected by a statistical drop in labour productivity expressed in euro. Likewise, other highly efficient sectors include research and development activities. This segment constitutes the main source of innovation for the economy, however, its nominal share in GDP is low, which is typical not only for Poland but also for the most developed economies of Western Europe.

2.2. EXPORTS OF BUSINESS SERVICES

When observing the share of particular types of business services in trade, it can be concluded that this sector is highly diversified in particular countries. The clearest example of this is India’s specialisation in exporting ICT services, whereas IMF data on trade in services also emphasises the role of Ireland and Israel in this segment. Furthermore, according to this data, USA and Germany have a stable position in the area of research and development services, which create the highest added value.
Krenz (2014) notes that there is a large degree of specialisation in financial services among the most developed countries. In addition to R&D, highly developed countries (among others, USA, Germany and France) also have a comparative advantage in the professional consulting services (including the financial ones) and IT. On the other hand, countries with a relatively lower prosperity level seek advantages in the exports of more simple services. The Polish model of export of services is more and more similar to the profile of the developed countries, however, these changes take place gradually and over a long period of time. A more important challenge for the forthcoming decade would appear to be maintaining sufficient growth in the rate of turnover in all types of business services, i.e. maintaining the high growth rate recorded since 2004.
In such circumstances, structural changes will occur naturally because the increasing labour productivity in the total economy will be followed by growth in wages, entailing an increase in the scale of activity of service providers whilst eliminating those segments of the market that are unable to offer competitive wages. A comparison with Canada, Germany and USA, where the supply of business services per inhabitant and the role of more complex types of such services in exports is higher, shows that in the future, the Polish market will have to seek reserves. It will do so both by increasing the scale of activity and by reallocating resources to market segments with the highest added value.

The analysis of Polish exports leads to the conclusion that, like in the case of commodities, business services are addressed for several major recipients. They include countries of Western Europe and the United States. Within the last three years, Germany has become the leader among the recipients of Polish business services. It surpassed Switzerland, which had been the major trade partner in that sector before, but reported the most substantial fall in relation to its share in turnover. The highest growth of share in the exports of Polish business services has been reported in the case of the United States and the United Kingdom. At the same time, an increased concentration of business services exports to English-speaking countries is not a prevalent trend in all European Union countries. Perhaps, this phenomenon can be explained by high linguistic competences of Polish graduates in comparison with their European peers, as a result of which English-speaking companies locate their services in Poland. The share of other countries also grows, which proves that Polish companies open themselves to the new markets. On the other hand, a tendency to limit the scope of cooperation to several main business partners can be observed in the European Union. When compared to the total exports of services, it is noteworthy that there is an increased concentration of exports to several major trading partners, on the one hand, but a but a lower dependence on the largest of them (Germany). While the first observation is identical in comparison with the cross-section of all European Union countries, the smaller concentration of business services in relation to services in general is a typically Polish feature.
PART III. MODERN BUSINESS SERVICES OF THE GLOBALISATION ERA

3. LABOUR MARKET OF BUSINESS SERVICES

At present (2014), ca. 11% of the whole working population is employed in business services in the European Union, which is an upward trend. Obviously, this percentage varies in particular EU member states. There is a clear division between Western Europe and the new member states, including, in particular, Central Europe. In Western countries, the employment in business services in relation to employment in the total economy is visibly higher than in new member states. This is related directly to the effect of relative deindustrialisation of highly developed economies, which is described in Part II. Such effect is manifested by the positive correlation between the share of the services sector in employment and the value of GDP. Initially, this occurs at the expense of agriculture and subsequently, at the expense of the industrial sector. The rate of growth of employment in the sector of modern services for business is, however, higher in the case of medium-income countries. In the most developed EU economies, the employment in services is relatively high but stable. The growth of employment in business services slows down after reaching the income threshold of ca. USD 30 thousand per capita. The future growth of employment in that sector assessed for the entire EU will be predominantly attributed to the new member states, even though the European Commission (2014) also expects a substantial future growth of employment in that sector in some highly developed countries, including, among others, Finland and Ireland.

The European Commission estimates (EC, 2014) that the growth of employment in the sector of business services in the next decade will reach 13.6% in the European Union, whereas the average growth of employment in the economy will be approximately 3%.

Already in 2025, almost 37 million Europeans will be employed in the business services sector. Demand will grow, in particular, for services requiring medium and high qualifications, which will reinforce the tendency of moving from simpler operational services towards more advanced knowledge-based ones. Currently, 38% of all those employed within the business services sector in Europe, deal with less advanced operational processes, among others, in the area of HR, security services, and industrial cleaning. The share of these types of services will fall, however, to be gradually replaced with professional and technical services, research and development, legal and taxation services, audit, market research, advertising, architectural and engineering services. In some EU countries, the rate of growth of employment will be higher than in others. According to estimates from the European Commission, the highest growth (ca. 20%) will be recorded in the new EU member states, including Romania, Hungary, Croatia and Slovakia, as well as Portugal, Finland and Ireland. What distinguishes the growth of employment in business services in Central and Eastern European countries (e.g., Slovakia or Hungary) from that of the remaining EU countries, is certainly, the continuing growth rate in simpler operational services provided to customers from Western Europe within the framework of outsourcing.

The growth of demand for business services in Europe will be inevitably related to the need to increase and change the nature of employees’ competences. The most sought-after persons will not only include graduates in law, IT, and engineering but also those with analytical skills, showing self-reliance, an innovative approach to problem solving, an ability to quickly absorb new knowledge, as well as skills of critical selection of information and logical thinking.

FIGURE III.27. Share of business services in the total employment in selected European countries, 2012

FIGURE III.28. Share of employment in business services in comparison with the sector in selected EU countries, 2012 (million persons)

Source: Own elaboration based on Eurostat data
Note: Business services according to the definition of Eurostat (NACE: J 58.2, 62, 63.1, M 69, 70.2, 71, 72, 73, N 78, 80, 81, 82)
Factors affecting employment in the sector of business services

The determinants of employment in the business services sector have not been thoroughly analyzed in the economic literature. Among the factors discussed most widely in the literature, which are responsible for the growth of employment, there are relatively low labour costs, but first of all, high qualifications of workforce (KPMG 2009). In Table III.4, shows the result of the econometric model estimation whose purpose is to analyze the relations between the share of employment in the business services sector in the total economy and a number of variables describing its structural and institutional features. Hence, the dependent variable of the model is the ratio of employment in business services to employment in general, whereas the independent variables include GDP per capita in PPP, wages, share of (public and private) expenditures on R&D in GDP, the quality of human capital (percentage of workforce with higher education), population density, level of urbanisation, and the Economic Complexity Index. The model was estimated on the basis of a sample of the European Union countries in the period 1995-2013.

<table>
<thead>
<tr>
<th>Table III.4. Dependency of the share of business services in total employment on structural features of the economy – results of econometric model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
</tr>
<tr>
<td>Log (GDP)</td>
</tr>
<tr>
<td>Log (remuneration)</td>
</tr>
<tr>
<td>R&amp;D</td>
</tr>
<tr>
<td>Percentage of people with higher education</td>
</tr>
<tr>
<td>Population density</td>
</tr>
<tr>
<td>Urbanisation</td>
</tr>
<tr>
<td>Economic Complexity Index</td>
</tr>
<tr>
<td>FDI</td>
</tr>
<tr>
<td>R-squared</td>
</tr>
<tr>
<td>R-squared adjusted</td>
</tr>
</tbody>
</table>

Most results received are intuitive. First of all, we observe a positive, important correlation between the economic development of the country expressed through gross GDP per capita and the economic advancement, on one side, and employment in the sector of business services on the other side. Another coefficient that is essential from the statistical point of view is the amount of the accumulated human capital and expenditure on research and development. The first observation confirms that a large number of people with relevant qualifications for work in the sector of business services positively affects the number of jobs created in that sector. On the other hand, the expenditure on R&D create new jobs for scientists and researchers, thus, directly increasing the percentage of people employed in the sector. Meanwhile, the relation, important from the statistical point of view, between the population density and the employment in business services analysed against the influence of urbanisation, which is statistically irrelevant, shows that smaller countries specialise in business services more often than larger countries with lower population density. The foregoing observations are in line with the findings presented by Markusen and Strand (2007), namely, that the development of international trade in business services favours small countries with qualified workforce.

What draws the attention is the lack of statistical significance of the level of wages, which would imply that the popular view, according to which relatively low labour costs are one of the main attributes attracting investments in the sector of business services, is erroneous. However, it is not an observation taken out of context since several authors have already emphasised that wages were a factor of secondary importance, if not irrelevant at all, for making decisions concerning the reallocation of departments dealing with business processes in large corporations. According to these authors, the following structural factors are much more important: level of human capital, cultural proximity, and political as well as institutional stability (Sass, Fifekova 2011).
Factors affecting the growth of employment in particular areas of business services may differ from each other considerably. Therefore, (Table III.5) we estimate models for IT services, R&D, professional activity, and other business services separately. In each case, except for Research and Development, human resource is an important factor for the scale of employment in a given area. The irrelevance of that variable in the case of R&D services arises most likely from the fact that R&D in certain countries is limited as a result of low expenditure on research rather than the low quality of human resource (the percentage of persons with higher education). It should be noted that the economic complexity (measured by the Economic Complexity Index) substantially and intuitively correlates with employment in particular sectors, in the same configuration as before. This shows that the economic development has significant influence on employment in each of those business services sectors. A negative return of the coefficient of that variable in the sector of professional services may be related to the fact that the strongly industrialised countries in which the service sector is smaller in the broad sense have a higher complexity. In turn, developed countries with the service-based profile of economy (for example, the United Kingdom and Luxembourg) are relatively less industrialised. As in the case of general regression, it appears that the level of wages has no significant influence on employment in the sector of business services as well as on the number of particular areas, which confirms the conclusion shown in Box III.6.

**TABLE III.5. Dependency of the share of respective types of business services in total employment on structural features of the economy – results of econometric model**

<table>
<thead>
<tr>
<th></th>
<th>IT</th>
<th>R&amp;D</th>
<th>Professional services</th>
<th>Other business services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-3.14</td>
<td>1.08</td>
<td>-4.86</td>
<td>-1.94</td>
</tr>
<tr>
<td>Log (GDP)</td>
<td>2.26</td>
<td>-0.95</td>
<td>2.57</td>
<td>1.53</td>
</tr>
<tr>
<td>Log (remuneration)</td>
<td>0.53</td>
<td>-0.16</td>
<td>-0.47</td>
<td>0.83</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>1.41</td>
<td>4.03</td>
<td>3.48</td>
<td>0.70</td>
</tr>
<tr>
<td>Percentage of persons with higher education</td>
<td>10.10</td>
<td>0.82</td>
<td>5.09</td>
<td>7.11</td>
</tr>
<tr>
<td>Population density</td>
<td>2.96</td>
<td>0.77</td>
<td>14.64</td>
<td>3.81</td>
</tr>
<tr>
<td>Economic Complexity Index</td>
<td>7.37</td>
<td>1.41</td>
<td>-1.88</td>
<td>4.40</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.81</td>
<td>0.25</td>
<td>0.74</td>
<td>0.70</td>
</tr>
<tr>
<td>R-squared adjusted</td>
<td>0.78</td>
<td>0.24</td>
<td>0.71</td>
<td>0.67</td>
</tr>
</tbody>
</table>

Statistical significance: 1%, 5%, 10%

Source: Own elaboration based on Eurostat data, World Bank, The Observatory of Economic Complexity

In Poland, due to the significant role played by outsourcing centres, the outsourcing services rendered by medium and large companies (which often have foreign capital), are most often referred to as a modern service. Its characteristic features include the use of advanced technologies and qualified employees, which generates relatively high added value. Nevertheless, employment in that sector goes beyond the segment of service centres, because small and medium-sized enterprises operating in the domestic market are also active in that sector. The same applies to big companies that do not operate as service centres, like for example consulting or architectural companies, or advertising agencies. Therefore, it is necessary to distinguish between the segment of business service centres (SSC, BPO, ITO and R&D (R&D)) and the business service sector in a broad sense, as the latter also covers consulting companies, architectural offices, and advertising agencies.

The level of total employment may be estimated on the basis of employment in particular divisions of services specified in the Polish Classification of Business Activity, which is the equivalent of the European NACE. According to the general European definition of business services (Eurostat), such services include the activity mentioned in specific divisions of the following sections: J – Information and communication, M – Professional, scientific and technical activity, and N – activity within the scope of administration and supporting activity.
Modern business services account for approximately 10% of the whole services sector in Poland. The estimated number of employed people in the sector does not exceed one million. This number covers those employed in the private sector both in large companies hiring over 250 people and the self-employed. The difficulty with estimating the volume of employment in the sector arises from the absence of data which would match the divisions of Polish Classification of Business Activity covering the services defined as businesses. For example, in the first quarter of 2015, 730,200 people were employed in the private sector providing services falling under the categories marked as J, M and N, which make up 13% of the entire employment in the sector of companies. The meaning of business services grows from year to year, since the rate of growth of the number of new jobs has been growing in their case for years. During the period 2004-2012, the employment in business services grew by 54%, whereas in the remaining services, the growth amounted to 22% in the same period.

3.1. MARKET OF SERVICE CENTRES VS. THE ENTIRE SECTOR

Polish outsourcing companies providing modern services still focus on foreign customers who decide to carry out business activity in Poland. They have a competitive advantage over international corporations dealing with business processes thanks to better knowledge of the domestic market and greater flexibility.

However, the key role in the sector of modern services is played by the SSC, BPO, ITO (Box III.8) and R&D centres, to which the definition of the Polish sector is often refined. A definite majority of the newly-established service centres includes branches of global corporations providing services to parent companies or foreign clients. Nine out of ten centres provide services to entities from Western Europe, and 45% to the North American clients.

According to PAiiIZ (2015), in the last ten years, 532 investment projects were executed in Poland, and today approximately 155 thousand people are employed in the newly-established business service centres, with most of them being hired in the shared service centres (39% of the total employment in the sector) and in the BPO centres (28%). The next centres, in terms of the number of created jobs include ITO (22%) and research and development centres (11%) (PAiiIZ, 2015). According to data provided by the Association of Business Service Leaders, 22,000 (net) new jobs were created in the sector in 2014.

The superior processes offered by service centres include: IT services covering the support and management of IT infrastructure, as well as software development, customer service (call centres), human resources management (administration, recruitment), as well as legal and financial services. It is reflected by the structure of employment in the business services sector, where one in three people provides IT services, and 22% provide financial and accounting services, respectively. The latter include accounting activities and employee settlements (payroll). Moreover, shared service centres and BPO centres provide services in the field of supply chain management, procurement, data and document management, as well as marketing and legal services. The most advanced processes offered in Poland include research and development activity, as well as carrying out analyses and creating recommendations on that basis. Simpler services such as customer services, where 15% of all people employed in business services work, also have a substantial share in this type of employment.
Box III.8. Centres of Business Services in Poland

Unlike in the European market, dominated by small companies, in Poland, business services are provided by large corporations operating in the form of the following centres:

**SHARED SERVICES CENTRES**

Units of large companies separated from their basic structures for the purpose of focusing on selected processes and providing services by that particular department to other departments within the framework of the same organisation. Under such structure, the financing and resources needed to perform the services are shared, and the providing department is the internal services provider.

**BPO CENTRES**

Business Process Outsourcing centres are entities providing services to external entities on the basis of contracts for activities and responsibility for business functions, particularly, in such areas as: finance and accounting, customer service, provision of HR and payroll services, as well as administration related to procurement process.

**ITO CENTRES**

Information Technology Outsourcing Centers are entities providing IT services to external customers within the scope of software development infrastructure, system implementation and integration; this category also includes development centres of companies dealing with the creation, implementation and sales of software.

**R&D CENTRES**

Research & Development centres conduct research and development activity. The research operations cover scientific work focusing on the search for new solutions, whereas the development operations refer in the first place to product development, including, for example, development of applications and software as part of the internal departments in companies whose main activity does not cover the sales of software.

Source: Own elaboration

Box III.9. Human Capital in Poland

Poland is the fourth country in the European Union as far as the number of students is concerned. Poles make up 10% of the total number of students in the European Union. In the academic year 2013/2014, 1.55 million students studied at Polish higher education facilities, whereas the number of graduates reached ca. 455 thousand in the same period. In Poland, there are 438 higher education facilities located in 116 cities. The largest academic centres are located in country’s eight main urban agglomerations (Warsaw, Krakow, Wrocław, Poznań, Upper Silesian Agglomeration, Tri-City, Łódź, and Lublin), which are, at the same time, the largest business service centres. From the above Warsaw and Krakow are the largest university centres, surpassing other cities in terms of the number of students. A certain mismatch is visible in the structure of faculties preferred by the students. Service centres mainly search for students from the economics and administration faculty as well as engineering and technical faculties. While the first one of these faculties has the highest number of students in Poland (20% of students), the second is only ranked fourth (9% of students). The centres are also ready to hire graduates of IT, mathematical and linguistic faculties (PAiIiZ, Hays, 2015).

Linguistic competences of Polish graduates are one of the most important and decisive factors for foreign investors regarding the attractiveness of the Polish labour market. It arises directly from the fact that they start learning a foreign language at an early stage of education. Another factor that has an additional positive influence on the growth of linguistic competences of Polish students is the Erasmus exchange programme intended both for students and members of academic staff. In the last two decades, the Erasmus program was a catalyst for change in Poland, not only due to the fact that it raised the level of language skills of students participating in the international exchange programs. It also enforced the necessity of running courses in English at Polish higher education facilities. The exchange program also played a vital role in the promotion of international teaching standards. As a consequence, a definite majority of students in Poland declare knowledge of the English language, which is beneficial for foreign companies that open their service centres in Poland. In addition to English, German and Russian are other most popular languages among Polish students.
A large number of university graduates is undoubtedly a consequence of the tuition-free public education facilities. In addition, certain faculties (called requested faculties) have been established to satisfy the needs of the economy. They include biotechnology, mechatronics, and are subsidised by the state. The graduates of such faculties have constituted valuable resources for the existing and new R&D centres in Poland. Apart from creating technological specialisation, which is already considered advanced, at present, the main challenge Polish universities are facing is the development of analytical skills and intercultural communication capabilities of students (PAiIiZ, 2014).

As stated in the PAiIiZ & Hays Poland report (2015), on average, large service centres in Poland employ 228 people. BPO centres, which employ 328 people on average, are the largest companies in the sector of business services in terms of the number of people employed. However, IT centres with totalling 145 people on average are the smallest. The most frequent location of centres with foreign capital are large cities. With regard to the number of centres, most of them (133) are located in Warsaw. The second location with the largest number of such centres is Katowice together with its agglomeration, where 83 centres are situated. The third is Krakow (78 centres), which is a leader in terms of the number of the people employed. Over 30 thousand people work in the outsourcing centres in Krakow. Warsaw is ranked second in terms of the number of employees. In the capital, approximately 27 thousand people work in the business services sector. Warsaw is followed directly by Wrocław (23 thousand people). With regard to the geographical location, the largest number of SSC centres is located in Krakow (46% of all entities) and Łódź (41%). In the IT services, Warsaw (44%) and Lublin (43%) are the leaders, whereas in the field of research and development services, Rzeszów (27%) and Wrocław (26%) have the largest market share as far as the number of centres is concerned (PAiIiZ, Hays, 2015).

A definite advantage of the newly established service centres is being part of global corporations and performing tasks for the benefit of parent companies or foreign customers. Nevertheless, as stated by ABSL, Polish outsourcing centres also have a significant share in the market. They employ approximately 50,000 employees on aggregate, whereas the analogous centres with foreign capital hire twice as many (ca. 105,000 people). That sector has been undergoing a noticeable trend of consolidation, as a result of which complex services can be provided and one provider can be entrusted with as much as a dozen or so different business processes. As a result, in order to be able to compete with foreign companies, Polish firms must expand their scope of activity and strive to achieve effects of scale. One of the Polish examples is the OEX Group, which has over 50 locations throughout Poland and executes almost 2500 projects every year, hiring 10,000 employees.

Over 90% of people employed in the business service centres have a higher education. Therefore, while searching for the employees with the best qualifications, centres often team up with universities and colleges, for example by subsidising certain faculties or participating in the creation of the educational offer. Thanks to such partnerships, the centres gain the possibility of carrying out recruitment processes at universities, which are the main source of their future staff. The average age of the centre employees is around 30.
The average salary of the lowest level employees of persons providing services to individuals—PLN 3,000 (Sedlak & Sedlak in 2014). Research is carried out in three areas: demand for business services, integrated development of services, and effective service operations. The aim is to make business services a key factor in the development of the Finnish industry (Fimecc, 2012). Finland, owing to the similar share of the industry in GDP is a good model for Poland as it has already become evident that Poland would rather stick to industrialisation than move towards servitisation, which is more characteristic of smaller economies. Nevertheless, in view of the progress in industrialisation, it has potential to specialise in services for the industry, whose participation in the industrial value chain grows faster than in most EU countries. In this context, the aim of public policy is to reinforce cooperation between industry and scientific centres, which can result in technological progress in industry, which, as a consequence, will increase demand for more advanced business services provided to the manufacturing sector.

Some of the centre managers are foreigners. However, at least 70% of the staff are Poles or people permanently residing in Poland. Micek et al. (2011) also note that the competition with local companies for employees is not strong, owing to the differences in preferences as to the requested competences that occur between the BPO/SSC centres and local accounting companies, or even IT companies. Another area that differentiates local companies from BPO centres/SCC is the range of customers. Polish companies also provide their services to domestic customers, whereas BPO centres/SSC mostly deal with foreign customers— as many as 90% of the centres with foreign capital provide services to customers in Western Europe, in comparison with 63% dealing with domestic customers as well. Moreover, 81% of domestic outsourcing companies provide services to both, Polish and foreign customers (Górecki et al., 2014). The domestic market is not the predominant market towards which the centres located in Poland are orientated. However, the fact that most of them also provide services to Polish customers, means that domestic companies also benefit from improved productivity generated by business service centres located in Poland.

3.2. EMPLOYMENT CONDITIONS IN SERVICE CENTRES

Wages in business services are highly diversified, which is an obvious consequence of the general internal diversification of the sector. In 2014, the gross salary of every second person employed in business services exceeded the amount of 4,500, whereas in case of persons providing services to individuals—PLN 3,000 (Sedlak & Sedlak, 2014). The average salary of the lowest level employees providing services to business partners made up 65% of median of wages in the economy, which amounted to PLN 4,150 in 2014. Nevertheless, the medium value of the salaries earned by specialists amounted to PLN 4,200, and managers PLN 7,000 (Table III.6). The average salary earned by persons even with minimum experience who hold positions related to financial analytics in service centres is higher than the national average salary.

Among the people employed in business services, the largest salaries were earned by those involved in technical consulting (PLN 5,782) and market research (PLN 5,645). Voivodships with the highest earnings in services for business included: Mazovia (PLN 5,641), Lower Silesia (PLN 4,667) and Lesser Poland (PLN 4,300). Employees providing services in Warmia-Mazuria voivodship received the lowest salary, which did not exceed PLN 2,800 per person. The average salary in service centres is shown in Table III.7.

Having compared the wages in the business services sector with the average wages of persons with higher education, one can notice a clear difference between them with a preference on the side of the service centres. Moreover, as reported by ABSL (2013), service centres offer stable conditions of employment. Experts from Hays emphasise that companies from that sector usually offer permanent employment at the very beginning of the career path (Błaszczak, 2014).

In addition to attractive pay conditions, service centres often provide their employees with fringe benefits, medical care package, sports club membership, including special cards for entry to various sports facilities. Other benefits of this type include subsidies for language courses, studies, as well as additional insurance (pension, life).

TABLE III.6. Wages in services for business and individuals in 2014, gross in PLN

<table>
<thead>
<tr>
<th>Level</th>
<th>Median of wages in services for business</th>
<th>Median of wages in services for individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>12 600</td>
<td>8 000</td>
</tr>
<tr>
<td>Manager</td>
<td>7 000</td>
<td>4 500</td>
</tr>
<tr>
<td>Specialist</td>
<td>4 200</td>
<td>3 200</td>
</tr>
<tr>
<td>Regular employee</td>
<td>2 683</td>
<td>2 270</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on the Nation-wide Salary Survey Program (OBW) conducted by Sedlak & Sedlak in 2014
### TABLE III.7. Illustrative salary in service centres (gross) in comparison to the average salary of persons with higher education (gross in PLN)

<table>
<thead>
<tr>
<th>Completed master’s degree studies</th>
<th>Salary (gross in PLN)</th>
<th>Positions within the framework of specific business processes provided by service centres</th>
<th>Salary proposed most often (gross in PLN)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economy, finance and management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25% earn less</td>
<td>3403</td>
<td>Accounting (Chief Accountant)</td>
<td></td>
</tr>
<tr>
<td>MEDIAN</td>
<td>5100</td>
<td>Junior Accountant (less than one year of experience)</td>
<td>4000</td>
</tr>
<tr>
<td>25% earn more</td>
<td>8600</td>
<td>Senior Accountant (above three years of experience)</td>
<td>6500</td>
</tr>
<tr>
<td><strong>Law and administration</strong></td>
<td></td>
<td>Process Manager (team of min. 20 persons)</td>
<td>15000</td>
</tr>
<tr>
<td>25% earn less</td>
<td>2800</td>
<td>Audit</td>
<td></td>
</tr>
<tr>
<td>MEDIAN</td>
<td>4083</td>
<td>Junior Associate (less than one year of experience)</td>
<td>3000</td>
</tr>
<tr>
<td>25% earn more</td>
<td>6500</td>
<td>Senior Associate (above three years of experience)</td>
<td>5000</td>
</tr>
<tr>
<td><strong>Information technology</strong></td>
<td></td>
<td>Team Leader (team of 5-10 persons)</td>
<td>8000</td>
</tr>
<tr>
<td>25% earn less</td>
<td>4900</td>
<td>IT support</td>
<td></td>
</tr>
<tr>
<td>MEDIAN</td>
<td>7000</td>
<td>Second level of support</td>
<td>5500</td>
</tr>
<tr>
<td>25% earn more</td>
<td>10475</td>
<td>Team Leader</td>
<td>8500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Process Manager (team of min. 20 persons)</td>
<td>13000</td>
</tr>
</tbody>
</table>

Source: Own elaboration of WISE on the basis of data provided by HAYS, 2015 and Nation-wide Salary Survey Program conducted in 2014 by Sedlak&Sedlak

### BOX III.11. SERVICE CENTRES FROM THE EMPLOYEES’ POINT OF VIEW

Apart from stable and competitive terms of employment, employees of service centres also mention other non-financial advantages of working in business services. The survey conducted in April 2015 among the employees of centres in Krakow indicated that the reasons for taking a job in the centre, which are mentioned most often, include career development opportunities, access to training, the possibility of gaining experience abroad, as well as rapid promotion opportunities. Another important factor is the possibility of using the competences and skills acquired during education. Specialists in the field of customer service mention flexible working hours (chosen by 48% of respondents) and remote working (from home) (44%) as the most attractive non-financial benefits of such employment. At the same time, only a few percent of survey respondents mentioned the feeling of having influence on the operation of the company and satisfaction from work as the factors creating an incentive to work at service centres. Besides, few persons pointed to the possibility of finding an interesting and diversified job. Moreover, the respondents mentioned salary and professional development as the most motivating factors.

Source: Own elaboration based on Hays Poland & Aspire Survey, 2015

Further development of the business services sector, particularly driven by cooperation with financial institutions and modern industry would enable attractive jobs to be created for specialists in finance and IT sectors as well as graduates of technical faculties, who often decide to emigrate, having found better employment conditions in developed Western economies.
The brain drain phenomenon, i.e., a tendency among the best educated residents of developing countries to take jobs in more advanced economies due to better pay conditions was first observed at the beginning of the 1960s with reference to the outflow of specialists from the Third World countries to the wealthy European and US economies. In Poland, the first wave of brain drain took place in the 1980s as a result of the difficult economic situation. The second wave started in 2004, after Poland's accession to the European Union as a consequence of the gradual opening of the job markets by the Western European countries for the new EU members. The research conducted by the Gallup Institute mentions Poland as one of the countries threatened most by the phenomenon of brain drain in comparison to the rest of the world. The Potential Net Brain Gain Index developed by the Institute measures a potential change in the number of people who completed four or more years of a master's degree or at least hold a bachelor's degree. According to research, Poland is included in countries who have the highest negative index which means that it has a particularly high percentage of an educated population when considering emigration (Table III.8).

**TABLE III.8. Countries with potentially highest inflow and outflow of specialists on the basis of the Potential Net Brain Gain Index**

<table>
<thead>
<tr>
<th>Country</th>
<th>Potential Net Brain Gain Index</th>
<th>Country</th>
<th>Potential Net Brain Gain Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>The United Kingdom</td>
<td>21%</td>
<td>Japan</td>
<td>-20%</td>
</tr>
<tr>
<td>Spain</td>
<td>188%</td>
<td>South Korea</td>
<td>-26%</td>
</tr>
<tr>
<td>France</td>
<td>7%</td>
<td>Poland</td>
<td>-12%</td>
</tr>
<tr>
<td>Germany</td>
<td>24%</td>
<td>Ukraine</td>
<td>-27%</td>
</tr>
</tbody>
</table>

Source: Own elaboration on the basis of data provided by the Gallup Institute (research based on 154 countries in the years 2010-2012)

The research conducted by Work Service (2014) indicates that Poles would preferably emigrate to Germany or one of the Scandinavian countries. The next most attractive emigration destinations include The United Kingdom, the United States, or Canada. People who have a higher education are twice as likely to choose Scandinavia than those with elementary education, who most often mentioned Germany or the Netherlands. Graduates of higher education facilities preferred emigration to the United States or Canada (Figure III.33).

In most cases, people planning emigration have economic motivation. Even though wages in Poland grow systematically, they are still much lower than in Western European countries, not only in nominal terms but even after taking into account the parity of purchasing power. It also refers to positions in the sector of business services (Figure III.34), where the wage rates are competitive in comparison to the total economy.

The development of the business services sector is a chance for limiting or stopping the brain drain phenomenon which may, however, occur no earlier than after wages in Poland become comparable to those in the developed economies.

**FIGURE III.33. Emigration destinations preferred by Poles, 2014**

**FIGURE III.34. Wages in the sector of business services in selected EU countries, 2010 (PPP)**

Source: Own elaboration based on Work Service, 2014 and Eurostat data

Source: Own elaboration based on Carrington&Detragiache, 1999

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23 Research measures potential change in the size of population of persons with higher education. The research was conducted in the years 2010-2012 and 520,000 of adults were asked if they would like to emigrate permanently. The results illustrate potential net population change that would occur if the persons declaring the willingness to leave in fact left.
3.3. Employment in Business Services in Regions

The choice of location for a service centre concerns not just a country but a specific region and city. When choosing a country for an investment project related to business services, the decision is based on analogous factors as in the case of industry, namely, traditional advantages such as labour costs and the quality human capital. However, only to a small extent do these factors explain the diversification of investment directions inside a country. In this case, the main factors include the size of the market and potential demand from industrial customers, which has a greater impact on business services than the presence of other services. Another significant element is the type of industry: the most beneficial is a mid- or mid-high technology industry because such companies use outsourcing services most often. Hence, the presence of industrial companies in a given region has an impact on the presence of services for business in that region (Castellani et al. 2013, at the EU region panel).

Research conducted on the basis of a panel of European cities showed that the most decisive factors for the location of the services for business include market maturity, agglomeration effect, transportation accessibility and institutional conditions (political, cultural, accessibility of means of production). In general, both demand- and supply-related factors are important, even though the first ones are of greatest importance (Rubacalba et al. 2009). For example, according to research conducted with respect to French companies, the demand from foreign investments of the industry in a given country increases the chances for the location of French branches of companies offering services for business, whereas the doubling of that demand raises that probability by ca. 20%. This dependence arises from strong links between these sectors and use of services in industry (Nefussi, Schwellnus 2010). However, these results are not confirmed in the case of Italian companies (Armenise et al. 2009).

The presence of large international corporations in a given agglomeration contributes to the development of companies from the sector of knowledge-intensive business services. However such development is based to a greater extent on the expansion of the already existing companies than the establishment of the new ones. This effect has a relatively greater significance in the case of IT services and marketing. The development of R&D centres is to a greater extent affected by the presence of universities, and the companies specialising in economic services (among others, financial, consulting, accounting companies) are set up most often in locations where the sector of knowledge-intensive services has already been developed (Jacobs et al. 2012).

The services for business have a tendency to accumulate in locations where a demand for this type of activity is high, i.e., in large urban agglomerations. Poland is no exception to this rule; voivodships, in which large urban centres have developed, are among the leaders in the classification of the number of companies operating in that sector. Moreover, a definite majority of service companies are registered in capital agglomerations of these voivodships: from 63% (Greater Poland) to 87% of companies (Mazovia). While manufacturing plants from mid-tech or high-tech sectors are located on the outskirts of large cities and in smaller but well-connected centres in South-Western and Central Poland, business service centres and research and development centres tend to be based in the heart of development centres. This is because relatively large, and inexpensive resources of human capital combined with regulatory and institutional stability and the accessibility of relevant office and telecommunications infrastructure (highly-rated by investors) are a source of comparative advantage for the largest Polish cities on the international market. As a result, the economic significance of Warsaw, Krakow, Wrocław and Łódź is undoubtedly more dominant in business sectors than in the industrial sector, which rather chooses smaller centres located in their direct vicinity.

On the regional level, it is difficult to notice clearly defined specialisation of particular centres, even though, as it seems, the first symptoms of that process are already visible. Among the major economic centres, the highest share of companies dealing with R&D is recorded in Lesser Poland and Silesia voivodships. Qualified human resources are one of the prerequisites for the development of the R&D sector in Southern Poland.

DIAGRAM III.1. Factors decisive for the location of investments in the business services area

Source: Own elaboration based on Rubacalba et al., 2009
According to the data of the Central Statistical Office, in 2014, there were 1,468,406 active students and 43,399 post-graduate doctoral students in Poland. As many as 12% of students studied in the Lesser Poland voivodship and 9% at the higher education facilities in the Silesia voivodship (i.e., in total, over one-fifth of students in the whole country), whereas among doctoral students, 16% studied in the Lesser Poland voivodship and 8% in the Silesia voivodship (i.e., in total, almost one-fifth of the doctoral students). On the other hand, the relatively low percentage of companies from the R&D sector based in Warsaw is somewhat surprising. Relatively more companies providing professional services (bookkeeping, accounting, legal and managerial) were registered in the Mazovia and Lower Silesia voivodships, with the Mazovia voivodship being the leader in this area due to Warsaw. The largest number of business entities operating in the sector of IT services are based in Mazovia and Lesser Poland voivodships.

Kujawy-Pomerania, West Pomerania and Warmia-Mazuria voivodships are also distinctive but in a negative sense, as in these locations, IT services with a high added value per employee have a lower share, whereas simple operational services and those related to customer service have a high share.

The general outlook for the modern business services sector in Polish regions is positive. Polish cities will continue to reinforce their position on the global map of business services. [Górecki et al., 2013] Most probably, the market will continue to grow at the pace observed in recent years, and Polish companies will be one of the main beneficiaries of that growth. Moreover, in recent years we have observed a clear tendency of this sector to move the emphasis from less complex traditional customer service processes towards services based on specialised competences. Moreover, an indispensable element of the provision of high quality services is the knowledge of this segment of the economy, for the benefit of which the services are provided. At the same time, the development of particular areas of the economy, which use the services provided by outsourcing centres to the greatest extent, may be the key stimulant that will determine the direction for development of the sector. In Poland, financial services are an example of a segment that is likely to have a positive influence on the development of the sector of modern services.
**4. BUSINESS SERVICES FOR THE FINANCIAL SECTOR**

The financial sector is an increasing beneficiary of the intensive growth of business services worldwide.

Companies from that sector increasingly entrust the handling of processes to external entities. The growth of the number of outsourced processes goes hand in hand with the increase in their complexity. That tendency arises from numerous advantages for financial companies resulting from the outsourcing of tasks that had been performed internally before. First of all, the purpose of outsourcing is to cut costs. Other reasons for which the financial sector uses business services is a better access to technologies and the possibility to focus on their key processes (BIS, 2005). As a consequence, the use of external services becomes a standard for the financial sector.

**BOX III.13. EXAMPLES OF BUSINESS SERVICES PERFORMED AS PART OF SHARED SERVICE CENTRES (SSC) OWNED BY FOREIGN INVESTORS IN THE FINANCIAL SECTOR IN POLAND**

- Financial and bookkeeping services, including invoicing, posting transactions, settlement of fixed assets
- Services within the scope of credit card services and financial operations, including handling of payments and management of receivables
- Transaction services and management of orders
- Services within the scope of investment management, risk analysis, advice on mergers and acquisitions, asset management
- IT services, including the hosting of system resources, services related to database management, IT safety and provision of network links, as well as software development
- Services related to ICT infrastructure
- HR services
- Operational consulting within the scope of post-sale services

Source: Own elaboration based on ABSL, 2013

Even though the significance of business services for the financial sector is growing in all its segments, including banking, capital market and insurance services, models of cooperation differ between various segments. In particular, companies from the investment funds and insurance sectors are more willing than those from the banking sector to entrust tasks included in their strategic activity to external companies.

In Poland, cooperation between financial institutions and external service providers is dominated by a hybrid model of cooperation, under which a company concurrently uses outsourcing and shared service centres (SSC). A commonly observed tendency in that area is the withdrawal from the use of outsourcing and its replacement with shared service centres (SSC). Among the processes entrusted by financial institutions to their separated SSC, there are, both, services related to key financial operations, such as risk analysis, processes related to capital markets, credit card services, as well as support services, such as IT support or those related to human resources management (ABSL, 2013).

**BOX III.14. EXAMPLES OF BUSINESS SERVICES PERFORMED AS PART OF BPO CENTRES WITH FOREIGN CAPITAL IN THE FINANCIAL SECTOR IN POLAND**

- Bookkeeping services
- Credit and payment services, electronic accounts
- Management of risk and regulations in the sector of financial services
- Strategic consulting
- IT projects related to safety, information technology systems necessary for reporting, software development
- Outsourcing of applications
- Mobile solutions for the financial sector
- Procurement of new clients, analysis of presence of target groups in a given area
- Outsourcing of recruitment processes
- Call centre services

Source: Own elaboration based on data provided by ABSL, 2013
So far Poland has stood out in comparison to other countries of Central and Eastern Europe in terms of its exceptionally high share of expenditure on IT services made by companies from the financial sector. Among the services related to key processes of financial institutions, investment fund accounting services are provided more and more often. Taking into account the relatively large size of the Polish banking sector, the market of investment funds in the CEE region and the consolidation trend visible in modern services sector, Poland may become an important target for investment projects of Western European companies from the financial sector. In search of high-level skills, they will willingly locate their shared service centres within the Polish market. Another circumstance pointing to the large potential for development of business services for the financial sector is the dynamic development of the banking sector in Poland, which certainly belongs to one of the most rapidly developing EU markets. One of the reasons for such a situation is undoubtedly the small size of the Polish banking sector in comparison to many developed Western economies. Nevertheless, it is also a sign of its large potential and justifies predictions according to which such high growth will continue in the forthcoming years.

The Association of Business Service Leaders is of the opinion that the development of the sector of business services for the financial sector could accelerate considerably if Poland attracted companies providing services for investment funds. It is estimated that thanks to such services, the sector of public finance could gain over PLN 7 billion by 2017 on aggregate, and Poland would be ranked in the top ten most attractive markets for the financial sector (ABSL, 2013).
5. RELATIONS BETWEEN BUSINESS SERVICES AND INDUSTRY

Services, including those for businesses, play an increasingly important role in developed economies not only due to the growing share in GDP or employment, but also as a result of their growing share in industrial production. Initially, this happens because the services are in most cases an inherent element of the production process and may be provided both internally and in the form of outsourcing. Second, the phenomenon of servitisation of the industry, i.e., change from a model based on the manufacture of products towards delivery of complex solutions, which, in addition to goods also offer complementary services, has become widespread. On the other hand, services depend on production as they use finished industrial goods in the process of performing tasks for customers, e.g., during the sale of certain products within the framework of providing services. Business services which constitute activities based on knowledge and technology may also be an important source of innovation in industry contributing to the growth of sector productivity. The research conducted by Maroto-Sanchez and Cuadrado – Rougera (2008) showed that between 1980-2005, a definite correlation between the growth of services (in terms of share in the total employment) and the general growth of productivity could be observed in 37 OECD countries.

From the point of view of the added value present in particular stages of the value chain, business services can be divided into: i) development-related, which include R&D work and design, ii) related to production in a strict sense, where services related to supply management process engineering and other technical services are used, and iii) related to the introduction of products into trade, where activities like advertising, marketing and market research are applied. In general, in the last two decades, the share of industry in domestic product in developed countries dropped noticeably while the share of business services grew. That trend was also prominent in the European Union, where, the share of industry in GDP fell by 4% in the years 1995-2007 as against an increase in business services. Nevertheless, in various countries, the course of that process was diversified. The highest growth of business services was recorded mainly in smaller, export-orientated countries, whereas larger economies like Germany, France or countries of Central Europe, including Poland, maintained a high share of industry in GDP. In turn, Hungary, Czech Republic and Slovakia, despite having relatively small economies, at the turn of the 1990s and 2000s, recorded a significant growth in industry with a concurrent slight growth of business services. At the same time, one of the highest growths of business services was observed in the United Kingdom. It not only points to considerable internal diversification within the European Union but also indicates that some EU countries specialise in specific segments of the economy (Box III.13).

Specialisation models become particularly important when relations of business services with industry as well as cross-border transfer of services are analysed. A general dependence between the share of added value of business services in the value of industrial production appears to be that the more advanced a given industry measured by the degree of efficiency, the more the demand for business services, consequently their share of production is higher.

At the same time, the use of business services increases productivity thanks to innovations and, as a result, raises the level of advancement of production. Whether industrialised countries should produce advanced services for the industry by themselves or import them from the countries that specialise therein remains an open question (ECSIP, 2014).

**BOX III.15. DIRECTIONS IN SECTORAL SPECIALISATION IN THE EU**

Based on the observation of the trends prevailing in industry and services, three groups of economies can be distinguished:

- **Highly industrialised economies**, in which there is a noticeable industrialisation trend. They include Germany, Austria, Poland, Hungary and the Czech Republic. In other countries, e.g., Finland, Sweden, Italy, Slovenia, or Slovakia, even though industry still has a considerable share of GDP, its significance in the economy is declining.

- **Leaders of business services** – countries with the highest observed growth of business services’ share in previous years – they include Belgium, the Netherlands, Luxembourg, The United Kingdom and Ireland.

- **Economies with low share of both industry and business services**, which include Baltic states, as well as Spain, Portugal, Denmark, Greece, Slovenia, and Finland.

Source: Own elaboration based on the report of ECSIP, 2014

So far, small and medium EU economies have been the main importers of business services. The research conducted by the European Commission (2013) showed that these small and medium countries, which imported business services, had a higher level of productivity in industry than the countries whose economy was based on domestic market. However, it only applied in case of medium- and high-technologically advanced areas of industry. It could result from the fact that, on average, medium- and high-technologically advanced industry has a higher level of internationalisation, which makes international relations an important source of improvement of efficiency. This principle does not apply, however, in the case of large, advanced economies like the United Kingdom, Germany, Italy or Spain, where business services generated domestically have more impact on productivity.

Another, clearly visible trend shows that the higher is the share of industry in GDP, the lower is the share of business services in production. Therefore, the countries specialising in industrial production recorded a lower growth of share of business services in production than the countries where a significant drop of the share of the industrial value chain in GDP was observed.
The change in the share of added value in industry generated by services can be illustrated by the industrial value chain perspective, i.e. taking into account both the share of added value of the services provided both internally by manufacturing companies and outsourced to external companies. The industrial value chain refers to the whole process of creating value in industrial production. Hence, in addition to the physical manufacture of consumer goods it also covers other activities related to the creation of the finished product’s value, such as research and development, management of the supply chain, marketing, sales and post-sale services. These actions apply in the case of most industrial companies, contributing to the coordination of internal and external networks of a company centred towards the creation of value. When comparing changes in time related to the share of industry and share of industrial value chain in GDP in the EU countries, it can be observed that in most cases, such changes occur simultaneously (Figure III.37). The majority of countries are close to the line of 45 degrees, which indicates that the share of the industrial sector in GDP changes according to the share of the industrial value chain, such as in the EU treated as a whole. Nevertheless, in countries such as Sweden, Luxembourg, and Poland, between 1995-2007, the share of industry GDP dropped more considerably than in the case of the value of the industrial value chain. It proves that the share of added value in industry generated by production-related services is growing.

The use of business services in industry is a complex matter which can only be understood taking into account such factors as: the specific features of a given branch of industry, its degree of development, structure, innovation, openness and circumstances prevailing in the country of origin. For example, in medium- and highly-advanced production, which includes the machine and automotive industry, research and development activities and engineering services play a key role among all services, as the product development process is crucial in the development of that segment. The exact opposites are branches of industry with a low degree of advancement, including food, textile and apparel industry, in the case of which the most important role is played by services that can boost effectiveness of the production process and effectively introduce new products into the market. Therefore, in this area of activity, services like production management, as well as market research, marketing, advertising and product placement have the greatest significance.
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**BOX III.16. ROLE OF BUSINESS SERVICES IN DEVELOPMENT OF POLISH AND CZECH AUTOMOTIVE INDUSTRY**

The comparison of the development path of the Polish and Czech automotive industry is a good example illustrating the role of the advanced business services in the development of a highly advanced industry. In both countries, that process looked different, which resulted from differences in the use of research and development activities in both economies. Contrary to Poland, in the Czech Republic, the use of R&D work and modern technologies started relatively early.

**FIGURE III.41. Expenditures on R&D per capita in Poland and in Czech Republic, 2000-2011 (PPS)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Czech Republic</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>2001</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>2002</td>
<td>200</td>
<td>250</td>
</tr>
<tr>
<td>2003</td>
<td>250</td>
<td>300</td>
</tr>
<tr>
<td>2004</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>2005</td>
<td>350</td>
<td>400</td>
</tr>
<tr>
<td>2006</td>
<td>400</td>
<td>450</td>
</tr>
<tr>
<td>2007</td>
<td>450</td>
<td>500</td>
</tr>
<tr>
<td>2008</td>
<td>500</td>
<td>550</td>
</tr>
</tbody>
</table>

**FIGURE III.42. Share of automotive industry in the total added value in Poland and the Czech Republic, 200-2011 (%)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Czech Republic</th>
<th>Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>2001</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>2002</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>2003</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>2004</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>2005</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>2006</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>2007</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>2008</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>2009</td>
<td>65</td>
<td>60</td>
</tr>
<tr>
<td>2010</td>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td>2011</td>
<td>75</td>
<td>70</td>
</tr>
</tbody>
</table>

Source: Own elaboration based on Eurostat data

After 2001, the volume of production in the automotive industry in Poland grew in parallel to the number of people employed in this sector. As a result, the productivity of the sector remained on the same level whereas in the Czech Republic, it reached its peak in the same period. It resulted from the potential of the Czech sector to perform work with high added value, which in turn, was a consequence of the structure of that industry – first of all, the direct merger of the Czech Skoda with the German Volkswagen. Thanks to, this relationship, the Czech Republic could easily join the global value chain and take a high position using closer relations with global leaders within the automotive sector, whereas in that period, the Polish sector remained on the margin of the global value chain, seeking advantages in the production volume. The comparison of these two markets also shows how significant the degree of integration is with the global value chain for the productivity of a sector.

Source: Own elaboration based on Wood, 2005

In the case of Poland, even though there is a noticeable increase in the share of services in industrial production expressed in added value, that phenomenon does not necessarily cover business services. It results from a low level of technological advancement of the Polish industry, which is dominated by food, chemical, oil and metal sectors. The share of business services in industry refers mainly to the processes related to production management, as well as services used for introducing products into the market. A low level of advancement of the Polish industry points, however, to a high development potential for that sector. Hence, potential growth and advancement of production will inevitably suggest there is a growing demand for specific knowledge-intensive services, initially, in the area of research and development, engineering services, and IT.
The increase in competition in global markets, as well as the growing pressure on raising productivity accompanied by an unprecedented rate in technological changes leads to a natural transformation of economic processes and creates a need for a new development policy for the state. The growing significance of scientific and technological competences and the increasing complexity of processes of conducting research and implementing its results justifies predictions that the significance of the most efficient segments of the economy will increase, including both the development of the technologically advanced industry and modern services for business. The role of the modern state policy in this area is to create solutions reinforcing cooperation between these segments and scientific and research centres that constitute the most important source of knowledge and innovations.

In Poland, the Upper Silesian Agglomeration is an example of the area which will be subject to the most substantial transformations in the forthcoming decades, both in terms of changes in the structure of industry, connections between production and the development of modern services, as well as intensification of research and development activities. The technological foresight conducted by the Institute of Mining indicates that the maintenance of regional and global competitiveness for that region will require comprehensive changes, starting from structural transformation, i.e., gradual shift from „old” segments like hard coal mining, coke industry, steel industry, production of machinery and equipment for mining, steelworks and energy industry, to the modern segments related more closely to the global value chains. Such segments include the vibrantly developing automotive industry. The assumption to withdraw from „old” industrial segments and move towards modern technologically advanced ones with a high degree of automatic control results in the growing servitisation of that area. In the recent years, an intensive development of the banking and insurance sector, as well as the development of the real estate market and the transportation and logistics sector was observed in the Special Economic Zone in Katowice. Nevertheless, the maintenance of permanent competitiveness will require inputs in higher education in order to ensure the availability of new executive personnel, invest in new technologies, as well as carry out investments in the urban area to attract talented people. All these elements are consistent with the concept of transformation of the Upper Silesian Agglomeration into the Upper Silesian Metropolitan Area, i.e., a region having the features of a metropolitan area with the development of a modern economy, high level of public services, including medical and educational ones, as well as offering tourist attractions and cultural values. The achievement of such a goal requires investment in technologies and complementary competences. In potential scenarios for development of this region, the experts point to technologies serving the energy industry and environmental protection, which can help modernise the sector of energy production and at the same time make it efficient and environmentally friendly. Another solution is to invest in information and communication technologies that may help to develop the business services sector in Upper Silesia. Another scenario is based on medical engineering technologies and biotechnological solutions having the potential of transforming Upper Silesia into a modern industrial and service centre as far as these sectors are concerned.

Source: Own elaboration based on the project developed by the Central Mining Institute, 2009

**BOX III.17. CONCEPT OF THE UPPER-SILESIAN METROPOLITAN AREA AS AN EXAMPLE OF TECHNOLOGICAL FORESIGHT**

The increase in competition in global markets, as well as the growing pressure on raising productivity accompanied by an unprecedented rate in technological changes leads to a natural transformation of economic processes and creates a need for a new development policy for the state. The growing significance of scientific and technological competences and the increasing complexity of processes of conducting research and implementing its results justifies predictions that the significance of the most efficient segments of the economy will increase, including both the development of the technologically advanced industry and modern services for business. The role of the modern state policy in this area is to create solutions reinforcing cooperation between these segments and scientific and research centres that constitute the most important source of knowledge and innovations.

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Source: Own elaboration based on the project developed by the Central Mining Institute, 2009
6. FOREIGN DIRECT INVESTMENTS

Direct foreign investments in the business services sector have a positive impact on the productivity of companies in the industrial sector, and especially the ones intensively using business services. Initially, they increase the quality and versatility of available services and reduce their cost. Manufacturers benefit from interaction with foreign services providers thanks to the transfer of managerial, organisational, marketing and technical knowledge. Fernandes et al. (2001) notes that direct foreign investments in the services sector are responsible for the 7% growth of productivity observed in the Chilean industrial sector. It is a very high result taking into account the fact that direct foreign investments in industry in The United Kingdom carried out between 1973-1992 triggered only a 5% growth of productivity (Hasekel et al. 2007) in that sector. Hence, the removal of barriers which slow down direct foreign investments in the services sector (still present in many developing countries, including Poland) may lead to an increase in productivity, as they stimulate innovations in the production sector. The research conducted by Mattoo et al. and Eschenbach and Hoekman (2006) indicates that economies of countries with a wider access to the services sector grow faster. It is related to the fact that innovative actions require access to specialised knowledge, which is, in particular, available to the foreign branches of service-providers. Hence, direct foreign investments should be perceived as a vehicle stimulating innovative actions undertaken by business entities in technologically underdeveloped countries. Their innovative potential arises from the fact that the delivered knowledge-intensive services increase the innovation of companies and optimise the use of machinery as well as current production processes. Moreover, the use of new forms of services may enable industrial companies to improve production and operations, which will encourage them to use more technologically advanced processes. Such positive effects of direct foreign investments are based on an assumption that foreign service providers are more productive and offer better services than their domestic competitors.

The influence of direct foreign investments on the productivity of companies is more noticeable in sectors with more diversified products and strong relations with R&D activities. Based on the example of OECD countries, it can be said that the openness of the services sector (in the first place, to direct foreign investment) has increased, in particular, the efficiency of advanced industry (Francois and Woerz, 2008). Castellani (2013) also emphasises that what attracts direct foreign investments in business services is not the industry in general but the presence of industrial plants, which are heavy users of these types of services, mostly from mid- and high-tech sectors. Direct foreign investments create added value for companies from the industrial sector also in the form of transfer of the so-called soft skills, e.g. managerial skills, as well as technical knowledge gained by the employees. The inflow of such type of knowledge to companies may result from a demonstration effect, personal contacts, as well as transfer of management staff and employees between companies.

Fernandes et al. (2001) demonstrated that considerably underdeveloped companies gain more benefits from direct foreign investments in business services. It may be construed in the following manner: less advanced companies have the possibility to chase more developed ones by learning advanced management techniques and work organisation, optimisation of machinery use, and by raising the efficiency of production. This is a particularly important observation from the point of view of politics, as it indicates that liberalisation of the services sector has a more positive influence on business entities with lower level of advancement than the country’s business leaders.

According to Marin et al. (2010), there exist two types of direct foreign investments: those creating competences and those making use of the competences. He noted that the investments in subsidiaries that create competences have a positive impact on the economy, whereas those making use of the competences may in some cases have a negative influence as they do not deliver new technological solutions but still compete with domestic companies for market share. Kugler (2006) claims that positive side effects of direct foreign investments in the form of increased productivity in companies from the business services sector on business cannot be observed or can be observed to a very limited extent. The transfer of positive side effects related to investments is on the other hand observed in companies from outside the sector of investments, which directly cooperate with an established subsidiary.

The statement that positive side-effects of direct foreign investments cannot be observed in companies from the business services sector may be explained by the fact that foreign investors try to stop dissemination of specific technical knowledge among potential competitors at any price. In this way, they try to keep the biggest advantage within the scope of know-how over their rivals. Therefore, when making investments, foreign companies choose markets with a low level of competition, which are least capable of absorbing/copying their technology. A more competitive market structure increases the potential for the transfer of knowledge within a sector in connection with an easier transfer of technology. An additional benefit taken into account at the time of choosing a market is the highest possible development of the market of customers to which they can provide their services. The fact that there is only limited evidence of spreading external effects within the sector indicates that subsidiaries of foreign companies are able to keep their technology just for themselves.
The transfer of positive external effects related to investments is observed in the case of companies from outside the sector of investments which directly cooperate with an established subsidiary. Kugler (2006) points to the significant transfer of technical knowledge between various levels of the value chain: customers and sub-suppliers. It also refers to the services sector where customers are users of the services provided, and the manufacturers of equipment used by service providers are sub-suppliers. The vertical dissemination of know-how is limited mainly to generic diffusions of less developed technology than the advanced technical knowledge specific for the sector. Foreign subsidiaries are located in places which ensure the minimizing of the transfer of specific technical knowledge to competitors, but on the other hand supporting, as strongly as possible, the flow of fundamental knowledge to complementary sectors. Research shows that connections established between the companies deliver incentives for sharing technical information (Rivera-Baitz et al., 1990). At this point, it is worth noting that the inflow of foreign companies providing business services lets other companies from the remaining sectors additionally boost productivity through an increased specialisation.

In addition to the phenomena of vertical knowledge diffusion across the value chain, Kugler (2006) draws attention to the positive effect of the inflow of foreign direct investments in the form of increased competition. In light of the international experience, national, inefficient companies from the sector are weak competitors for prosperous foreign companies, which in turn leads to loss of their market share, and in the end, their liquidation. Therefore, foreign companies often choose sectors in which domestic plants cannot withstand competition even for a short period of time, so that they can strengthen their market position, but eventually contribute to a positive increase in the efficiency of the whole sector.

Todo (2006) pointed to a particularly positive impact of foreign direct investment in the R & D service sector on the overall productivity of domestic companies. He also noted that the dissemination of knowledge among domestic entities does not take place through manufacturing activity but R&D activity. Moreover, more extensive dissemination of knowledge derived from foreign companies is related to their higher technological advancement than in the case of domestic companies.
Nicolini et al. (2010) conducted a research of positive effects of direct foreign investments in Romania, Bulgaria and Poland. While in Romania, and to a lesser extent in Bulgaria, he observed their significant and positive impact, in Poland that effect was no longer of major importance. It is related to the fact that the difference in the technological advancement of Polish and foreign companies was marginal. However, Todo (2006) pointed out that the potential to absorb R&D services grows along with an increase in the technological advancement of domestic companies.

A small opportunity for the transfer of knowledge between firms from the same sector intended for foreign companies to maintain competitive advantage, suggests that know-how of the foreign companies may be used only to a limited extent for developing Polish companies in the business services sector. In Poland, knowledge of foreign companies to a greater extent serves the development of other sectors of the economy. Only the staff of modern foreign companies gain knowledge they can later use to work in other domestic companies from the business services sector (often in a limited way in connection with no-competition clauses and prohibitions to use the created intangible assets) and more often in other economy sectors. In addition, as we mentioned above, Polish companies are at a level of development where the inflow of direct foreign investments to Poland has a minor impact on their technological advancement. On that basis, it may be stated that Polish companies use similar technologies to those used in foreign companies. In a situation where new technologies actually emerge, Poland, by virtue of its technological advancement, is able to quickly absorb them and use them in its creative process. It is worth noting that a large amount of the business services provided in Poland still comprises simple services. In some cases, such services have a negative impact on the economy, as they employ human capital which could be used in other, more innovative sectors of the economy. As a consequence, Poland’s economic potential is only used in part.
The development of the business services sector in Poland is predominantly stimulated by external factors. The inflow of foreign investments in the form of service centres plays a key role in the process of shaping the dynamics of the entire sector. So far, the growth of business services in Poland has depended mainly on activities taken by the global avant-garde in that field, i.e., large corporations originating from the most developed Western economies. In this way, the Polish sector of business services is under strong influence from global trends, which determine its development, even though it occurs with some delay. The most important trends, which will have a considerable impact on the shaping of both global and, as a consequence, Polish business services market, include technological changes (including the increasing automation and robotisation of production and services), demographic processes (primarily including the problem of the ageing of societies) and the growing pressure on natural resources giving rise to a need to rely on resources other than raw materials in order to achieve growth.

The development of the services sector occurred to a large extent in connection with the technological progress allowing the departure from the industrial model of the economy and moving towards services. The automation and robotisation are the basic processes that increased the productivity of the industrial production in the 20th and 21st century.

Automation means the use of machines, control systems, information technologies for the purpose of optimising the productivity in the manufacturing sector. The reason for the quick increase in automation is undoubtedly its potential to increase the quality of production and productivity by replacing human (physical and mental) labour with machines leading to a reduction in costs. An analogous process, whereby human labour is replaced by machines, is robotisation. In this case, however, the work performed by humans is replaced with work performed by robots.

The automation and robotisation are in many aspects beneficial for the economy. The growing automation of work in industry resulting in higher productivity and larger volume of manufactured goods moves the work resources from factories to the services sector.

| Table III.9. Countries with the highest predicted percentage of persons above the 60 years of age in 2050 |
|----------------------------------|------------------|------------------|
| Japan                           | 44%              | Bosnia           | 39%              |
| Korea                           | 41%              | Italy            | 39%              |
| Singapore                       | 40%              | Portugal         | 39%              |
| Germany                         | 40%              | Poland           | 39%              |

Source: Own elaboration on the basis of data provided by UN, 2009 [in:] Struijk, 2009

Concurrently, the majority of Western economies are affected by the problem of an aging society, that is, a growing percentage of persons at age above 60 and, as a consequence, shrinking resources of human labour. In the future, this particular category of the society will constitute the largest demographical group, thereby considerably limiting the available resources of the workforce (Struijk, 2009). Nevertheless, such problems are also predicted in developing countries, like China, which, even though it has has a small percentage of old people, can expect a future deficit of blue collar workers as a result of the “single child” policy, and now intensively invests in machinery than can replace humans at work.

On the other hand, as a result of limiting the demand for human labour, in the short term, automation brings the risk of structural unemployment among employees with low and medium qualifications. In the 20th century, in the United States and Western Europe, the automation of the industrial production led to the shifting of a considerable part of the employed from the industrial sector to the service sector. The research conducted by Machin & Reenen (1998) using data concerning the employment in seven OECD countries: Denmark, France, Germany, Japan, Sweden, the United Kingdom and the United States between 1973-1989, indicates that the widespread automation, which took place in those countries, caused a general growth of competences in the economy. On the other hand, in the United Kingdom and United States, a definite stratification of the society in terms of wages occurred, whereas no such changes were observed in other countries. However, based on an institutional analysis, researchers came to a conclusion that what differentiated these two groups of countries was the capability of the institutions to determine prices, organize vocational training and limit companies’ rights to dismiss low-qualified employees. Substantial limitation of a state’s interference in the British and American economies in the 1980s had, in the opinion of the authors, a crucial impact on the creation of social inequalities in their societies.

Nevertheless, technological progress has accelerated creating an ever growing pressure on the labour market. The introduction of computers and IT systems on a massive scale in the economic processes leads to the decrease in demand for employees with low qualifications (Machin & Reenen, 1998). The digital revolution, even though it offers unprecedented possibilities, at the same time, poses threats for medium- and low-qualified employees, not only in industry, but also in services. Employees performing repeatable routine tasks, like invoicing, simple calculations or document segregation will be the first victims of the automation. Since the beginning of the 1990s, the drop in employment among medium-qualified employees has taken place in all of the developed economies. As indicated by Frey & Osborne (2013), based on the analysis of 702 companies in the United States, 47% work positions in that country are or will be threatened within the next two decades. All these professions have three common characteristic elements: 1) they do not cover tasks requiring creativity, 2) they do not refer to tasks requiring social intelligence and do not cover social interactions, 3) they do not cover tasks requiring perception and manipulation (e.g. operation with the use of non-regular items, in which case human work has still an advantage over machines). The demand for white-collar workers will, however, grow in the most technologically advanced areas of the economy, including, in addition to the modern industry, the sector of advanced knowledge-intensive services for business.
For the business services sector in Poland, this will mean a reduction of employment in repetitive business processes (e.g., invoicing) and replacement with the most knowledge-intensive jobs (e.g., R&D). The development of the latter directly affects the growth of innovation and contributes, the greatest, to the creation of a knowledge-based economy. According to this concept, the economic development is based on an intensive use of knowledge being at the same time a product and a primary source of innovation. The key role in the economic model is played by scientists and specialists, as well as new technologies. A technological change, possible thanks to substantial expenditure on research and development enables very efficient use of resources with a concurrent generation of a smaller volume of pollutants. The role of the regulators is to implement market instruments encouraging the introduction of resources being efficient in terms of innovations. As Smulders notes (2005), the introduction of new resource-efficient solutions will not result in the reduction of the level of environmental pollution. The fact that the wealthiest economies emit less and less harmful substances per unit of production arises from the implementation of rigorous environmental policies. Only a purposeful selection of relevant low-emission technologies may contribute to the reduction of emission of harmful substances. However, it will not happen in passing, as a side effect of the technological change and the economic growth.

Aware of such fact, decision-makers in the most developed economies are introducing increasingly rigorous solutions within the framework of sustainable development, which are changing the business environment, regardless of the sector in which the companies operate. According to the definition of the Brundtland Commission, sustainable development can be understood as the one that meets current needs and at the same time does not pose a threat to the needs of future generations (DeSimone & Popoff, 2000). It means that the economic development may not be accompanied by the use of non-renewable resources or destruction of ecosystems. Therefore, since the 1970s, the largest global corporations, such as 3M or Dow have started to introduce the concept of "eco-efficiency" into their strategies (DeSimone & Popoff, 2000). It consisted in the incorporation of environment-friendly solutions into the process of production of goods and services through a limited use of energy and raw materials per unit of the manufactured goods, as well as reduction of the volume of wastes and emitted harmful substances. A more effective use of contributions in the production process increases, however, final profits which will grow along with the introduction of more and more restrictive instruments by the state, increasing the price of resources and the cost of emission of pollutants. According to the eco-efficiency concept, the additional added value is created thanks to a better adjustment of products to the needs of the customers with a concurrent limitation of its impact on the environment. Not only financial factors (like the high costs of emission of greenhouse gases resulting from a specific governmental policy) but also the question of image, force companies to introduce the eco-efficiency strategy. Increasingly often, a company's approach to environmental issues determines its reputation among its clients, employees and shareholders. A negative reputation in this area can be detrimental to recruitment processes, weaken the sales, or even lead to a ban on the conducted activity. As indicated by Desimone & Popoff (2000), the introduction of the eco-efficiency strategy requires in-depth changes both in the theoretical and practical operation of specific business processes, including, for example, procurement, production, product development, and marketing. Moreover, the eco-efficiency is based on an assumption of increase in the quality of management, higher quality of relations with customers or sub-suppliers. An innovation policy aimed at increasing resource efficiency, exerting pressure on companies to implement an eco-efficiency strategy, boosts demand for business services, including the most advanced services, such as research and development activity, and others, like marketing, market research and customer service. From the point of view of the business services sector, it means a need to adjust the offer to a new business model. For example, R&D companies, when working on new innovations targeted at the increase in productivity, must take into account potential consequences of their solutions for the environment and not only focus on raising the efficiency of work but also increase the efficiency of the resources.

7.1. DEVELOPMENT PERSPECTIVES OF THE BUSINESS SERVICES SECTOR IN POLAND

Today, shared service centres (SSC) are the dominant model of companies providing business services. In the future, however, more and more companies will migrate towards the use of specialised outsourcing service providers. The future outlook shows that instead of internal SSC, the so-called outsourcing hubs will be in a growing demand. These will most probably be external entities employing more people and offering services for a large number of companies. While utilising the effects of the economies of scale, they will be able to offer services on a much more advanced level than ordinary, traditional centres. There have been cases when the company, after a few years of experience with its own service centre, decided to, either, fully outsource or went in the opposite direction and developed its own SSC centre, but in the hybrid model, thus enabling the provision of services for external clients. There are also reverse processes. An example is public administration, which usually creates its own service centres in order to increase savings (potentially from 20 to 50%).

From the global point of view, Poland is considered a developed market for business services. It is ranked third in the world as regards to the number of employees working in large non-IT centres of business services (SSC, BPO, R&D). Moreover, it is ranked in the top ten countries hiring employees from the IT area (PAIIIZ, 2015). A totally different situation is observed in the case of employment in business services in small and medium-sized Polish companies, where relative employment is much lower when compared to foreign partners. Small and medium-sized companies were victims of a massive inflow of very competitive large service centres at the beginning of the 21st century. Small and medium-sized Polish companies from the business services sector were at an early stage of development at that time thus being unable to compete with the largest foreign players. As a result, they were forced to use market niches in areas where foreign competitors did not provide their services, i.e., mainly small domestic business entities.
Therefore, as noted by Miec and associates (2011), the competition between BPO centres/SSC and local business entities for employees is limited due to slightly different skills they require in comparison to local accounting firms or even IT companies.

In the process of developing their services, Polish centres move towards more advanced processes, climbing up the ladder of competences and adding knowledge-based processes. According to the PAIIIZ Report (2015), recently 89% of service centres have increased the degree of advancement of the conducted processes. On the Polish market, in addition to SSC and BPO centres, we observe a growing role of ITO and R&D centres. Moreover, there is a tendency of locating such services in Europe, especially where services are provided to customers and European projects.

When forecasting the direction of development of the business services sector in Poland, it should be borne in mind that the development of other sectors will determine the trajectory of changes in that segment, due to their complementary nature in relation to other segments of the economy. In view of the steadily growing labour costs in Poland, it is clear that the only possible direction is to increase the most advanced services using the highest competences.

One of the paths business services can take in Poland is the specialisation in services for the industry. Poland is one of the big countries that are moving towards industrialisation in contrast to smaller more open economies specialising rather in services. Undoubtedly, the demand for business services, such as complex engineering or IT services will therefore grow along with the degree of technological advancement, which, however, can only be achieved through increased expenditures on research and development. To achieve such feedback, it is necessary to make initial investments in R&D, which could be financed, e.g., through public subsidies. The development of modern industry in Poland is therefore certainly an opportunity for the sector of business services for industry, which having been developed by the domestic industry, can also be exported to other countries.

Another possible direction for development of the business services sector is the specialisation in services for financial institutions. Grounds on the basis of which growth in demand for business services for the financial sector can be predicted undoubtedly include the noticeable development of banking, capital markets and insurance companies. The Polish market of business services for the financial sector is ready for further development also on the supply side, as it has numerous and high-quality economic and financial specialists. Studies in economics and finance are chosen most often at higher education facilities in Poland.

For several years we have observed a trend in growth of the scope and value of services for the financial sector. It is dominated by the provision of services for financial institutions from the level of BPO and ITO centres. In 2012, Poland was the main provider of IT services in the region of Central and Eastern Europe. At the same, the segment of BPO services for the financial sector undergoes intensive development. As indicated by ABSL (2013), the combination of these two forms and creation of an integrated model capable of providing comprehensive financial and IT services for banking, capital markets and the insurance sector is a is a likely future trend. Towards the end of 2013, this type of outsourcing was used by at least one-third of companies from the financial sector. Concurrently, more and more financial companies decide to use the hybrid model that combines outsourcing with an intensive creation of shared service centres, which systematically replace services provided internally. Górecki and associates (2014) indicate that key factors for investors who intend to locate their services in Poland still include costs and availability of the “relevant” pool of talented people. Miec and associates (2011) note that at the beginning of their activity in Poland, newly established centres were short of Polish managers with knowledge of the sector, but such specialists have already been educated. In its report, KPMG (2009) also notes that the large amount of talented people is the main competitive advantage of Poland. Another highly important fact is that the majority of graduates of higher education facilities speak English or other foreign languages. The high quality of available resources arises from the high level of the education system in Poland (Box III.7). In addition, Poland offers several cities with strong academic centres where there is a limited competition for the best resources. The authors have observed that such a workforce is relatively inexpensive in comparison with Western European countries. Marciniai (2013) also points to cultural homogeneity with main recipients of business services abroad.

Apart from offering high-quality human capital, Poland attracts investors with relatively low labour costs, comparable to the level of wages in Southeast Asia. Poland’s cost advantage in the modern services sector is even greater than that of the industry, as the share of labour costs in total manufacturing cost of the product is higher than in the industry. This is an opportunity to attract foreign investment, but not necessarily permanently. Modern service centres are much more mobile than the production units, which means that some services, especially operational ones, which do not require specialised training, may be easily removed from Poland and transferred to a cheaper location. The largest emerging competitors to the Polish market are not so much the states of Southeast Asia, but the new member states of the European Union, namely Bulgaria, Romania and Croatia. The Polish market loses in competition with these locations in terms of labour costs, which are much lower in those countries. Losing its cost advantage, Poland should therefore pay particular attention to gaining competence advantage, which can only be achieved through investment in education.

Apart from a favourable relationship between the quality of competences and labour costs, Poland attracts foreign investments with high quality of transportation and office infrastructure, as well as the policy of investment incentives. Among the tools that support investments in the sector of modern services, both tax relief offered within the framework of the Special Economic Zones (SEZ) and public subsidies in the form of EU funds or Polish government grants can be mentioned. However, to date, less than every fifth service centre has declared the use of government grants, and only 12% use tax incentives under the SEZ. Some of the service centres also received grants from the EU, including 17% of companies which received funds for training, and 12% received funds through programs aimed at increasing employment.
BOX III.18. LABOUR COSTS IN POLAND

Poland is still an attractive place to invest in terms of labour costs for companies wishing to offer business services to foreign clients. Average earnings remain (in foreign currency terms) over three times lower than in Western European countries (Figure 1). Earnings statistics for IT department employees, who constitute one of the key groups of employees in the sector of advanced business services, look very similar. In Poland, a Software Engineer earns a little over EUR 20 thousand per year. It puts us almost at the end of the classification of earnings in the European Union (Sedlak & Sedlak). In Poland, an IT specialist’s salary is more than twice lower than in Ireland (Figure 2). Wage rates offered to specialists in our country have been a little higher in comparison with other European countries such as Greece, Italy, Portugal and Hungary. Given the high qualifications of Polish staff, we look fairly attractive from the perspective of potential investors that consider moving some of their operations to cheaper locations.

However, when compared to the situation prevailing a few years ago, we start to observe the growth of competition among employees in some specialisations, which in turn leads to a gradual increase in wages and frequent horizontal displacements between companies in the business services sector. For obvious reasons, this creates pressure on the budgets of service centres. However, financial factors are not the only ones that are decisive for the transfer of services and operations to a specific location. Equally important are the high competences and the quality of delivered processes, which position Poland quite favourably in relation to other countries of Central and Eastern Europe.

FIGURE III.43. Annual gross salary of software engineers in Poland in comparison to European countries (Poland =100%)

FIGURE III.44. Labour costs per unit in OECD countries, 2012

Source: Own elaboration based on Eurostat data

Source: Own elaboration
**Box III.19. Investment Incentives**

**Non-refundable subsidies co-financed from the EU funds**

As part of the Operational Program Innovative Economy financed with EU funds within the framework of the financial outlook for 2008-2013, the Minister of Economy carried out Measure 4.5 entitled „Support for investments of high importance to the economy”, whose aim was to improve the competitiveness of the economy through an increase in the number of investments with high innovative potential in the production and modern services sector. Companies from the latter could count on subsidising their qualified expenditure of an amount up to 30% in the case of Shared Service Centres and ITO and from 30% to 70% in the case of R&D projects.

The Minister of Economy signed agreements on grants with 147 companies, including 121 from the sector of modern services for business, as a result of which 12.7 thousand jobs were created in that sector (PAIiIZ, 2014). The situation changed in the current financial outlook for 2014-2020, in which Measure 4.5. (except for the support for R&D) was excluded in whole. The area of Research and Development is the only one in which large companies (including the modern business services sector) can count on public funding.

**Special Economic Zones**

Special Economic Zones (SEZ) are designated areas on the Polish territory, in which investors are exempt from corporate income tax. The primary objective of the establishment of SEZ was to create jobs in regions with high levels of structural unemployment.

Not all areas of activity are nonetheless subject to tax exemptions as part of the SEZ. Tax exemptions do not apply, for example, to activities that require a licence or financial services. The tax exemption limit is calculated on the basis of capital expenditure or 2-year labour costs, and the limit amount varies by region (up to 15% in Warsaw, 25-35% in most regions, and 50% in Eastern Poland).

During the first years of operation of the Zones, only the companies conducting manufacturing activities could enjoy that privilege. In 2005, the list of beneficiaries was extended by adding companies carrying out investments in the modern business services sector. During the first nine years since the opening of SEZ for service companies, 46 such projects were located there with a total declared employment of 7.8 thousand people. Nevertheless, only 7 out of 14 Special Economic Zones can boast of investments in the business services sector (PAIiIZ, 2014). A rather average popularity of this type of support resulted from the fact that in most cases, these centres were cost-based and aimed towards the maximum reduction of costs instead of the generation of the highest possible profits, and thus, boosts in the form of exemptions from income tax is irrelevant from their point of view.

**Diagram III.3. Special Economic Zones**

Source: www.poiz.gov.pl
CONT. BOX III.19. INVESTMENT INCENTIVES

Governmental grants

The system of support for investments of high importance to the economy carried out by the Polish government offers grants for investments and/or creation of new jobs. The main condition for obtaining grants for modern business services is the creation of min. 250 new jobs, and capital expenditure totalling PLN 2 million. For the Research and Development Centre the condition for obtaining the grant is to create at least 35 new jobs for employees with higher education and at least PLN 3 million capital expenditure. The financial support per work position ranges from PLN 3200 to PLN 15 600 and depends on several factors. It cannot be combined with any other forms of support, including, in particular, support from EU funds and exemptions available in the area of the SEZ. While the companies from the sector of modern business services can only apply for a grant related to the creation of new jobs, the investors who plan research and development activity may also apply for an investment grant.

54 (57%) out of 94 effectively executed support programs concerned investments in the sector of services for business and R&D centres. Their total value exceeded PLN 460 million (which only makes up 2% of all capital expenditure of companies benefitting from governmental support), whereas the declared employment was 23,500 persons (43% of all jobs created under the program) (PAiIiIZ, 2014).

TABLE III.10. Criteria qualifying for the application for governmental grants

<table>
<thead>
<tr>
<th>Sector</th>
<th>Conditions of providing the Grant</th>
<th>Maximum level of support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Employment</td>
<td>Investment expenditures</td>
</tr>
<tr>
<td>Grant for employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sector of modern business services</td>
<td>250</td>
<td>1.5 million PLN*</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>35</td>
<td>1 million PLN*</td>
</tr>
<tr>
<td>Investment grants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>35</td>
<td>10 million PLN*</td>
</tr>
</tbody>
</table>

*Excluding costs of office space rent
**Plus 20% for location in Eastern Poland
Source: Own elaboration based on the Program for supporting investments of major importance to the Polish economy for the years 2011-2015

7.2. DEVELOPMENT OF R&D AS A PRIORITY IN THE EU AND POLISH ECONOMY

The Polish policy of investment incentives gives special preferences to the sector of modern business services as one of the priority sectors. In addition to traditional investment support instruments, recently, the role of instruments intended for subsidising the research and development activity has been growing (R&D). The financial support provided for R&D activities has an increasing importance in Poland's economic policy and a growing share in investment incentives, both domestic and those financed as part of the current financial outlook with EU funds. R&D activity may cover various processes, however, the achievement of an innovation effect is the key element, as it enables considerable improvement of services. Besides, the following factors may be decisive for classifying a given activity as the research and development activity: the involvement of personnel with a PhD degree or higher, cooperation with higher education facilities in the field of science, or reaching a specific level of eligible costs.

BOX III.20. R&D TAX RELIEF SYSTEM IN SELECTED EU COUNTRIES

The fiscal policy of the countries with the highest share of business services in GDP covers a wide variety of tools. For example, Belgium, being one of the business services leaders in Europe, offers instruments like tax relief for R&D-related expenditure, up to 80% deduction from the tax base in the case of income from patents, as well as partial tax relief applicable to salaries of research staff. Another example of the fiscal policy, this time supporting in particular, the development of R&D in small and medium-sized companies, is France. Since 2013 companies hiring less than 250 persons and having a level of sales below EUR 50 million have had the possibility to use a 20% tax relief for R&D activities. In the countries of Western Europe (e.g. in France) a popular solution is the so-called patent box that allows reduction of the tax rate in case of proceeds gained on the basis of patents. Another tool is the privileged system of taxation for small and medium-sized companies which helps them to grow and consolidate.

Source: Own elaboration
Priority directions for activities undertaken on an EU level are set out in „Europe 2020 Strategy”, whose objectives include the promotion of intelligent development, i.e., economy based on knowledge and innovations. The 2020 Strategy introduces a new instrument of its implementation in the form of lead projects called the flagship initiatives. One of them - “Innovation Union” is fully dedicated to the policy of innovations. According to its assumptions, member countries will have to, among others, carry out a reform of the national (and regional) systems of conducting the R&D activity for the purpose of developing excellence and intelligent specialisation in order to tighten cooperation between higher education facilities and the scientific community and business. In addition, they should respectively adjust domestic financing procedures so as to ensure the dissemination of technologies across the European Union.

Assumptions contained in EU documents are reflected in the national strategic documents. In the case of Poland, it is the Country Development Strategy 2020, which states that the tightening of cooperation between the science sector and business entities, as well as better use of scientific achievements in business is a particularly important point in the process of construction of the knowledge-based economy. Detailed provisions regarding priority directions for activities in the area of R&D are set forth in the document Strategy of Innovation and Effectiveness of Economy „Dynamic Poland 2020”, which provides a more in-depth insight into the medium-term Strategy for Development of the Country 2020. The main objectives of the document include: the increase in expenditure on R&D (the target level of expenditure on R&D should make up 1.7% GDP in 2020), including in the first place the stimulation of the private sector to invest in R&D, the support of the transfer of knowledge among the research centres and economy. An executive program that accompanies the Strategy of Innovation and Effectiveness of Economy is entitled the Program of Development of Companies by 2020, along with an attachment „National Intelligent Specialisation” (KIS). The KIS concept is based on a targeted support for R&D in the areas of intelligent specialisation of countries and regions i.e., areas with the highest development potential in a given country/region, which may potentially constitute its greatest competitive advantage.

FIGURE III.45. Strategic goals for Poland by 2020 within the scope of expenditures on R&D activities

The support for R&D in the financial outlook 2014-2020 is ten times higher than in the one created for the years 2008-2013. The purpose of the funds intended for innovative activity is to increase cooperation between research centres and companies. Joint projects undertaken by research centres and companies are rewarded with a special bonus at the time of distributing the grants. It creates an exceptional opportunity for Poland, where the expenditures on R&D totalling 0.87% (2013) are among the lowest in the EU. An increase in expenditure on research and development is especially important if we take into account the structure of financing of that sector – the majority of projects in that area are financed with public funds. The introduction of tax reliefs, similar to those already existing in Western European economies, is a necessary tool. However, the existing policy of subsidies slowly brings positive results. We can observe an increase in the share of expenditure made by companies on R&D in comparison with previous years. In 2013, 44% of all costs related to research and development activity were borne by business entities in comparison with 37% in 2012 and 30% in 2011. Nevertheless, in relative terms, the existing tools are not sufficient. In the innovation rankings, Poland is still classified as a „moderate innovator” [Innovation Union, 2014]. The Regional Innovation Index shows that Polish regions belong to the „modest” or - in the case of distinctive voivodships – „moderate” innovators. This group includes the following voivodships: Lower Silesia, Mazovia, Lesser Poland, Silesia and, recently promoted, Subcarpathia.
Poland has the potential to be the driving force of innovations in Central Europe. Acceleration of this process could be facilitated by the government through undertaking an active policy of supporting R&D activity, first of all through the implementation of a mixed system, i.e., the supplementing of available subsidies with a tax exemption for research and development. This system is applied with success in many countries of Central Europe, which, in spite of access to EU funds, have implemented solutions that enable business entities to plan the R&D activity without making it dependent on the dates of competition and administrative decisions concerning the awarding of grants. In the opinion of almost half of the respondents in a Deloitte survey, a mixed system of incentives combining tax exemptions with grants, would have the largest impact on increasing expenditure on R&D in Poland (Deloitte 2015). As a consequence, it would help Poland achieve its goal of attaining expenditure on R&D equivalent to 1.7% of GDP by 2020 (Box III.14). The argument that the mixed system of incentives combining tax exemptions with grants is a more effective stimulant for investing in R&D activities may be proven by the fact that as many as 27 out of 34 OECD countries decided to use that system. In the opinion of almost half of the Polish companies, such a system constitutes a factor that would contribute to the largest extent to an increase in expenditure on the development of that area in our country. Therefore, Polish business enterprises are waiting for the introduction of an additional bonus for their R&D activities in the form of a new tax relief. It is particularly important in light of the fact that the businessmen participating in the survey conducted by Deloitte responded that the availability of various forms of support still remained the key external factor decisive for the level of expenditure on R&D among Polish companies. Unfortunately, in spite of the fact that the majority of companies are aware of the system of grants for R&D activities, they do not apply for any co-financing because the process of obtaining and using the grants is too formalised and complicated (Deloitte 2015).

An unfavourable phenomenon observed both from the point of view of the entire economy and, in particular, R&D centres, is a drop by 29 pp, in comparison with 2014, of the percentage of companies executing R&D projects in cooperation with other entities. 50% of companies claimed that they cooperated with third parties as it was required under support programs, whereas 41% did it for the purpose of obtaining a higher grant (Deloitte 2015). This is a negative signal for the R&D centres as it indicates that a large part of cooperating with companies arises from a necessity instead of actual benefits derived by companies from such cooperation. This fact is confirmed by the observation that most companies do not have a specific research, development and innovation policy (Deloitte 2015), so they cannot discuss any long-term plans of cooperation between R&D centres and companies.

**Box III.22. Role of educational institutions and employment services in the development of modern services**

The quality of education, including higher education has an influence on the country’s investment attractiveness. The availability of high-class specialists in a given country has a long-term impact on the international competitiveness of the sector. Consequently, an essential element of state policy in the context of maintaining and increasing competitiveness is to systematically increase spending on education. It is also important to promote technical studies, as well as those in the field of information technology and economics, for example, through a relevant system of scholarships. In addition to raising spending, it is also necessary to initiate and strengthen cooperation between educational institutions and businesses. This should be done both, at the didactic level – through a system of practices, participation of companies in the preparation of an educational offer – as well as cooperation between researchers and business entities, including first and foremost industrial companies.

In addition, higher education in Poland should be actively involved in lifelong learning programs for adults, including programs raising digital literacy. An important area is also to raise the competences of employees in the ICT sector, especially regarding the ability to quickly adapt to rapid technological changes.

Other state institutions that have the potential to play an important role in the development of the sector are the public employment services. In the case of companies from the business services sector, the recruitment process is all the more complex, as high and often rare competences are required. Effective and efficient job placement can greatly facilitate the work of companies in the sector, including primarily new foreign investors, who are unfamiliar with the market, and thereby make the Polish location even more attractive.

Source: Own elaboration
CONCLUSIONS

The sector of modern business services covers categories of services that significantly differ from each other, but whose common denominator is the intensive use of knowledge and technology, and a complementary nature in relation to the activities of their customers. The intensive development of business services in developed countries, observable in recent decades, is a result of the growing competitiveness in global markets and the desire of companies to increase productivity by outsourcing certain tasks, which enables them to reduce costs and increase productivity. Basically, advanced business services are a characteristic of economies with a high level of technological development. Therefore, they determine the global trends of development in that sector. However, developing countries and emerging economies also benefit from changes in this area, which are taking place at a global level. A particular variant of this process, whose beneficiaries are the Central European countries, including Poland, is nearshoring, that is, moving operations to neighbouring countries which are close to them not only in terms of geographical proximity, but also linguistically and culturally.

Business services are developing most rapidly in countries with the highest degree of economic advancement, expressed not only by the national product, but by the index of economic complexity. These locations are also characterised by a high level of competence in the economy – the existence of a skilled workforce being a result of high quality university education. Another factor conducive to the development of knowledge-based services is the spending on R&D, including those related to the development of high-tech industries, which are a prerequisite for the growth of innovations in this sector.

In the case of countries that are less developed in terms of their economy, including, Poland, the development of the business services sector depends to a large extent on the inflow of foreign direct investments (FDI). Direct investments in the form of service centres, depending on whether they create or rather use competences, can have a positive or negative impact on the sector development and economic growth in the broad sense. The new service centres not only create attractive jobs for the most qualified (which have the potential to stop the emigration of valuable talent) but are also an important provider of knowledge and know-how. At the same time, they introduce a new business model into the economy, by means of transforming the existing value chains. In the case of foreign companies focused on exploitation of local competences, transfer of knowledge is very limited and the impact on the economy is limited. Concurrently, it should be borne in mind that these companies represent strong competition for local players, often leading to their elimination from the market and creating high entry barriers for new ones. Therefore, public policies aimed at attracting foreign investments should be appropriately selective and focused on companies who offer high added value to the economy.

Poland is an attractive location for foreign service centres due to the favourable ratio of labour costs per unit in relation to competences. Nonetheless, with steadily rising wages, it becomes clear that the cost competitiveness will lose significance for cheaper locations in other parts of Eastern Europe. This means that gaining competitive advantage must be done by way of increasing competences. The business services market in Poland covers not only branches of foreign companies, but also Polish entities, including, in particular, small and medium-sized companies. Supporting this segment requires the use of separate tools. The most effective methods, observed in Western Europe, of supporting the development of advanced knowledge-based services, including primarily R&D, are based on hybrid models covering both grants and tax relief. It is also important that the new regulations are transparent and create a predictable environment for new investments.

A notable trend in the development of that sector in Poland is an increase in the business services provided to the financial sector companies. The development of the banking, capital markets and insurance sector also shows great potential for the development of business services offered to financial companies, and especially, investment funds. A prerequisite for using such potential is the creation of a favourable regulatory environment and support for the development of appropriate competences through investment in education, especially in information technology and economic studies. It is worth noting that looking for competitive advantages in business services is, however, the domain of smaller economies with an underdeveloped industry. Meanwhile, Poland, as a large country, follows the path of industrialisation. The systematic increase in the share of services in the Polish industrial value chain indicates that Poland has the potential to specialise in business services for industry, which could become its major export services. This requires high expenditure on R&D in the industry, which is the only way to transform Polish industrial production into a technologically advanced sector, which will automatically increase the demand for other business services.

The examples taken from international policies suggest that tax incentives for R&D activities are one of the most effective tools to support the development of the sector. Countries offering tax relief for R&D are considered a competitive location for investment in this area. In Poland, so far the only tax incentive has been the possibility to deduct up to 50% of costs on new technologies in the form of intangible assets, such as property rights, licences, patents and know-how from the taxable income (Deloitte, 2014). Companies are waiting for a draft reform of the system and the introduction of tax relief for the costs
of R&D regardless of the results of the work presently being developed in the Polish Parliament. Another long-awaited solution is the so-called patent box popular in Western Europe, which allows the tax rate on proceeds from patents to be reduced. Another tool is a privileged taxation system for small and medium-sized enterprises so that they can grow and consolidate. The tax system, in order to be effective, must be first and foremost, complete, transparent and must support both R&D activities and the creation of patents. It must also motivate not only large multinational organisations but also small and medium-sized enterprises. A list of eligible costs must be simple and transparent and also cover salaries for academic staff and the purchase of R&D services from research units.

The most important element of public policy that promotes the development of business services remains the support of the development of human resource potential in Poland. What predominantly attracts foreign investment in the form of a variety of business service centres is not the favourable taxation system or government subsidies but the high level of competences existing in the economy in relation to costs. Given the progressive increase in wages in Poland, it is the investment in human resources that will play the biggest role in the development of business services in Poland. There is a necessity to increase expenditures on higher education and the promotion of technical studies, as well as those in the field of information technology and economics, for example, through a relevant system of scholarships. In addition to raising the inputs, it is also necessary to initiate and strengthen cooperation between educational institutions and businesses. This should be done both at the training level – through a system of internship, participation of companies in the preparation of an educational offer – as well as cooperation between researchers and business entities, including first and foremost – the industry.

As part of the work on Chapter III of the Report, the authors used the technological foresight, which delivered qualitative forecasts for the labour market in the context of continuing automation and digitalisation of business processes. Moreover, directions and types of instruments of public policy, which are necessary for a better operation of the labour market have been identified.

Major conclusions:

- The technological change that accelerates the processes of automation and robotisation of production processes results in limitation of demand for human labour in industry and, as a consequence, the shifting of work resources from that sector to the services sector. In the services sector as well, the continuing computerisation leads to the replacement of persons performing repeatable actions with the work of computers. It means a substantial limitation of demand for low- and medium-qualified employees and unprecedented growth of demand for professionals, including engineers, specialists in science and health care.
- For the purpose of preventing the growing shortage of high quality human resources, public policy focuses on investments in education and expanding employees’ skills. Spending on R&D is growing and new professions emerge. IT technologies and high-class IT specialists contribute to structural changes as a result of which new sectors based on intelligent systems of solving problems, management and effective energy use are created. Investments in new technologies modernise industry and the shaping of relevant institutional framework leads to better integration of production and services, which improves its innovative character. We observe the emergence of a new system of predicting demand for work, which allows tailoring the educational offer to the needs of the economy in advance, which increases effectiveness of the labour market and minimises the level of unemployment.
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2. BIG DATA, OPEN DATA

3. DIGITAL DIMENSION OF THE LABOUR MARKET

3.1. ICT in public employment services

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INTRODUCTION

The dominating features of the contemporary world are interactivity and co-dependence and, contrary to the 20th century, a dispersed structure of economic and political forces. As a result of globalisation, developing countries like China or India have questioned the conceptual and economic superiority of the West.

Central Europe newly politically integrated with the Western world carried out in-depth transformations on an economic and social level coming closer and closer to the West from an institutional and economic point of view. It must be noted that between 1989-2014, the westernisation of Central European societies consisted of imitating the West in a form in which it prevailed towards the end of the 20th century. Poles, Czechs, Slovaks and Hungarians, while striving intuitively to copy the model of Western lifestyle hoped that it would bring an end to the era of transformation that was full of sacrifice.

The development of new technologies was initially an unstoppable expansion of the Internet in the early 1990s and was the beginning of a phase of social and economic transformations taking place at an unprecedented pace for the world. For Central Europe, this sudden acceleration meant not only the necessity of transformation through imitation of Western economies and societies, but also a step into a new digital era. The need to absorb the rules of this unknown technological world, turned out to be as equally as important for their development prospects as the systemic transformation and integration with the European Union after 2004.

This ongoing transformation, whose final outcome is impossible to anticipate, does not omit any part of the economy, also having a strong impact on the labour market through a change of its functioning rules and deepening its internal polarisation due to the emergence of new paths of access to the goods and services distributed digitally. The labour market still functioning in the traditional, yet relatively inflexible, employment model more and more often rewards individuals with high digital skills, while creating barriers to obtaining jobs for those digitally disadvantaged. Individuals, public institutions and companies wishing to maintain the effectiveness of their actions are subjected to strong adjustment pressure enforcing the creation of a multi-speeds labour market in which on the one hand, there are mobile individuals, active in the network of contacts and co-dependerencies, being capable of rapid modifications and completing qualifications, and, on the other hand, there are persons with low-performing digital competence, who perform simple and easy to automate actions (Attali 2006). This job market is subject to constant changes and stresses, which also affect public institutions, performing their objective and adjusting the means and methods of operation of continuously progressive changes in a more and more digitised economy.

Part IV consists of four chapters. In the first one, we describe the impact of digitisation on economic growth, analysing it in terms of geographical location and productivity – searching for reasons which cause differences in Europe and the United States. We also consider factors determining the use of ICT in enterprises, especially paying attention to Polish companies and their readiness to implement ICT technologies.

In the second chapter, we describe the new opportunities that access to large data sets can bring to the economy and its different sectors. Concurrently, we point to differences between the Open Data, Big Data, Open Access and Open Government, and describe the initiatives related to the releasing of public sector data. Moreover, we highlight the impact open data can have on the development of a new companies, i.e., start-ups, on which we elaborate in the next chapter.

The essence of the third chapter is to analyse the impact of digitisation on the formation of new phenomena combining the economy and the labour market, such as, among others, a sharing economy in which, by using state-of-the-art technology, private entities and organisations gain the possibility of sharing the resources they have. In this chapter, we reviewed new digital work tools, presented the impact of digitisation on contemporary HR, and pointed out that competences are becoming increasingly important in the digital labour market. Taking the Netherlands as an example, we showed how to use ICT in public employment services.

Moreover, in the fourth chapter, we analyse the level of digital skills, i.e., those that allow effective operation in a labour market which is changing under the influence of digitisation, observed in Polish society compared to other countries from the perspective of performing certain activities but also using the Internet to solve specific problems. Finally, we draw attention to the factors posing a risk from digital exclusion, including the most vulnerable elderly people, and thus directly affecting the functioning of the labour market.
1. INFLUENCE OF DIGITISATION ON ECONOMIC GROWTH AND PRODUCTIVITY

1.1. MACROECONOMIC PERSPECTIVE

Digital technologies now constitute an integral part of everyday life of not only for the majority of the inhabitants of developed countries, but more and more often the emerging ones. As stated in the report “Digital, Social & Mobile in 2015”, in 2014, the number of active SIM cards exceeded the number of people in the world, the number of Internet users reached 3 billion, and social media users – 2 billion.

Both, in Poland and in other OECD countries, providing access to information and communication technologies (ICT) is no longer a primary question (Sabbagh et al. 2013). The main challenge is to assess the possibility of absorption, use and real impact of these services on the life of users. Digitisation is becoming a major factor increasing the individual chances of access to services as well as social and economic benefits.

In 2014, the percentage of households in Poland with a computer connected to the Internet amounted to in 74.8% (Central Statistical Office of Poland 2015). This means that now owning a computer is almost synonymous with access to the web. However, computer use statistics are somewhat different – only 63% of those aged 16-74 used the computer regularly. On an international scale, in both classifications Poland is below the European average and far behind the top ranking nation, which is Iceland (over 70% on average in the EU and almost 100% in Iceland). The use of more advanced technologies also raises a moderate interest: 25.2% of households use smartphones, and only 8.7% of people use the Internet cloud (Buchholtz Bukowski, 2013).

The influence of IT technologies on countries and particular areas of the economy remains diversified. In developed countries, digitisation raises the level of labour productivity resulting at the same time in the transfer of work that requires low qualifications to countries with low workforce costs. Meanwhile, export-oriented emerging countries, which are focused on the production of bulk commodities with low workforce costs. Meanwhile, export-oriented emerging countries, which are focused on the production of bulk commodities participate in additional economic value generated as a result of digitisation to a lesser extent when gaining jobs Sabbagh et al. (2013).

The Digitisation Index developed by the consulting company Booz & Co (now Strategy &) estimates that in 2011, digitisation provided additional USD 193 billion to the global economy and created 6 million new jobs. The most advanced economies – US and Western Europe – have gained 66 billion dollars, but only 6 percent of jobs created as a consequence. The impact of digitisation on the reduction of unemployment (1.02 percent) was, however, several times larger than the similar effect of broadband networks one decade ago. This data was compiled on the basis of an econometric analysis on the level of total economies, as a result of which, it comprises of all jobs created directly or indirectly by digitisation. The generality of the conclusions was reached at the expense of analyses at the micro level, so one cannot say what the breakdown was by sectors or professions.

Digitisation, however, has become a factor that significantly increases the availability of many goods and services, both private and public, and thus strongly influencing the growth of individual and collective welfare. In this context, the primary challenge is a productive assimilation of its potential in the economy and in social life.

<table>
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<th>Region</th>
<th>Influence on GDP (USD billions)</th>
<th>Number of new jobs (in thousands)</th>
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<tr>
<td>Total</td>
<td>192.6</td>
<td>6 002</td>
</tr>
</tbody>
</table>

Source: Sabbagh et al., 2013
A similar argument was used by Crafts (2002), who extended the analogy with previous ground-breaking technologies. In his opinion, even before mid-1990s, the influence of ICT on the economic growth was much larger than the influence of the steam engine and comparable to electricity if one takes into account the similar period of development of these technologies. Hence, the whole „paradox” resulted from rather excessively high expectations as to the pace in which IT will have an impact on the economy. According to these arguments, all ground-breaking technologies need time in order to become a significant factor for growth.

As a matter of fact, in the mid-1990s, labour productivity in the USA accelerated considerably. The real annual growth of GDP exceeded 4%, and the simultaneously observed growth of labour productivity reached ca. 2.75% per year – twice as fast than before (Oliner and Sichel 2000). That period was related to a considerable boost of investments in computer hardware – they grew over fourfold from 1995 to 1999. The share of computers in capital resources increased and thanks to higher computer performance and falling prices, they were bringing growing benefits to companies. Six years following the previous study, Oliner and Sichel tackled the subject once again. According to their estimations two-thirds of productivity growth in the USA between the first and the second half of the 90s can be attributed to ICT technologies.

A rapid growth of productivity in the USA ended around 2004 which was surprising to some researchers. Since that slowdown outpaced the financial crisis of 2008 by several years, a hypothesis was formulated that the situation observed between 1995-2004 was a single event and the computer revolution ceased to have a large influence on the American economy, whereas future trends are likely to be unfavourable. Cowen (2011) claims that the United States used innovations that were easily achievable – low hanging fruit. A similar argument was presented by Gordon (2012), according to whom the most revolutionary technological innovations from the point of view of productivity were introduced in the 1970s and 1980s. At that time, for example, the most repeatable and standardised human work was replaced with robots and computer operations. In the 21st century, in the opinion of Gordon, inventions refer mainly to entertainment and communication and strive towards improvement of capabilities as well as minimisation of dimensions of the electronic equipment. Even though they are visible in everyday life, they don’t have such influence on labour productivity as it was in the case of electricity, cars or previous stages of computerisation. On the opposite side, there are advocates of a vision according to which the technological revolution will continue to have an impact on the productivity also in the future. Byrne et al. (2013) claimed that even though after 2004, labour productivity actually slowed down considerably, there is a high chance for its moderate recovery as a consequence of the continuing development of IT. In their analysis based, among others, on the prices of semiconductors whose drop was one of the main reasons for the technological revolution, they indicate that in the future, the annual growth of labour productivity in the USA may again reach ca. 2.25%.

Another empirical problem is the observation that IT technologies affected the economic growth in the United States much more than in Europe. Figure IV.1. is a good illustration of this phenomenon: by the second half of the 1990s, the level of labour productivity in Europe was growing and became comparable with that in the USA, however, the ubiquity of IT technologies that occurred later in the United States led to divergence once again.

Two hypotheses explaining the diversified use of ICT between the continents can be found while reviewing the literature. First of all, from the point of view of a company, external conditions may contribute to the preferential treatment of American companies in relation to the European ones, e.g. regulations, workforce, higher degree of competition. Second, U.S. companies, regardless of the regulations, may manage modern technologies more effectively. This second hypothesis is supported by the research conducted by Bloom et al. (2012), who stated, based on the financial results of international corporations operating both in the USA and Europe, that American companies present in Europe use IT to a higher extent and as a result, achieve higher productivity than domestic corporations.
The authors claim that it arises from different human resources management standards, which cover promotions, remuneration, employment and dismissal. However, Van Ark et al. (2003) rather supports the first hypothesis claiming that regulations are a part of the problem. The underperformance of Europe to a lesser extent results from either the weakness of computer manufacturers (they have similar results on both continents) or the market for new technologies, which is global. Firstly, the reason is worse use of these technologies in enterprises operating in other sectors. Thanks to computers, US companies in industries such as trade experienced a significant increase in productivity between 1990 and 2000, which was not the case with their European counterparts. In addition, technology investments in Europe were at a similar level to the USA. According to Van Ark et al. (2003), the reason behind this was excessive regulations on the old continent. In a major part it refers to labour law: limitation of working hours and employment protection reduce the possibilities of using ICT and inhibit competitive pressure. Studies have shown that most of the growth in labour productivity in the foreign trade sector arises from creative destruction – inefficient companies who have left the market being replaced by new, more productive ones. The authors note, however, possible benefits of the regulations – in the EU, standardisation has been beneficial for the development of modern telecommunications.

1.2. IMPLEMENTATION OF TECHNOLOGIES IN ENTERPRISES

Observable and considerable differences in the use of ICT between particular countries cannot be fully explained by the degree of development of these countries. Erbuman and de Jong (2005) studied the influence of culture, which has become an important factor even after taking into account the income and education in international cross-sections. The study used cultural dimensions developed by G. Hofstede, a part of which has turned out to be important. The dispersion of ICT usage is stimulated by a low power distance index (power distance – high index means the acceptance of non-flexible social hierarchy) and low uncertainty avoidance (uncertainty avoidance means unwillingness to face new, unusual situations of uncertain consequences and acceptance of rigid rules and laws). In both categories, Poland scores high: among 52 countries and territories covered by the study of Erbuman and de Jong, it is ranked 14. and 5. respectively, which means that Polish culture is not conducive to the implementation of ICT solutions. The use of ICT in a company depends on many factors related both, to a specific company and to the whole country. In the case of two main sectors, namely services and industry, there are no differences but in the case of agriculture and construction the use of ICT is lower. Internationalisation of a company is an important factor: export sales and participation in international holdings considerably increase the penetration of high tech technologies. Competences of human resources also affect the absorption of modern technologies. The skills of employees turned out to be a significant factor, however, their age is irrelevant. The strategy based on quality competition is also conducive to the use of ICT in the companies (Bayo-Moriones, Lera-Lopez 2007, Spanish companies).

Figure IV.3. shows the NRI (Networked Readiness Index) based on 53 single indicators concerning regulations, factors having positive impact on modern technologies like education or costs, as well as indicators of ICT use in the private and governmental sector and in households. In comparison to 143 countries, Poland is ranked 50. in the latest classification. The result of 4.38 is much lower than in the case of ranking leaders and places Poland on a level similar to that achieved by other countries in Central and Eastern Europe. However, in general the whole region, including Poland, is not particularly well prepared for the ICT revolution.

![Figure IV.3. NRI index for 2015 and change in the years 2012-2015 in the EU countries](source: Own elaboration on the basis of data provided by World Economic Forum)
Such a low position arises mainly from the poor performance of the public sector. In six out of 53 indicators, Poland ranks between 110 and 130. Each of these indicators concerns the public sector, and generally, they can be divided based on low efficiency of the judicial system and little interest of the state in promoting ICT. A weak result is confirmed in comparison with countries of a similar level of prosperity: while operation of the judicial system is relatively weak in other countries in Central and Eastern Europe, the indicators concerning the involvement of the government are at their lowest level among the 12 new member states. When viewed in relation to the European Union, including its less developed member states, Poland also performs poorly in terms of various indicators regarding ICT use in enterprises and indicators of the effects of ICT implementation. In these cases, Poland is not only behind the rich countries of Western Europe, but cannot even catch up with those of a comparable wealth level. In addition, the ICT laws are at one of the lowest levels in the EU. On the other hand, Poland’s strengths, i.e., categories in which it ranks among the top thirty countries in the world, relate to various areas, such as a high level of educated people in the population or the percentage of mobile phone users in society. In these categories, Poland outpaces many most advanced EU countries.

As shown in Figure IV.4., the use of ICT is associated with higher productivity at the sectoral level – the higher the productivity of the industry is the greater the use of ICT can be seen. Economic research using more detailed data confirms the impact of information technology on productivity at the level of companies and countries. Poland appears average when compared to the sector in terms of readiness to implement ICT. For obvious reasons, it is ranked behind its western neighbour, but other Baltic states also achieve better results. The rate of improvement of the index is slightly higher than in the case of, for example, Germany, however, it does not allow for a quick levelling of losses. Additionally, the improvement of the NRI index in several countries with a similar level of development as Poland, including, among others, Lithuania, was definitely higher than in Poland. Many economic phenomena are characterised by convergence – less-developed countries showed a faster growth rate in that sense than the leaders, as a result of which the indicators in two different countries become similar or equal. However, in the case of NRI, there is no strong negative relationship between the initial level of the index and its dynamics, both in regard to all the countries studied and within the EU (Figure IV.3.). This means that leaders can relatively easily "escape" stragglers and specific actions are necessary to avoid being at the bottom of the classification.

Polish companies implement new technologies slower than the European ones. Taking broadband as an example, a delay of several years can be noted. Understandably the gap will be closing soon but it arises from the saturation with technology (approaching 100%) rather than from actual approximation of the level of ICT use. New solutions are emerging and European companies implement them faster than those in Poland. One of the examples here might be cloud computing, which is currently used by approx. 6% of Polish enterprises compared to 19% in the EU. The analysis of selected information technologies (cloud, ERP and CRM), as well as investments made by the companies in ICT skills shows that especially Polish small businesses are dragging behind – in every country, computerisation of companies is correlated with their size, but while large enterprises in Poland are not far behind the European ones, there are the smaller ones that cannot keep up with their European peers. Figures IV.6. and IV.7. show that digitisation is related to the wealth of a given country: the higher the GDP per capita, generally the higher the degree of computerisation. In comparison with countries having similar income, Poland does not fall behind, but at the same time it is not a leader in the use of digital technologies in enterprises either.

![Figure IV.4. Sections of the Polish economy according to PKD-2007 in terms of productivity and ICT use, 2013](image1)

Source: Own elaboration on the basis of data provided by the Central Statistical Office of Poland and Eurostat

![Figure IV.5. Sub-indicators of NRI 2015](image2)

Source: Dutta, 2015
Figure IV.9. shows barriers to implementing cloud computing declared by Polish entrepreneurs. However, feedback given by them may also help in understanding the differences between particular classes of enterprises in the use of other computer technologies. Large companies fear most security-related problems. Among small businesses that do not use the cloud, nearly half of them does not have sufficient knowledge. This is the case in most EU countries, although in Poland, the rate is slightly higher, which is further enhanced by a greater proportion of small and medium-sized businesses in the general population of business entities. So it turns out that the lack of knowledge of companies can be detrimental to economic development because it inhibits the growth of small and medium-sized businesses that are uncompetitive when compared to large enterprises. Another important finding in the case of the cloud is a relatively small importance of cost as a barrier. This is the case for all size classes of enterprises – presumably solutions for small businesses are much less complicated and therefore cheaper. Although in the case of some technologies, price may be a greater problem, these results suggest that the lack of knowledge is a more important barrier than the cost. Comparison of Poland with the results of analogous surveys conducted in other EU countries shows that there are no significant differences so the conclusions proved to be similar for Poland and the EU.
2. BIG DATA, OPEN DATA

The access of companies to large data sets and application of new technologies in their analysis is another issue within the modern digital economy affecting the economic growth and productivity. From an economic point of view, open data stimulates economic growth, competitiveness and innovation. The potential of Open Data is estimated by McKinsey Global Institute for approx. USD 3 trillion globally, out of which 900 billion in Europe. In turn, the WISE study (2014) estimates the total economic potential of Big & Open Data in the European Union at the level of EUR 200 billion in 2020. The greatest beneficiaries in this sphere can be the following sectors: finance, trade, public administration, manufacturing, and ICT. The positive effects will be greater in the most developed countries, while weaker in Southern and Eastern Europe. Poland is one of the exceptions, thanks to the strong presence of industry and trade in the economy. In our country, the potential impact of Big & Open Data implementation on GDP is approx. 1.9% of GDP. The main growth-stimulating potential is associated with the implementation of solutions in the area of Big Data, but also the opening of public data contributes to the final result due to the overlapping of the two categories and the considerable potential of the public sector in the creation of economically useful large data sets.

The term Big Data is widely understood as large and complex data sets, analysis of which exceeds the capabilities of traditional IT technologies. Hence, the concept of Big Data includes not only the size of existing databases, but also the very process of their processing, exploration and exploitation. Although in recent years we deal with exceptional acceleration in the field of generating new databases, that concept has its roots in the scientific and medical community, where complex analysis of large amounts of data served to the development of pharmaceutical products, building physical models and other forms of conducting scientific research. Along with the progress achieved through the use of analysis of large databases, the researchers concluded that the more data, the more accurate the test results. The scientific communities began to massively accumulate related sets of data, unstructured data, historical data and those collected in real time, which gave rise to the phenomenon specified today as the Big Data (Ohlhorst, 2013).

What distinguishes Big Data from other data sets is:
1. high volume – often linked to a specific nature of data; it allows more precise statistical research.
2. high pace of changes – data is often updated and collected as well as analysed in real time.
3. variety in terms of quality – data may have a non-numerical form, like for example, texts, video materials, or be derived from new sources like social media, or Internet search engine results (Bholat, 2015).

The actual determinant of the more and more common use of Big Data is, on the supply side, the growing availability of increasingly advanced technologies, which increase the possibilities of storing such large sets of data and enabling their rapid processing at falling costs (Minelli et al., 2013). On the demand side, business entities are increasingly interested in opportunities offered by Big Data within the scope of improving productivity and profits (Bakhshi et al., 2014). As Rifkin predicts (2014), in the macro scale, Big Data’s potential is capable of changing the structure of production, whereas the use of Big Data by state institutions may revolutionise the system of redistribution of funds in the society. The directions of development in that area are still difficult to predict.

According to data presented by IBM in 2013, each day 2.5 quintillion (2.5 × 1018) bytes of data were generated, which means that 90% of the data existing at that time worldwide were created within the time span of two years (Ohlhorst, 2013). They covered both structurised data, i.e. stored, for example, in the form of relational databases and spread sheets, as well as non-structurised data in the case of which initial processing and systemisation is necessary to allow their proper interpretation and use. The latter ones make up for approximately 90% of the entire Big Data. Non-structurised databases contain information like emails, video materials, phone calls, website clicks (Syed et al., 2013).

Today, Big Data is used both by the companies, non-governmental organisations, and public administration institutions. New York Times uses data for text analysis and Walt Disney uses them to check the behaviour and preferences of its customers and accordingly tailors the offer of its amusement parks, or shops. The National Oceanic and Atmospheric Administration (NOAA) uses Big Data to carry out research on climate, weather and ecosystem, similar to the National Agency of Aeronautics and Space (NASA), which applies Big Data in the research conducted in the field of aeronautics (Ohlhorst, 2013). As noted by Bholat (2015), Big Data has considerable potential to play a vital role in central banks, increasing its operational efficiency.

Access to Big Data becomes a companies’ new competitive advantage. They more and more often use Big Data to follow business processes and their results and construct predictive models using statistics to foresee specific results of the actions being undertaken. So far, leaders in that area included the largest online companies, but not only them. The example is Amazon or Netflix, which create a recommendation as to the purchase of a given book or film thanks to predictive modelling based on data concerning earlier purchases made by their customers. Google search engine results are based on algorithms that predict relevance of particular websites or articles. Another example is the function of adding words to a text written on Apple devices automatically, based on previous usage schemes.

Tools and methods for using Big Data in the private sector will gradually be adopted in the public sector. State institutions have a capability of gathering a large quantity of data, for example from the administration of the tax system and social programs. Moreover, both state and local authorities have access to enormous sets of data containing information concerning education, social insurance and the spending of local governments. These sets of data are often stored separately, which prevents comprehensive examination of individual behaviour of members of the whole population.
Making big data sets available may contribute to the establishment and development of companies of a new type – start-ups – which not only settle themselves in a new, earlier unknown and continuously expanding economy sector but also change the manner of providing work, which will be discussed in the next part of the study. One of the most successful Polish examples of using Big Data is JakDojade.pl – it is an application intended for searching public transportation options using data that is publicly available. It was invented in 2006 by two students of the Poznan University of Technology. The web service responds to the question posed in its name by presenting means of transportation thanks to which it is possible to arrive at a desired location. After several years of developing the product, the application has 3 million unique users and 52 million page views per month; the brand is recognised by 60 per cent of inhabitants of the largest cities. The application is available in 20 of the biggest cities in Poland. At present, City-Nav, the company established and held by project founders, which owns JakDojade.pl, employs 20 people.

Big Data may be used for the purpose of improving the functioning of the state and its institutions in several ways:

1. **Making data available to the public.** Even making the data public can have an impact on the public policy of the state. As an example, a study by Piketty and Saez (2003) can be mentioned, concerning social inequalities, which uses data from the U.S. Internal Revenue Service for the purpose of collecting historical data on the income of the population of the United States. The authors, thanks to the access to administrative data studied the income of US citizens in the upper level of the working population. It raised a social debate continuing until today not only in the USA, concerning the problem of inequalities and their impact on the operation of the economy. Some governmental agencies, which do not have their own resources necessary for analysing data, provide this data on purpose hoping that scientists will use it in order to develop more effective procedures raising the efficiency of work of particular areas for which institutions are responsible. Here, one of the examples may be the functioning of the City of New York, which provided public data within the framework of the NYC Open Data. Publicised data includes information on the location of schools, urban transportation, electricity consumption, crime statistics, etc. (Einav & Levin, 2013).

2. **Use of Big Data for adjustment of services to individual needs of the citizens.** Administrative data constitutes an important resource in view of its high quality and capability to precisely identify the whole behaviour of units in time (Card et al., 2011). Moreover, taking into account the universal nature of the data, they may become correlated with other potentially more selective sets of information. Thanks to the above-mentioned features, Big Data can become a chance for revolutionising the methods of work applied in public administration and its interaction with citizens. It may be reflected by the manner of designing services intended for the population by public institutions. For example, in the health care sector, appropriate analysis of available records may help in the adjustment of treatment methods to the individual condition of the patient.

3. **Use of predictive analytics for the purpose of adjusting public policy to social dynamics.** The use of Big Data by governmental agencies may take the form of predictive models that allow, on the basis of administrative data, the foreseeing of social dynamics, i.e., the directions of development in various domains of society life. On that basis, the government can better predict how the implemented public policy solutions will be adopted by the social system, and accordingly, make certain adjustments in advance.

FIGURE IV.10. ePSI index

![ePSI index](http://www.epsiplatform.eu)

Source: Own elaboration on the basis of data published on [http://www.epsiplatform.eu](http://www.epsiplatform.eu)

FIGURE IV.11. Global influence of Open Data on GDP in 2020 according to McKinsey

![Global influence of Open Data on GDP in 2020](http://www.epsiplatform.eu)

The dark pole means the minimum value and the entire pole means the maximum value. The percentage value set out above the poles shows the percentage of the entire profit attributable to a given sector based on an assumption of maximum profits.

Source: Own elaboration based on McKinsey Global Institute, 2013
4. Big Data as a tool of growth and innovation. In the same way as the use of Big Data in business, analysis helps to improve productivity on the level of a company, the use of an analogous analysis on the macro scale, i.e., on the level of a state organisation, can help to identify the most productive sectors of the economy and better redistribute the resources. Analogous application of Big Data in the evaluation of social programs and other state policies may point to either effective or ineffective solutions, and such knowledge will become the basis for adjustment of the existing program and creation of new and better ones in the future (Yiu, 2012).

At the same time, three main channels through which Big Data exert influence on the economy can be distinguished. The use of big data may help increase the value of:

- **products and processes.** The use of data sets to optimise the production processes and products may consist of a more effective diagnosing of problems and finding innovative solutions, as well as possibilities of a more effective allocation of resources.

- **information.** In the modern economy, business model is often based on information that can be „derived” from data sets. For example, it can be the finding of a better investment strategy or gaining valuable knowledge concerning the behaviour of customers.

- **management.** It can constitute the greatest challenge for companies as in addition to the processing of data it is necessary to change the model of management into the one based on data.

These three channels will have various impacts depending on the sector. For example, industry will benefit from the use of Big Data most to improve products and production processes, and the improved information will be particularly useful in the financial and insurance sector, as well as in modern sectors such as e-commerce. On the other hand, the improvement of management quality should bring positive effects in the total economy, with the most significant ones in public administration and health care, where particularly high ineffectiveness is observed (WISE 2014).

The great potential of large data sets cannot be, however, fully utilised because when the barrier to the transmission and storage of data are disappearing, another one emerges, namely, the lack of open access. In public resources, vast amounts of information are stored (e.g., concerning the health of citizens, climate and weather, crime, activities of the judiciary, road traffic), the attractiveness and relevance of which even their holders do not realise. At the same time, access to public information has been associated so far initially, with issues of transparency and control over actions taken by the government – it has been considered primarily as a political right. However, in the new approach, a re-use of public information, treated as an economic and social right, has become a very important issue. It is the realm of Open Data, as shown, among others, by interviews with experts, that is still the weakness of Poland when compared to other EU countries. At the same time, the barriers to the opening of public data in Poland are of multiple nature: organisational, technical, legislative, as well as related to competence / motivation and demand (Buchholtz et al. 2015).

Despite some progress – in the last two years, Poland has advanced from the European straggler to a strong middle position (from 25th up to 10th place) – still a lot of missed opportunities is related to the sphere of openness of public data. In light of the ePSI Scoreboard results, what ensures a high position in the ranking is good practice of data sharing, a clearly defined fee schedule and openness of data formats, as well as remaining activity. In most of these areas (scale of fees and charges and pan-European directive), we are still quite behind the UK, which leads the classification. In particular, it is reflected by the limited scope of information being made available on the local level, too many exemptions of data sets or file formats (Buchholtz Bukowski, 2015).

According to McKinsey Global Institute (2013), areas in which open data will be most profitable for the economy:

1. **Education.** The data will increase the effectiveness of education, because thanks to the data concerning the educational and professional results (e.g. salary) it will be able to evaluate the effectiveness of strategies and educational tools. Moreover, students and their parents will be able to make better choices of school or university.

2. **Transport.** The main way to use open data will be the optimisation of time and cost of transport. This applies both to the transport of goods and communication of particular individuals.

3. **Consumer products.** Consumers will benefit from the possibility to compare prices, information e.g. about the origin of the products and their manufacturers. Vendors will be able to better adjust their offer to customers based on information about them.

4. **Electricity.** By providing data on energy consumption, consumers can discover methods to save it. Suppliers can benefit by improving management of e.g. transmission of energy.

5. **Mining sector.** The information can help choose the right place to extract resources and construct processing infrastructure.

6. **Healthcare.** Benefits will be the result of increased customer activity in the prevention and treatment; for health care centres, open data will help increase the effectiveness of treatment, among others, thanks to matching patients to treatment and doctor more effectively. In addition, it will help develop new therapies and new ways of providing health services.

7. **Finance.** In the financial sector, the biggest benefit may be the ability to assess customers without credit history. Openness of data will reduce the scope for fraud. Consumers will gain a tool enabling them to optimise their choice in the case of a wide and complex offer of banks and insurance companies. In the real estate industry, open data will contribute to better choices.

In the years 2010-2012, Great Britain made available the largest amount of information about the public sector in the world. Proposals for making data available to the public in that country were fulfilled in 2000, when Act on the Freedom of Information was enacted. By 2012, each of the British ministries created its own strategy for dissemination of public information, which was implemented within the next two years. Meanwhile, in France there are several institutions being in charge of opening of data sets. A task group Etalab acting at the General Secretariat for Modernisation of Public Actions organised six open databases in specific subjects. They include: health, real estate, higher education and research, transportation, environmental protection and public expenses. For some databases a report will be drafted suggesting what data should be available with the itemisation of benefits of such action.
In 2014, the office of director general for data, who is to be responsible for an increase in the use of data, was established (Dillet 2014). In 2009, in Spain, the Ministry of Industry, Energy and Tourism, acting via a public unit Red.es and in partnership with the Ministry of Finance and Public Administration introduced a project called Aporta, for the purpose of supporting and developing re-use of public sector information. The project was based not only on the development of legal framework but also the promotion of the use of open data intended for raising social awareness. Regular reports, research, training materials and bulletins are published on a page that compiles databases from particular regions. Every year the „Aporta Conference” is organised as a reference to the introduction of a strategy for the re-use of public sector information. In total, over 85 initiatives were introduced in Spain in relation to the re-use of public sector information and over 8,500 databases were published (Aporta 2014).

**BOX IV.1. OPEN DATA AND OTHER TYPES OF DATA**

According to the definition provided by Open Knowledge, an international organisation promoting the idea of open knowledge, Open Data means data that can be freely used, processed, and disseminated by anyone, subject (at least) to the specification of their source and requirement of their dissemination by other people according to the same principles.

In connection with facilitating the storage, processing and dissemination of data in the business environment, certain overlapping trends have emerged. The concept of open data should be distinguished from other phenomena:

- **Big Data** is a term used for large data sets. Big data sets may be open – when they are made available to the public – or not, when they are used for internal purposes of a given company or institution. They may come from public or private sector or other sources. The volume of resources is the key factor in this case.

- **Open Government** – idea of promoting transparency of government and involvement of citizens in the affairs of the state.

- **Open Access** (open access) refers to the openness of scientific research materials – publications and sets of data used in the research.

Companies whose business model is based on processing and selling this type of information are the main beneficiary of open data, which leads to the emergence of a new sector in the economy.

Source: Own elaboration based on Open Data Handbook

In many countries (e.g. Austria), access to public information is free-of-charge. In other countries, institutions may decide on the introduction of fees. This is the case in Germany, where institutions decide, among others, on the methods of providing services, as well as determine the conditions of use and related fees. In Hungary, there is a possibility to collect a fee for providing information, however, it may not exceed the costs of gathering, producing, processing and distributing information plus margin for the maximum amount of 5%. It is also necessary to enter into an agreement between the parties. In Germany, it is emphasised that the introduction of the Open Data strategy is related both to opportunities and obstacles. These consequences may affect many various target groups such as: sector of education, media, public administration, authors of legislation, companies and civil society. Copyright can pose some limitation, which is noted in connection with making ISP available to the public. In Germany, in the case of copyright, there are no specific guidelines concerning publication but the institutions must observe Section 5 of the Act on Copyright or may allow access of third parties to any and all information by means of granting usufruct rights.

**BOX IV.2. INITIATIVES WITHIN THE SCOPE OF OPENING PUBLIC SECTOR INFORMATION IN EUROPE**

In 2003, the European Parliament issued a directive on the re-use of public sector information. It promotes the opening of public data and introduces several key guidelines:

- the fees may be determined for the maximum amount of the costs of distribution, however, at best, the data should be provided free of charge.
- the conditions of use may not discriminate against any entities and the licences shall not be excessively restrictive; it shall be prohibited to enter into exclusivity agreements.
- The public sector may not be favoured as far as the use of data is concerned.
- the conditions should be specified precisely and the period for making them available should not last excessively long.

In 2013, an amendment was introduced which reinforces the above-mentioned postulates and extends them by adding, among others, cultural institutions. In addition to the EU initiatives, many states undertake additional actions related to making the data available to the public. The states, when making information public, do it for various purposes, and it is often related to the development of democratic values. For example, regulations concerning the principles of distributing information are according to French government a driver of democracy, and support economic development as well as social innovations. Moreover, they catalyse processes of the modernisation of public actions. In particular, in new EU member countries (Slovakia, Latvia and Estonia), the fight with corruption is often mentioned as one of the more important functions of making data available to the public. Another important function is the creation of transparency of the administrative system. It is the case, e.g. in the Czech Republic, where the purpose of the initiative of making ISP public is to help with the creation of a transparent database regarding public sector. As illustrated by the example of many countries, the reforms aimed at making information available to the public were conducted in several recent years – in August 2010, the government of Slovakia published a Manifesto of the Government concerning that issue. In 2011, the country joined Open Government Partnership, and one year later an act on re-use of the public sector information was enacted in Hungary.

Source: Own elaboration based on materials published on the website of the European Parliament and Open Government Partnership

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3. DIGITAL DIMENSION OF THE LABOUR MARKET

By reducing the barriers to market entry and expansion the digitisation radically changes the model of conducting business activity, contributes to both the creation and destruction of jobs (Sabbagh, Friedrich, El-Darwiche, Singh, Koster 2013). On a similar scale it influences labour relations and models of performing work, lifting geographical barriers and leading to the modification of the set of skills needed to sustain the market. Digitisation has become a stimulant for the creation and development of new forms of performing work, including remote work, freelancing or sharing economy, which break with traditional framework on which the labour market was based in the past (Buchholtz Bukowski 2015). According to one of the definitions, work can be called digital (Horton 2010) if it is remunerated, the product of such work is transferred electronically, and the principal and contractor act with a price-based set in a certain framework. Digital work requires certain skills from the employee and the employer (digital competences) and the use of technologies (e.g. in the case of work in a cloud).

Changes in the economy and the labour market – the emergence of new professions, changes in the way traditional professions perform, growing importance of soft skills – accelerated as a result of digitisation in all areas of life highlighted the mismatch between today’s life and education and training systems. 30-45% of people worldwide are unemployed, inactive or work part-time, which adds up to a total of 850 million people in the countries like the United States, United Kingdom, Germany, Japan, India, Brazil and China. At the same time, a global study conducted by LinkedIn in 2015 indicated that 37% of employees in those countries feel they are overqualified in relation to the work they perform. Meanwhile, another study by an international consulting company HR Manpower revealed that 36% of 37,000 surveyed companies confirmed that in 2014 they were not able to hire an employee having skills matching their requirements (McKinsey Global Institute, 2015). The greatest difficulties in that area were observed in Japan, where the functioning of the labour market is more and more affected by the ageing population. Similar problems, although on a smaller scale than in Japan were found in Germany, Italy, China and South Korea. McKinsey’s study indicated that in the United States, by 2018, there will be a shortage of about 180,000 workers with deep analytical skills and 1.5 million managers and analysts able to use Big Data in their work (McKinsey Global Institute, 2015). These figures include only the demand for analysts and managers in the area of Big Data. The authors of the report compared them with trends in the supply of employees having advanced analytical skills: a talent for mathematics and general education are not enough, therefore, employees are mainly recruited among the graduates of courses covering statistics and teaching quantitative skills. It turns out that Poland performs unexpectedly well: it is ranked second among 38 countries surveyed, first of all, as a result of the fact that 23% of university graduates have advanced statistical skills (for the sake of comparison: in the US 8%, and in Germany 4%). McKinsey Global Institute summarises the report by claiming that countries like Poland could become global suppliers of talents – however, this should not happen through immigration but primarily by creating jobs domestically.

Along with the expansion of the Internet, new forms of digital labour market, which meet some challenges created by demographic trends, are emerging. Currently, they can be divided into three groups:

• connecting individuals with the workplace: e.g. LinkedIn. At present, it is the most developed group of 364 million users worldwide. In addition to standard CV-like information which can be easily sought through such platforms, employers also receive soft information, e.g. on a given person’s presence in a social media world.

• connecting groups of people with specific tasks e.g. Uber, Upwork. Freelancers get assignments thanks to such solutions, e.g. to provide transportation service or design a website.

• talent management, various platforms allowing the collection of additional information. For example, PayScale gathers information about earnings, which helps employees to reasonably define their pay requirements. In turn, Pymetrics, with the use of short games, constructs the profile of an employee, which contains information like e.g. willingness to cooperate, fear to take risk, ability to learn on mistakes. At present, these platforms are in the phase of development, but their perspectives are promising.

In general, new forms of the digital labour market have triple impact on that market. Firstly, they give jobs to the unemployed and those working part-time, because thanks to online platforms they can find a full-time position. Second, they limit frictional unemployment through the reduction of time needed to find a job, and thirdly, they raise productivity as a result of matching employees and jobs more effectively.

In the mid-90s, new online companies operating in the area of recruitment and HR entered the market. They facilitate finding a new permanent job or an additional activity. This group includes entities providing opportunities to find a job or an employee, such as LinkedIn, Monster.Com, Vault, Indeed, Careerbuilder, Xing. In addition, new companies connecting services or employees with work assignments, like e.g. Uber, TaskRabbit, Angie’s List, Upwork were established, as well as entities used for talent management, such as Good.co, Payscale, ReviewSnap. According to McKinsey Global Institute (2015), online platforms matching employees and employers may add approximately USD 2.7 trillion (approximately 2%) to the global GDP by 2025 and enable 72 million people to find a job. On such websites, employers could publish job announcements, whereas the website users could filter them using key words and geographical location. With time, they have become very popular and gave millions of people an opportunity to find a job: just Monster.com website records 7900 searches per minute.
The biggest entity on the „digital HR” market is LinkedIn operating since 2003, which has 364 million users; in 2014, it facilitated the employment of approximately one million Platforms of this type have evolved gradually, at the beginning being a kind of an advertising pole on which the employees posted their CVs describing education and professional experience. Currently, to a large extent, LinkedIn plays the role of a network of contacts enriched with recommendations or assessment of hard and soft skills (endorsements) being an external confirmation of the information contained in virtual profiles. So far, LinkedIn users evaluated the endorsements of each other approximately 3 billion times. The users may also join groups of interest and follow selected companies. The latter ones may publish announcements of jobs for which the users may apply by referring a prospective employer to their public profile.

Even though LinkedIn set a new standard among the platforms connecting employees with employers, the functionalities it offers, so far considered ground-breaking, start to be perceived as quite traditional in comparison to the solutions offered by the new players. Start-up Good.Co uses psychometric tests to determine whether a given employee matches the new workplace not only in terms of professional skills but also the work culture. Knack uses computer games to specify soft skills of employees, such as creativity or leadership skills.

In addition, start-ups offering complex HR tools to manage human resources in companies are established, including, for example, Evolv, which created a system that contains tools to stimulate co-operation in the organisation, competence development, performance measurements, compiling periodic work summaries or even helping to plan replacements for particular positions. Such tools are especially useful for companies having offices in many places in the world.

Advanced technological tools to search and manage talented people were created by the group „People Analytics” at Google, which aims to „match precision in managing people with the level characteristic for engineering decisions”. One of the elements of this approach is a project called „oxygen” intended for identifying the characteristics of a leader, based on available data. Google has introduced a flat management structure, in which only 14% out of 27,000 employees hold senior management positions, 3% are directors, and 0.3% perform functions at board level. In the opinion of a consulting company Fabernovel, when a company like Google, Facebook or Apple employs one person, their market competitors who use traditional management methods must employ from 3 to 9 people to achieve comparable revenues.

In Poland, the largest online platform for the labour market, i.e., Pracuj.pl, was founded in 2000. On average, it publishes over 30 thousand job offers (386,000 in 2014) per month and has a database of over 3.7 million registered users. Within a month the portal is visited by about 2 million unique users.

In 2014, the number of job advertisements in Pracuj.pl increased by almost 17% compared to 2012 (330 thousand offers) and by almost 8% compared with 2013 (358 thousand offers). Trade and sales are the sectors in which most ads have been published – 84 thousand jobs in 2014, which made up 22% of total offers.

Pracuj.pl also introduced two products in the area of technological solutions offered in the SaaS model (Software as a Service), namely, eRecruiter ATS system, which supports companies in conducting recruitment, as well as empl.co platform, which streamlines communication and HR processes in companies.

Pracuj Group currently employs over 500 people (450 people in Poland and 80 in Ukraine), about 200 more than in 2011.

Source: Own elaboration

The number of people who are likely to benefit from the digital activity of HR platforms in the forthcoming decade will reach 500 million people – around 10% of the active professional population in the world. Out of that number:

- 230 million people will be looking for a job for less time than it would be the case if they did it in the traditional model.
- 200 million unemployed and working part-time will gain additional assignments.
- 60 million people will find a better job corresponding to their qualifications and talents.
- 50 million people will take a permanent job in place of a previous temporary work.

It is estimated that the biggest beneficiaries of the services offered by these platforms will be the countries with the highest levels of unemployment and low economic activity, such as North Africa, Spain, and Greece. Another beneficiary will be the United States, where the labour market is characterised by high flexibility and mobility, and the impact of new technologies will further reduce the weaknesses and limitations of their labour market. Countries which, as the forecast of McKinsey indicates, will gain the least advantage of the digital opportunity in this area include China and Japan. According to calculations made by McKinsey Global Institute (2015), the impact of online head-hunting platforms in 2015 will be 2% of GDP and 72 million work positions globally, as well as 2.2% of GDP and 353 thousand positions in Poland.

The main beneficiaries may be those working part-time or likely to engage in such work. The survey conducted in the United States showed that 75% of mothers staying at home would like to work part-time. Simultaneously, a LinkedIn survey in 2015 indicated that nearly 40% of employees working part-time would like to get new orders. It is estimated that the impact of business platforms like LinkedIn will also result in the reduction of costs of employment supporting programs – The McKinsey report estimates such financial profit at 9% in the United States, mainly as a result of shortening the job search period.
TABLE IV.2. Types of online HR platforms

<table>
<thead>
<tr>
<th>Type of a platform</th>
<th>What does it offer?</th>
<th>Examples of platforms in 2015</th>
</tr>
</thead>
</table>
| Connecting individual employees with traditional work places | • Placing job offers  
• Creating CV online  
• Advanced search for candidates or offers  
• Transparency of companies and employees within the scope of reputation, skills, etc. | Careerbuilder  
Glassdoor  
Indeed  
LinkedIn  
Monster  
Vault  
Video  
Xing |
| Group work platforms                                  | • Matching groups of candidates with projects for freelancers or group projects  
• Conducive to concluding agreements thanks to the promotion of transparency of reputation and evaluation | Amazon Home Services  
Angel’s List  
TaskRabbit  
Uber  
Upwork |
| Talent management                                     | • Assessment of candidates’ skills and personal properties  
• Personalisation of new employee onboarding, training, employee management  
• Optimized creation of work teams and matching employees with particular tasks  
• Assistance with the selection of the best training and development opportunities | Good.co  
PayScale  
Pymetrics beta  
ReviewSnap |

Source: McKinsey Global Institute, 2015

The same study estimates that the financial profits will also be gained by companies – the operating costs of their HR departments will decrease by 7%. The development of similar platforms raises the significance of “passive recruitment”, in which recruiters directly contact employees who, in their opinion, match the profile of a requested employee instead of posting a job offer and waiting for the reaction of interested people. Research conducted by HR JobsTheWorld showed that employees hired using the method of passive recruitment worked in a company 21% longer, on average. It is associated with the fact that they make a selection of the new company not as a result of a sudden employment need, but as a consequence of a conscious decision related to the greater professional development opportunities, better wages or better relationship between work and personal life. The method of passive recruitment is most suitable for highly skilled employees in countries with rapidly growing economies.

BOX IV.4. SHARING ECONOMY

Sharing economy is a term covering a wide variety of new business models and platforms for sharing goods and services, which were created as a response to the expansion of digital technologies. As a result, private entities and organisations gained the possibility to distribute or re-distribute goods and share them among each other. This way, the consumers gained access to goods they could not afford if they had to purchase them just for themselves.

The origins of such business activity date back to the mid-1990s, when eBay and Craigslist online platforms entered the US market offering new product sharing options to their customers. However, a pioneer of the sharing economy on the real estate market was the Couchsurfing platform, which connected, free of charge, persons offering accommodation to travellers. Its footsteps were followed on a huge scale and commercially by the Airbedandbreakfast.com website, whose name, abbreviated later to Airbnb.com, has almost become a synonym of a sharing economy and its global success cleared the path to the next similar projects.

Sharing economy operating at the interface of new technologies and open data enters every area of life changing the relations between employers and contractors, and at the same time challenging the labour market and tax regulations. It is estimated that it brings profits to the economy and consumers in five areas:

1. It enables the introduction of “idle capital” into the market – e.g. cars or apartments that are not used or are used below their potential.
2. As a result, companies and whole sectors deepen their specialisation thus being able to better meet market needs.
3. It reduces the transaction costs because contacts between contracting parties are facilitated and simplified, with a concurrent increase in the monitoring of the service provided.
4. It reduces asymmetry of information because the opinions of previous users provide additional information about the product or service to the next customers.
5. It challenges the operation of companies that offer ineffective and expensive products, whose activity has been regulated too strictly.
The operating costs of companies conducting activity within the scope of a sharing economy are lower by approximately 20-30% than in the case of their competitors operating under a traditional model, by hiring employees and owning assets necessary to perform services (e.g., cars in the case of transportation companies). Car-sharing companies (e.g., Uber) do not have assets and only operate at the point of contact between people being ready to perform work and people requesting certain services (e.g., transportation).

Uber is an example of a company operating in that model – it is a mobile application allowing users to order cars with drivers. It is an entity whose activity echoes in both United States and Europe. Uber cannot be classified as any of the existing forms of conducting business activity – even though it operates in 57 countries of the world it does not pay local taxes, does not enter into any formal arrangements with drivers, adding them to the application instead, and does not require any licence to drive passengers; only insurance, driving licence and vehicle registration certificate is needed. According to Fortune magazine, in San Francisco, a city where Uber was set up, one-third of taxi drivers resigned from work from taxi corporations and now accept orders via mobile applications. The Uber’s model of activity triggered a reaction from regulatory authorities. At the end of June 2015, the French police detained two managers of Uber under the charge of conducting illegal activity. In several countries, including among others, Poland, Belgium and Spain, work on the introduction of new regulations, according to which drivers would be obliged to hold a licence for transporting persons, has been initiated.

Robert Reich, a former secretary of the U.S. labour department under Bill Clinton’s, when referring to the activities of companies operating outside the official system of providing work (agreement, contract) compared that situation to the employer-employee relations prevailing towards the end of the 19th century, when “there was no economic safety, predictability, and employees did not have a chance to receive fair remuneration for their work”. As Reich stated, this led to the establishment of trade unions and enactment of labour market regulations, which are treated with distrust by the sharing economy today. Some of the analysts predict that the pressure of the shared service market will lead to the creation of a new type of contract being somewhere between the employment agreement and mandate contract. Under the new contract, both parties would share labour costs (the principal would refund e.g. business expenses, and the contractor would pay his own social security costs).

An interesting dimension of the economy was also revealed in the United States in the context of racial discrimination – according to the results of a research conducted by Airbnb, people of white ethnic origin who offered their apartments as lodging to travellers earned income 12% higher than landlords of a different ethnic origin.

In spite of doubts raised by regulatory authorities, the development of the sector of companies operating under a model similar to that used by Uber is unstoppable. In July 2015, the Wall Street Journal described the high rate of development of the mobile applications market where even the tiniest sphere of life has its equivalent of Uber by giving a meaningful title to the article “There’s an Uber for Everything Now”. In Israel, a start-up called RideWith, owned by Google corporation, was established. It connects commuters using the same routes to their workplace. The price, suggested and later negotiated by both parties (Google charges 15% of it) for the trip, is calculated automatically on the basis of the length of the journey and costs of amortisation of a vehicle. In Poland, this market has also been developing at a high rate; in June 2015, Lynk, a start-up similar to Uber, however, with a difference that the price for the trip is determined in advance, started its activity in the Tri-City. Additionally, in Poland, Flyover, i.e., the first application for sharing flights was created with an intention to fill the market gap of non-standard and often short plane trips to another country, e.g. in connection with a cultural event held there.

The McKinsey report (McKinsey 2015) indicates that the next stage in the development of this type of virtual labour market will be based on the growing role of reputation-building skills in the digital world. Individualised “recommendation” also used in the traditional labour market will be as a consequence of further digitisation, a commonly used tool. At the same time, as pointed by the report authors, digital reputation developed by the users will not be easily transferable to other platforms, which means that an employee who develops his or her profile, e.g., in LinkedIn, will have to constantly keep track of new digital tools, probably being even more sophisticated and precise in matching employers and employees to maintain and expand their own professional recognition.
Freelancing, a model traditionally chosen by the representatives of the media and industries related to creativity is an example of development of the digital labour market. This phenomenon was developed in the USA around the 80s: a lot of people provided services like graphic design, writing reports, translations. These types of activities did not require permanent contact with the employer: they were contracted, and after a specific period of time, the client received the finished product. The emergence of this form of work led to the professional activation of groups, such as parents of young children, students, or the elderly (Johns, Gratton 2013). On the other hand, companies gained flexibility: they could outsource the work if they had more tasks but did not have to pay employees for the remaining time, thus optimising their costs. Along with the ICT advancement and the development of platforms for matching clients with contractors, freelancing has become an attractive alternative to permanent employment of, among others, IT specialists, as well as HR managers or specialists (Buchholtz Bukowski, 2015).

Since the late 90s, new online platforms have been emerging, giving employers an opportunity to hire short-term and skilled employees. The biggest of them – Elance and Guru were established in 1999, oDesk in 2005, and Freelancer in 2009. The first one gathers freelancers from more than 180 countries worldwide. These platforms earn their profits by charging employees and in some cases employers with a fee. They grow on a scale so far unknown to traditional industries – in one of them, the number of hours worked increased by 55 percent from 2011 to 2012, the amount of wages reached USD 360 million, and the number of active contractors increased by 1,000 percent between 2009 and 2013 (Agrawal Horton Lacetera Lyons 2013).

<table>
<thead>
<tr>
<th>Platform</th>
<th>Number of employees in the USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upwork</td>
<td>2,500,000 freelancers</td>
</tr>
<tr>
<td>Uber</td>
<td>160,000 drivers</td>
</tr>
<tr>
<td>Lyft</td>
<td>60,000 drivers</td>
</tr>
<tr>
<td>Taskrabit</td>
<td>25,000 service providers</td>
</tr>
<tr>
<td>Freelance Physician</td>
<td>10,000 physicians</td>
</tr>
<tr>
<td>Sidecar</td>
<td>6,000 drivers</td>
</tr>
<tr>
<td>HourlyNerd</td>
<td>5,400 consultants</td>
</tr>
<tr>
<td>Postmates</td>
<td>4,000 couriers</td>
</tr>
<tr>
<td>Instacart</td>
<td>1,000 purchasers</td>
</tr>
<tr>
<td>Favor</td>
<td>225 couriers</td>
</tr>
</tbody>
</table>

Source: McKinsey Global Institute, 2015

A survey conducted by the oDesk platform shows unsurprisingly that most often employers pointed to the factor of the reduction of costs (76 percent) (e.g. searching for and supervising employee) as the most decisive for the remote recruitment of employees. At the same time, 46 percent indicated that this type of work was done faster, and 31 percent mentioned difficulties in obtaining qualified employees using traditional methods. The lowest number of respondents, i.e., 21 percent, pointed to logistics-related factors (lack of work place for the employee) as an important element of using the remote form of assigning tasks (Agrawal Horton Lacetera Lyons 2013). The most important aspect of removal of geographical barriers in the process of recruiting employees is related to its costs, which arises from the fact that the vast majority of clients come from highly developed countries with high labour costs, and most contractors from countries with low labour costs – the oDesk platform brings ten times more employees from Ukraine than from Spain, a country with a similar population potential. Significant differences are also reflected in the level of wages, with unexpectedly high rates of wages in countries like China, Poland and Russia. It is connected with the fact that most providers of services in the freelancing model in these countries operate in the IT sector, which on average, offers twice as high earnings than in the translation sector and over three times as high as in the administrative support sector (Agrawal Horton Lacetera Lyons 2013).

Meanwhile, Eurofound (2015) distinguished as many as nine new broad forms of employment that have appeared recently on the labour market: employee sharing, job sharing, voucher-based work, interim management, casual work, remote working – based on mobile technologies (ICT), crowd employment, portfolio work, and collaborative employment.

1. **Employee sharing** means that the individual employee is hired jointly by a group of employers (who are not customers of a traditional temporary job agency), which results in the creation of full-time employment. As a result, employees rotate between different companies. The main reason for employer’s involvement in an employee sharing scheme is the demand for specific human resources (with certain skills or due to increased demand), which could not be obtained on the basis of a full-time contract of employment due to insufficient work load. An additional advantage of this form of employment is the fact that a rotating employee, who returns to the same employer, is already familiar with the work and organisation and does not require another onboarding process.

2. **Job sharing** is a form of employment, in which a single employer hires two or more employees for the joint performance of a specific task, combining two or more part-time positions to create one full-time position. People sharing a particular job are groups formed by employers rather than autonomous groups of employees. This solution is particularly often used when employees have complementary skills and qualifications.

3. **Voucher-based work** is a type of work in which payments related to the employment relationship existing in such circumstances are based on a voucher instead of a contract. In most cases, the status of people who use this form of employment is somewhere between employees hired under a standard contract of employment and the self-employed. In some cases, this work entitles employees to accumulate health insurance premiums. Most persons employed in this form are those who previously operated on the outskirts of or outside the labour market. This form of employment allows a formal declaration of work with minimum administrative obligations.

4. **Interim management** is a new scheme of work among employees and is applied in situations, where an employee – usually a highly specialised expert – is hired on a temporary basis by the employer, often to carry out a specific project or to solve a specific problem.
In contrast to traditional fixed-term contracts, interim management has some elements of consulting, however, the expert has the status of a worker, rather than external counsel. Companies are particularly willing to use this type of employment in the case of ongoing restructuring or if they want to achieve an increase in the scale of activity using additional resources of management skills.

5. Within the framework of casual work, the employer is not obliged to provide the employee with a regular job, but has the possibility to call upon the employee to perform the work when such a need arises. Employers often keep the entire pool of such workers, whose services they can use immediately when a task to be performed has appeared. As a result, it is not a stable and continuous work. There are two types of this form of employment – the employer searching for a worker, if needed, and work on call while sustaining the employment relationship (often specifies the minimum number of working hours, which the employee provides to the employer). This form of employment is characteristic especially for seasonal work or in industries with high volatility of demand. It is provided mostly by young, uneducated workers.

6. Remote working – based on mobile technology (ICT), i.e., the freelancing, which is frequently described above, is characterised by the fact that the employee can perform his work from anywhere, at any time, with the support of modern technology. This form differs from ordinary remote working with considerably lower dependence on the workplace (e.g. working while travelling) and greater informality in employer-employee relations. In the case of such form of employment, the employer automatically accepts the reduction of control over the work performed by the employee. Such work requires that employers create a remote, secure system of access to communication tools and information exchange. On the other hand, by allowing the employee to work remotely, the employer reduces the cost of office space.

7. Crowd employment uses a web-based platform that gathers a larger group of employees and employers in one place, which in turn, often results in dividing large tasks into smaller ones among a larger group of people. Technology is the key here, because thanks to technology, customers and employees are connected and, in most cases, the results of the work are delivered using this channel. This is a new option for the self-employed and freelancers, which also has low dependency on the work place.

8. Portfolio work consists of doing work by the self-employed for a large number of customers, with performance of only small part of a larger task in each case. Mallon (1998) argues that this form of employment has enabled employees to become independent from one employer and allowed them to offer their skills to a larger group of recipients. It is the predominant form of employment in the case of creative professions, which also allows a greater professional development thanks to a greater diversity of projects.

9. In the case of collaborative employment, freelancers and the self-employed cooperate in different ways and in different forms, often informal, which in effect go beyond the traditional relationship of business partners.

In the opinion of authors (Eurofound 2015), employee sharing and job sharing are the forms of providing work which have the most favourable working conditions from the point of view of the employees. Interim management can also be regarded as favourable as the employees hired on the basis of such contracts may consider a higher stress level and personal responsibility for the development of their own skills and career as something normal, as a result of which other benefits typical for such contracts are decisive for them.

Remote working – based on mobile technology (ICT) also offers some important benefits related to flexibility and autonomy of work, even though, on the other hand, there is the danger of work intensification, higher levels of stress, increased working time or the blurring of boundaries between private life and work, as well as outsourcing traditional employer responsibilities, such as health and safety protection, to workers. For freelancers and the self-employed, forms of work such as portfolio work, crowd employment and collaborative employment offer mainly a potential to enrich the portfolio of executed orders through their diversification. These forms of employment are characterised by high uncertainty of income and low levels of social protection (typical features of freelancing). A job based on vouchers has unfavourable working conditions, including, in particular, instability and limited access to career development. On the other hand, this form gives certain advantages, namely the opportunity to work legally, which brings minimum social protection like the minimum wage and health and safety standards, and possibly better pay. Among the analysed forms of employment, casual work is the one that raises the most concerns related to working conditions. This is because it is characterised by a low level of job security and income, and poor social protection.

Flexibility is a common element to all forms of employment identified above, and in all cases, except for casual work, it can be considered positive from the point of view of working conditions, enabling employees to achieve a better work and life balance. It also brings greater autonomy, responsibility and scope of tasks – features usually appreciated by employees. Disadvantages of flexible forms of work are revealed when we take into account the availability of training and opportunities to develop skills and careers. While employee sharing, job sharing, crowd employment and collaborative employment contain elements of a positive impact on career opportunities, the interim management, casual work, portfolio work and voucher-based work are less favourable in this aspect. The instability of work is one of the negative consequences of labour flexibility, and this in turn leads to a higher level of stress and its intensity as the employees try to work more hoping for a greater level of work safety and further orders.

According to the authors (Eurofound 2015), employee sharing, job sharing and interim management have the greatest positive impact on the labour market among all studied forms of employment, while casual work is the most disadvantageous. However, all of the identified new employment forms have the potential to aid labour market integration of specific groups of workers. In the case of job sharing, casual work and voucher-based work, it refers mainly to people who do not want to work full-time, for example, due to the child care or sick care, continuing education, or their own health problems. Interim management and job sharing may allow older workers to extend their period of active work beyond the retirement age. Casual work and crowd employment can enable access to the labour market for young people. Job sharing, remote working and crowd employment can be beneficial for employees in remote rural areas with limited possibilities of finding a job. On the other hand, these forms of employment, with the exception of employee sharing, have a limited impact on the creation of new jobs.
Employee sharing, job sharing, interim management, voucher-based work and collaborative employment are more visible in traditional industries, while remote work, portfolio work, and crowd employment are important for the IT sector and creative industries. Most analysed forms of employment have no specific legal form, which is a result of their emergence as a response to changes in the labour market, and not a development plan implemented in the labour market. Casual work and voucher-based work that have a legal framework are an exception here.

Against this background, the statistics showing the Polish landscape of new work models and flexible time organisation are very low; focusing on a contracting or working time considerably limits the perception of how a task could be carried out if assumptions concerning the conditions of their performance were disregarded. Relatively, most frequently mentioned work form is remote work, specified in the Polish Labour Code since 2007, which – although more and more employees and employers are familiar with it – is not a viable alternative to working on the premises of the employer (Buchholtz Bukowski, 2015). PARP study (2014) indicates that slightly more than 3% of companies employed remote workers, and 11.2% of respondents showed a willingness for such work. In turn, the WISE study prepared for the World Bank (in printing) shows that even after the amendment of the Act on employment promotion and labour market institutions, grants for remote working constitute one of the relatively less popular forms of support in the Polish counties (poviats).

In 2007-2008, three projects related to the creation of a nationwide network of public Internet access points, intended for raising professional qualifications, called the distance education centres, were executed in Poland. They were supposed to be the centres of lifelong learning with the use of e-learning methods. As part of the projects „Distance Education Centres in Rural Areas”, „Internet Village” and „Internet Educational Centres In Rural Areas”, a total of over 1.1 thousand public Internet access points were created in rural areas in Poland. In 2002-2006, the Ministry of Labour and Social Policy in cooperation with labour offices formed almost one thousand municipal information centres whose aim was, according to assumptions, to fight against unemployment (Buchholtz, Jasiewicz, Tarkowski 2015).

3.1. ICT IN PUBLIC EMPLOYMENT SERVICES

Technology changes interactions between people, as well as communication between citizens and the government institutions. This also applies to public employment services, which increasingly use ICT. It is currently unknown how much of the labour office tasks can be improved by computerisation and how this change would translate into the quality and efficiency of services provided. An example that gives an overview of these issues is the employment services in the Netherlands, which is the leader in the introduction of technologies in this area.

The reorganisation of the Dutch system for public employment services did not result from the desire to increase the efficiency, but from the need to reduce costs. In 2010, a goal of reducing the costs of this system by up to 50% by 2015 was set. The main way of achieving such significant savings was to significantly reduce employment (by approximately one half) and the number of local labour offices (by ca. two thirds). Personal contact with a person seeking employment has been limited and replaced with electronic interaction. For the first three months of unemployment, contact is maintained exclusively through online channels, and afterwards, traditional or telephone conversations are held every three months. Moreover, individual and group support for most of the unemployed has been limited by means of introducing e-services in its place. Customers without Internet access may, however, use standard services. In addition, new tools have been developed:

- **Profiling** of the unemployed is carried out in the form of an online survey. On that basis, the likelihood of finding a job by a given person is determined and instruments that can help in finding such job are selected. The profiling was also introduced in Poland in 2014, however, the online survey is completed by a labour office employee following a conversation with an unemployed person. In the Netherlands, such procedure does not require physical presence in the office.

- An **online account** is opened for every unemployed person, where the schedule of actions and suggested job offers are presented. It’s activity is monitored on an ongoing basis.

- **Counselling support technologies** are used by job agencies thanks to the data analysis systems, which, among others, compare job seekers with each other. Such information helps advisors prepare for a personal conversation with the client.

- **Sanctions** – since the activity of a candidate can be analysed automatically, in the event of a job search being too passive, reminders are sent. When the system detects that a given person does not seek employment actively for a longer period of time, sanctions can be imposed on such a person, however, they are not automatic and must be accepted by the employees.

Certainly, the possibility of introducing e-services related to employment depends on the ability and skills of the target group to use the Internet. In the Netherlands, 95% of the unemployed are registered online, and 85% use e-services offered by their online account, e.g. submit applications for benefits online. The procedure is different in certain EU countries, as in many of them there is a possibility of applying for benefits both online and in the traditional way, but depending on the country the popularity of this solution varies. However, other tasks of labour offices, like counselling or training, can be more difficult to transfer to the web. Here, EU countries use different solutions, e.g. Belgium combines e-learning with standard courses; in Estonia, one can contact the employment office via Skype, while Sweden plans to organise virtual meetings of the unemployed with employers.

In Poland, the practices described above take place mostly in the traditional manner. The introduced electronic systems (among others, Sirius STD and SEPI platform) are used by office clerks, but contact of the unemployed with the labour office is computerised only to a small extent [e.g., you can register with the labour office via the Internet]. However, there is no certainty, how a greater use would affect the quality of service, given the shortage of digital skills among the unemployed with low education levels and the elderly.
In the Netherlands, where the degree of saturation with digital technologies is higher, preliminary studies have shown a decline in customer satisfaction after the reduction of personal contacts and introduction of online procedures (OECD 2015).

Certainly, in Poland there is space to expand and improve IT systems that support employment services. Practice shows that the tools used in the labour offices limit the duration of the procedures and improve work, but they are implemented slowly and in many areas, still traditional methods are used. In addition, often the problem is to adapt employees and customers to the new system of work. Faster implementation of the existing solutions, development of the new ones, and training of labour office employees should bring a positive result in the form of improvement of the quality and speed of service. On the other hand, given the low computer skills among the unemployed, it appears that currently, such solutions as those applied as in the Netherlands should not be introduced, especially in view of the fact that in the future, the experience of countries currently leading in terms of digitisation of labour offices can be used.

3.2. NEW TECHNOLOGIES AND TRANSFORMATIONS IN LABOUR RELATIONS

By fundamentally changing the relations in the labour market, digitisation also leads to a change in the set of competences needed to effectively move on in that market and avoid redundancy. Creativity, social skills and human interaction are the features which, on the one hand, are difficult to automate, but on the other hand, are key factors for performance (Levy and Murnane, 2005). As a result of the digital revolution, those who have the following features will benefit most (Bergstrom, Wennberg, Stadin 2014):

- **Perceptiveness and flexibility** in responding to unforeseen events, such as crisis management, complicated disease treatment planning,
- **Creativity and intelligence** in tasks such as cooking, drawing, and other activities that require visualisation of sensations and feelings,
- **Empathy and social intelligence** in recognising emotions.

Thus, the future of educational systems meeting the needs of digitisation of the economy may not lie in abandoning the system of education typical for social science faculties and moving towards hard skills in the STEM area (science, technology, engineering, math), but in combining technologies and social skills in the process of solving tasks. According to the Talent Shortage Survey conducted in 2013 by the Group of Manpower, approximately 20 percent of employers worldwide cannot fill vacancies due to the lack of suitable candidates having skills and personal attributes such as motivation, interpersonal skills, and flexibility. In turn, the study of Adecco Group North America conducted in 2013 indicated that skills such as effective communication, critical thinking, creativity, and ability to cooperate are according to 44 percent of high-level managers an area with the greatest deficiencies in the employees’ competences. Other research has shown that self-awareness and problem solving skills were more decisive factors for success in professional career than gender, education, age, and the number of hours worked. Therefore, it is not enough to extend the school programs with additional classes of computer science and promote fields of study related to IT. The education system should to a higher extent teach soft skills, cooperation, or problem-solving.

The omnipresence of communications technology created opportunities to perform work at home or elsewhere, e.g. when travelling or in a cafe. It has great implications for the working time: it has become much easier to adjust hours, which increased the flexibility of workers. On the other hand, these opportunities have led to increased expectations of entrepreneurs, bosses or co-workers, making them believe that a person can be contacted during non-working hours or even 24 hours a day.

A conflict between work and leisure or family time has become more evident because technology has blurred the boundaries between them. It is illustrated by the survey conducted among Canadian workers and employers. As the main advantages of remote work, those employed mentioned greater time flexibility and, as a consequence, higher productivity. When they can adjust hours during which they perform tasks, they choose them freely so that they can do more. Digital world, while affecting jobs, inevitably affects other spheres of life, too. Freelancers, constantly looking for customers have problems with work and life balance.

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**FIGURE IV.12. Internet use skills among the unemployed in selected countries, 2013**

Source: Own elaboration based on Eurostat data
The prevalence of information technologies and mobile devices has boosted employee productivity and elevated levels of stress in their lives. Studies conducted at the University of California in San Francisco showed that 49% of entrepreneurs, including those engaged in business start-ups, suffer from the problem of mental health, from which depression, being found in 30% out of 242 respondents, is predominant, while in the case of the total population this ratio amounts to 7% in the United States.

**BOX IV.5. ECONOMY OF ALTRUISM AND ECONOMY OF HAPPINESS**

The global financial crisis of 2008 drew the attention of the economists to the behavioural economics as a study critical towards the neoclassical paradigm and opting for a more realistic description of behaviour of individuals, and, in particular, the process of making decisions and human relationships including their soft skills. Behaviourists mention these factors as essential for social and economic relations, including in the labour market, contrary to the neoclassical approach ignoring the aspect of social skills. In the 50s and 60s, the critic of the homo economicus concept became the basis of the theories developed by the representatives of the first generation of behavioural economics, namely, Herbert Simon, Harvey Leibenstein and Richard Nelson, who strived towards the expansion of the theory of economics with psychological foundations and making it more realistic. At the same time, Friedrich Hayek, one of the founders of the Austrian school of economics argued that the most important and most difficult task for a human being was to comprehend one’s own limitations, whereas the key challenge was the ability to be understood by others (Franz Leeson 2013).

The postulates of behavioural economics are, today, gaining a new framework in the concepts of the economics of altruism and the economics of happiness. In France, Jacques Attali, the initiator and first President of the European Bank for Reconstruction and Development, as well as advisor to successive presidents of France developed the concept of „positive economics” gathering outstanding personalities from the business environment, non-governmental organisations, social enterprises, as well as artists, philosophers, social innovators, thus creating a network of contacts and developing, on the basis of the participation culture, solutions and recommendations for public policies in the area of technology, environmental protection, politics and new (positive) economics within the framework of the free market to cooperation, morality and reciprocity.

In his famous book „Brief History of the Future” published in 2006, Attali foreshares the emergence of an economy based on human relations managed by a new class of altruists, world citizens, and members of many societies for whom work will be a pleasure deprived of pressure. Attali predicts the establishment of new enterprises dealing with human relations, in particular, in the area of urban management and natural environment management, health care, women’s rights, fight against poverty, and fair trade. According to Attali, such enterprises will replace private businesses and public services, and will form a basis for the development of a new approach to work based on providing pleasure, which will create a new area of the economy in the future and new types of jobs.

Arguments that remote working is conducive to the fulfillment of family-related duties cannot be fully confirmed: some employees notice this advantage, but almost half of the respondents answered that the time devoted to relatives or personal matters reduced and was replaced with time devoted to work (Duxbury, Smart 2011). This is partly because the entrepreneurs expect higher productivity from remote workers in exchange for the possibility to work at home. As a result, over 60% of respondents admit that they work much longer (Maruyama et al. 2009).

On the other hand, remote workers can try to limit the negative effects and benefit from the positive ones. Among others, they can more effectively divide their time between work and home responsibilities. Time is not wasted on commuting, so they devote these hours to their family. A properly arranged schedule allows remote workers to organise their day in such a way that it is possible to take care of one’s family, for example, have breakfast with the children, which is often impossible for people working in the office. It appears that the most effective and most preferred solution for remote workers is when they can freely set the hours of their work. For this reason, despite the fact that remote working takes a lot of time, it is often chosen because of the benefits that it brings. Another important factor is age: people over 55 years of age who do not have duties related to raising children, and often hold senior positions in their company are more satisfied with remote working than the young ones (Maruyama et al. 2009).

In Poland, the problem of reconciling work with family and personal life is important. In comparison with other OECD countries, many Poles have problems in that area. In general, relatively few people work very long (7% of people work over 50 hours per week, whereas in the OECD – 13%, respectively), but the Poles are left with relatively little time for private affairs and social life, namely, 14.2 hours. Out of the OECD countries, only Turks and Mexicans have less time for such matters (according to OECD data). Justifying unsatisfactory results of Poland on the grounds that its level of economic development is lower is not entirely reasonable: the index of work life balance drawn up by the OECD shows that some countries, such as Hungary, despite low income in comparison with other OECD countries, scores above the average, while citizens of the USA and Japan have difficulty in reconciling work and private life. Poland ranks 28th out of 36 countries for which the index is published. Work culture that is not conducive to maintaining such a balance can become a problem when new technologies will further blur the boundary between work and private life. Regulations such as in France, where electronic correspondence and conversations with the use of company mobile phone with the employer are prohibited after 6:00 p.m., are one of the ways to solve such problems.

Another major problem is the balance between work and parental responsibilities; particularly for women. It brings the risk of falling out of the labour market – mothers can face discrimination from their employers. Another problem is the too small, though growing, number of nurseries and kindergartens in Poland. In this case, digital technologies can be beneficial: for example, young mothers will be able to work on a remote basis.
4. DIGITAL SKILLS AND RISK OF DIGITAL DIVIDE

4.1. DIGITAL SKILLS

The level of computer skills in the Polish society is lower than in other EU countries. Comparable data covering the European Union is published by Eurostat, which regularly carries out surveys concerning the performance of particular computer activities: the simplest of them is copying files, and the most advanced – writing programs. High skills are assigned to people who have done 5 or 6 out of 6 activities. A relatively low level of competence among the population (21% with high computer skills in Poland, and 29% in the EU-28 in 2014, respectively) forms a barrier for both society and the economy. At a time when digital technologies are used more and more often by companies, individuals unable to use the computer efficiently are exposed to the risk of decline in their value on the labour market. It appears that many Poles believe that their ICT skills are insufficient to find or change a job. In addition, the figure shows that although the level of competence in Poland is only higher than in two other countries, namely, Romania and Bulgaria, in comparison with citizens of similar countries, Poles are relatively more likely to rate their skills as sufficient. In reality, however, they are rather low. In certain social groups, especially those economically inactive for various reasons, the use of computer or the Internet is a rare value, so one cannot even talk about more advanced ICT skills.

The situation described above gives a negative image of Poland, but disaggregation of the data reveals positive trends. As seen in Figure IV.15., the level of computer skills among adults actually strongly deviates from that observed in the EU, and the pace of catching up is not satisfactory. Meanwhile, in the age group of people who are entering or have entered the labour market the situation looks completely different. Already in 2012, young Poles were above the EU average, and since then, the advantage has increased. An evident gap prevailing at the time of accession to the EU has been overcome in less than 10 years.

It seems difficult to replicate among the older generations. People born in the Internet era certainly learn new technologies more easily, and use a lot of skills every day, using computers for entertainment or as a tool for contacting friends. It turns out that Poles born after this transformation are more familiar with computers than their European peers. In contrast, the largest gap exists in the case of people born in the 1960s. Computer skills of older people are lower, but this also applies to people of a similar age in Western Europe. However, among younger people a reverse situation can be observed in some countries: Lithuania and Estonia have become the leaders, and many countries regarded as poorer record high scores; on the other hand, highly developed countries such as Sweden and the Netherlands were below average. A relatively good position of younger Poles is a part of a broader tendency, but the new leaders, among whom there are many new member states achieve even better results. Another reason why such good results achieved by young people should not be misleading is the fact that at the age of 30-40, they will continue to be in the labour market and their low level of skills will be problematic for both themselves and their employers. Unfortunately, in the older age groups the process of gaining competences within the scope of ICT is slow, partly due to the fact that companies make small investments in their employees. Especially the employees of small enterprises who should not expect that they will learn computer skills at the workplace (section concerning companies).

FIGURE IV.13. Percentage of persons having high computer skills and percentage of persons who think that their skills are sufficient for finding a new job, 2011

FIGURE IV.14. Percentage of Internet users by groups

Source: Own elaboration based on Eurostat data. Dots mean EU countries + Norway as well as Iceland. Poland was marked with blue dot

Source: Own elaboration based on research of Social Diagnosis, 2013
In another comparative study, the skills of young Poles look definitely worse. The PIAAC survey, conducted by OECD, measures not only the ability to perform certain actions by using the computer but also the ability to use it to solve problems. Participants solve the tasks of varying difficulty, like searching for information in a spreadsheet and sending them by e-mail, or booking a conference room online. The comparison of the results of this study with the Eurostat ratios described above leads to interesting conclusions, if we assume that the Eurostat data measures the computer use skills and those of the OECD – practical usage of the computer.

Adult Poles do poorly in both categories. However, differences emerge in the case of young people. Among the OECD countries Poland is at the bottom of the ranking and the percentage of people with low skills is higher than in most countries. Additionally, ca. 12% of participants refused to participate in a part of the research referring to computers, which in many cases can mean competence deficits. The conclusion that can be drawn from the study is negative: although young Poles know how to efficiently operate a computer, they are not able to use it for solving the problems of everyday life. People who have problems with the completion of the tasks carried out within the framework of PIAAC survey probably would not cope with IT technologies in the workplace.

**FIGURE IV.15.** Computer skills. Persons who performed 5 or 6 out of 6 tested computer activities. Persons at the age of 16-24 (left panel) and at the age of 25-54 (right panel)

**FIGURE IV.16.** Ability to use computer for solving problems among persons at the age of 16-24, 2012

**FIGURE IV.17.** Correlation between the computer literacy and its use for solving problems among young persons, 2012

Source: Own elaboration based on Eurostat data

Source: Own elaboration on the basis of data provided by OECD

Note: there are newer data concerning computer literacy, however, they are not available for practical skills.
Figure IV.18. Percentage of companies that train their employees within the scope of ICT, 2014

Source: Own elaboration based on Eurostat data

Figure IV.19. Difference in the percentage of persons with high computer skills between Poland and UE-28 in percentage points for particular age groups and position of Poland in the EU, 2014

The level of digital literacy influences broadly understood participation in various areas of social life. A digital skills deficit may thus lead to exclusion in one of the five key areas:

- **economic** – covering mainly issues related to employment and job search as well as benefits of making online purchases.
- **social** – covering the establishment of human relationships and interpersonal communication as well as related growth of social capital.
- **political** – covering, among others, participation in the political process (for example, related to the elections) or in non-institutional politics (for example, in the public debate on political issues) and civic activity.
- **cultural** – covering broadly understood cultural activity, as well as the sphere of education.
- **institutional** – covering the use of public services and information, including medical services.

Differences in the degree of Internet usage, which is more and more often the only source of information, causes increasing alienation from professional, social, cultural and political life of people who do not use the Internet. Moreover, digitally divided people have fewer opportunities to use a variety of public services, which further deepens the risk of their marginalisation. This applies especially to the elderly. While the Internet is used by almost the entire population of students in elementary, secondary and high schools (99%) and the majority of economically active people, the smallest number of its users is recorded among pensioners.

4.2. DIGITAL DIVIDE

Deficiencies within the scope of digital skills contribute to the growth of the risk of a digital divide. Technological progress deepens the differences between social groups in their access to goods and services distributed digitally. This applies to material resources, but also to time, mental, social and cultural resources (van Dijk 2010). A permanently changing labour market will force continuous improvement and the deepening of one's skills, including digital skills. They have, however, a drawback that once gained, having become outdated, may once again lead to digital divide and limitation of access to these resources (Ppioleke 2010). Their absence becomes comparable to that of illiteracy, and unequal acquisition of competences deepens already existing internal divisions (Buchholtz, Jasiewicz, Tarkovsky 2015).

Moreover, even people who can operate ICT equipment may have no skills to apply it to a particular purpose – this case, in particular, refers to young people, for example, with respect to their ability to search for specific information. The low level of digital skills among older adults will be a growing problem in view of the increasing life expectancy.

Differences in the degree of Internet usage, which is more and more often the only source of information, causes increasing alienation from professional, social, cultural and political life of people who do not use the Internet. Moreover, digitally divided people have fewer opportunities to use a variety of public services, which further deepens the risk of their marginalisation. This applies especially to the elderly. While the Internet is used by almost the entire population of students in elementary, secondary and high schools (99%) and the majority of economically active people, the smallest number of its users is recorded among pensioners.
It is they, similarly to those living in small towns and having low-income, who are most at risk of digitally-based social exclusion. What is worse, even if a representative of a social group using the Internet rarely overcomes the access and skills barrier, it rarely leads to improvement of his/her living conditions (Czapiński, Panek 2013).

Lack of motivation arising from deficiencies in the educational system, both today and in the past, is a key barrier to the common use of computers and the Internet, as well as raising digital competences of Poles, including, in particular, the high-risk groups exposed to digital divide. This applies, in particular, to the insufficient ability to improve creative thinking, including the use of the web among younger and older students. Meanwhile, the current shape of the Polish labour market is not conducive to the improvement of the employees’ skills. In this market, it is still more important that employees know how to perform specific predefined commands, and the availability of computer tools (databases, data processing computing systems, management systems, etc.) in small and medium-sized companies is very limited.

Various types of motivation are also essential for ways of using the web, propensity to use the Internet to extend knowledge, get new opportunities, and omit content and services, which only help to kill time.

The digital divide in Poland concerns mainly the elderly, the unemployed, and persons with a low level of education. This problem can be difficult to observe in the course of conducting social research. For example, relatively few companies operating in the Mazowieckie voivodship face problems with senior staff adapting to new technologies and conditions. Only 7% of companies believe that this issue is very important to them and for 30%, it is quite important. As many as 28% of companies believe that this issue does not affect them at all, and 14% claim that it only refers to them to a small extent. Such a large number of companies, which do not experience the problem of partial incompetence of senior staff within the scope of ICT, may partly arise from the fact that these companies either do not hire older employees, or hire them for positions that do not require such skills (Batorski 2015).

The universal use of computers at the workplace varies between countries. Among the working population and those that ceased to work earlier than 12 months before the interview, in the OECD countries, on average, 30% does not or did not use the computer. In Poland, this group includes 46% of the considered population (out of which, nearly ⅓ does not have any experience with computer use). For comparison sake, in the Scandinavian countries and the Netherlands, approximately, only 20% of the workforce does not use the computer at work. (Czapiński, Panek 2013). As demonstrated by Social Diagnosis 2013, i.e., a nationwide sample survey of the living conditions of Poles, the percentage of office workers in the whole group of the employed decreases gradually, which is related to the reduction of the role of professions associated with the office support services as a result of the technological progress.

The way to efficiently customise a professional profile to the constantly changing labour market conditions is to offer a new type of education placing more emphasis on creativity, practical knowledge, where continuous and partnership-based learning, coaching and tutoring become increasingly important (Bergström, Wennberg, Stadin 2014). A relatively new trend, which is quickly gaining popularity, are massive open online courses (Mooc). Internet platforms such as coursera.org allow for completion of the course, which has some significant advantages when compared to a standard education:

- most of them are free (open)
- one can participate in courses created by scientists from top universities while staying in any place all over the world, if one only has a computer and access to the Internet (online)
- Most of these courses do not have a limited number of participants (massive)

Thanks to the above features, online courses have the opportunity to create access to high quality education for people who previously could not afford it.
CONCLUSIONS

The strength of digital technologies and the rate at which they penetrate every area of economic and social life forcing individuals and entities to make substantial adaptation efforts changes the landscape of the labour market, the relationship between employers and employees, creates and puts an end to certain professions, forces mobility, and often blurs the boundaries between professional and personal life, as well as work in the virtual and the real world.

Despite ongoing discussions on digital technologies, their impact on the productivity, the GDP growth and the number of jobs raises no doubts. In Poland, the level of development of ICT is comparable to that of other countries of its region of similar wealth, but Poland is clearly behind the leaders. This means that certain efforts are necessary to keep up with the others – convergence does not always occur spontaneously – but also allows evaluation of the trends prevailing in the countries with a higher level of development and wealth and to draw conclusions.

One of the important trends is the development of an economy based on data. Open Data and Big Data provide new information allowing optimisation of production, use of resources, and creation of new business models based on data. Even though in Poland, a significant progress has been observed as far as making public data available is concerned, it still remains at a level insufficient to be used commercially and have a substantial share in the economic growth. In order to increase economic benefits in this area it is necessary to expand and deepen the scope of access to them.

Changes caused by the digital revolution do not consist only of the introduction of information technologies into the existing industries, companies or institutions. New companies, i.e., start-ups are formed, which act in a way that is completely different from the traditional one, and in which labour relations are defined anew. Freelancers are a growing group of workers, and modern communication technologies also enable the development of remote working. New forms of work may interfere with the reconciliation of work and private life, but it also helps, e.g. parents taking care of small children. Expansion of the forms of providing remote, shared and distance work, in particular for the latter social group, will be extremely important in Poland.

Public employment services are an area in which you can learn a lot from the leaders of digitisation. Solutions similar to those introduced recently in the Netherlands, namely the growing use of electronic communication instead of the traditional one and the computer-based organisation of services provided by labour offices seems to be the future also in Poland. A large number of emerging online platforms, which operate as job agencies, become competitive with public employment services and help millions of people find a job more suited to their expectations and skills more quickly than through traditional job search methods.

The use of these opportunities requires the acquisition and ongoing development of IT competences and complementary, soft skills. Analysis shows that older Poles can operate a computer to a limited extent, whereas younger generations, despite significant time spent in front of a computer screen, and often despite being quite skilled in the operation of the equipment, have no knowledge of how to use digital tools to solve real problems. Among the older Poles – and it will be a constantly growing group – not only low skills are a challenge, but also combating digital divide, especially among the poor and less educated.

An uninterrupted period of economic growth and EU structural funds that promote investment in infrastructure and human capital have allowed Poland to make up certain technology and competence deficits which are important from the point of view of the needs of the digital economy. Digital technologies bring new opportunities and tools that facilitate getting out of poverty through, among others, distance learning opportunities. However, at the same time, they also have the potential of deepening social divisions, and expanding the group of factors of exclusion by the new ones, namely digital factors. State institutions can play a significant role in preventing this situation through regulatory expansion and increase in the flexibility of the possibilities and forms of undertaking and providing jobs, training with emphasis put on digital literacy, increasing access to public data – but also by means of changing the principles according to which they operate thereby reducing the distance between the institution and a citizen, which includes the offering of new forms of support in the constantly changing labour market.
As part of the analytical work on Chapter IV of the Report, we used the **technological foresight** that has provided qualitative, long-term prospects for the labour market in the context of the development of digital technologies and assessment of their impact on the economic and social life.

Key findings:
- Digital technologies affect the creation of new and modified traditional forms of work provision, among which one can mention e.g., telecommuting, or working in a virtual cloud. This influence can also be seen in the modification of traditional forms of providing work, including the emergence of job sharing and employee sharing.
- The role of new types of jobs will also grow in Poland, being a part of the global economic cycle, and the labour costs, being lower still than in the countries of Western Europe will give an advantage to Polish employees; this phenomenon is visible among others, in the context of the development of platforms offering work for freelancers.
- A new type of workplace creates opportunities for admitting people staying on its outskirts (e.g. the elderly) into the labour market, however, it will depend on the possibility of their acquisition of the necessary digital skills. Otherwise, the likelihood of permanent or deepening exclusion from the labour market will increase.
- The risks associated with unusual forms of employment, among others, in relation to the of work and personal or family life are real, and in Poland, they are higher than in most other European countries. Patterns for solving this problem can be sought in countries where the scale of penetration of digital technologies is greater than in Poland and which have already started working on methods of their prevention.
- There is no doubt that digital technologies will affect the work of employment services, and the scale of that impact will depend on the solutions adopted by the legislature. The reorganisation of public employment services in some countries of Western Europe raised their efficiency but at the same time deeply reorganised them internally.
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