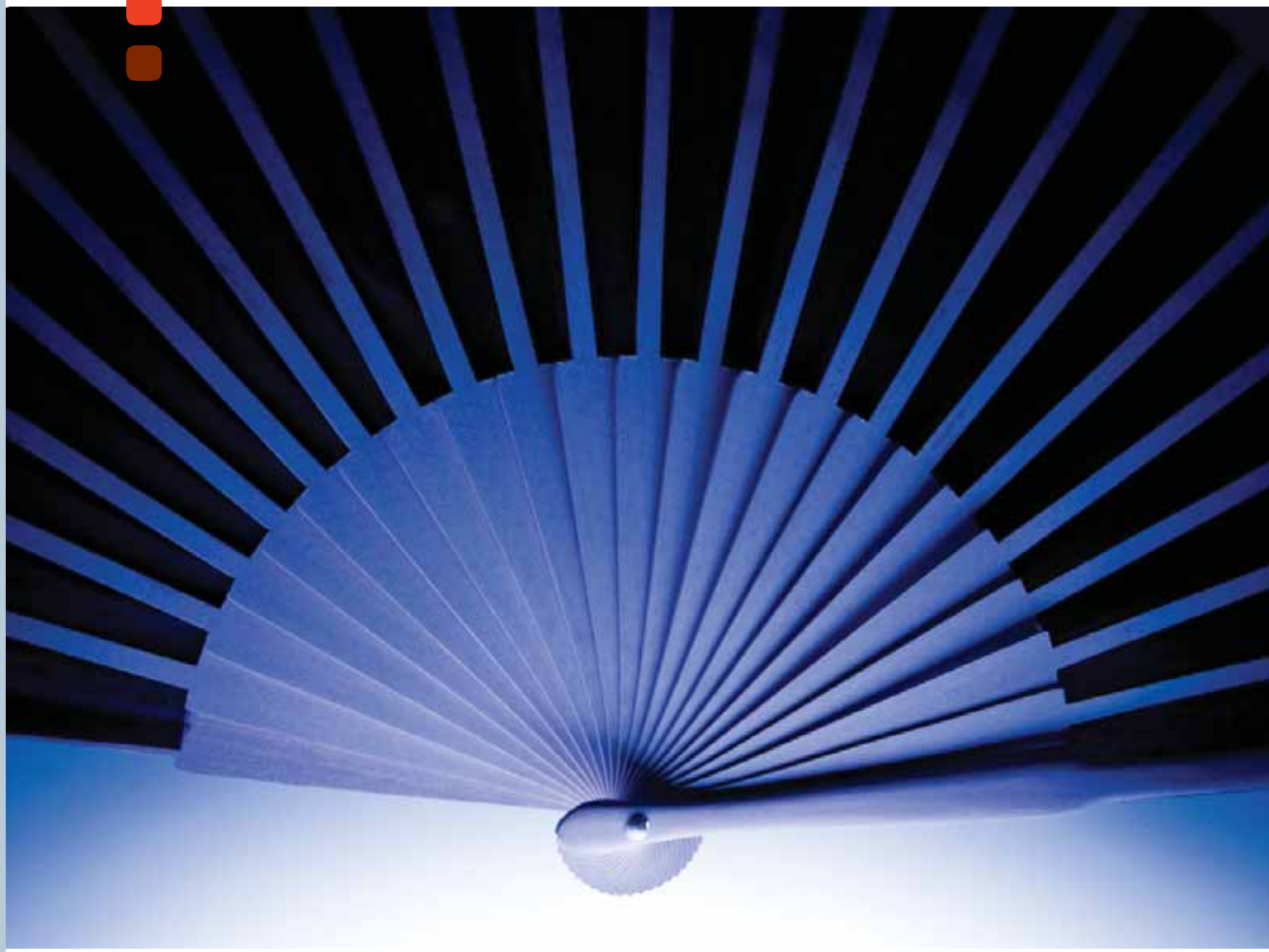
Employment in Poland 2008

Work over the life course

edited by Maciej Bukowski

Warsaw 2010



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All opinions and conclusions included in this publication constitute the authors' views and do not necessarily reflect the official position of the Ministry of Labour and Social Policy.

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Introduction

It is with great pleasure that we present the fourth edition of *Employment in Poland*. The report, commissioned by the Department of Economic Analyses and Forecasts of the Ministry of Labour and Social Policy, has been prepared by a consortium headed by the Institute for Structural Research as part of a project coordinated by the Human Resources Development Centre. In this edition we address the issue of work across the lifespan which, in the face of the ongoing demographic changes and population ageing, is a key problem for the future of Poland and Europe. We discuss the impact of demographic changes on the labour market and examine what policy adjustments are required in order to counter the negative effects of population ageing on the economy and to ensure the stability of the age structure in Poland in the long term.

Part I discusses the macroeconomic aspects of demographic changes in Poland, also in the light of the past and future reforms of the pension system. Long-term projections (up to 2060) of labour market indicators and basic macroeconomic variables are the core element of this Part. The forecasts demonstrate the various possible institutional responses to problems caused by population ageing in the fields of labour market policy, social policy and immigration policy. They also provide a macroeconomic background to the remaining parts of the report.

In Part II we focus on the marginal age groups of labour market participants, i.e. youth below 24 and the elderly above 54. Their situation is analysed against the age group consisting of prime-aged individuals. We analyse their relative wages, labour market indicators as well as present the results of an experiment investigating the scale of age and gender discrimination in the Polish labour market. It can be observed that the improvement of the labour market position of young people in Poland is accompanied by the relatively worse situation of the elderly, which can be partly explained by discriminatory behaviours of employers. The recognition of the obstacles that the analysed age groups encounter in the labour market is crucial for shaping public policies geared at increasing their labour market participation.

Part III adopts a comparative approach to present the labour market positions of men and women. The analysis of mutual relations between institutions, cultural background, labour market situation of women and demographic developments is an important element of Part III. It is also in this section that we discuss a mix of public policies which will best counteract gender discrimination in the labour market, improve male and female participation and raise the fertility rate.

Part IV is less concerned with demography, focusing instead on individual choices related to education and enhancing one's skills across a lifespan. We argue that despite high educational attainment at tertiary level, Poles' involvement in lifelong learning is very limited. This is likely to form an obstacle to the quick absorption of technological progress and impede adaptation to the increasing expectations of employers. At the same time, low lifelong learning participation in Poland can be largely blamed on public policies, which are sufficient in scope but improperly shaped.

Employment in Poland 2008 concludes with recommendations presenting a coherent vision of a public policy which would adequately respond to demographic challenges and labour market problems looming on the horizon.

Part I. Macroeconomics of the life course

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Introduction

Demographic changes occur slowly, but their long-term impact on economies is almost as important as that of technological development or accumulation of human capital. Whereas the last two centuries witnessed an unprecedented growth of Europe's and the world's population, today the number of people in developed countries is starting to decline. Adopting a long-term perspective, Part I looks at the problem of ageing in Poland against a wider European background. The process of ageing is a key problem for the Polish and other European economies and labour markets both in the medium and long-term. Although Poland's population is still relatively young, for the past 20 years it has been undergoing the second demographic transition, which manifests itself in expanding life expectancy (by 7 percent in 1990-2008) and a rapid drop in the total fertility rate (from 1.62 in 1995 to 1.22 percent in 2003, Central Statistical Office). The last few years brought an increase in the fertility rate (to 1.39 percent in 2008), however, it still remains one of the lowest in the EU. Consequently, the average age of Polish citizens is surging, just as is the number of people aged over 64. At the same time, the share of 20 year-olds and younger keeps shrinking. While in 1990 these groups represented respectively 10 and 33 percent of the Polish population and 13.5 and 21 percent in 2008, Eurostat forecasts that in 2020 this relation will change to 18.2 and 18.5 percent, then reversing to 23 and 17 percent in 2030. While in 2008 there were 39 individuals in non-productive age for every 100 prime-aged individuals (15-64), this number is bound to rise to 48 in 2020, and 55 in 2030. Furthermore, the growing elderly population, accompanied by a drop in the number of children, is projected to increase the demographic burden.

Section 1 presents recent developments in the Polish labour market and points to the fact that Poland, which in the last decade has been confronted mainly with cyclical fluctuations, now has to face a new challenge: population ageing. The next section discusses the scale of this phenomenon both in Poland and in Europe, applying a quantitative approach. We then study a range of scenarios of demographic and systemic changes on the Polish labour market over the coming 50 years. We utilize the SYMDEM 2.0 model, a simulation tool enabling an in-depth analysis of their impact on the Polish labour market and the structure of the population. In the next step, we apply a dynamic stochastic general equilibrium model EUImpactMod III to compute detailed macroeconomic simulations of economic consequences of the demographic and policy scenarios in the short, medium and long-term. Finally, in the last Section we adopt a qualitative approach to discuss possible institutional responses to the implications of population ageing, focusing on the policies increasing labour force participation and fertility. The major objective of this Section is to point to solutions that could be applied in Poland in order to alleviate the negative effects that ageing may exert on the economy and population.

1. Recent developments on the Polish labour market and its medium-term characteristics

Economic recovery brought by 2003, strengthened labour demand so effectively that in a relatively short period (2003-2008) the employment rate for the 15-64 age group in Poland rose to 59 percent – the highest since the political transition. As a result, high unemployment rate, which at the beginning of the decade constituted one of the major socio-economic problems in Poland, declined to 7 percent, a rate similar to that observed in other EU countries. Since 2006, real wages have been rising by a few percent each year, triggering consumption growth and improvement of living standards in Poland. The global economic crisis, however, caused a deep recession in Western Europe and, although it did not hit Poland directly, it significantly hampered the economic growth. In 2009, total GDP in the European Union fell by 4.2 percent compared to previous year. An identical drop was recorded in the euro area, which absorbs 60 percent of the Polish exports. Germany, Poland's biggest trade partner, recorded a 5.0 percent decrease in GDP. A lower foreign demand weakened Poland's growth. Nonetheless, Poland in 2009 was praised as the most rapidly developing economy in the EU and the only one achieving year-on-year GDP growth.

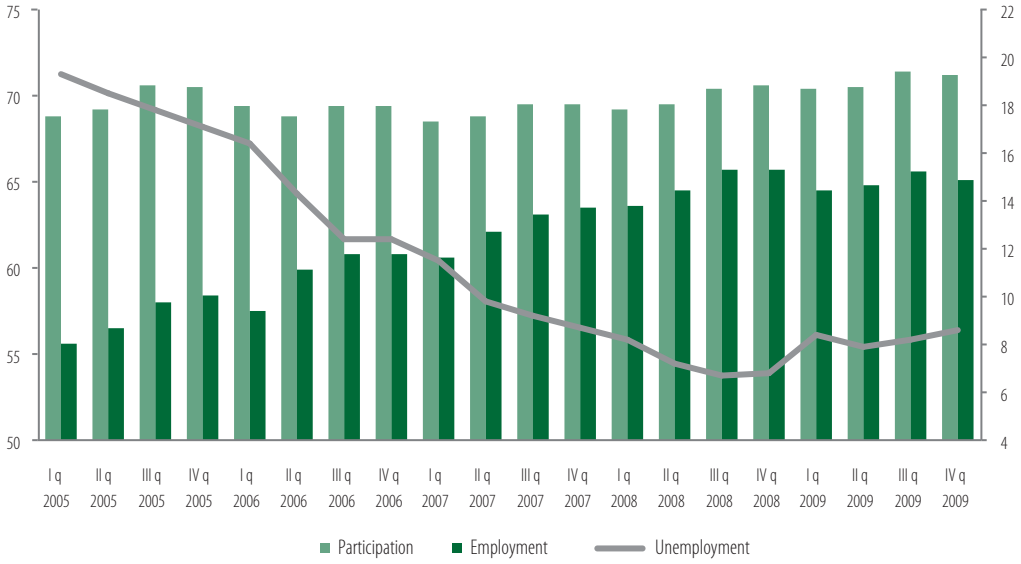
Table I.1. GDP growth rate, quarterly year-on-year, adjusted seasonally (percentage change).

	Q4 2005	Q4 2006	Q4 2007	Q1 2008	Q2 2008	Q3 2008	Q4 2008	Q1 2009	Q2 2009	Q3 2009	Q4 2009
Poland	4.2	6.8	7.0	6.5	5.6	5.1	2.5	1.5	1.5	1.3	2.8
EU-27	2.3	3.5	2.6	2.4	1.7	0.6	–1.8	–5.0	–5.0	–4.3	–2.3
Euro area	2.3	3.5	2.6	2.2	1.5	0.4	–1.8	–5.1	–4.9	–4.1	–2.1
Germany	1.6	4.1	1.7	2.9	2.0	0.8	–1.8	–6.7	–5.8	–4.8	–2.4
US	2.7	2.4	2.3	2.0	1.6	0.0	–1.9	–3.3	–3.8	–2.6	0.1
OECD	2.1	3.4	2.1	2.4	1.5	0.3	–2.1	–4.8	–4.5	–3.4	-

Source: OECD 2009.

The deep global economic slowdown in 2008-2009 translated into plummeting employment rates and soaring unemployment in the OECD economies. Poland belongs to a small group of countries, where these changes have not been so dramatic. Even though for the first time in three years the first quarters of 2008 and 2009 observed an increase in unemployment rates (LFS), later the situation remained stable with the unemployment rate oscillating at around 8 percent. The employment rate for 15-64 year-olds dropped at the turn of 2009, however, in the first half of 2009 it was still higher than in 2008. Additionally, the number of the unemployed and the employed rose on average by 108 and 176 thousand respectively. It was possible due to a rising participation rate among people aged 15-64, which improved by 1 percentage point.

Figure I.1. Participation and employment rates (left axis) and unemployment rate (right axis) among people aged 18-59 (women)/64 (men) in Poland in 2005-2009 (Q2) (percentage).

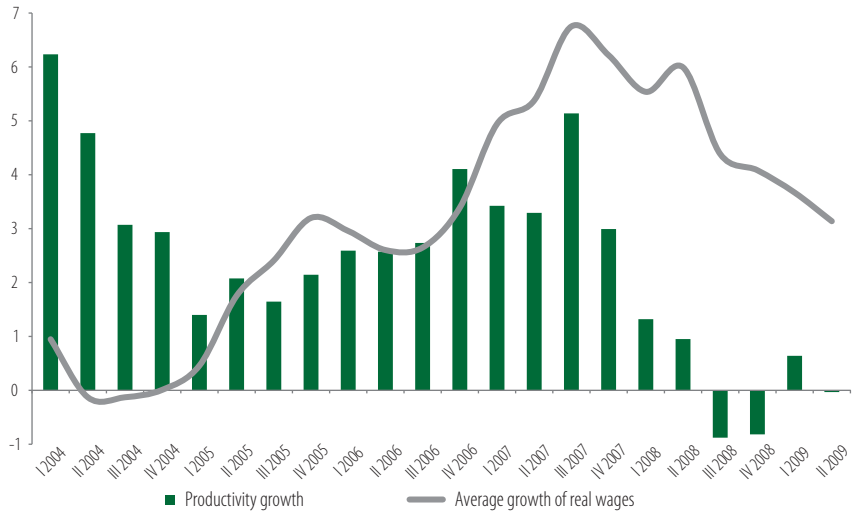


Source: own calculations based on LFS data.

Employment contracted mainly in manufacturing. It was 1.2 percent lower in 2009 compared to 2008. Agriculture recorded a 0.7 percent drop in employment, while services enjoyed a 1.7 year-on-year growth. Good situation in the services sector (in the first two quarters of 2009 the employment in services was by 4.0 percent higher than a year earlier) caused the employment rate to increase in 2009 to 59.4 percent, 0.2 more than in 2008. At the same time, average weekly hours of work in Poland shortened by one hour.

Following the lower dynamics of labour productivity, the growth of real wages started to slow down already in mid-2007. A moderate response of employment and unemployment to the economic slowdown in Poland was accompanied by a lower utilisation of labour and consequently reduced the growth of real wages, which was additionally compressed by the above average inflation.

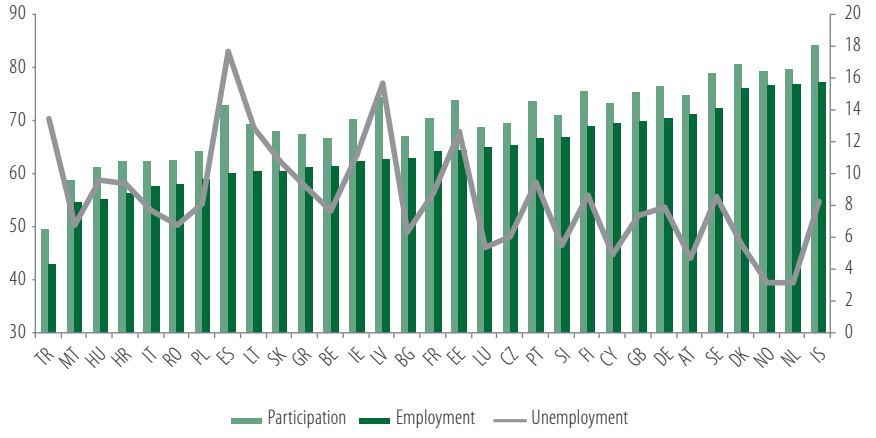
Figure I.2. Labour productivity growth (GDP per worker) and the average real wage growth in Poland in 2004-2009 (Q2) (percentage).



Source: Own calculations based on Central Statistical Office data (GUS).

In mid-2009,[1] Poland stood out in the EU and OECD with one of the smallest increases in unemployment. Moreover, Poland and Luxemburg were the only countries with actually rising employment rates. Following the dynamically growing employment in 2004-2008 and a relatively moderate impact of the global crisis on the Polish labour market, it's situation, relatively to other EU countries, has slightly improved.

Figure I.3. Participation and employment rates (left axis) and the unemployment rate (right axis) among people aged 15-64 in the European countries in mid-2009 (percentage).



Source: Own calculations based on Eurostat data.

[1] The 2009 data were not available for some EU members at the time of writing this report.

The unemployment rate among 15-64 year-olds was slightly higher than the EU-27 average. Poland lagged, however, almost 6 percentage points behind the EU average employment rate, and 7 percentage points behind the EU-15 average. An even greater discrepancy was observed in labour force participation. The period of dynamic growth and increasing labour demand in 2004-2008 brought just a modest advancement in solving structural problems of the Polish labour market. As reported in the previous editions of *Employment in Poland*, the country is notorious for low participation and employment rate of youth and people above 50. Table I.2 shows that in Poland the participation rates for the 15-24 and 55-64 age groups are by 1/3 lower compared to the EU-15. Although the participation and employment of prime-aged people are almost identical with the EU-15 countries, and even slightly exceeding those in the CEE EU members, rates for the economic activity and employment of individuals aged 45-54, and especially 55-64, remain strikingly low. Decompositions presented in Part II prove that the low labour supply of the youngest and the oldest labour market participants are mainly responsible for the employment gap between Poland and the EU-15.

Table I.2. Participation, employment and unemployment rates by gender and age groups in Poland, EU-15 and NMS9[2] in 2008 (percentage).

Participation rate									
	Poland			EU-15			NMS 9		
	Total	Women	Men	Total	Women	Men	Total	Women	Men
15–64	64	57	71	72	65	80	66	59	73
15–24	33	30	37	48	45	52	31	26	36
25–44	86	79	93	86	79	93	84	76	91
45–54	76	71	81	84	76	92	82	78	86
55–64	33	22	47	50	41	59	45	36	56
Employment rate									
	Poland			EU-15			NMS 9		
	Total	Women	Men	Total	Women	Men	Total	Women	Men
15–64	59	52	66	67	60	74	62	56	68
15–24	27	24	31	41	38	44	26	22	30
25–44	80	73	88	80	73	88	79	72	86
45–54	72	67	77	79	71	87	77	74	81
55–64	32	21	44	47	39	56	43	34	54
Unemployment rate									
	Poland			EU-15			NMS 9		
	Total	Women	Men	Total	Women	Men	Total	Women	Men
15–64	7.8	8.8	7.0	6.9	7.7	7.5	6.1	5.1	6.8
15–24	18.2	20.0	16.2	14.6	15.6	15.4	16.1	15.4	16.7
25–44	7.0	7.6	5.4	7.0	7.6	5.4	6.0	5.3	5.5
45–54	5.3	5.6	4.9	6.0	6.6	5.4	6.1	5.1	5.8
55–64	3.0	4.5	6.4	6.0	4.9	5.1	4.4	5.6	3.6

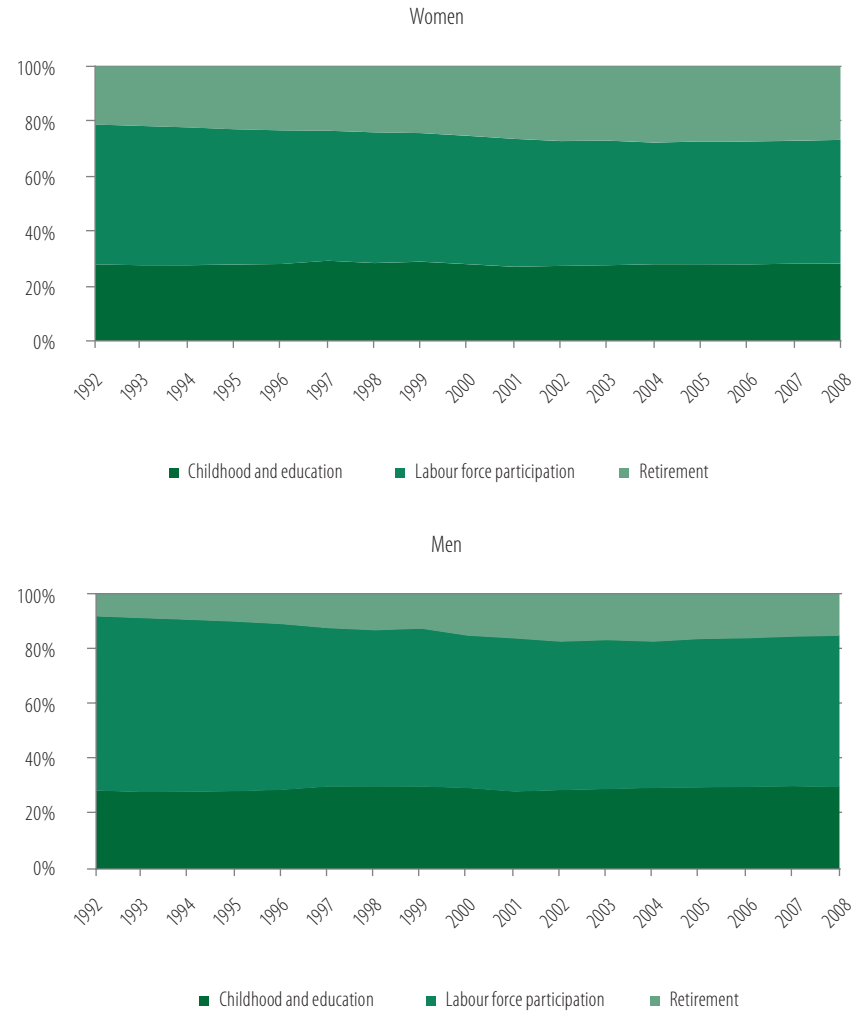
Source: Own calculations based on Eurostat data.

It is noteworthy that in the case of the 45-54 age group the gap between Poland and Western Europe has been wider for men than for women. While in the EU-15 labour market participation and employment rate in this age group of males are comparable to 24-44 year-olds, in Poland the difference reaches 10 percentage points. Since it is common in Poland for women over 55 to exit the labour market, participation and employment rates are half the value of the ones in the EU-15. Also in comparison to the NMS9, Poland exhibits lower participation, and consequently lower employment among women at this age. Similarly to the situation in the EU-15 and the NMS9, the unemployment rate in this age group is moderate, which only points to the fact that economic inactivity is the major reason of joblessness at this age. Moreover, individuals younger than 25, both in Poland and in other CEE countries, participate in the labour market far less frequently than their counterparts in the EU-15. Compared to the EU-15 and the NMS9, Poland has also a higher youth unemployment rate (even though it has decreased by more than a half in the past 4-5 years), reaching 20 percent.

[2] Czech Republic, Slovakia, Hungary, Lithuania, Latvia, Estonia, Slovenia, Bulgaria, Romania

Low economic activity of those groups reflects the fact that Poles usually begin their career later in life and finish it earlier than is the case in the majority of European countries. Since the beginning of the 1990s, Polish citizens tend to spend a steadily rising share of life retired, and consequently a decreasing share as economically active. This is partly due to a gradually increasing life expectancy,[3] nevertheless the average age of exiting the labour force has been declining and that of entering the labour market – rising.

Figure I.4. Lifetime allocation of economic activity and leisure (childhood, retirement); men (lower panel) and women (upper panel) in Poland in 1992-2008 (percentage).

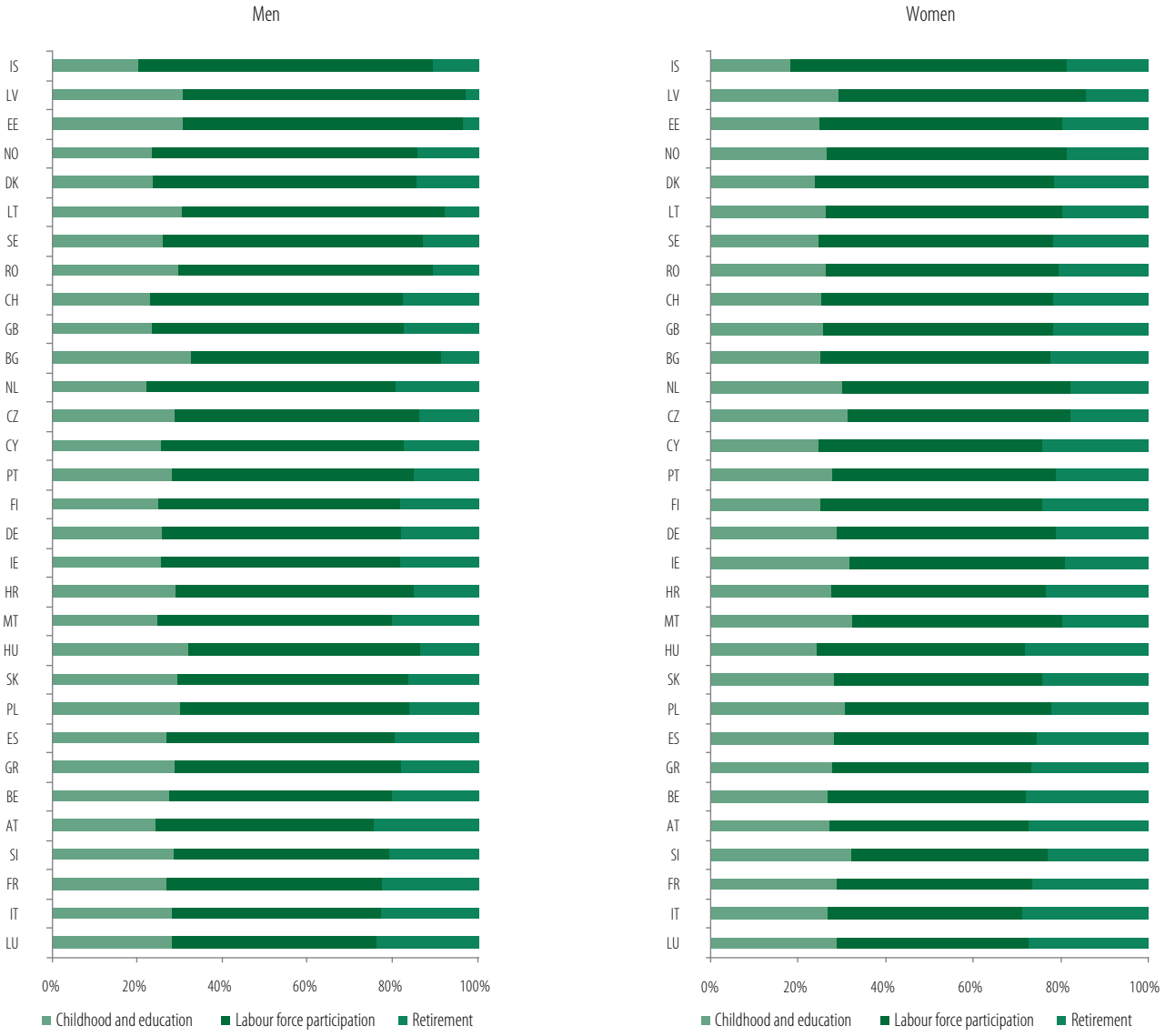


Source: Own calculations based on LFS data and Central Statistical Office data (GUS).

In 2008, the effective age of labour market entry for women reached 21.7, which is slightly earlier than on average in the EU-15 (22.3) and the EU-27 (22.3), while men started their careers at 21.3, compared to 20.2 in the EU-15 and 20.4 in the EU-27 (see Box I.1). In 2008, men's average exit age was 59.7, while that of women equalled 58.0, which in both cases belongs to the lowest values in Europe. In the same year, Polish females were on average economically active for only 45 percent of their life, i.e. 10 percentage points less than their counterparts in e.g. the Netherlands, Denmark, Ireland or Latvia. What is more, women in Poland spent 27.5 percent of life being retired (precisely, inactive after exiting the labour market), which clearly exceeds the values for the EU-15 and CEE countries (see Figure I.5). The parallel proportions calculated for males do not stand out so much against other European countries which, however, results from their relative short life expectancy rather than long labour market participation. In Poland, men are active in the labour market for on average 38.5 years (2008), accounting for one of the shortest spans in Europe.[4] In the light of expanding life expectancy (which is in itself positive and indicates that the living standards in Poland converge to those of the most developed countries), maintaining the current labour supply patterns would mean that even before 2030 an average male in Poland would be economically active for less than a half and retired for more than 1/5 of his life. Females would be active for 40 percent of their lives and spend 30 percent being retired.

[3] From 1991, when the average life expectancy reached the lowest level from the 1980s, by 2008 it rose by 5.15 years for men and 4.75 for women.
[4] Only in Poland, Slovakia, Slovenia, Hungary and Luxemburg it was shorter than 40 years.

Figure I.5. Lifetime allocation of economic activity and leisure (childhood, retirement); men (left panel) and women (right panel) in the European countries, 2008 (percentage).



Source: Own calculations based on Eurostat data.

2. Population ageing in Poland

If the labour force participation patterns characterising Poland do not alter in the future, substantial shifts in the proportion between the economically active and inactive will occur. These changes will be strengthened by a gradual ageing of the labour force, due to the rising share of age groups with typically relatively low participation rates. Population ageing will constitute the most serious demographic challenge in all developed countries over the coming decades. Although the process of ageing in Poland is currently less advanced than in other European countries, it is expected to exhibit greater dynamics.

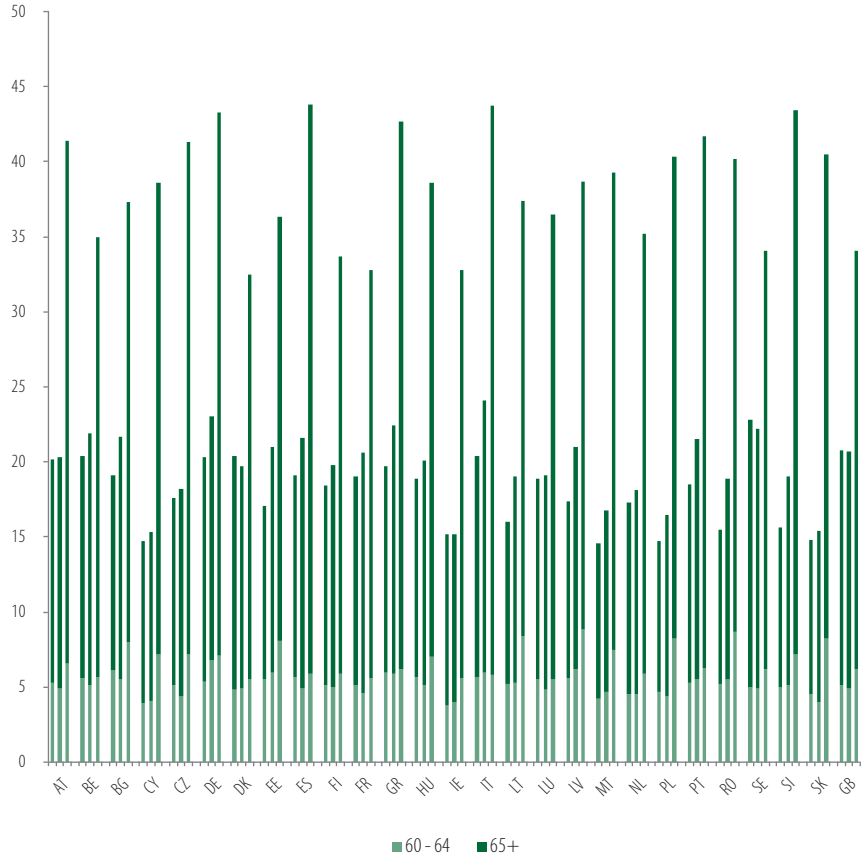
In the first Subsection we study how this process may develop in Poland and other EU countries. Then, we present detailed demographic and labour supply simulations for Poland. The analysis focuses on and quantifies the potential of increasing the participation of selected groups, rising fertility rates and reversing migration flows to counteract the consequences of ageing for the Polish labour market and economy.

2.1. Population ageing in Poland and global ageing trends

At present, the Polish population is relatively young compared with other populations in Europe (share of people aged 65+ and median age are lower in Poland), the process of ageing is yet expected to be exceptionally dynamic. Diverse demographic trends in the EU-15 and in Poland (both before and after 1989) have led to substantial differences in the demographic structure of their labour forces. Firstly, the post-war baby boom was stronger and occurred earlier in the CEE countries than in Western Europe. Secondly, the drop in fertility characteristic of the second demographic transition took place in Eastern Europe later (after 1989), but then proceeded much faster.

The post-war baby boom in the CEE countries was echoed in the populous cohorts born in 1975-1985. Such a phenomenon was not registered in Western Europe. Additionally, changes in the average life expectancy were also of different nature behind the Iron Curtain. The process of decreasing male mortality rates, which in Western Europe had already started in the post-war period, in the Central-Eastern Europe was curbed in the second half of the 1960s. This difference was less dramatic for women, but the drop in mortality rates in the socialist countries ensued visibly slower than in the West.

Figure I.6. Share of people above 60 and above 65 in the total population in EU-27 in 1990, 2000 and 2050 (percentage)

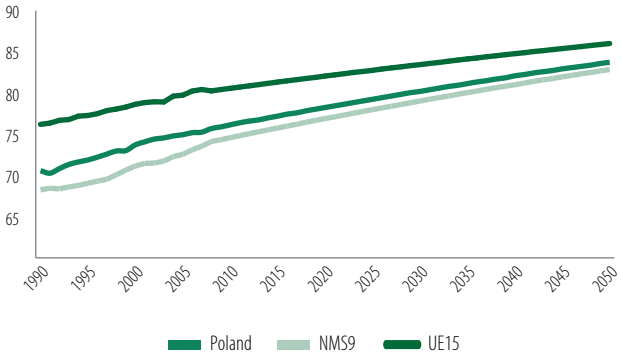


Notes: Each country is described by three neighbouring bars: 1990, 2000, 2050 (from the left).
Source: Own calculations based on Eurostat data and projections.

The transformation of the age structure consisting in a decreasing share of the youngest and a growing share of the oldest people in the total population are therefore currently more advanced in the EU-15 than in the CEE countries, including Poland. Still, over the next forty years Poland is likely to reach one of the largest fractions of the people aged 65+ in total population among the EU countries. The process has already started, with the baby-boom cohorts born in 1950-1965 gradually retiring or reaching the pre-retirement age. In the forthcoming decade, the elderly population will be expanding by over 100 thousand individuals each year.

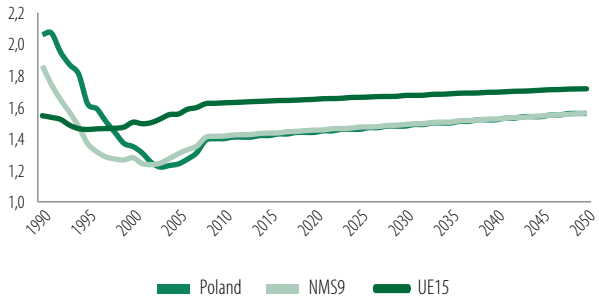
Firstly, the process of ageing is driven by life expectancy, which has significantly increased in Poland since the early 1990s, resulting mostly from the declining mortality rates of infants, but also of prime-aged and elderly population. The process is bound to continue, but probably will be less intense and induced by a lowering mortality of people above 50/60 years of age. Secondly, fertility decline also plays a key role in ageing. For over 20 years TFR in the European countries has oscillated below the replacement fertility rate (Total Fertility Rate, TFR, equal to 2.12), and the lowest values of 1.2-1.3 in the NMS (including Poland) and 1.5 in the EU-15, were recorded in 2000-2005.

Figure I.7. Average life expectancy over the 1990-2050 period in Poland, EU-15 and NMS 9.



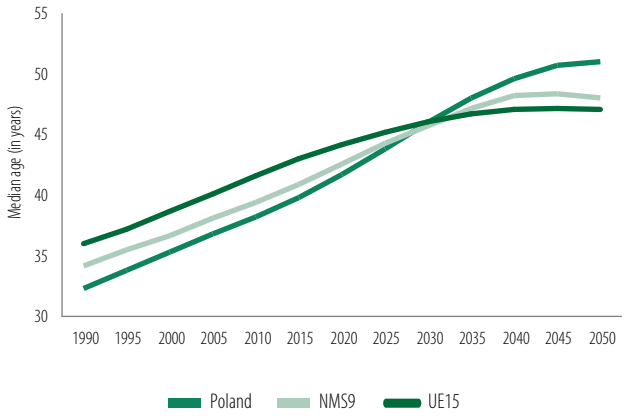
Source: Own calculations based on Eurostat data and projections.

Figure I.8. Total Fertility Rate (TFR) over the 1990-2050 period in Poland, EU-15 and NMS 9.



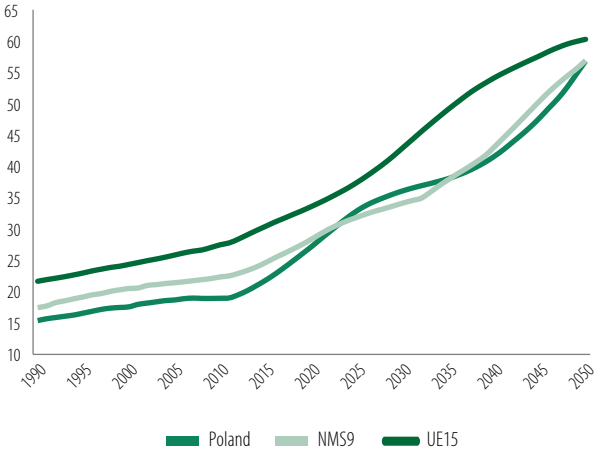
Source: Own calculations based on Eurostat data and projections.

Figure I.9. Median age over the 1990-2050 period in Poland, EU-15 and NMS 9.



Source: Own calculations based on Eurostat data and projections.

Figure I.10. Old age dependency ratio over the 1990-2050 period in Poland, EU-15 and NMS 9.



Source: Own calculations based on Eurostat data and projections.

Downward trends in fertility rates have recently been reversed in a number of EU countries, e.g. in Poland TFR rose from 1.22 in 2003 to 1.39 in 2008. It is generally expected that such an upward trend will continue, however, it is unlikely to be strong enough to reach the replacement rate, which would prevent the population shrinkage and secure a stable demographic structure by 2060. The median age of the Polish population is therefore going to increase. Whereas in 2000 it amounted to 35.3 years, the UN and Eurostat predict that in 2050 more than a half of the population will be 50 or older. As soon as in 2030, median age in Poland will probably exceed respective values for the NMS9 and EU-15, which itself illustrates the pace of the ageing in Poland. Consequently, it is expected that the share of older people (60+ and 65+) in the population will be noticeably higher, thus increasing dependency ratios. For the time being, these values in the EU-15 are still higher than in Poland and the NMS9, but are projected to increase less vigorously. Hence, Poland is likely to catch up with the EU-15 around 2050. Eurostat projects that for every 100 individuals in productive age in Poland, there will be nearly 60 in post-productive age, compared with around 20 at present.

The intensity of demographic developments will result in a significant drop in the size of the labour force in Europe (see Table I.3). It will be caused mainly by shifts in the demographic structure, i.e. an increasing share of age groups characterised by a relatively low participation (over 55 years of age). These conclusions are supported by the labour supply projections for the European countries, which we decompose into contributions of evolution in (i) size of the population aged 15+, (ii) its demographic structure and (iii) labour force participation. Projections for Poland and the EU-27 are presented in Figure I.11.[5] It is expected that compared to 2010, the total number of the economically active individuals in the EU-27 in years 2020, 2030, 2050 will decrease by 1.9, 8.0 and 22.5 percent respectively. The negative impact of changes in the demographic structure will be visible already in 2015, meaning that by 2020 the size of labour force would, *ceteris paribus*, decrease by 5-6 percent in respect to 2010. Every subsequent 5 years this factor would contribute additional 5 percent (of 2010 levels) to the decline in the size of the labour force. Provided that labour force participation over the life cycle in the European countries follows the current patterns in each of them and that demographic developments adhere to Eurostat's assumptions, the steepest drop in the labour supply will be observed in Italy, Germany (of men) and the Central-European members of the EU,

[5] The methodology of the projection and detailed results (by gender) for a range of European countries are presented in Appendix I.

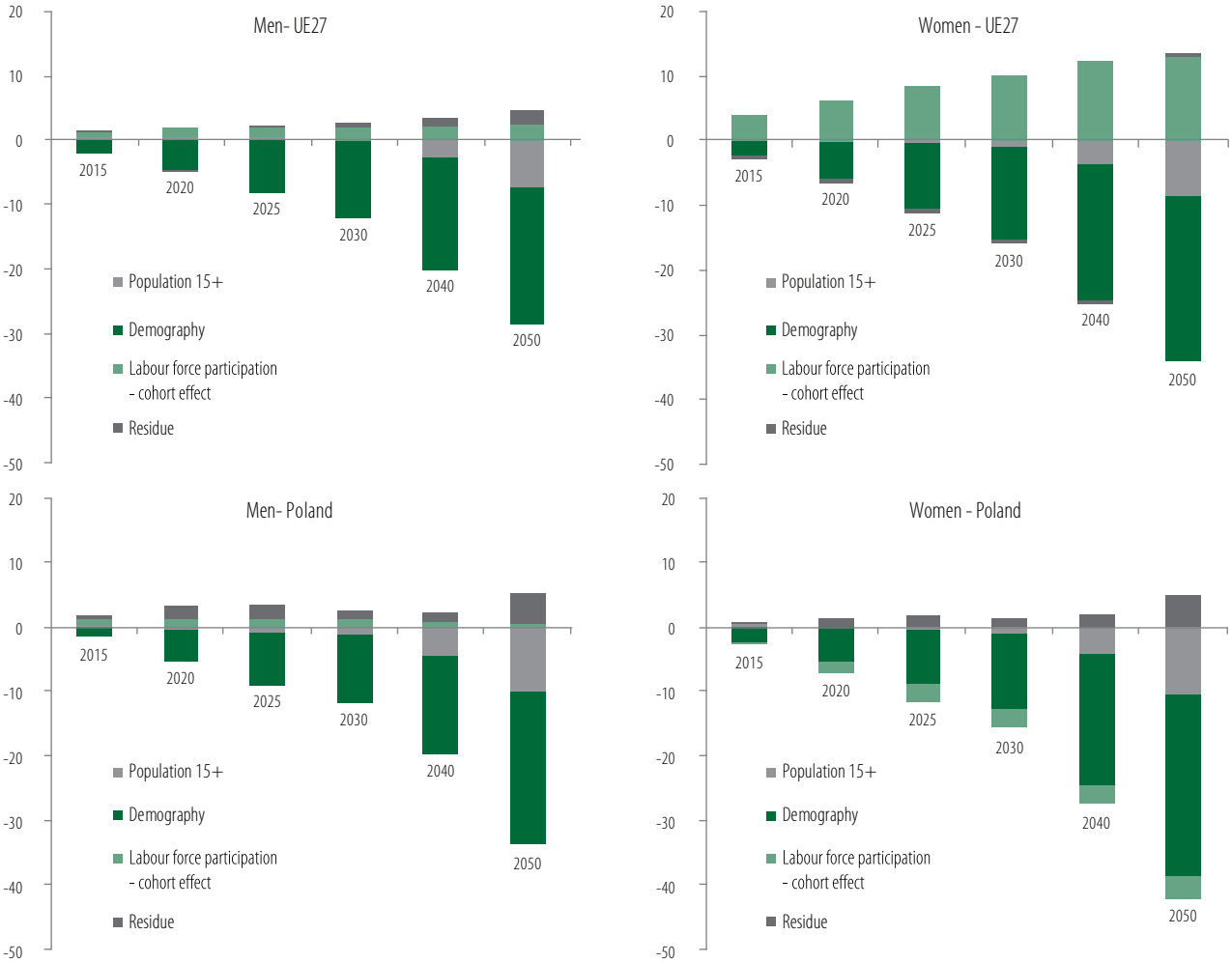
including Poland. In Poland, with respect to 2010, the projected number of economically active women will fall by 6 percent already in 2020, and as much as by 10 percent in 2025. Only in Slovakia (40 percent in 2050) the decline of female labour supply is expected to be deeper than in Poland.

Table I.3. Projected change in labour supply in Europe over the 2010-2050 period.

Scope of change	Country
Growth	Ireland
Decrease by 0-9 percent	Norway, France, Sweden, the UK, Denmark, the Netherlands
Decrease by 10-19 percent	Belgium, Cyprus, Finland, Estonia, Luxemburg, Malta
Decrease by 20-29 percent	Latvia, Austria, Portugal, Switzerland, Spain, Bulgaria
Decrease by 30-34 percent	Hungary, Romania, Greece, Germany, Poland, the Czech Republic, Slovenia
Decrease by more than 35 percent	Italy, Lithuania, Slovakia

Note: Change in labour supply based on projections described in Appendix 1. Detailed results for specific countries broken down by gender are presented in Table A.1. in Appendix 1. Countries are ordered by projected change in labour supply over the 2010-2050 period (descending order)
Source: Own calculations based on Eurostat data and projections.

Figure I.11. Decomposition of the projected changes in male labour supply (left panel) and female labour supply (right panel) in Poland and EU-27 over the 2015-2050 period, into components related to (i) the size, and (ii) demographic structure of the population 15+, as well as to (iii) labour force participation – differences with respect to 2010 (percentage).



Note: Change in labour supply based on projections described in Appendix 1. Detailed results for specific countries broken down by gender are presented in Table A.1. in Appendix 1.
Source: Own calculations based on Eurostat data and projections.

Changes in the demographic structure will be most pronounced in the Southern Europe and slightly less so in the CEE countries. They will be least visible in the Anglo-Saxon and Scandinavian countries . It is diverse fertility patterns over the 1980-2010 period and their expected developments that lie behind these differences. While fertility rates are particularly low in the first group of countries, they are relatively high in the second one. In a number of European countries, including Poland, the negative impact of changes in demographic structure will be temporarily offset with the overall population growth. In countries such as France, Norway, the United Kingdom and Ireland (the only country with projected increase in the labour supply till 2050), the rising population will positively affect labour supply during the entire projected period. In Poland, however, this effect will disappear already between 2020 and 2025, while labour supply will dwindle away, contracting by 9 percent for men and 4 percent for women in 2010-2030, and 26 and 21 percent respectively in 2010-2050. In the EU-27, the contribution of the shrinking population aged 15+ to labour supply will be negative form 2030 on.

On the other hand, at the EU-27 level, the projected decline in labour supply will be mitigated by an increasing participation of subsequent cohorts. Reforms implemented mostly in the EU-15 countries have boosted labour supply since the mid-1990s, both for females (Jaumotte 2003) and for the cohorts entering the labour market (OECD 2006). Thus, the present generations of 30 and 40 year-olds are likely to exhibit higher labour supply when aged 50+ and 60+, than they do currently. Although this factor will exert a positive impact on the size of the labour force, its magnitude will be inferior to the contribution of negative demographic trends. The projected impact of changes in the labour force participation patterns varies across the EU countries. In general, it is significantly greater for women than for men, especially in Belgium, Ireland, the Netherlands and Spain. On the other hand, it is negative in Poland, the Czech Republic, Lithuania, Romania and Slovakia, where subsequent female cohorts have recently supplied less labour over the life course than the slightly older generations. This factor is on the whole far less important for the evolution of male labour supply. Nonetheless in Bulgaria, Estonia, Latvia and Sweden it helps to compensate a half of the labour force decline caused by demographic changes. It is worth mentioning that the analysis presented above does not take into account the effects of the recently implemented reforms, since they are not yet visible in the data used as a starting point for our projections. Likewise, we have not considered reforms which can be carried out, provided that in the light of a more intense ageing process the current public policy undergoes a considerable revision.

It is for this reason that in the next Section we present a range of scenarios for Poland produced with SYMDEM 2.0, a simulation tool developed for this purpose (see IBS 2010a). Using SYMDEM we quantify the implications of a range of already implemented or still potential reforms influencing fertility, labour supply and employment as well as international migrations in Poland.

2.2. Impact of population ageing on the Polish labour market - insights from the SYMDEM 2.0 simulation model

2.2.1. Demographic context of the Polish labour market over the 2010–2060 period

This Section studies the projections of demographic trends and labour market outcomes in Poland over the coming fifty years. They are simulated with the SYMDEM 2.0 model (IBS, 2010a). The model and methodology are described in details in Box I.1 and I.2. SYMDEM 2.0 consists of a demographic and a labour market modules. The former is a conventional cohort-component model, used to forecast the population by gender and 1-year age groups on the basis of the assumptions on age-specific fertility and mortality rates and age-specific net balance of international migration flows. The resulting demographic scenarios are then utilised within the labour market module to forecast the evolution of labour supply, employment and unemployment. SYMDEM 2.0 enables us to predict both the consequences of maintaining the present patterns of labour force participation over the life course, to foresee the probable impact of reforms already introduced in Poland and to analyse the potential influences of institutional and policy reforms. We consider the reforms which should increase labour supply and employment of specific demographic groups, especially those characterized by a relatively low labour utilisation in Poland, i.e. youth, the elderly and women. The adopted approach to study policy options separately, yet along with their interactions, allows us to pinpoint the priority areas and suggest the optimal *policy-mix* that could mitigate the consequences of population ageing in Poland. These policy scenarios are described in Box I.3. Scenarios of the demographic module assume:

- rising life expectancy (at various pace);
- increasing Total Fertility Rate (up to different levels);
- rising mean age of women at childbirth to 30 years in 2030, which is based on the developments observed in Western Europe;
- improving balance of net migration (initially and for some time still negative), according to which Poland may expect a positive influx of migrants from 2015, or 2020, or 2025 on.

The evolution of participation and employment rates of 5-year age groups by gender, calculated according to the methodology described in Appendix 1,[6] serves as a starting point for the labour market projections. Scenario 1 (labelled S1, see Box I.3) shows a hypothetical evolution of the Polish labour market based on the labour force participation patterns typical for the 2003-2008 period. It does not take into account the changes in institutional setting that have already been introduced, as their impact on the labour market is not yet visible in the data. In particular this applies to: (I) the pension reform of 1998, (II) expiry of the early retirement and economically

[6] The methodology used in the projections for European countries, which are presented in Table I.3, Figure I.11, and in Appendix 1.

equivalent pre-retirement benefits and allowances (2009) and (III) introduction of the so-called bridging pensions (2009). Scenario 2 (S2), on the other hand, evaluates the impact of those reforms on activity and employment of prime-aged and older people. Consequently, S2 serves as a point of reference for all other scenarios. This setting allows us to compare each alternative to the most likely, although still uncertain, evolution of participation and employment rates conditional on maintaining the institutional and policy *status quo*.

Box I.1. SYMDEM 2.0 – assumptions for demographic projection.

SYMDEM 2.0 (see IBS, 2010a) is a modelling tool that combines demographic projections with modelling of scenarios of labour market and economy in macroeconomic scale. SYMDEM 2.0 is composed of three modules: (i) demographic module, used to forecast the population size and structure based on assumed fertility and mortality rates by one-year age groups and by gender, as well as an age-specific net balance of external migration flows; (ii) labour market module, allowing to estimate the impact of changes in institutions and policies on the labour force participation and employment, following the methodology proposed by Burniaux et al. (2004); (iii) macroeconomic module, utilising dynamic stochastic general equilibrium modelling (DSGE) put forward by IBS (2010b) and used to quantify macroeconomic implications of developments simulated in the previous two modules. The methodology applied in the macroeconomic module is presented in detail in Box I.4. The population forecast covers the 2009-2060 period and results in population numbers by one-year and 100+ age groups (0,1,2,...,99) and gender.

According to the Central Statistical Office (GUS), the jump-off (i.e. 2008) population of Poland was 38 136 thousand citizens with permanent residence. In the light of recent migration flows, the number should be adjusted for all the individuals who resided abroad for longer than 12 months (Kupiszewski et al., 2003). Due to the difficulties in estimating the number of (e)migrants, we decided to make a correction for the (negative) value of net migration in 2008 (GUS data). The assumed vital rates (i.e. fertility and mortality rates) were based on the forecast by Matysiak and Nowok (2007).

The coefficients were adjusted to make the Matysiak and Nowok (2007) assumptions for 2008 in line with the empirical vital rates in that period. The assumed evolutions of age-specific vital rates over the 2009-2050 period are parallel to the median scenario of Matysiak and Nowok (2007) forecast, while coefficients for 2051-2060 have been extrapolated.

It was assumed that TFR would increase from 1.39 in 2008 (empirical observation) to 1.51 in 2030, and remain at this level till 2060. The most recent forecast by Central Statisical Office (GUS 2008) for the 2008-2035 period, predicts TFR to reach 1.45 in 2035. The former forecast for the years 2002 to 2050 assumed a drop in TFR by 2010, which has already turned to be wrong. The Eurostat forecast for the period 2005-2050 is based on a decline of TFR to 1.18 in 2009, then a rise to 1.64 in 2034, while the latest forecast for 2008-2060 assumes an increase from 1.27 in 2008 to 1.49 in 2060. Fertility patterns remain, however, under the influence of a range of economic, cultural, sociological and psychological factors, and the *ex post* errors of fertility projections are in general large. Thus an assumption of a stable TFR after 2030 seems to be a plausible *ex ante* solution. Following Matysiak and Nowok (2007), we also assume that the mean age at childbearing will be gradually rising to reach 30 years in 2030. The recent increase in TFR may be explained by recuperation effects (young women who postponed procreation decision and give births in later stages of life). The increase in TFR and a shift in childbearing patterns were calculated on the basis of historical observations for Spain and Italy, the countries similar to Poland with respect to strong Catholic traditions, traditional family model, female labour market participation and downward trend in TFR before the rebound (Matysiak, Nowok, 2007).

Mortality is assumed to fall relatively more steeply among the elderly, especially men. The difference between the average male and female life expectancy in 2008 was 2.5 year higher than in the EU on average. The baseline scenario assumes an increase in the average life expectancy both of men - from 70.5 in 2008 to 74.7 in 2030 and 78.4 in 2050, and of women - from 80.3 to 83.9 and 86.7 respectively. A forecast for the years 2008-2035 produced by GUS also postulates a narrowing gender gap in life expectancy, which in 2030 is believed to reach 75.8 for men and 82.2 for women. Eurostat projections for the 2007-2060 period estimates that life expectancy of males will reach 76.6 in 2030 and 80.7 in 2050, while for females 83.7 and 86.7 respectively.

Alternative scenarios were produced with additive modifications of age-specific vital rates, assuming that in the last year of the forecast TFR/average life expectancy would differ from baseline scenarios by X percent. In this way, the difference between age-specific fertility/mortality rates in the baseline and modified scenarios would follow a linear trend.

Due to the lack of relevant data, it was impossible to estimate age-specific net migration flows. For this reason we assumed that, to the best of our knowledge, this number amounted to overall 25 000 people in 2009. Additionally, we assumed the following characteristics of migrants: the highest migration flows are believed to be observed in the 29-30 age group, with 2/3 of migrants being men. This refers both to negative and positive migration flows of people migrating to/from Poland. Then we assumed that this balance would evolve in line with linear or square function and, depending on the scenario, net migrations will level out to zero, then turn positive after 2020, 2015 or 2025. This tendency will be caused by Poland becoming more and more attractive to foreigners, and by more frequent return migrations of Polish citizens. We have been quite conservative when producing scenarios for external migrations. The forecasts of migration flows spanning more than few years are characterized by a considerable variance of the estimates, which furthermore increases rapidly with the projection horizon (see Bijak and Wiśniowski, 2009). The net total flows assumed in the scenarios do not exceed those obtained in the median projections produced by Bijak and Wiśniowski (2009). Compared with the Eurostat population projection for the 2008-2060 period, our scenarios exhibit slightly higher net migration outflows during the initial years of the projection and slightly lower inflows at the later period of the projection.

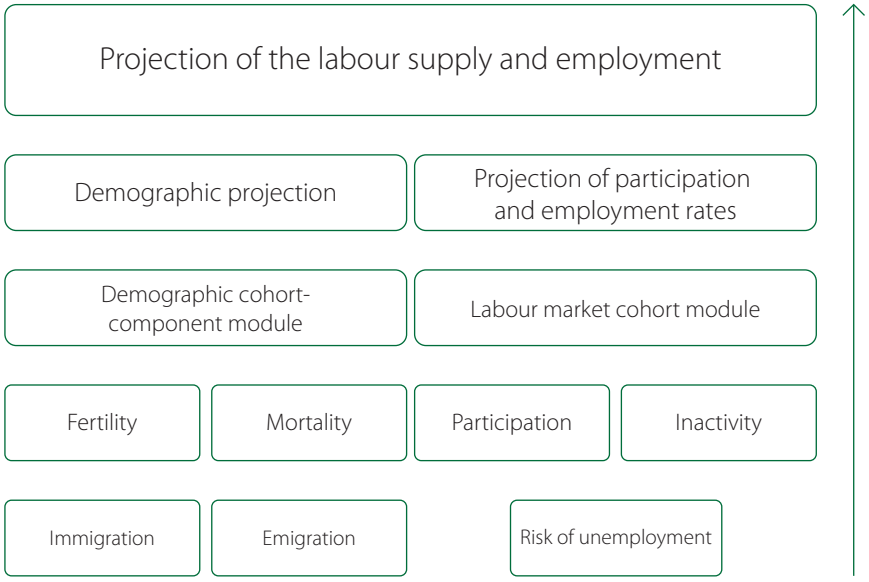
Box I.2. SYMDEM 2.0 – a projection tool.

The labour market forecast in SYMDEM 2.0 results from applying the labour market module to outcomes of the demographic forecast (see Box I.1 for its major assumptions). The labour market module is based on methodology proposed by Burniaux et al. (2004). The probabilities that (i) an inactive person enters the labour force and (ii) a labour market participant becomes inactive, by 5-year age groups and gender, work as "vital rates". On the basis of a simulated evolution of these probabilities, we calculate participation rates of the mentioned groups, as well as employment rates by additionally adjusting the results for the group-specific risk of unemployment.

We begin with estimating the impact of the pension reform and abolishing early retirement rights on the risk of exiting the labour market. Burniaux et al. (2004) indicate that in the traditional pension system, working in pre-retirement age is "implicitly taxed", especially if the system enables early retirement. What follows is that the contributions paid do not translate into an adequate increase of expected benefits. The greater the availability of early retirement schemes, the higher the implicit tax. The estimates for the "implicit tax" are based on Ruzik (2004). However, in the reformed, actuarially fair pension system, the "implicit tax" is almost negligible. Following the methodology proposed by Burniaux et. al (2004), we then estimated the impact of the pension reform as a product of the reform-driven change in the "implicit tax" multiplied by elasticities of probabilities of retiring (with respect to this variable), estimated for the OECD countries by Duval (2003). We apply a mean of the "high" and "low" elasticities used by Burniaux et al. (2004). By analogy, in estimating the effect of higher retirement age on the economic activity of the elderly, we resorted to the methodology of Burniaux et al. (2004) and labour elasticities from Duval's (2003) study. As regards the variants of reforms influencing the participation of young and prime-aged people, the projected probability distribution (and changes in them) of entering and exiting the labour market by 5-year age groups by gender were based on the experiences of countries that implemented reforms similar to those studied here.

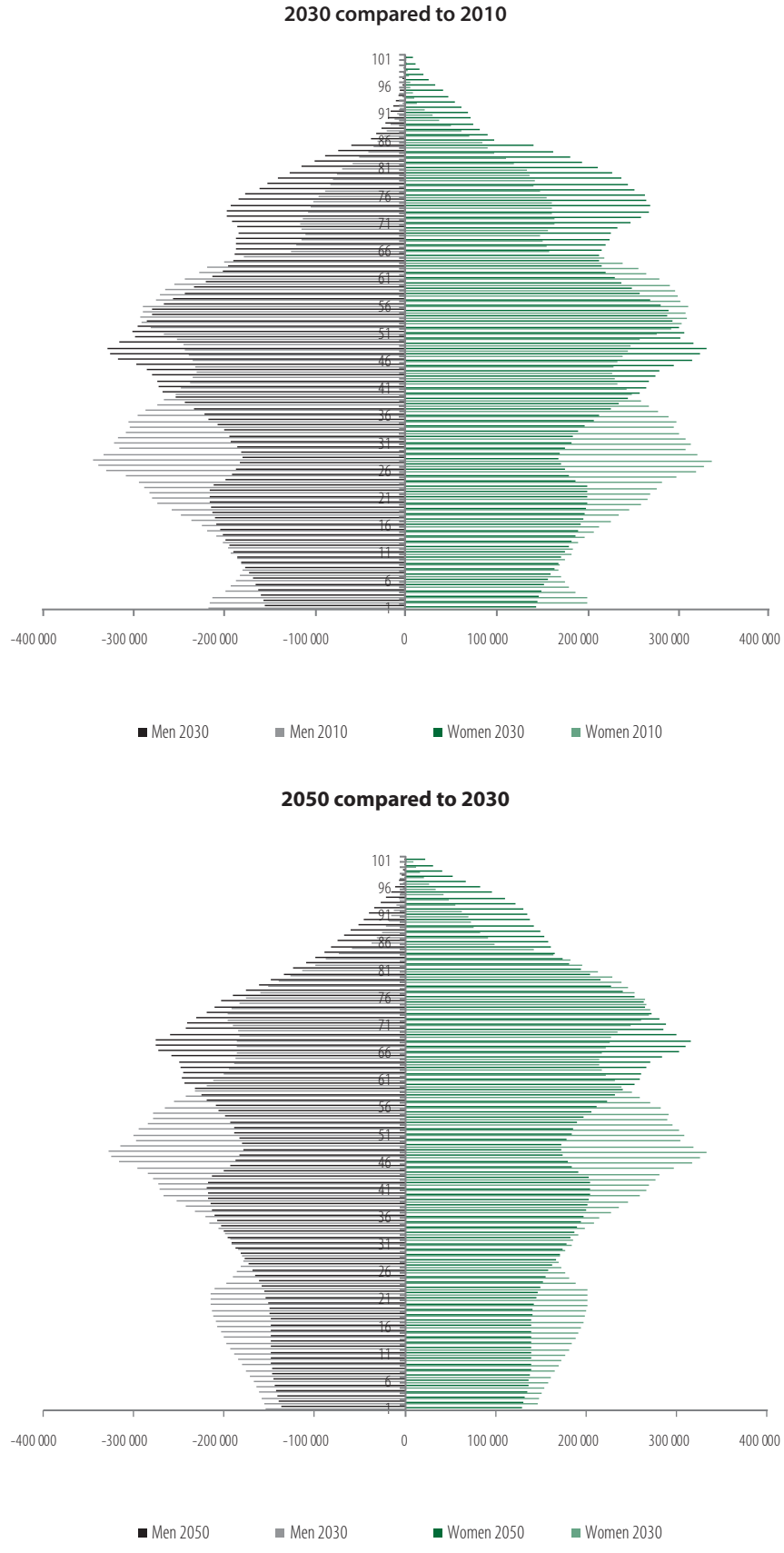
The next step involves calculating participation and employment rates conditional on the particular policy-reform scenario. Additionally, we indicate the year when they are likely to be achieved (usually 2020 or 2030). Rates calculated for the period from 2008 to that given year are interpolated with Hermite's multinomials, and in all subsequent years they remain stable until the last year of the projection – 2060. Finally, the forecasted size of the labour force and employment in 2008-2060 is generated as a product of the projected population of 5-year age groups by gender (calculated in the demographic module) and projections of the relevant labour market indicators.

Graph I.1. SYMDEM 2.0 - block diagram.



Source: IBS (2010a).

Figure I.12. Population structure in Poland in 2010, 2030 and 2050 (scenarios S1-S9).



Source: Own calculations based on SYMDEM 2.0 IBS (2010a).

Figure I.12 presents the baseline population forecast (conditional on baseline scenarios of vital rates and migration flows). It illustrates the shifts in the population structure and the scope of ageing: in 2030 all one-year age groups up to 37 will be less populous than in 2010 (the greatest differences are predicted for the 25-30 age group). At the same time, all groups aged over 65 are expected to be more numerous. Moreover, ageing will intensify in the two subsequent decades, as population is likely to shrink (in scenarios S1-S9 by 3.5 million in 2050 compared to 2010 and by further 1.6 million in 2060), the share of 25 year-olds is expected to decline (from 0.31 in 2010 to 0.26 in 2030, to 0.22 in 2050 and to 0.20 in 2060), and the old-age dependency ratio to nearly triple by 2050.

Table I.4. Population forecast for Poland, 2008-2060 (scenarios S1-S9).

	Population (thousand)	Average life expectancy		TFR	Dependency ratio	Old age dependency ratio
		Women	Men			
2010	38 164	80.7	70.9	1.40	0.40	0.19
2015	38 262	81.7	72.1	1.43	0.45	0.23
2020	38 205	82.5	73.1	1.46	0.53	0.29
2025	37 930	83.3	74.0	1.48	0.58	0.34
2030	37 458	83.9	74.7	1.51	0.58	0.36
2040	36 104	85.4	76.6	1.51	0.61	0.42
2050	34 386	86.7	78.4	1.51	0.77	0.55
2060	32 750	88.0	80.3	1.51	0.95	0.71

Source: Own calculations based on SYMDEM 2.0 IBS (2010a).

A decrease in population can be prevented first and foremost by a significant rise in fertility. However, a moderate increase, e.g. reaching TFR=1.5 not in 2030 but already in 2020 and then approaching TFR=1.6 in 2030, would not improve the situation. In such circumstances population is likely to be higher by 275 thousand in 2030 and by 750 thousand in 2050, in comparison to the baseline scenario.[7] A more optimistic scenario (S10, S13, S16), assuming that the total fertility rate will reach 1.7 and 1.8 in 2020 and 2030 respectively,[8] implies that population in 2030 will exceed the one of 2010. Still, it would not prevent population shrinkage in the more distant future. On the other hand, a moderately pessimistic scenario, assuming that TFR will not exceed 1.4 (S12), implies that in 2025 population would dwindle by 600 thousand compared to 2010. In the course of the following 5 years the difference would double and in 2050 it would reach 5 million (see Table I.5). Moreover, even in the optimistic fertility scenario, the shifts in population structure and increase of old-age dependency ratio are expected to develop almost in the same way as in the baseline scenario. If the average life expectancy expands more rapidly and the average female life expectancy reaches the EU average (as projected by Eurostat) by 2050, population will be by almost 600 thousand people larger than in the baseline scenario. At the same time, in this scenario the pace ageing, in terms of the old-age dependency ratio, would be similar to that of the low fertility rate scenario.[9]

[7] This variant is not further discussed and detailed results are thus not presented.
[8] In 2008 (most recent data) TFR exceeding 1.8 was recorded only in six European countries.
[9] The labour market implications of population ageing in this scenario are basically the same as in the status quo scenario (S2). Participation and employment rates of the age groups, which are more populous in this variant, i.e. over 65/70 year-olds, are close to null and are unlikely to be significantly changed by policies. Therefore, we decided not to study the "low mortality" case further.

Table I.5. Population forecast for Poland, 2008-2060 – alternative scenarios.

	Population (thousand)	Average life expectancy		TFR	Dependency ratio	Old age dependency ratio
		Women	Men			
High fertility scenario – TFR=1.8 as of 2030 (S10, S13, S16)						
2010	38 181	80.7	70.9	1.43	0.40	0.19
2015	38 403	81.7	72.1	1.52	0.46	0.23
2020	38 535	82.5	73.1	1.61	0.54	0.29
2025	38 471	83.3	74.0	1.71	0.60	0.34
2030	38 249	83.9	74.7	1.81	0.61	0.36
2040	37 477	85.4	76.6	1.81	0.64	0.41
2050	36 500	86.7	78.4	1.81	0.79	0.52
2060	35 550	88.0	80.3	1.81	0.95	0.65
Generation replacement rate scenario – TFR=2.1 as of 2030 (S11)						
2010	38 192	80.7	70.9	1.45	0.40	0.19
2015	38 506	81.7	72.1	1.61	0.46	0.23
2020	38 811	82.5	73.1	1.77	0.55	0.29
2025	38 978	83.3	74.0	1.94	0.62	0.34
2030	39 037	83.9	74.7	2.11	0.63	0.36
2040	38 905	85.4	76.6	2.11	0.67	0.40
2050	38 788	86.7	78.4	2.11	0.80	0.50
2060	38 672	88.0	80.3	2.11	0.95	0.61
Low fertility scenario – TFR=1.4 as of 2030 (S12)						
2010	38 120	80.7	70.9	1.32	0.40	0.19
2015	38 126	81.7	72.1	1.34	0.45	0.23
2020	37 972	82.5	73.1	1.37	0.52	0.29
2025	37 573	83.3	74.0	1.39	0.56	0.34
2030	36 977	83.9	74.7	1.42	0.57	0.37
2040	35 352	85.4	76.6	1.42	0.61	0.42
2050	33 294	86.7	78.4	1.42	0.77	0.57
2060	31 356	88.0	80.3	1.42	0.95	0.73
Low mortality scenario – average female life expectancy converging to EU average in 2050						
2010	38 171	80.7	71.0	1.40	0.40	0.19
2015	38 319	81.8	72.3	1.43	0.45	0.23
2020	38 317	82.8	73.5	1.46	0.53	0.29
2025	38 073	83.6	74.6	1.48	0.58	0.35
2030	37 635	84.4	75.6	1.51	0.59	0.37
2040	36 393	86.0	77.9	1.51	0.62	0.43
2050	34 783	87.3	80.0	1.51	0.79	0.57
2060	33 245	88.7	82.3	1.51	0.98	0.74

Source: Own calculations based on SYMDEM 2.0 IBS (2010a).

2.2.2. Increasing labour force participation of the elderly as a tool to counteract consequences of population ageing in Poland

The presented changes in the population structure will have a strong bearing on the employment rate and proportion between the economically active and inactive subpopulations. The UN (2004) suggests, however, that the total fertility rate around 1.6 might be enough to avoid structural problems related to population shrinkage, provided the right (i) migration policy and policies to increase the labour force participation are in place. Box I.3 introduces 17 scenarios of various policy reforms and population developments. We simulate each of these scenarios to find the ones which would optimally fulfil the above UN prescription.

Box I.3. Demographic and policy scenarios simulated in SYMDEM 2.0.

We discuss seventeen scenarios differing in the assumptions related to the government policy affecting the labour market, social security and family policy, as well as to migration flows in the period covered by the projection. Taking into account the findings discussed in Section 1 and results of the analyses presented in Part II and Part III of this report, we have distinguished the following scenarios:

1. S1 – return to labour force participation patterns shaped by the old pension system and availability of early retirement;
2. S2 – the 1998 reform of the pension system and abolishment of early retirement (status quo);
3. S3 – S2 plus raising statutory retirement age to 67 years in the 2011-2020 period;
4. S4 – S2 plus raising statutory retirement age to 67 years in the 2021-2030 period;
5. S5 – S2 plus increasing participation of women aged 25-44;
6. S6 – S5 plus increasing participation of men aged 25-54;
7. S7 – S6 plus raising statutory retirement age to 67 years in the 2011-2020 period;
8. S8 – S2 plus increasing participation of people aged 15-24;
9. S9 – S8 plus increasing participation of prime-aged women and men and raising retirement age to 67 years in the 2011-2020 period;
10. S10 – S2 plus high fertility (TFR=1.8 in 2030);
11. S11 – S2 plus generation replacement fertility rate (TFR=2.1 in 2030);
12. S12 – S2 plus low fertility (TFR=1.4 in 2030);
13. S13 – S9 plus high fertility;
14. S14 – S2 plus positive net migration to Poland from 2015 on;
15. S15 – S2 plus positive net migration to Poland from 2025 on;
16. S16 – S13 plus positive net migration to Poland from 2015 on;
17. S17 – S9 plus TFR=2.1 in 2030 and net migration to Poland from 2015 on.

Scenarios are simulated independently using SYMDEM 2.0 (IBS, 2010a) and analysed in terms of projected participation and employment rates, as well as the total employment in the population aged 15+ in the years 2010 to 2060.

Projections for the EU countries (Table I.3) indicate that maintaining participation patterns of the past two decades in Poland would imply one of the steepest declines in labour supply in the EU. It is confirmed by a hypothetical scenario (S1) assuming a return to the "old" pension system, i.e. the one before the 1998 reform. Given the fact that over the 2015-2025 period populous cohorts born in the early 1980s (baby boom) will achieve the peak of their economic activity, Poland would in the short term benefit from the demographic premium; so even in the S1 scenario a slight improvement in participation and employment rates of the 15-64 age group ensues. In the 15+ population, demographic effects would, however, cause a gradual decrease of those rates starting already in 2010. According to this scenario, till 2015 total employment would fall by over 100 thousand people comparing with 2010. By 2025, the number of the employed would drop by another million, and in 2050 by over 4 million people. As a result, the return to the previous pension system in Poland, along with reinstating the early retirement privileges, would make over a half of people aged 15+ economically inactive by 2025.

Table I.6. Employment changes in Poland over the years 2015-2060 compared to 2010, assuming the return to the old pension system with early retirement privileges (S1) and status quo scenario (S2) (in thousands).

	2015	2020	2025	2030	2040	2050	2060
S1	-119.0	-438.5	-1016.1	-1606.4	-2932.3	-4377.7	-5664.2
S2	355.4	399.3	-207.7	-696.2	-1891.7	-3615.1	-5113.4

Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

The pension reform (1998), expiry of early retirement privileges (2008) and introduction of the so called "bridging pension scheme" significantly modified the institutional context, in which decisions concerning labour supply are made. These institutional changes have not yet fully translated into higher participation and employment rates, but it is bound to happen in the coming decade.[10] Indeed, our simulations demonstrate that by 2020 (S2 scenario), the increase in the labour force participation of people aged 50+ (driven by the aforementioned institutional changes) will counterbalance the negative demographic effects that lower labour supply. Over the coming decades, 30-50 percent of demographic shrinkage in labour supply and employment will be offset in this way. We thus expect that the participation rate of the 15-64 year-olds will reach 70 percent around 2020 and will oscillate around this level over the next decade. In comparison to the S1 scenario, a drop in the economic activity rate of people aged 15+ below the level of 50 percent will occur 20 years later.

Scenario 2 (S2) implies a slightly higher increase in participation and employment rates of women than of men. Nevertheless, even in 2020 this would not allow for reaching the rates of 65 and 60 percent (the EU-15 average in 2008) of participation and employment rates respectively, among females aged 15. The gap between the effective labour market exit age and statutory retirement age is expected to shorten from 7 years in 2008 to 6-12 months in 2020. Therefore, the participation and employment gaps between Poland and the EU-15 which, according to the forecast, persist in the status quo scenario S2, results from the low statutory retirement age in Poland. Since males and females exhibit different average life expectancies, a woman retiring in 2010 at the age of 60 will on average spend 23 years retired, while a man retiring aged 65 will on average live for less than 15 years. These periods will expand as a result of the declining mortality of older people in Poland (by a year before 2020[11]). Equalling women's and men's statutory retirement age in 2011-2020 (which is taken into account in the following scenarios: S3, S6, S9, S13, S16, S17) will reduce this difference and also have a significant impact on labour supply and employment.

Table I.7. Labour market forecast for Poland – participation and employment rates in 2010-2060 depending on the institutional determinants of the labour supply of individuals aged 50+.

	2010	2015	2020	2030	2040	2050	2060
Return to the old pension system and early retirement privileges (S1)							
Participation 15-64	63.7	64.8	66.2	65.1	63.3	64.2	65.3
Participation 15+	54.3	53.8	52.9	49.5	47.0	44.6	42.5
Employment 15-64	59.2	60.3	61.7	60.7	58.9	59.9	60.9
Employment 15+	50.5	50.0	49.3	46.1	43.8	41.7	39.7
Reformed pension system with no early retirement privileges – status quo (S2)							
Participation 15-64	64.1	67.8	70.7	70.2	69.1	69.7	70.3
Participation 15+	54.6	56.1	56.3	53.1	51.1	48.1	45.4
Employment 15-64	60.0	62.9	65.9	65.4	64.4	64.9	65.7
Employment 15+	51.1	52.1	52.5	49.6	47.6	44.9	42.5
Reformed pension system with no early retirement privileges and gradual increase in the statutory retirement age to 67 years in the 2011-2020 period (S3)							
Participation 15-64	64.2	69.3	73.1	72.2	71.8	72.5	73.3
Participation 15+	54.7	57.9	59.3	55.7	54.2	51.4	49.0
Employment 15-64	60.3	64.2	68.2	67.2	66.9	67.6	68.4
Employment 15+	51.5	53.7	55.3	52.0	50.6	48.1	45.9
Reformed pension system with no early retirement privileges and gradual increase in the statutory retirement age to 67 years in the 2021-2030 period (S4)							
Participation 15-64	64.1	67.8	70.7	72.0	71.8	72.5	73.3
Participation 15+	54.6	56.1	56.3	55.2	54.2	51.4	49.0
Employment 15-64	60.0	62.9	65.9	67.0	66.9	67.6	68.4
Employment 15+	51.1	52.1	52.5	51.8	50.6	48.1	45.9

Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

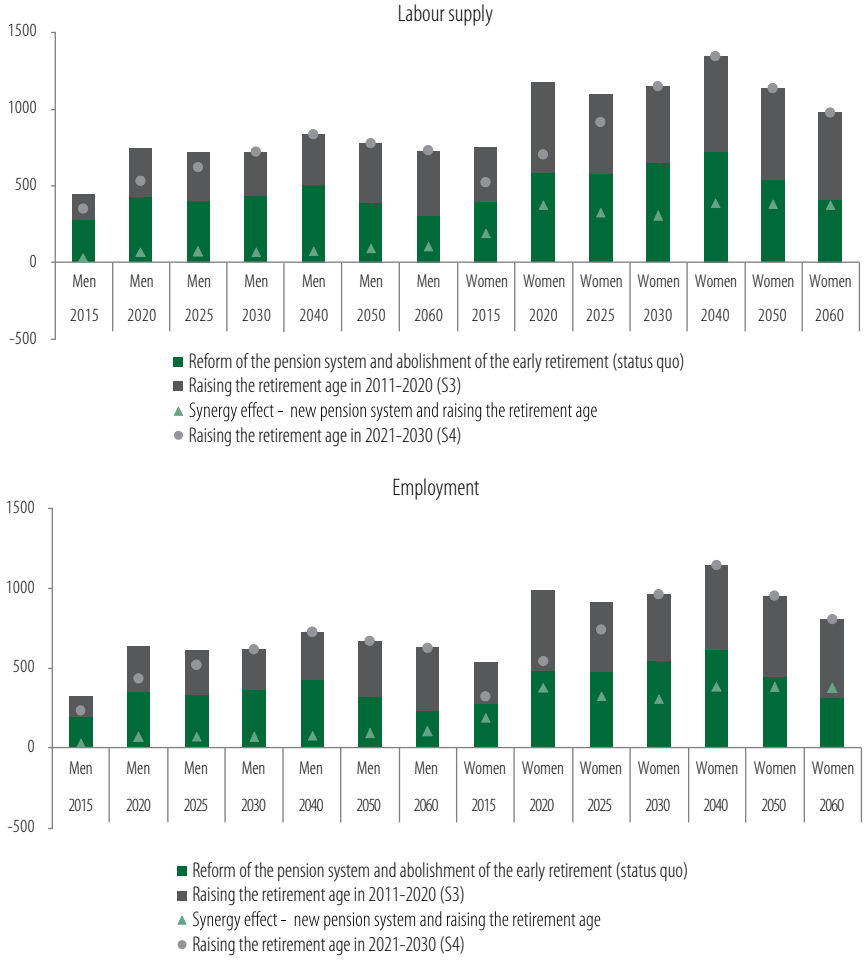
[10] The research shows that actuarial fairness of the new pension system and elimination of transfers which permanently finance consumption of the economically inactive persons, should considerably increase the labour supply of people aged 50+. Analysing the OECD countries, Burniaux et al. (2004) conclude that such reforms have the greatest potential to raise labour supply in order to counteract the effects of ageing.

[11] The gender gap will be slightly decreasing.

The gradual increase in the statutory retirement age to 67 years in 2020 (S3, S6, S9, S13, S16, S17) will bring „additional" 350 thousand females and 150 thousand males to the labour market already in 2015. Labour supply of women and men in 2020 will then grow even by 500 thousand and 300 thousand respectively, compared to the status quo (S2) (assuming that there will be no policy changes after the retirement age is set on 67 years for both genders). Figure I.13 shows that such reform will bring benefits in the form of higher labour supply and employment, amounting to ¾ of the impact of the 1998 pension reform (S2). What is more, in the new institutional context (after the pension reform and abolishment of early retirement) increasing the statutory retirement age should generate larger gains in terms of employment than in the old institutional setting. It is due to the fact that equalling the retirement age in the new system will cover more numerous groups of still economically active people than would be the case in the pre-reform one.

The synergy effect, showing the differences in labour supply and employment between increasing the retirement age in the current and previous institutional settings, is more pronounced for women. Postponing the equalling of the statutory age till the 2021-2030 period (scenario S4), implies in comparison to S3, labour supply lower by on average 350 thousand each year in 2011-2030. The participation gap between those two scenarios will widen gradually, reaching its peak at 700 thousand people in 2020 when, according to S3, the reform would have already been implemented, whereas in S4 it is about to be introduced (affecting 10 years younger cohorts). Therefore, postponing the reform will clearly result in a loss of labour supply, employment and output over the years 2011 to 2030. This will be aggravated by a demographic factor – the cohorts reaching the statutory retirement age in 2011-2030 are by about 600 thousand more populous (mainly women) than in the cohorts of females and males reaching the age of 60/65 in the next decade.

Figure I.13. Projected impact of the policies affecting participation of older people on labour supply (upper panel) and employment (lower panel) over the 2015-2060 period (in thousands).



Notes: Bars show net effects of each variant – the difference between the number of the economically active (employed) in a specific year compared with the same category if the variant was not introduced. The blue part denotes the effect of the status quo scenario, the entire bar - S2.
The synergy effect is understood as a difference between the net impact of higher retirement age in the new pension system with no option of earlier retirement and the net impact of higher retirement age in the old pension system with earlier retirement.
The S4 scenario assuming higher retirement age (67) in the years 2021 to 2030 is presented as the overall impact of the new pension system without early retirement and higher retirement age introduced over the 2021-2030 period.
Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

2.2.3. Increasing labour supply of youth and prime-aged vs. population ageing implications for the polish labour market

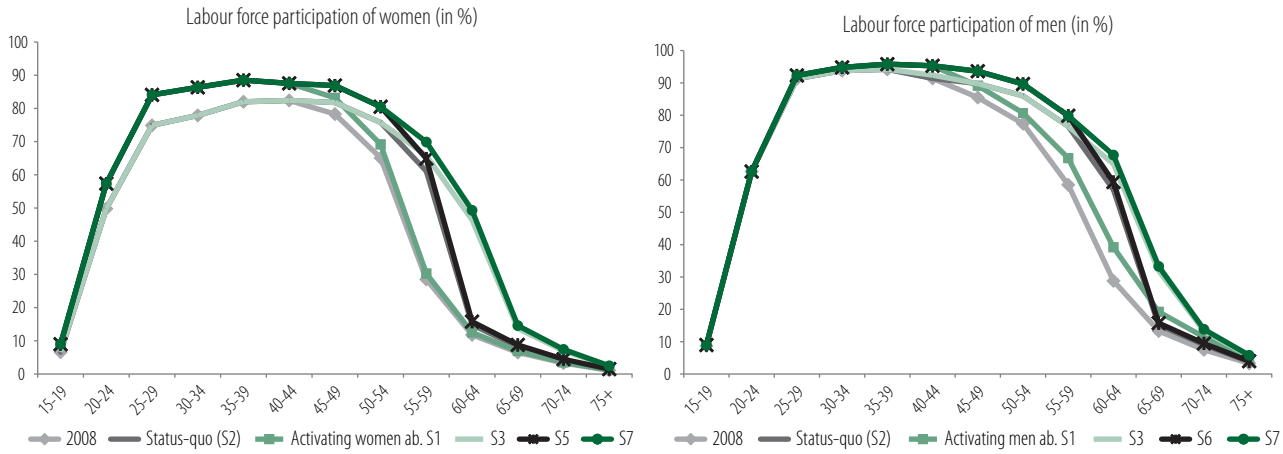
According to the S3 scenario (in which retirement age gradually increases to 67 over the 2011-2020 period), labour force participation of the working age population will exceed 50 percent till 2050. It is because participation and employment rates of individuals 50+ increase in this scenario to reach the current EU-15 average. As a result, Poland would meet the Lisbon targets with respect to female employment (60 percent in the 15-64 age group) between 2015 and 2020, which has found to be impossible in the status quo scenario (S2). Changes in population structure will be, however, extensive: both the share of 55-69 year-olds in the population 15+ and the share of 55-64 year-olds in the 15-64 group will soar by 10 percentage points over the period 2010-2050 (with a 7 percentage point growth occurring over the years 2030 to 2050). Consequently, measures taken in the S3 scenario will not be enough to guarantee stable participation and employment rates of people aged 15+ after 2020. To avoiding such a situation, higher labour supply of prime-aged women is required (scenarios S5-S7, S9, S13, S16-S17).

The gender gap in participation and employment rates is common for all European countries. In Poland, it is especially large in the age groups that are normally characterised by the highest participation over the life cycle. They are, at the same time, in childbearing and childrearing age, which negatively affects their procreative decisions. The divergence of participation and employment of these specific groups of females is especially important, as it tends to strengthen over the life course due to career breaks.[12] Male economic activity in Poland is high among 25-34 year-olds, exceeding the EU-27 and the EU-15 averages. However, after the age of 35, the risk of economic idleness among males increases. Differences in participation rates between the 25-34 and 35-39 age groups, and between the subsequent age groups (40-44, 40-44 and 45-49, 45-49, 50-54) in Poland belong to highest in the EU. As a consequence, the inactivity rate of men aged 50-54 in Poland exceeds the EU average by 12 percentage points and the average for the Scandinavian countries by over 15 points.

The division of time between market work and household duties is affected by cultural factors. The predominant family model and its impact on such decisions are thus characterised by significant inertia (Pissarides et al., 2005). Labour force participation patterns often change as new cohorts enter the labour market (Jaumotte, 2003). Scenario S5 shows the effect of raising the participation of prime-aged women (assuming that the gender gap in the 15-44 age group will narrow by half by 2030[13]), with scenario S6 analysing the increase of economic activity among 30-50 year old men. We assume that by 2030, the discrepancy in participation rates in the subsequent age groups will follow the current average EU pattern. Scenario S7, on the other hand, investigates the effect of raising retirement age before 2020, along with the reforms targeted at prime-aged groups (S7).

A comparison of scenarios S5 (for women) and S6 (for men) with S2 (see Chart I.14) leads to the conclusion that the scale and continuity of labour force participation at the age of 25-45 play a key role in the attachment to the labour market later in life, especially among women. On the other hand, incentives to supplying labour after the age of 50 strengthen the impact of higher participation in prime-age on the labour supply over the entire life course. The increase in participation of 45 year-olds in the old pension system (hypothetical scenario – S1) would only marginally improve participation after that age, due to early withdrawals. However, within the new pension system, it is expected to translate into a significantly higher labour supply 10-15 years before the statutory retirement age (S5, S6). The additional strengthening effect of higher labour supplied over the life cycle can be achieved by raising the statutory retirement age (S7) together with improving participation of prime-aged people.

Figure I.14. The effect of increasing labour force participation of prime-aged people, pension reform and setting the statutory retirement age at 67 on male and female participation rates over the life-cycle.



Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

[12] These issues are analysed in greater detail in Part III.
[13] It means that participation of women relative to that of men would be similar to the pattern currently observed in the Scandinavian countries.

The results of simulations imply that increasing labour market attachment of prime-aged women (S5) will lower their effective age of entry on this market by a year before 2030 (as compared to 2008). On the other hand, the pension reform (S2,S5,S6,S7) shifts the average exit age – we estimate that this increase may reach even three years for females and four years for males. Higher statutory retirement age (S7) would move the exit age by two additional years for women and one for men. Hence, in comparison to the status quo scenario (S2), the average career of women would be a year longer in S5 and S6, and nearly three years longer in S7.[14] The abovementioned developments, together with higher participation in prime-age, will raise female employment rates in the 15-64 age group by 4 percentage points (S5, S6) and 8 percentage points (S7) in the course of 10-15 years. This translates into employment higher by 0.5-0.6 and 1.0-1.2 million workers. Improving the participation of prime-aged men (S6) would bring, relatively to the status quo, employment higher by 200 thousand in 2020 and even 300 thousand workers in 2030. In the S7 scenario, when the impact of higher retirement age is taken into account, the employment of males is expected to exceed the status quo by 400 and 500 thousand respectively. This scenario allows therefore to maintain till 2040, the employment rate exceeding the one predicted for 2010 .

Table I.8. Labour market forecast for Poland – participation and employment rates for the years 2010 to 2060 in scenarios which assume increasing labour supply of prime-aged people and youth (S5-S9).

Increasing labour supply of prime-aged women (S5)							
	2010	2015	2020	2030	2040	2050	2060
Participation 15-64	64.3	68.4	72.2	72.5	70.8	71.1	71.6
Participation 15+	54.8	56.6	57.5	54.6	51.6	47.8	44.4
Employment 15-64	59.6	63.6	67.3	67.4	65.8	66.2	66.7
Employment 15+	50.8	52.7	53.6	50.8	48.0	44.6	41.4
Increasing labour supply of prime-aged women and men (S6)							
Participation 15-64	64.3	68.9	73.4	74.6	72.9	73.2	73.6
Participation 15+	54.8	57.1	58.4	56.2	53.2	49.3	45.8
Employment 15-64	59.6	64.1	68.3	69.5	67.8	68.1	68.6
Employment 15+	50.8	53.1	54.4	52.4	49.5	46.0	42.7
Increasing labour supply of prime-aged women and men plus raising the retirement age to 67 over the 2011-2020 period (S7)							
Participation 15-64	64.3	70.4	75.9	76.9	76.0	76.4	77.0
Participation 15+	54.8	58.9	61.5	59.0	56.6	53.0	49.7
Employment 15-64	59.6	65.5	70.7	71.6	70.7	71.1	71.8
Employment 15+	50.8	54.8	57.4	55.0	52.8	49.5	46.5
Increasing labour supply of people aged 15-24 (S8)							
Participation 15-64	64.3	69.8	73.7	73.4	71.6	71.8	72.1
Participation 15+	54.7	57.7	58.6	55.2	52.1	48.3	44.7
Employment 15-64	59.6	64.6	68.3	67.9	66.2	66.4	66.8
Employment 15+	50.8	53.5	54.4	51.1	48.3	44.8	41.6
Increasing labour supply of prime-aged women and men and people aged 15-24 plus raising the retirement age to 67 over the 2011-2020 period (S9)							
Participation 15-64	64.5	71.3	77.4	80.0	78.8	79.1	79.7
Participation 15+	54.9	59.5	62.6	61.3	58.7	54.8	51.3
Employment 15-64	59.8	66.2	71.9	74.1	73.0	73.4	73.9
Employment 15+	51.0	55.3	58.3	56.9	54.4	50.9	47.8

Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

The third key factor determining the employment gap between Poland and EU-15 is the low participation and employment rate of young people, which results from (i) extremely low employment rates of students and (ii) difficulties in entering the labour market experienced by graduates (of both secondary and tertiary levels). Scenario S8 (and S9, S13, S16-17) assumes increasing participation of youth via reducing the average age of entry on the labour market by two years, as compared to 2008. This means entry, on the average, at the age of 19.0 for men, and at 19.6 for women, and translates into participation rates of 15-19 and 20-24 year-olds gradually increasing to 33 and 75 percent for men and 33 and 69 percent for women respectively in 2030.[15]

[14] Compared to S1, which assumes a return to the old pension system, females are expected to be economically active for on average 4 (S5, S6) and 6 (S7) years longer.
[15] The average rates for those European countries which recorded high participation of youth (see Figure I.22).

The average age of entry will decrease by a year because of the already implemented reform setting the beginning of the primary school at the age of six, instead of seven. This should materialise between 2020 and 2025. An additional year may be gained with improving the fit of vocational education to labour market requirements and by supporting the work of tertiary students. The process has already been encouraged by the introduction of the Bologna system, which shortens the education spells in Europe (Martins, 2007).

In terms of employment, gains from such a change are expected to be comparable to the ones stemming from increasing labour supply of women, at all forecast horizons (Table 1.8 and Figure I.15). Scenario S8, however, universally increases both female and male activity. Similarly to S6, it allows to keep the employment level over the current levels for several years, but just after 2030 they vanish as the demographic effects prevail and the share of youth and prime-aged people in the population 15+ declines steeply.

It is therefore only scenario S9, which combines the reforms on all four margins considered, allowing to utilise interactions among the reforms in a comprehensive way. Scenario S9 assumes (i) lowering the effective age of entry on the labour market by two years over the 2010-2030 period, (ii) reducing the gender gap in employment and participation in prime-age by 2030, (iii) reducing the inactivity risk among men aged 35-50 to European standards, (iv) increasing the statutory retirement age to 67 (over the years 2011 to 2020). Compared to the status quo (S2), employment in 2015 would be higher by one million, in 2020 by additional 800 thousand, and by approximately 2.5 million over the 2030-2040 period.[16] The forecasted employment rate of males aged 15-64 would remain stable at 77 percent from 2020 on. The one of females of this age would exceed 60 percent in 2015 and reach 70 percent in the years 2025 to 2035, with the employment rate of the 55-64 group expected to oscillate at 60 percent after 2020. Scenario S9 shows that it is possible to achieve all three Lisbon employment targets in Poland. However, the employment rate of population 15+ would start to decline after 2020, reaching the level from 2010 in 2050. Total employment will deteriorate from 2020 on, and by 2044 would be lower than in 2010.

Avoiding the downslide of employment and output in Poland over the coming 50 years is impossible without policies affecting population size and structure, notably the ones leading to an increase in the number of the working-age individuals (especially the prime-age groups) in total population.

2.2.4. Policies influencing labour supply and population structure

Fertility and migrations are the major determinants of the population structure and can be influenced by the policy. Changes in the fertility patterns are taken into account in scenarios S10-S13,S16-S17, and migration flows are studied in scenarios S14-S17. Table I.9 and Figure I.15 show that, although increasing fertility over the period 2010 to 2030 and maintaining its high level (S10) may alleviate a drop in employment after 2050, exerting a significant impact on the labour market is possible only when higher fertility is accompanied with the above-mentioned reform package (S13). This conclusion applies also to the very optimistic case of fertility gradually reaching the generation replacement rate in 2030 and remaining at this level thereafter (S11). By contrast, maintaining institutional status quo and fertility at the level of 2008 (TFR=1.4, S12 scenario) would lead to employment lower than in S2 scenario. In absolute categories, compared to 2010, employment would be lower by 2 million in 2040, by 4 million in 2050 and by almost 6 million in 2060.

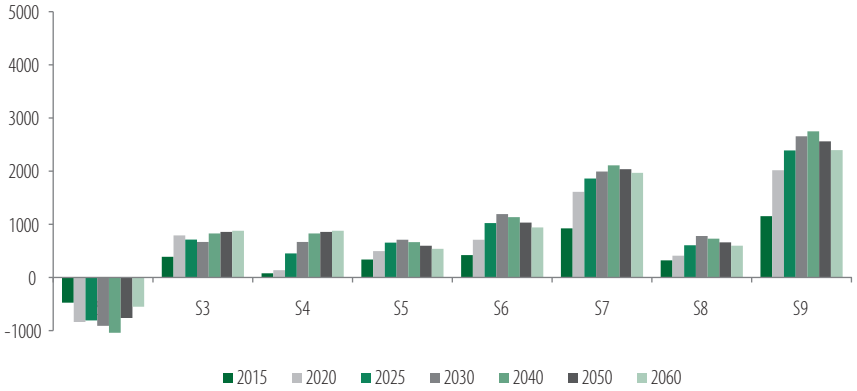
A gradual increase of the total fertility rate to 1.8 in 2030 and introduction of a reform package targeted at labour supply (S13) would strongly boost employment with respect to the status quo (see Figure I.15). By 2045 employment would be higher than in 2010 (see Figure I.17), however, due to population shrinkage it would later decrease anyway. This could be cushioned by reaching the replacement fertility, but this assumption does not seem realistic – in 2008 Ireland and Island were the only European countries exhibiting such fertility levels.[17] An alternative way to even compensate for the decline in population, especially of prime-aged groups, would entail improving the net balance of migration flows. Poland has traditionally been an emigration country, and the outflows have intensified after the EU accession. However, the net flows are likely to reverse in the future, due to intensified return of migrations and inflow of immigrants from poorer countries. This taking place as soon as in 2015, together with an influx of 20 thousand migrants a year over the 2015-2030 period and of 40 thousand in the subsequent years (as assumed in S14, S16, S17)[18], and the fact that migrants are predominately prime-aged[19] then, even in the institutional status quo (S14), it would make up for approximately 1/3 of the loss in labour supply in 2030 (caused by a change in the native population structure) and for approximately 1/10 of that loss after 2050. If Poland remains a net emigration country till 2025, as is assumed in S15, the decline in employment after 2020 would be by a few percent higher than in the status quo scenario (in which net migration flows are bound to reverse in 2020).

[16] Comprehensiveness of the policy reform plays a crucial role. In the case of improving labour force participation of youth and prime-aged, but leaving the retirement ages intact, in 2040 employment would be by 750 thousand lower than projected for 2010. In 2050 the difference would reach 2.6 million, while in 2060, exceed 4 million.
[17] Scenarios involving policy reforms included in S9 and S13 and setting the total fertility rate at 2.1 after 2030 is not presented.
[18] Alternatively, net migration flows may reverse later and more numerous groups might settle in Poland then. This, however, would raise the issue of difficult integration process of immigrants in the host society. There is yet no evidence suggesting that the impact on the labour market of the receiving country of immigration resulting from sudden and populous migration waves is different than impact of regular migration building over time (von Weizsäcker, 2008).
[19] Employment rates in this group are also frequently higher than for the native population. This depends, however, on immigration policy and social security model in the receiving country (von Weizsäcker, 2008).

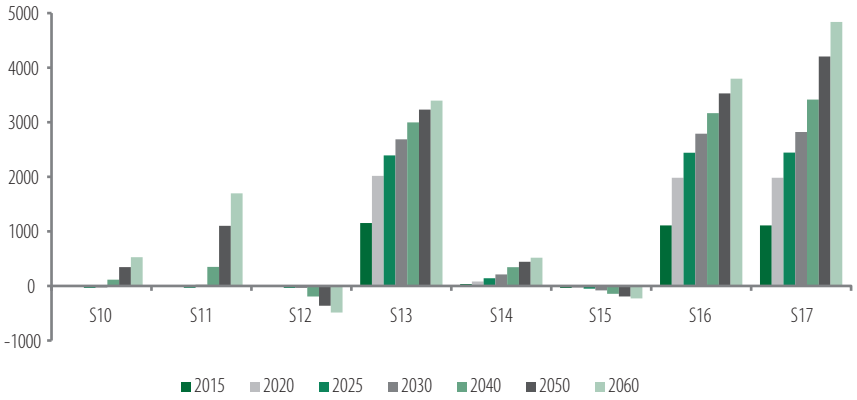
According to the S16 scenario, the influx of migrants from 2015 on would partially offset the negative population effects of fertility below replacement rate. Moreover, together with the labour market reforms, immigration opens an opportunity for a healthy employment increase in comparison to the status quo scenario over the entire forecast horizon. Thus, by 2050 total employment would exceed the one in 2010 (see Figure I.17). However, to achieve the long-lasting gains (i.e. till 2060) it is necessary to (i) gradually reach the replacement fertility rate in 2030 and later (S17), or (ii) double the size of migration inflows, compared to S14 and S16.[20] In this "high immigration" variant of the S13 scenario (Figure I.16),[21] in 2050 immigrants and their children are expected to constitute approximately 7.5 percent of the total population – a share similar to the one currently recorded in countries like Germany, Austria and Belgium. It is noteworthy that the forecasted employment rates of immigrants exceed that of the native population, which results from an advantageous (i.e. with higher share of prime-aged groups) population structure of immigrants. With time, the median age of immigrants will grow as those coming in the first waves will approach retirement age. Their employment rate will then decrease due to demographic effects.

Figure I.15. Total employment forecasted in various policy reform and population developments scenarios compared to the status quo scenario (S2) (in thousands).

Scenarios of labour supply increasing reforms (S3-S9) and return to the old pension system (S1)



Scenarios assuming alternative population developments and labour supply increasing reforms (S10-S17)



Notes: Bars show net effects with respect to the status quo scenario (S2) – the difference between total employment in a given scenario in a specific year and total employment in the same year in the status quo scenario (S2).

Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

[20] Or any combination of both options that implies the same population growth.

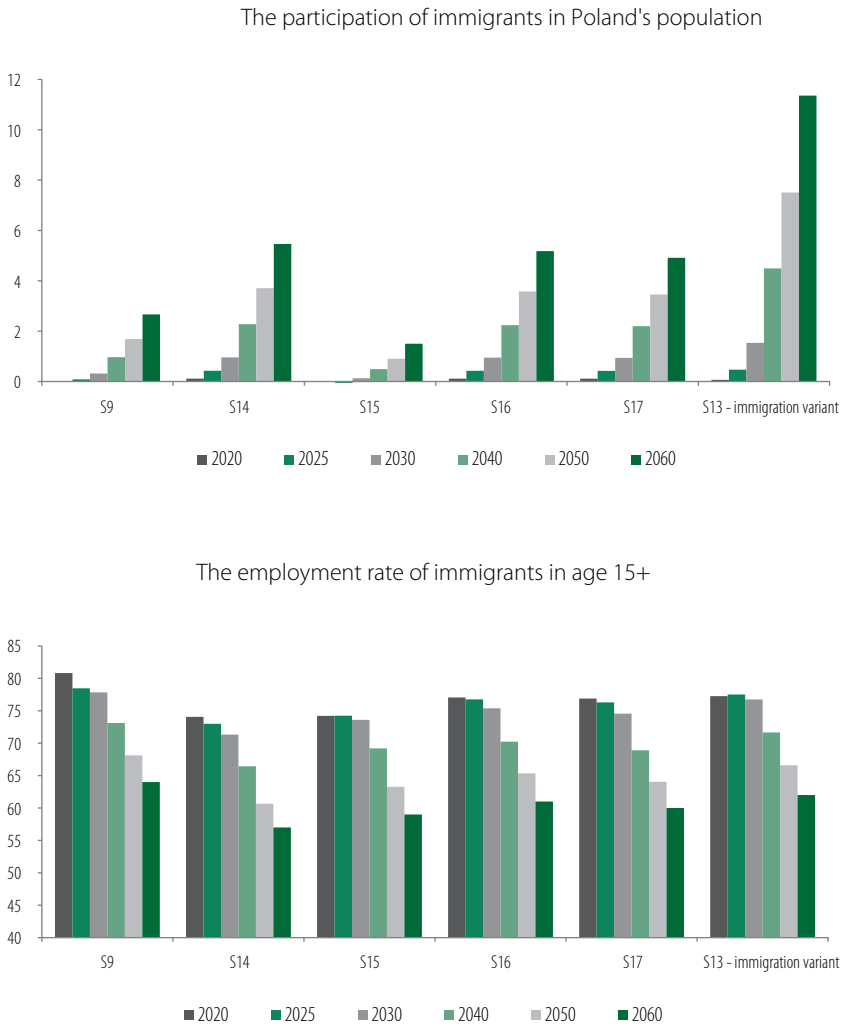
[21] Defined as the dual problem: the immigration required to maintain total employment above the 2010 level, while maintaining all other assumptions of the S13 scenario over the entire forecast period.

Table I.9. Labour market forecast for Poland – participation and employment rates for the years 2010 to 2060 in scenarios assuming increasing labour supply and alternative population developments (S10-S17).

	2010	2015	2020	2030	2040	2050	2060
High fertility (S10)							
Participation 15-64	64.1	67.7	70.7	69.6	67.7	68.0	68.3
Participation 15+	54.6	56.1	56.2	52.5	49.7	46.6	43.7
Employment 15-64	60.0	62.8	65.9	64.8	62.9	63.2	63.6
Employment 15+	51.1	52.1	52.4	49.0	46.2	43.4	40.8
Generation replacement fertility (S11)							
Participation 15-64	64.3	67.7	70.7	69.4	67.1	67.4	67.7
Participation 15+	54.7	56.1	56.2	52.4	49.5	46.9	44.4
Employment 15-64	59.6	62.8	65.9	64.6	62.3	62.6	62.9
Employment 15+	50.8	52.1	52.4	48.8	46.0	43.6	41.4
Low fertility (S12)							
Participation 15-64	64.5	67.7	70.7	70.2	68.5	68.7	68.9
Participation 15+	54.9	56.1	56.2	52.8	49.8	45.8	42.3
Employment 15-64	59.8	62.8	65.9	65.4	63.8	64.0	64.3
Employment 15+	51.0	52.1	52.4	49.3	46.4	42.8	39.5
High fertility, increasing participation of prime-aged and 15-24 year-olds and retirement age rising to 67 over the 2011-2020 period (S13)							
Participation 15-64	64.1	71.2	77.3	79.8	78.4	78.7	79.1
Participation 15+	54.6	59.5	62.6	61.2	58.6	55.3	52.2
Employment 15-64	60.0	66.1	71.9	73.9	72.4	72.8	73.2
Employment 15+	51.1	55.3	58.3	56.8	54.3	51.3	48.5
Positive net migration from 2015 on (S14)							
Participation 15-64	64.1	67.8	70.7	70.0	68.5	68.9	69.3
Participation 15+	54.6	56.1	56.3	52.9	50.2	46.7	43.5
Employment 15-64	60.0	63.0	65.9	65.2	63.8	64.2	64.7
Employment 15+	51.1	52.2	52.5	49.3	46.8	43.6	40.7
Positive net migration from 2025 on (S15)							
Participation 15-64	64.1	67.7	70.6	69.8	68.2	68.5	69.0
Participation 15+	54.6	56.1	56.2	52.6	49.7	46.0	42.7
Employment 15-64	60.0	63.0	65.8	65.0	63.4	63.8	64.3
Employment 15+	51.1	52.2	52.4	49.0	46.3	42.9	39.9
High fertility, positive net migration from 2015 on, increasing participation of prime-aged and 15-24 year-olds and retirement age rising to 67 over the 2011-2020 period (S16)							
Participation 15-64	64.5	71.3	77.4	79.9	78.6	78.8	79.3
Participation 15+	54.9	59.6	62.7	61.4	59.0	55.7	52.7
Employment 15-64	59.8	66.2	71.9	74.0	72.6	72.9	73.4
Employment 15+	51.0	55.4	58.4	57.0	54.6	51.7	49.0
Replacement fertility, positive net migration balance from 2015 on, increasing participation of prime-aged and 15-24 year-olds and retirement age rising to 67 over the 2011-2020 period (S17)							
Participation 15-64	64.5	77.5	81.8	82.9	82.0	82.3	82.8
Participation 15+	54.9	68.2	70.6	68.6	66.8	63.7	60.9
Employment 15-64	59.8	72.5	76.6	77.4	76.4	76.8	77.3
Employment 15+	51.0	63.9	66.2	64.2	62.4	59.6	57.0

Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

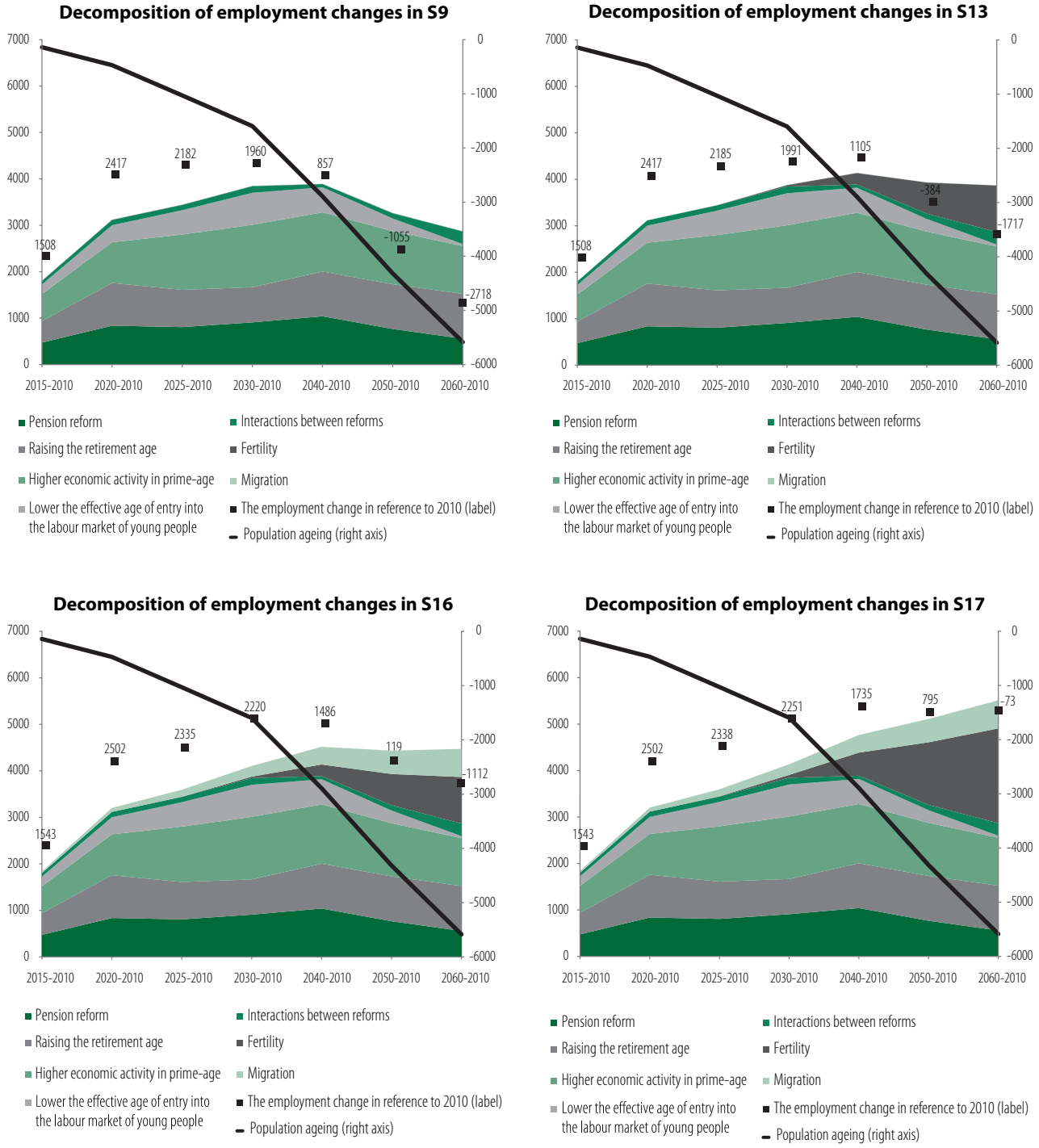
Figure I.16. Share of immigrants in total population (including children) and employment rate of immigrants in various scenarios (percentage).



Notes: S13 immigration variant: the immigration required to maintain total employment above the 2010 level, while maintaining all other assumptions of S13 scenario over the entire forecast period.
Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

Simulation results indicate that the imminent, demographically determined decline in employment over the coming 50 years could be stopped only by a coherent package of reforms raising labour force participation and active policies shaping demographic processes. As illustrated in Figure I.17, of all considered variants, the highest employment gains till 2030 could be brought by improving the labour supply of prime-aged individuals, especially women. However, after 2030, an increase in fertility and/ or intensified immigration will become most prominent. Therefore, in order to prevent a decrease in employment, it is essential to implement successful population policies, which should be developed and implemented as soon as possible. Figure I.17 reveals the importance of a comprehensive approach to challenges of population ageing. Combined, reforms exert much stronger effects than when implemented independently – the synergy amounts to a few percent of the total impact.

Figure I.17. Decomposition of employment changes, with respect to 2010, over the years 2015 to 2060 into the impact of population ageing, effects of policy reforms and their interactions in scenarios: S9, S13, S16, S17 (in thousands).



Notes: Impact of population ageing is depicted on the right axis. Labels denote employment changing over time with respect to 2010.
Source: Own calculations based on SYMDEM 2.0 (IBS, 2010a).

2.3. Macroeconomic consequences of population ageing in Poland

2.3.1. Population and institutional status quo

We begin the analysis of the macroeconomic implications of population ageing by simulating the evolution of the major economic aggregates in the status quo scenario (S2), which assumes that the pension reform has been implemented, early retirement is no longer available and has to some extent been replaced with a bridging pension scheme. This scenario does not take into account further reforms concerning the labour market or social security. We investigate the macroeconomic impact of demographic developments in Poland by comparing scenario S2 with a hypothetical situation, in which the Polish labour market would be "frozen in 2008". The "frozen scenario" assumes that no change occurs either in total employment or in its structure with respect to age, gender, educational attainment etc. This approach allows us to determine what kind of economic consequences may be attributed to the population and institutional setting of the Polish labour market in the face of ageing. The analysis in this and the following sections has been carried out with the EUImpactMod III (IBS, 2010b) model, described in Box I.4.

Table I.10. Deviations of macroeconomic variables in the status quo scenario (S2) from the hypothetical ("frozen") scenario of employment and population fixed at 2008 levels over the years 2010-2060 (in percentage).

	GDP	GDP pc.	I/GDP	C	C pc.	GI/GDP*
2015	0.48	0.11	0.00	0.47	0.11	0.30
2020	0.58	0.27	0.61	0.36	0.05	0.45
2025	–0.10	0.31	0.20	–0.17	0.24	0.16
2030	–0.79	0.90	0.69	–1.04	0.65	–0.32
2040	–2.52	2.80	3.14	–3.66	1.66	–1.56
2050	–5.08	4.84	4.62	–6.75	3.15	–3.37
2060	–7.64	6.70	4.40	–9.23	5.09	–5.45

Notes: * - GI/GDP = share of government revenues in GDP, I/GDP = gross domestic investment rate, C and C pc = consumption and consumption per capita.

Source: Own calculations based on EUImpactMod III (IBS, 2010b).

Table I.10 demonstrates that without the policy response and behavioural change, including a change in procreation patterns, population ageing will bring GDP down by 7.5 percent before 2060, in comparison to the "frozen labour market AD2008" scenario. GDP will already start declining before 2020 and the downward trend will progress over the next decades due to the shrinking of the labour force. An even sharper fall will be recorded in consumption, since older people, whose share in the population will be increasing, exhibit on the average lower consumption levels than the prime-aged citizens. The second factor behind this process involves substitution of a shrinking labour with capital, which in turn leads to a relatively higher investment. Consequently, it is expected that the share of savings and gross accumulation of capital in the status quo scenario will exceed those in the hypothetical variant that serves as a point of reference.

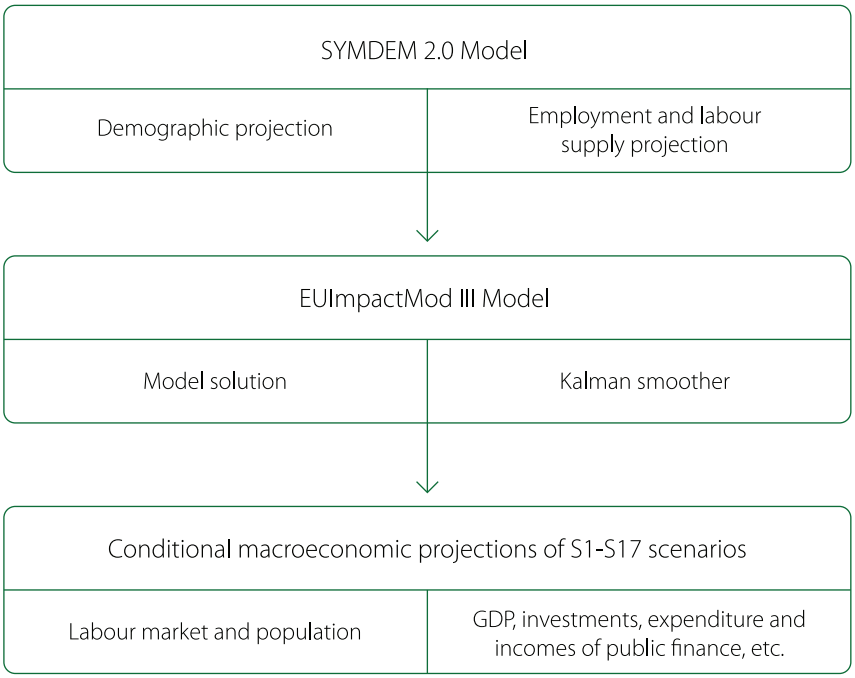
The relative drop in GDP has to translate into relatively lower tax revenues. The status quo scenario implies that aggregate consumption is to contract even more than GDP, while the total employment and aggregate wage fund will decline, compared to the hypothetical reference scenario. Government revenues will be further reduced because of the lower revenues from consumption (VAT and excise duty) and labour taxes (PIT and social security contributions). As a result, we expect that in the status quo scenario, the ratio of the government revenues to GDP will decrease, as compared to the hypothetical scenario of no population changes (see the final column in Table I.10). Such a decrease will be possible because of a decline in both public consumption and investment, since transfers targeted at people in retirement age will rise in terms of share of GDP, with the government deficit and public debt not experiencing any significant changes (due to long-term budget constraints). Increased transfers to people in post-working age in the status quo scenario will be accompanied by higher health care costs. On the other hand, since the new pension system automatically adjusts the benefits to accumulated contributions paid by individual workers, in the long run the share of pension spending in the GDP will decrease with respect to the hypothetical scenario without the 1998 pension reform.

Box I.4. The methodology of macroeconomic forecasts.

To examine the economic implications of population ageing and the impact of hypothetical scenarios (described in the previous section) on Polish economy, we produced macroeconomic projections using the structural model – EUImpactMod III (IBS, 2010b). The model is a dynamic stochastic general equilibrium model (DSGE), where the general equilibrium theory is applied (GE – General Equilibrium). This theory assumes that agents respond to economic shocks taking into account the expectations of other agents' behaviour, and that all markets in the model clear (supply and demand meet), consequently setting the relative price levels. In such model the economy functions as an interconnected system. The model used for simulations accounts for stochastic uncertainty (S – Stochastic) and the related formulation of dynamic expectations (D – Dynamic).

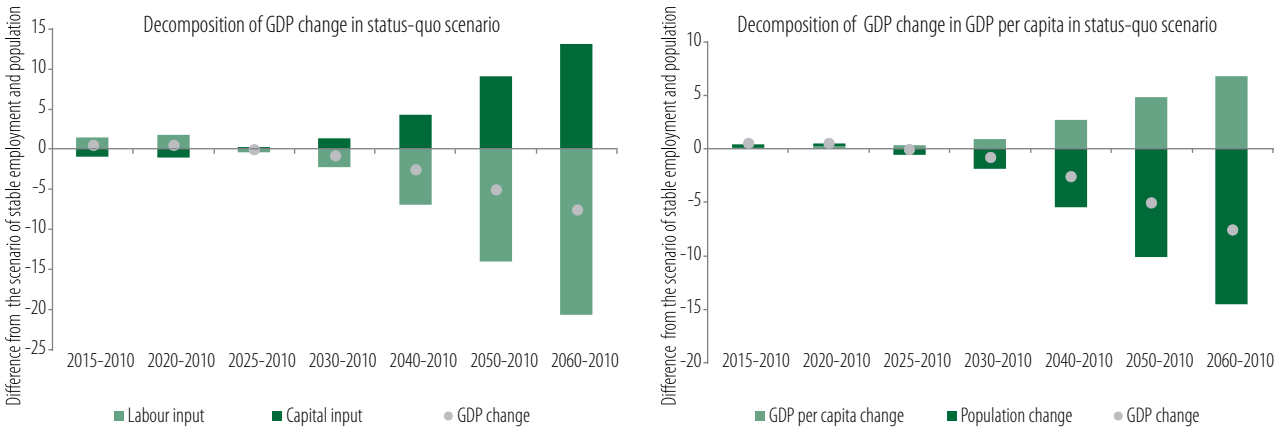
EUImpactMod is a six-sector model equipped with demographic and labour market modules allowing for simulations of the effects exerted by the demand and supply shocks. These include: demographic innovations, shocks to job matching efficiency, workers' or employers' bargaining power, labour demand, etc. In particular, it allows to simulate the impact of demographic developments and the key developments on the labour market (such as changes in the size and structure of the working-age population, fluctuations in the labour force participation and employment rates, etc.) on the economy.

The model was constructed, solved and parameterised using the symbolic and numeric computations of FORMA 2.4 toolbox (see IBS, 2007). It was also applied to produce conditional forecasts in the scenarios S1-S17 described in the previous section. The solution and study of the DSGE model requires setting the first order conditions, i.e. partial derivatives of the Lagrange functions. The FORMA toolbox uses automatic symbolic computation to determine the first order conditions. As a result, a system of equations is obtained and then numerically solved according to the Kowal (2007) procedure, which is a modified Judd's perturbation method. This in turn results in a system of dynamic matrix equations which determine the solution of the model. The elements of particular matrices determining the model solution are expressed as the functions of parameters of the model and were obtained directly from data coming from Polish Central Statistical Office, OECD, EC and Eurostat data (e.g. demographic, labour market (LFS), public finances and national accounts (I/O matrixes) data). Following the common practice of the DSGE modelling, the so-called deep parameters of the model (e.g. elasticities) were set according to findings of other microeconometric studies described in the literature.



Thanks to the recursive procedure of the so-called Kalman smoother (see Simon, 2006), the solved and calibrated model can be used to generate conditional forecasts of all relevant variables (e.g. GDP per capita, factor productivity, wages, unemployment, government expenditures and revenues, etc.). The forecasts are conditioned on the assumptions about the past and future evolution of selected variables – the so-called information set. In the case of presented simulations, the information set comprises of the developments of the population size, labour force participation and employment rates, which are obtained from the demographic and labour market projections obtain with the SYMDEM 2.0 module (see IBS, 2010a). The application of the Kalman smoother makes it possible to identify the evolution of other macroeconomic variables (i.e. not included in the information set), provided that variables in the information set will follow the patterns forecasted in S1-S17 scenarios.

Figure I.18. GDP and GDP per capita in the status quo scenario (S2) compared with hypothetical ("frozen") scenario of employment and population fixed at 2008 levels over the years 2010-2060 (in percentage).



Source: Own calculations based on EUImpactMod III (IBS, 2010b).

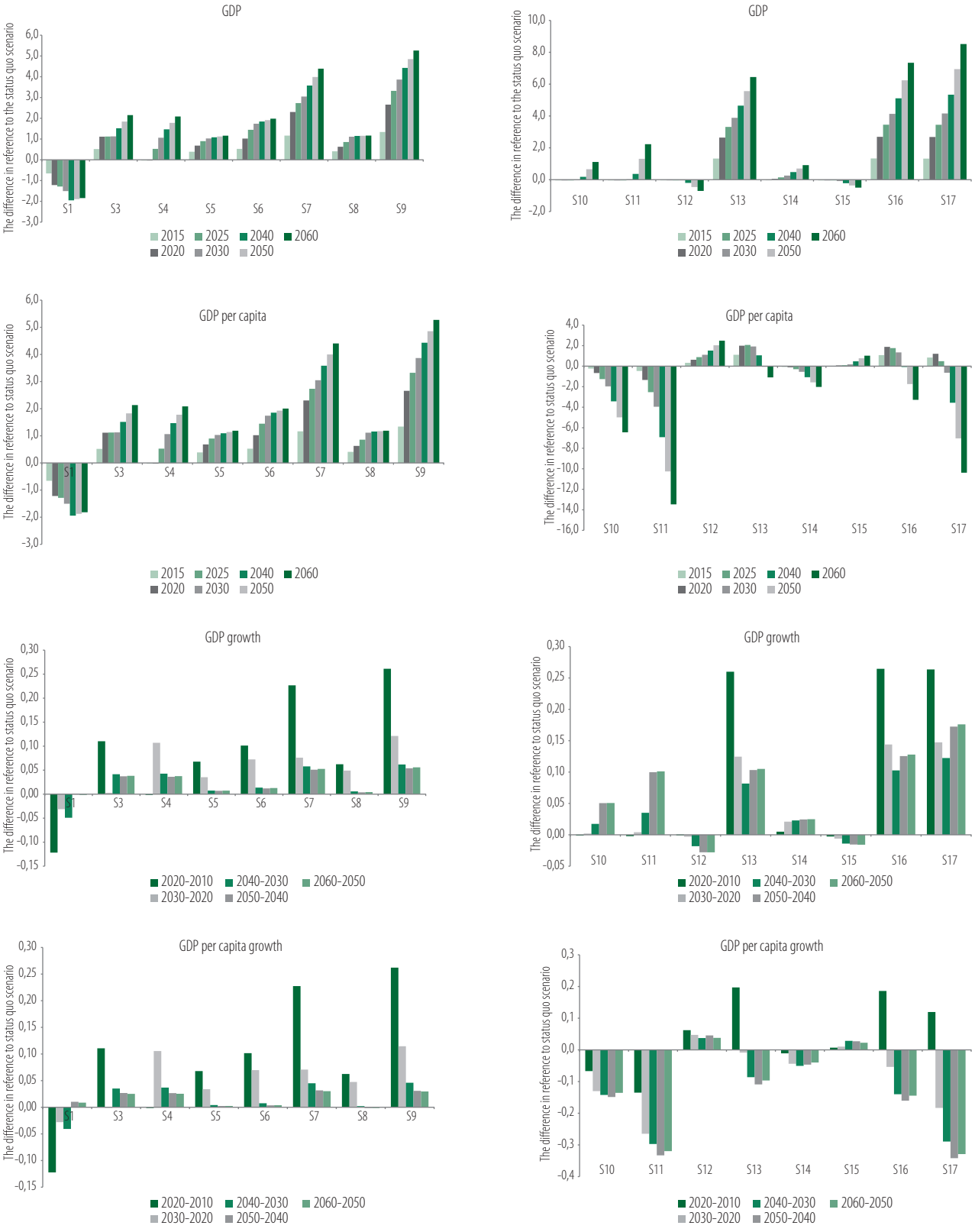
Although shrinking employment will cause the total GDP to fall, the S2 scenario implies that GDP per capita would be higher than in the hypothetical variant that "freezes the labour market situation and population of AD2008 till 2060". Such a situation is possible as diminishing of labour force is accompanied by dwindling of total population in Poland, following a decline not only in the number of children but also, after 2030 and increasingly after 2050, of the elderly. Since the GDP growth is determined not only by the developments of labour supply, but also by the accumulation of capital, which depreciates relatively slowly, the negative GDP dynamics does not need to translate into decline of the per capita GDP. By contrast, in the status quo scenario the declining number of workers is accompanied with the growth of capital-to-labour ratio, which means that GDP will keep falling over the entire analysed period, but not so sharply as the total employment and population size. Consequently, GDP per capita should rise more dynamically in the status quo scenario than in the hypothetical "frozen" one.

2.3.2. Macroeconomic effects of policy reforms and the effects of their abandonment

In this subsection we study the sixteen scenarios presented in the former section from the macroeconomic point of view. Fifteen of these variants (S3-S17) assume either an institutional status quo or introduction of additional reforms concerning social security, labour market policies, or family and migration policy. Additionally, one variant (S1) assumes reversing changes already made in the pension system in 1998 and withdrawal of the reform of early retirement privileges of 2009. In our analysis the S2, which assumes the demographic and institutional status quo (its macroeconomic implications were discussed in the previous subsection) serves as the baseline scenario. Thus, all the variables presented here are relative and refer to the analogical variables in the baseline scenario. In other words, they show gains/ losses caused by a specific set of policies and developments, such as e.g. higher employment or GDP per capita. Scenario S1 is a specific case. Comparing it with status quo scenario allows us to evaluate macroeconomic effects of the 1998 pension reform, supplemented by the reform of early retirement privileges in 2009.

GDP is the basic macroeconomic variable which permits to quantify in a synthetic way the impact of any kind of reform. Figure I.19 juxtaposes all discussed variants and enables a comparison between them in terms of both GDP and GDP per capita levels and dynamics in the 2010-2060 period. A significantly lower GDP, as compared to status quo (S2), might be expected only in S1, since this is a sole scenario with the forecasted employment substantially lower over the coming years than in S2. Among the remaining scenarios, only S12 (low fertility) and S15 (prolonged net emigration from Poland) exhibit such characteristic. In both cases, population in the subsequent years is lower than in S2, with other parameters remaining unchanged. As a result, if any of these scenarios materialises, GDP would fall, while GDP per capita would increase (compared to S2). It is especially the case in the low fertility scenario (S12), as the lower number of children makes the inactive subpopulation share in total population relatively smaller than in status quo.

Figure I.19. Impact of different policy reforms on GDP and GDP per capita levels and average yearly growth rates, with respect to status quo (S2) (in thousands).



Notes: Bars denote net effects with respect to the status quo scenario (S2 – pension reform, no early retirement), i.e. differences between a specific scenario and status quo expressed in percentage of GDP (for GDP and GDP per capita) and percentage points (for growth dynamics).

Source: Own calculations based on EUImpactMod III (IBS, 2010b).

The remaining scenarios postulate reforms that involve raising retirement age (S3, S4, S6, S9, S13, S16, S17), introducing policies aimed at increasing participation and labour market utilisation of youth (S8, S9, S13, S16, S17), improving the labour supply of prime-aged women and men (S5, S6, S7, S9, S13, S16, S17), those which assume policies supporting higher fertility (S10, S11, S13, S16, S17) and active immigration policy (S14, S16, S17). These policy reforms would lead to an increase in labour supply and employment and consequently to a higher GDP. The most substantial impact on output is predicted in scenarios which assume comprehensive reforms (S7, S9, S13, S16, S17), in particular in these with the reform packages embracing all policies (see Figure I.19). It is noteworthy that in the considered time horizon of 50 years, a trade-off between high fertility and high GDP per capita emerges. Such a phenomenon is related to the fact that a strong increase in the number of births rapidly raises the size and share of dependent population, which is not offset by an adequate increase in employment and in turn, in GDP.

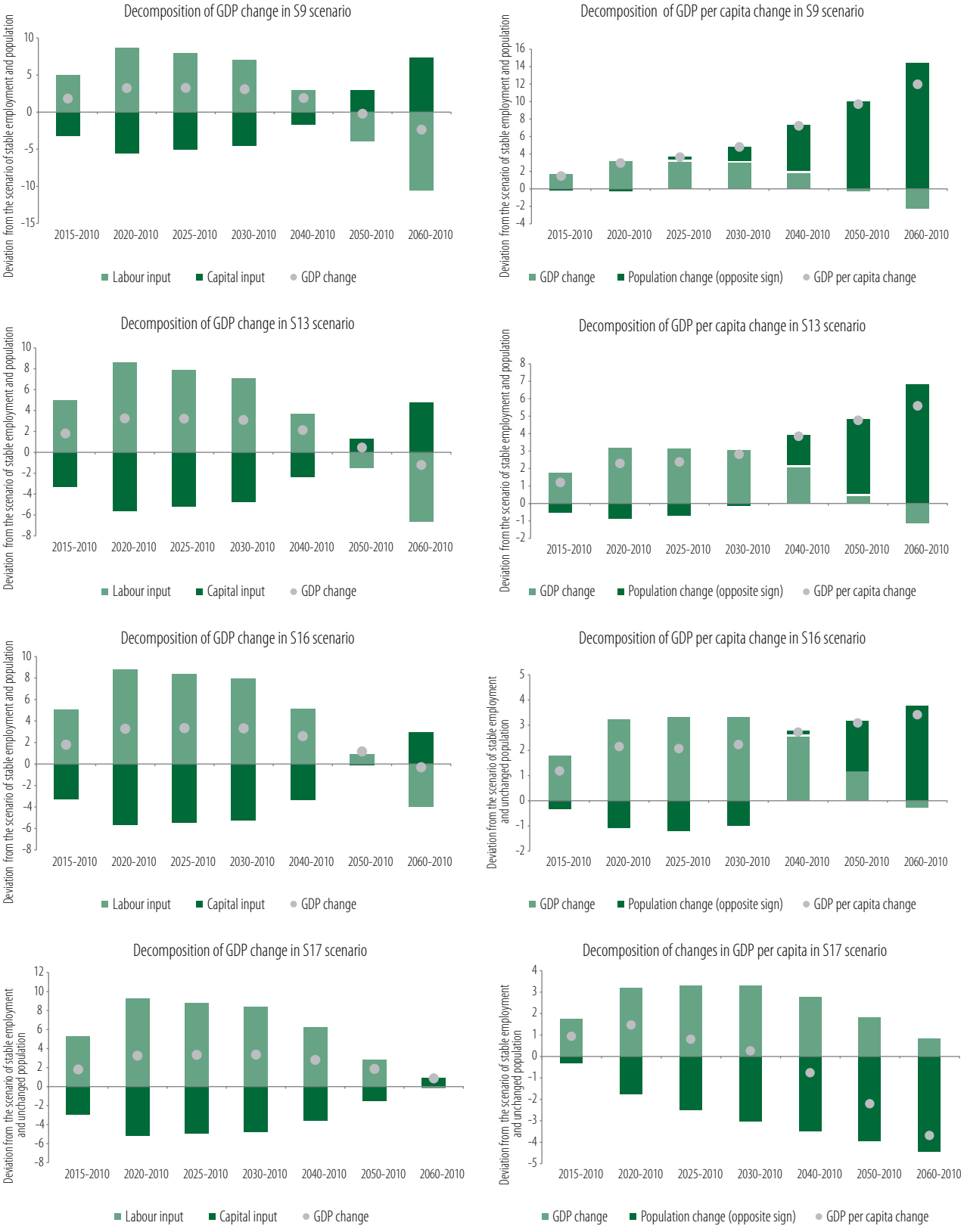
Similar, but less pronounced phenomena, can be observed in scenarios assuming larger immigration inflows. Both effects are significantly stronger when immigration is accompanied by higher fertility rates, as incoming migrants are usually in childbearing age. It must be stressed that the described demographic developments, being of long-term character, are likely to have a long-term negative impact on GDP. This effect will be additionally exacerbated by the fact that both the cohorts of natives born during the baby boom and incoming immigrants create additional labour supply, but do not constitute the source of capital. Their productivity will be therefore limited by the already accumulated capital stock. Raising this stock at the aggregate level requires, on the other hand, long-term investments. What follows is that, a growing GDP dynamics, stimulated by an increasing labour supply, will be for many years weakened by capital restraints. As a consequence, the GDP growth will not fully translate into growth in per capita terms, not only in a short- (baby boom, migration boom) but also in mid-term. In both horizons workers will not benefit from "demographic premium" (visible in S2 after 2030), according to which a decreasing share of baby boom cohorts in population raises GDP per capita (compared with the status quo scenario). As already mentioned, higher GDP per capita in S2 stems directly from the fact that total population shrinks faster than the number of workers, and indirectly from escalating per capita capital stock – the capital accumulated by the previous generations is at the disposal of a less populous generation and as a consequence, a higher capital-to-labour ratio brings productivity gains.

It is worth noting that the GDP growth in 2010-2020 and 2020-2030 (see Figure I.19) is particularly high only in these variants which surmise early policy implementation, i.e. before 2020. Raising retirement age of men and women in this period would boost the GDP yearly growth (the GDP per capita growth as well) by as much as 0.2 percentage points, i.e. by 1/20 of the average growth rate of the Polish GDP per capita over the years 1992 to 2008. GDP will thus climb, with respect to status quo, by 2 percent by 2030. It seems that among all studied policies, gradual raising of statutory retirement age to 67 indeed exerts the most potent impact on GDP and GDP per capita. At the same time, in the long run there are still significant gains from increasing labour supply of prime-aged women and men (S5, S6) and youth (S8). Although the impact of each of these reforms is less significant than that of increasing the retirement age (S3, S4), it still remains considerable and the gains from their joint implementation are even superior to the ones resulting from the retirement age reform.

From the macroeconomic point of view, the most favourable scenarios comprise comprehensive policies aiming at expanding the labour force – S9, S13, S16, S17. They differ with respect to population developments: (1) scenario S9 assumes baseline demographic and migration patterns, (2) scenario S13 exhibits a significantly higher fertility rate (but below replacement rate) and (3) scenarios S16 and S17 assume high, or even replacement fertility along with considerable immigration inflows.

The first three of these scenarios (see Figure I.20) not only imply higher employment (relatively to S2), but also significantly boost GDP and GDP per capita over the entire period studied. In the last one, demographic and immigration developments are so profoundly different from the baseline (S2) that they cancel out the already described "demographic premium". As a result, in the long-run GDP per capita slides below the level projected in S2.

Figure I.20. Decomposition of GDP and GDP per capita changes in scenarios assuming comprehensive labour market reforms and different demographic and migration developments compared with the hypothetical variant of employment and population fixed at 2010 levels, 2010-2060 period (percentage).



S9 – comprehensive labour market reforms and baseline demographic and migration developments; S13 – comprehensive labour market reforms and high fertility; S16 – comprehensive labour market reforms, high fertility and high immigration; S17 – comprehensive labour market reforms, replacement and high immigration.

Source: Own calculations based on EUImpactMod III (IBS, 2010b).

Table I.11. Deviation of basic macroeconomic variables in the S9 scenario (including comprehensive labour market policy reforms, baseline fertility rate and migration) from the S2 (status quo) scenario over the years 2010-2060 (in percentage).

	GDP	GDP pc.	I/GDP	C	C pc.	GI/GDP*
2015	1.34	1.34	–0.66	1.58	1.58	0.72
2020	2.66	2.66	–1.33	3.14	3.14	1.84
2025	3.32	3.32	–1.68	3.93	3.93	2.54
2030	3.86	3.87	–1.85	4.53	4.53	3.27
2040	4.43	4.43	–1.88	5.10	5.11	4.47
2050	4.85	4.86	–1.89	5.53	5.54	5.62
2060	5.26	5.27	–1.93	5.96	5.97	6.73

Notes: * - GI/GDP = share of government revenues in GDP, I/GDP = gross domestic investment rate, C and C pc = consumption and per capita consumption.

Source: Own calculations based on EUImpactMod III (IBS, 2010b).

Table I.12. Deviation basic macroeconomic variables in the S16 scenario (including comprehensive labour market policy reforms, high fertility rate and high immigration) from the S2 (status quo) scenario (in percentage).

	GDP	GDP pc.	I/GDP	C	C pc.	GI/GDP*
2015	1.33	0.87	0.21	1.08	0.79	0.58
2020	2.69	1.47	-0.34	2.40	1.59	1.55
2025	3.45	1.09	-1.70	3.50	1.70	2.17
2030	4.13	0.13	-4.00	5.09	1.56	2.94
2040	5.11	-2.95	-4.93	6.89	-1.16	4.28
2050	6.24	-6.28	-5.08	8.60	-4.42	5.73
2060	7.34	-9.43	-4.36	9.98	-7.82	7.20

Notes: * - GI/GDP = share of government revenues in GDP, I/GDP = gross domestic investment rate, C and C pc = consumption and per capita consumption.

Source: Own calculations based on EUImpactMod III (IBS, 2010b).

To conclude, a fast and consistent implementation of comprehensive policy reforms which would significantly increase labour force participation of prime-aged men and women, youth and elderly (who currently retire too early), offers an opportunity to overcome the negative macroeconomic consequences of population ageing in Poland over the coming decades. The presented simulations prove that although the consequences of ageing for population structure and the economy will become visible in the forthcoming decade, it is still possible to completely neutralize the latter by 2050. This calls, however, for a quick and coordinated action in a number of key areas of public policy. Maintaining the size of the Polish population by 2060 will not be possible without an increase in fertility and/or a rather high immigration. Success in these areas will yet bring down the dynamics of GDP per capita (but not of GDP itself), unless population growth is accompanied by considerable capital accumulation.

3. Institutional responses to population ageing in Poland

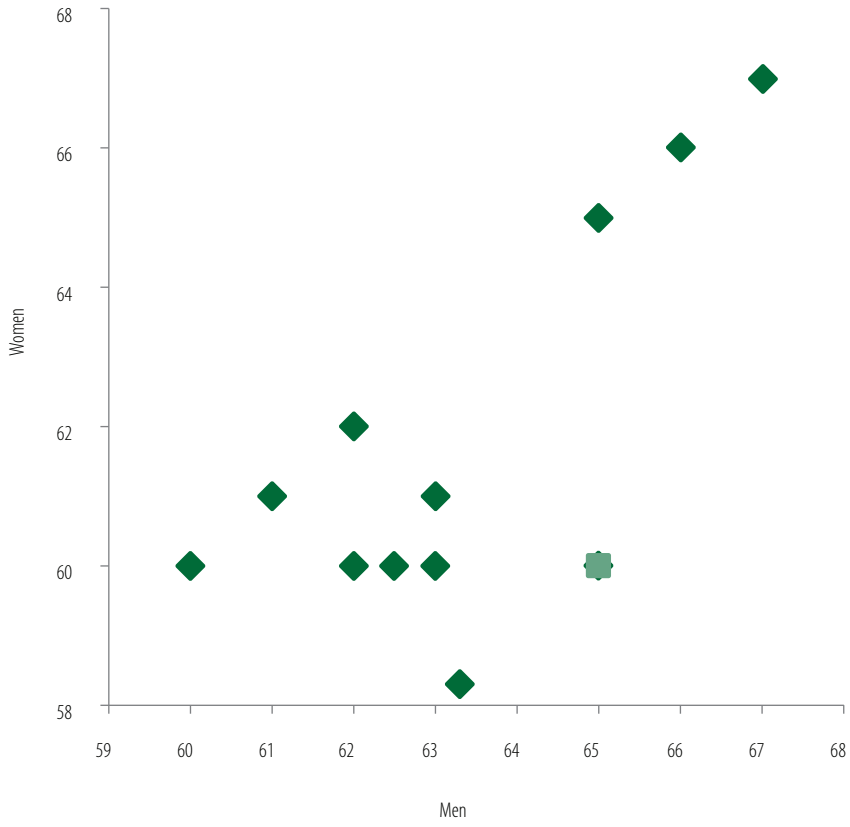
The reform of the pension system and the abolishment of early retirement schemes constitute the first step towards creating an institutional background of the labour market in Poland, one that would be able to appropriately respond to the challenges of population ageing. However, the projections presented in the previous Section indicate that this measure alone is by far insufficient. In order to prevent the employment in Poland from declining markedly, the labour force participation of groups that have so far exhibited relatively low economic activity and employment rates needs to increase, and the population ageing should be alleviated via higher fertility and influx of migrants to Poland.

3.1. Economic activity of the elderly

The key element of the policy response aiming to tackle population ageing involves raising the statutory retirement age. Such a reform has a positive impact on two dimensions of ageing: it lengthens the time spent on the labour market by the average person and improves the proportion between the economically active and inactive subpopulations. The analysis of scenarios S3 and S4 proves that the faster this reform is introduced in Poland, the more benefits in terms of higher (as compared with the status quo) employment, output, budgetary revenues and lower expenditures it brings. At the same time, as presented in Figure 1.21, the gender gap in the statutory retirement age in Poland belongs to the largest in Europe,[22] which reflects the fact that a number of the OECD countries have already raised the retirement age, particularly for women.

In the recent years, the statutory retirement age was increased in such countries as Belgium, Germany, the United Kingdom. The aim of the Belgian reform was to limit the possibility (existing from 1991) of an early exit from the labour market for people aged 60 and more who accumulated sufficient tenures. Male and female retirement age was evened out as well. Consequently, the participation rate of older individuals increased substantially in 1998–2008: among men aged 55–59 by 8.8 percentage points (to 60.1 percent), and among women by 15.1 percentage points (to 39.4 percent), whereas in groups aged 60–64 by 6.2 (22.9) and 5.5 (10.2) respectively. Similar changes took place in terms of employment rate. In Germany, raising the retirement age has been part of a comprehensive social security reform, aimed at combating the effects of previous decisions that increased access to different types of transfers, including earlier retirement. So far, the policies have been implemented at four stages: in 1999, 2001, 2004, and 2007. In 2007, a decision was taken to gradually raise the retirement age (the *Rente mit 67* programme) beginning in 2012, so that in 2029 it reaches 67 years. However, what should be highlighted is that according to the OECD estimates (2005), this move will prove inadequate in the light of the scale and speed of unfavourable demographic changes in Germany, where the number of economic active people will, in 2000–2020, *ceteris paribus*, decrease by 0.18 percent per year, with a decrease of 0.07 percent per year in the EU-15 and an increase of 0.39 percent per year in the OECD. In 2020–2050, the decline in labour supply will be universal, amounting to 0.69, 0.46, and 0.08 percent per year in Germany, EU-15 and OECD respectively.

Figure I.21. Statutory retirement age for men and women in European countries in 2008 – Poland highlighted.



Source: MISSOC.

[22] Only in Austria it also equals 5 years.

Table I.13. Examples of pension reforms affecting timing of retirement.

Country	Reform	Affected groups	When
Australia	Statutory age: from 60 to 65	Women	1995–2014
	Minimum age: from 55 to 60	Everyone	2015–2025
	(in the compulsory system)		
Austria	Statutory age: from 60 to 65	Women	2023–2033
	Minimum age: from 60 to 62	Men	2000–2005
	Minimum age: from 55 to 62	Women	2000–2027
Belgium	Statutory age: from 60 to 65	Women	1997–2009
Czech Republic	Statutory age: from 60 to 63	Men	1996–2012
	Statutory age: from 53–57 to 59–63	Women	1996–2012
Korea	Statutory age: from 60 to 65	Everyone	2013–2033
Germany	Minimum age: from 63 to 62	Men	Until 2010
	Minimum age: from 60 to 62	Women	2011–2016
USA	Statutory age: from 65 to 67	Everyone	2000–2027
	(entitlement to full benefit)		
Switzerland	Statutory age: from 62 to 64	Women	2000–2005
United Kingdom	Statutory age: from 60 to 65	Women	2010–2020
	Minimum age: from 60 to 65 (*Pension credit*)	Men	2010–2020
Italy	Statutory age: from 60 to 65	Men	Since 1992
	Statutory age: from 55 to 60	Women	Since 1992

Source: OECD (2006).

The scope of policy reforms in the UK goes even further than in Belgium and Germany: there are plans to raise the retirement age (*State Pension Age*) for women by 5 years between 2010 and 2020. Ultimately, the objective is to introduce a uniform retirement age of 68 in 2022–2046. This is accompanied by measures aimed at preventing poverty among pensioners through implementing a combination of fiscal instruments and encouraging people to set up individual pension savings accounts. It is worth noting that these changes are being introduced despite the fact that the demographic trends in the UK will be less severe than in many European countries – in 2000–2020, *ceteris paribus*, a slight increase in the number of economically active people is expected, while in 2020–2050 – a decrease of 0.1 percent per year (OECD 2005). Equalling male and female retirement age and then raising it for both genders attempts to neutralise the consequences of these unfavourable trends. In Poland, where labour supply and employment are forecasted to shrink sharply due to expected demographic developments (see Table 1.3), the scope and pace of reforms should be at least equal to those in the UK, Germany and Belgium.

At the same time, even though increasing the retirement age makes older people (both those above the pre-reform statutory retirement age and the ones a few years younger) more attached to the labour market (Burniaux et al. 2004), there are currently few countries where the effective retirement age is close to the official one. This is mainly due to the availability of early retirement or other, economically equivalent, benefits provided to jobless persons prior to the pensionable age (Blöndal and Scarpetta 1999, OECD 2006). It is also to some extent caused by the elderly wearing down their private savings. A lower adaptability of older workers to technological progress and a lower ability to work, in particular full-time (Eurofund 2007), exerts the influence as well. Nevertheless, a number of cross-country studies emphasise the significant negative impact of pre-retirement benefits on participation of older people (Blöndal and Scarpetta 1999, Gruber and Wise 2002, MGiP 2005). The evidence from individual countries supports this thesis.

In Iceland, despite a much more favourable demographic structure than in most European countries, the retirement age for private sector workers is 67 years, while for their counterparts in the public sector – 65. Men and women remain employed for a comparable number of years and their effective age of leaving the labour market does not differ substantially from the official age. This may be explained by the lack of possibility to receive benefits before the age of 67 (Jonasdottir 2007). What is important, such age limit was introduced right when the system was created in the late 1940s.

On the other hand, New Zealand managed to successfully review the policies encouraging early labour market exit (concerning in particular the *National Superannuition* - a benefit for non-working individuals aged 60+ introduced in the 1970s). In 1989, the government decided to increase the retirement age to 65 within two decades. This was soon verified and the statutory retirement age was raised rapidly from 60 to 65 in the years 1992–2001. Following the reform, the labour force participation of 60–64 year-olds surged in

1991–2004 from 33 to 69 percent for men, and from 16 to 46 percent for women (OECD 2006). Such a sharp increase in labour supply could have been caused by (i) the psychological influence of a higher statutory retirement age on actual decisions of potential beneficiaries (OECD 2004) and (ii) the design of the KiwiSaver system, which motivates people to work by making it difficult to withdraw the accumulated funds before the age of 65.

The experience of the countries which increased the retirement age thus suggest that the current institutional setting determining the elderly's labour supply decisions in Poland (the actuarially fair pension system, no possibility to receive benefits before the statutory retirement age) supports the positive influence of increasing the statutory retirement age on labour supply of Poles[23].

Given a lower adaptability of older people to the labour market requirements and a changing attachment/perception of work over the life cycle (see MPiPS 2007), apart from limiting schemes facilitating early labour market exit and financial support to early retirement, the OECD countries resort to various supplementary instruments, aimed at encouraging the labour supply of the elderly. These include e.g. allowing a gradual ending of professional career or increasing adaptability of older workers (see Table I.14). By subsidising part-time work (Finland, Belgium) or compensating for the wage loss combined parallel to receiving benefits (France), the former policy instruments involve enabling people to receive retirement benefits and remain in employment. The latter include e.g. lifelong learning and active labour market policies.

As demonstrated by the OECD (2006), contrary to raising the statutory retirement age, supporting instruments are characterized by a diverse, but in most cases limited effectiveness.[24] This refers in particular to education and training programmes (especially vocational training), as well as to subsidising employment – this form of support was introduced e.g. in Germany, Austria and the United Kingdom.[25] Active labour market policies aimed at older people exert only a moderate influence, which suggests that they mainly support other policy instruments aimed at delaying the labour market exit of the elderly, such as raising the statutory retirement age (MPiPS 2007). However, the policies supporting continuous employment over the life course and limiting the risk of inactivity may play a potent role. They include good practices taken up by individual enterprises, which attempt to prolong the careers (especially at the same employer), which in turn allows enterprises to keep employees with a company-specific knowledge.

Table I.14. Policies supporting the labour supply of old people in selected European countries.

	AT	BE	DE	DK	ES	FI	FR	GR	IE	IT	LU	NL	PT	SE	UK
Strategic policy approach to the employment and retirement of older workers	X					X									X
Research and development programmes on the issue of age and employment			X			X									X
Pension and social security reforms aimed at removing incentives to early retirement and encouraging later retirement	X	X	X	X	X	X	X					X			
Gradual retirement schemes	X	X	X	X	X	X	X					X			
Age discrimination legislation, protection against dismissal, proscription of age brackets in recruitment and advertisement, abolition of mandatory retirement	X	X			X	X	X		X	X					X
Awareness-raising campaigns			X	X		X						X			X
Employment and training programmes for older workers	X	X	X	X	X	X	X					X			
Support to employers, e.g. advice and guidance, training, employment placement			X	X		X	X			X		X			X

NB: AT – Austria, BE – Belgium, DE – Germany, DK – Denmark, ES – Spain, FI – Finland, GR – Greece, IE –Ireland, IT – Italy, LU – Luxembourg, NL – the Netherlands, PT – Portugal, SE – Sweden, UK – United Kingdom.

Source: Final Report of the European Commission – Ageing and Employment: Identification of Good Practice to Increase Job Opportunities and Maintain Older Workers in Employment (2006).

[23] The 1999 pension reform, in general, assumed removing privileges of selected occupational and industrial groups. However, in order to respect the rights previously acquired by individuals within the pre-reform system, it was necessary to introduce the "bridging" pension scheme in 2009. The new pension system does not cover (i) farmers (covered by the Agricultural Social Insurance Fund (KRUS) and (ii) the military, police etc., prosecutors and judges. In both cases, retirement benefits are not conditioned on the amount of contributions paid by the individuals, i.e. pensions are financed from general taxes (partially in the ASIF (KRUS), completely in the case of the second group). In both groups, the retirement age is not related to the statutory retirement age in the universal system. As for the second group, retirement is possible even after only 15 years of work, and the benefits are related to the salary received on the last day of service. As a result, these systems strongly demotivate their participants to change a job during their professional career. Therefore, a unification of the pension systems in Poland is strongly recommended, in particular by means of including all salary workers into one system. This is especially important when the negative impact of population ageing on labour supply, GDP and public finances (already analysed in Section 2) is taken into account.

[24] In the case of practical skills courses, depending on their structure, between 12 percent (Sweden) and 70 percent (Spain) of beneficiaries found a job after completing a course.

[25] This is to a large extent limited to freeing the employer from paying a part of social security contributions – subsidies equal to remuneration are rare.

According to the European Commission (2006), companies adopt a broad range of strategies aimed at encouraging older workers to extend their careers: from motivating them with higher remuneration and bonuses, to various forms of education, knowledge transfer and career development, and (especially in the sectors where know-how is vital), to pressure on internal mobility and modifications within the scope of individual's responsibilities. A similar motivation stands behind adjusting the working patterns of older workers: reduced or more flexible working hours, entitlement to extra leave or avoiding three-shift system for this age group. Firms also offer flexible retirement schemes with the option to work beyond the contractual retirement age (if national law sets limitations in this respect). The EC study (2006) also indicates that in order to ensure good physical condition of the older workers, enterprises provide regular medical examinations, sports activities, physiotherapy, external health care consultants or occupational health care service. Finally, setting up mixed-aged teams positively affecting the atmosphere at work, or senior clubs which act as forums enhancing contact among older workers. Other measures include voluntary protection against lay-off 5 years before retirement, preventive and informational programmes, motivational training sessions. However, age management can only be effective if the employer shows interest in their employees' individual situations and makes sure they do not feel discriminated on the ground of age (EC, 2006).

It is also noteworthy that introduction of anti-discrimination laws has not visibly improved the labour market position of older people. In the EU countries, these regulations basically come down to implementing actions described in Article 13 of the Amsterdam Treaty and they are binding for all Member States. Although this instrument is relatively easy to introduce, the OECD (2006) proves that the anti-discrimination laws have not been effective panacea to eliminate age discrimination and did not improve the labour market in EU countries in this respect.[26]

3.2. Labour force participation of young people

The number of people participating in education in Poland has rocketed since the early 1990s. However, the flip side of this process has been a drop in the labour force participation of young people (aged below 25). The subpar participation of youth stems from two phenomena: firstly, students (mostly at tertiary level) only occasionally participate in the labour market; secondly, the school-to-work transition of secondary education graduates (in particular graduates of vocational schools) is relatively long.

Box I.5. Legal limitations to the employment of youth in the European Union.

At the EU level, employment of people under the age of 18 is regulated by the Directive of 22 July 1984 regarding the protection of youth at work. The implementation of the legal norms it stipulated by the Member States was synonymous with putting substantial limits on possibility to work in this age group. This is clearly visible in Poland and the provisions of the Polish Labour Code (Part 9) and other relevant acts.

Firstly, by setting the minimum employment age at 15 years (in Poland 16) and providing that work cannot be detrimental to school attendance, the law reduces potential labour supply to less than 20 percent of 15–18 year-olds.

Secondly, young people with no occupational qualifications may only be employed to obtain occupational training in the form of vocational training (for 24 to 36 months) or to be trained in particular work (3-6 months). Relevant occupations and the duration of training are defined in the provisions of the vocational education occupations classification. It is therefore a specific type of employment relationship within vocational education. The adolescent employed on such terms is entitled to the minimum pay of PLN 129.74 in the first year of learning, PLN 162.18 in the second, and PLN 194.62 in the third (4, 5, and 6 percent of average wages respectively).

Thirdly, if young people are employed for reasons other than vocational training, the range of works they can perform is restricted. Youth are allowed to carry out the so-called 'light works'. There are, however, many restrictions on the so-called 'prohibited works'. These regulations notably decrease the labour supply of young people, particularly in manufacturing.

Finally, the working time of youth is limited to 12 hours per week during the school year and 35 hours during school holidays. Moreover, school time resulting from the compulsory schedule of classes needs to be included in the total working time, thus substantially reducing the competitiveness of youth compared to adult persons. The fact that young workers are neither allowed to do overtime nor take night shifts is also of significance here.

To sum up, regulations aimed at guaranteeing a proper mental and physical development of youth decrease both their labour supply and the demand for such labour. Legal limitations exclude approximately 80 percent of this age group from the labour market. Adolescents are governed by different working time regulations, but entitled to remuneration and leave in amounts specified for contracts of indefinite duration. As a result, labour supply provided by this age group is not competitive. Low productivity of young people, often insufficient to be remunerated with the minimum wage, reduces the aggregate demand for labour provided by 15–19 year-olds.

[26] The elderly may still be discriminated in the recruitment processes even if age is not an explicit criterion. This issue is analysed in Part II of the Report.

Poland is one of the OECD countries with the highest percentage of graduates who remain jobless one year after leaving education. At the same time, the differences in this regard between tertiary and all other graduates are outstandingly profound (OECD 2008). Although a comparatively better general condition of the labour market in 2003-2008 largely improved the relative position of young people (see Part III), the inactive and long-term unemployed are still overrepresented among youth without tertiary education. School-to-work transitions of vocational education graduates are usually smooth in the countries running the so-called "dual system" of vocational training, e.g. Austria, Germany, Switzerland (Quintini and Manfredi 2009)[27]. In this model apprenticeships are incorporated into formal education, with students sharing the time between classroom learning and training at the workplace. For instance, in Switzerland over 90 percent of young people combine work and study, in Poland only 15 percent do. The adequacy of skills taught is ensured by a certification system (see MPiPS, 2007) which, however, is often criticised for being expensive, also for employers, who have to co-finance apprenticeships programmes. This system is based on a long tradition and a unique model of social dialogue that helps to coordinate decisions of students, vocational institutions and potential employers (Seitz, Metzger and Kolber 2005). In Germany, attention is also paid to specialised skills specific for a given job. While for many years this approach had been an advantage, in the last two decades it has been recognised to impede the adjustment to challenges created by technological progress and globalisation. Lewandowski and Skrok (2009) point out that in terms of overcoming these challenges, the Finnish model of vocational education may be more successful (see Box 1.6). It is characterised by a relatively late selection of students for more specific education programmes (primary school lasts 9 years), the availability of higher education regardless of age, and broad, institutionalised possibilities of training after starting work. It is worth mentioning that the elements these two models have in common are support to combining work with education, as well as an effective system of certification and quality assurance mechanism.

Box I.6. The vocational education system in Finland.

The upper secondary education in Finland is divided into general and vocational education. All initial vocational qualifications can be obtained either through a three-year school-based education and training at vocational institutions or apprenticeship training. Additionally, since the 1990s it is also possible for young people and those aged over 20 to directly take a competence-based qualifying examination. This possibility, however, is mostly used by adults possessing professional skills but no formal qualifications.

Vocational institutions are designed for persons aged 17–20 who completed primary education and do not have work experience. A three-year curriculum covers general education (compulsory core and optional subjects) and vocational studies. Vocational education at the upper secondary level also includes a six month period of the on-the-job learning and ends with a vocational examination assessed collectively by a teacher and a representative of the enterprise organising the apprenticeship.

A three-year programme of apprenticeship training is the alternative. To take part in it, apprentices must be at least 15 years of age and have completed basic education. The programme is also designed for individuals aged over 20 who want to develop practical skills. From a formal point of view, a fixed-term contract is concluded between the employer and the apprentice, with the latter obligated to work under supervision in exchange for remuneration. In most cases the pay is set on the basis of collective labour agreement and amounts to 80 percent of the remuneration of a skilled worker in a particular field. The apprentice spends approximately 70-80 percent of his education time at the workplace. The remaining 20–30 percent comprise theoretical classes run by vocational institutions or education centres for adults. The programme ends with an examination and a certificate confirming professional qualifications.

The individual approach to students is an advantage of the Finnish vocational education system. The Finnish National Education Board guarantees that any student may turn to job counselling centres (operating at all universities) that help students to choose an academic path that will maximise their chances for a successful labour market entrance. There are also private operators offering educational guidance such as students unions and confederations of employers. The curriculum is also supervised locally by councils (appointed by vocational institutions) composed of representatives of employers, teachers and students. Apart from public funds allocated on general terms, since 2002 education has also been supported by additional subsidies. They are granted to vocational institutions on the performance-based criteria. The elements taken into consideration include: the share of persons finding employment after completing vocational education or pursuing further education; the drop-out ratio and the qualifications of teachers. At the same time, this particular method of assigning funds motivates vocational institutions to provide the best possible preparation for students to smoothly enter the labour market.

Source: Kyrö (2006).

Although obtaining higher education positively influences one's labour market position over the life course, its impact differs at various stages of life and, consequently, the influence on specific age groups is not uniform. Among persons aged 20–24, participation in tertiary education on the average delays the labour market entry (O'Higgins 2003). In most OECD countries, the educational attainment of 20–24 year-olds reduces their participation in the labour market – only in the four of them (Denmark, Iceland, the Netherlands and Switzerland) over 50 percent of students are economically active (OECD 2008).

[27] Quintini and Manfredi (2009) demonstrate that the highest proportions of young graduates who quickly find job and enjoy continuing employment and promotion prospects can be found in countries with a well-developed system of apprenticeship training. Similar perspectives are found in countries with low-regulated markets, such as the UK, while worst perspectives are to be expected in countries with high-regulated markets, e.g. Italy and Spain. These countries record an especially high percentage of youth working on fixed-term contracts and facing the risk of unemployment spells.

Nonetheless, in general there seems to be no trade-off between participation in education and in the labour market in the OECD countries. Such a relationship is typical for the Southern and Central-Eastern European countries. In this region, the correlation coefficient between employment and tertiary enrolment rates for 20–24 year-olds amounted to –0.58 in 2007,[28] while in North-Western Europe it was only 0.004.[29] The latter group of countries is characterised by much higher employment rates of students, both overall and in part-time or temporary work. Furthermore, the impact of tertiary education on employment rates five years after graduating is much stronger in the former group. This also holds for Poland, where participation in tertiary education and the labour market seem to substitute one another, and additionally employment gap and wage premium associated with attaining the tertiary education level are especially large[30].

OECD (2009) shows that under current economic conditions investment in higher education in Poland guarantees one of the highest wage premiums among the OECD countries. This premium, however, results not only from higher wages enjoyed by tertiary graduates, but also from low direct costs connected with participating in education and low alternative costs (income loss due to postponed employment). Considering the level of tuition fees for university education and public financial aid for students, the OECD countries can be divided into four groups. Group 1, with high fees and substantial subsidies, comprises Australia, New Zealand, the United Kingdom, the US; group 2, with low fees and substantial subsidies – Denmark, Finland, Iceland, Norway, Sweden, the Czech Republic, Turkey; group 3, with high fees and low subsidies – Japan and Korea; and group 4, with low fees and low subsidies – Austria, Belgium, France, Ireland, Poland, Spain and Italy.

Figure I.22. Employment and education enrolment rates for persons aged 20–24 in the European countries in 2007 (percentage).

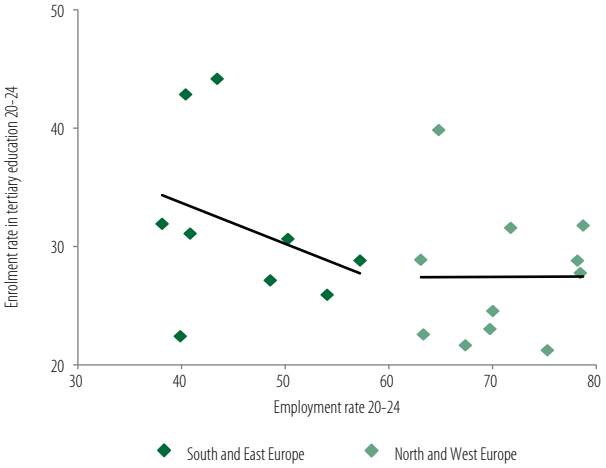
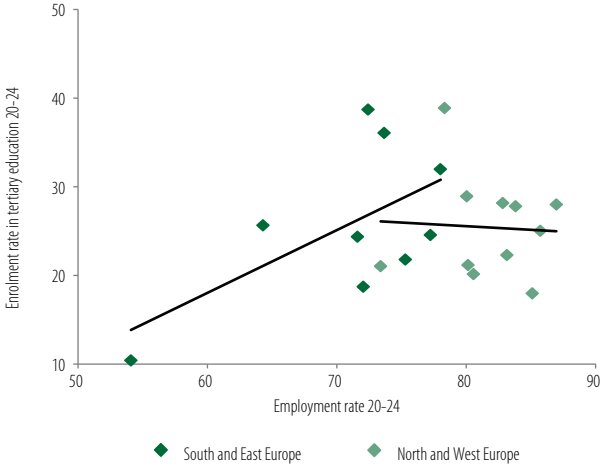
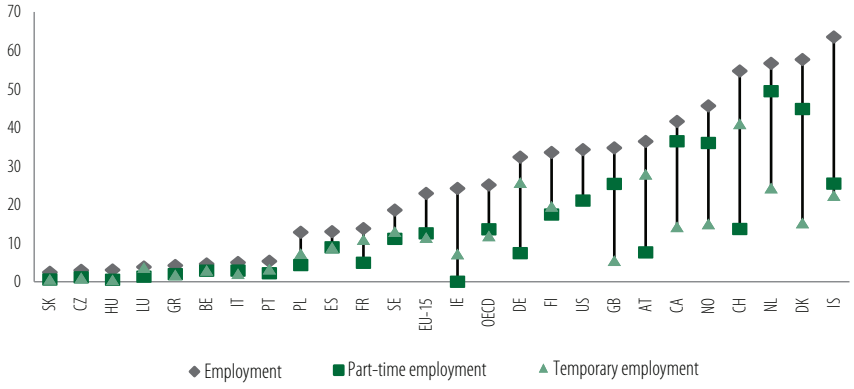


Figure I.23. Employment rate for persons aged 25–29 in 2007 and the tertiary enrolment rate for persons aged 20–24 in the European countries in 2002 (percentage).



Source: own work based on OECD data.

Figure I.24. Employment rates for students (percentage of youth aged 15–24 in education) in the OECD countries (2006) (percentage).



Source: OECD (2008).

[28] Czech Republic, Poland, Slovakia, Hungary, Greece, Spain, Portugal, Turkey, Italy.
[29] Austria, Denmark, Finland, The Netherlands, Ireland, Iceland, Germany, Norway, Switzerland, Sweden, United Kingdom.
[30] Naturally, at an individual level, tertiary degree generally positively influences the labour market outlook. OECD (2008) found that among men with higher qualifications, the probability of employment was on average 3.5 times higher than among those with merely primary level. For women, this relation was 4.1. Furthermore, as compared with persons with secondary education, higher education increases earnings – the wage premium in the OECD countries varies between 25 and even 90 percent (Boarini and Strauss 2007).

In Poland, both tuition fees and subsidies for students in the form of scholarships, grants and student loans are mediocre. Low costs reduce the limits to entry into higher education and lead to financing the public university education (especially master's studies) of individuals, whose return from attaining tertiary education is relatively low. Furthermore, they decrease students' motivation to accumulate human capital. Financial loss in the event of not completing tertiary education in Poland is much smaller than in the countries with high tuition fees or subsidies in the form of loans, the repayment of which is conditioned on completing higher education. Escalating the transfers in both directions should be a step towards increasing students' economic activity. OECD (2009) argues that transfers in the form of loans, instead of non-returnable benefits, foster the labour force participation of students.

The Netherlands can be quoted as the example of an efficient system of financing tertiary education. The fees for bachelor's studies (tertiary type B) are specified in the national legislation, and their amount depends on the average annual household expenditures and their structure. In the 2006/2007 academic year, bachelor fees amounted to approximately EUR 1.519, which constituted 6 percent of the average net income in the Netherlands, hence slightly less than the average monthly income. In the case of master's studies, fees are set independently by universities – they range between EUR 5.000 and up to EUR 15.000 (Dutch Ministry of Education, 2007). A substantial disparity between the cost of lower and higher education points to a deliberate government policy aimed at both supporting the accumulation of human capital among young people and their early entry to the labour market.

At the same time, the economic activity of individuals aged 15–29 must match the need of graduating from education and starting a family. Their labour force participation is therefore influenced by institutional factors ranging from the labour market to education and family policies. Table I.15 provides a summary of key institutional determinants of youth labour supply. On the other hand, labour market institutions and the resulting patterns of economic activity influence the participation in education and the family formation process. These issues are analysed more extensively in Part III of this report.

Table I.15. Institutional determinants of labour force participation of persons aged 15–29.

Institution		Impact on labour supply	Remarks
Pre-school education	Child	+/–	1. Positive impact on participation of men (aged 20–29) 2. Negative impact on participation of women (aged 20–29)
	Availability of cheap pre-school care	+	Positive impact on participation of women (aged 20–29)
	Developing human capital	+	Positive impact on the activity of all young persons (aged 15–29)
Upper secondary education	Developing human capital	+	Completion increases employment rate among young people (20–24) and speeds up their labour market entry
Tertiary education	Shift to educational activity	–	Postpones labour market entry of 20–24 year-olds
	Developing human capital	+	Higher return on education translates into higher activity of 25-29 year-olds with tertiary education
	Co-financing by beneficiaries	+	Decreases the number of potential students, moving some 20–24 year-olds to the labour market
ALMP	Job centre, career counselling, training courses	+	Must be related to appropriately identified social groups
	Subsidising workplaces, public works	–	Ineffective
PLMP	Benefits for the unemployed	–	Lowers motivation to seek employment (15–29) May affect women more – higher alternative costs of taking up a job (20–29)
EPL	Permanent contracts	–	The decrease of the EPL OECD index by two points may result in the increase of employment of young persons by 4 percent
	Fixed-term contracts	–	Low restrictiveness may result in easier entering the labour market by young persons
Legal minimum wage	Uniform level of minimum salary	–	Cuts off young persons with productivity below the minimum wage
	Lower minimum salary for young people	+	Offsets the results of a too high minimum salary (15–24)

Source: Own calculations.

3.3. Staring a family and female labour force participation

Simulations presented in Section 2 show that the negative effects of population ageing in the coming decades may be alleviated by the total fertility rate increasing up the replacement level. Poland has been far below that level since the late 1980s; since 1986 the total fertility rate has remained below 1.6, with the lowest TFR of 1.22 recorded in 2003. The following five years witnessed an increase in the fertility rate, which nevertheless remains one of the lowest in Europe.

Table I.16. Total Fertility Rate in the European countries in 2008.

Range	
[2.0;…)	Iceland, Ireland, France
[1.8–2.0)	Norway, Sweden, Denmark, Finland, United Kingdom
[1.6–1.8)	The Netherlands, Belgium, Estonia, Luxembourg
[1.5–1.6)	Slovenia, Greece, Czech Republic
[1.4–1.5)	Bulgaria, Switzerland, Lithuania, Spain, Cyprus, Latria, Malta, Austria
[1.3–1.4)	Poland, Germany, Italy, Portugal, Hungary, Romania, Slovakia

Source: Eurostat.

The process of influencing the procreation decisions of population with relevant policies is a relatively laborious and lengthy task. Costs and benefits of having a child are spread across the lifespan (materialising in varying economic conditions), with parenthood influencing virtually all spheres of the socio-economic situation. The economic reasoning is framed by social and cultural norms. In principle, after Sleebos (2003), the factors affecting fertility decisions may be divided into five groups: (1) material and psychological benefits of having children, (2) direct and alternative costs of having children, (3) broader economic factors, including the labour market situation, (4) individual life-style factors, (5) societal and cultural norms. A multidimensional character of parenthood requires the family policies to use complementary, or at least not non-contradictory, measures.

An evolving perception of factors influencing childbearing is believed to have played a crucial role in the change of fertility patterns over the last 50 years (see Ahn, Mira 2001; Castles 2002; Brewster, Rindfuss 2000; Esping-Andersen 1999; Frejka et al. 2008; Sobotka, Toulemon 2008). While until the 1980s a negative correlation between the total fertility rate and the economic activity of women, their education, the rate of divorces or the number of extramarital births was observed, research conducted in the second half of the 1990s proved the existence of the reverse relations. What is more, econometric analyses point to the positive influence of being in employment or living alone on the childbearing decisions of young people (Sleebos, 2003). Castles (2002) emphasises the irreversible character of the metamorphoses on the verge of family and professional life. It is therefore necessary to treat these changes as exogenous and look for a policy-mix adequate in the new circumstances. Furthermore, contemporary theories[31] of fertility suggest that procreation decisions have become more personal than they were in the past, but are still conditioned by the specific cultural and economic context of a given society. Thus, the broadly defined family policy should focus on incentives, costs and benefits of childbearing and childrearing, making the prospects of parenthood more attractive for both single women and couples.

A fertility-stimulating policy based on these principles may prove effective. Its positive results have been evidenced e.g. by Blanchet and Ekert-Jaffe (1994), Neyer (2003), Gauthier (2005), McDonald (2006). However, research conducted in the developed countries does not offer a clear answer to the question about effective policy tools. At the same time, the effectiveness of specific instruments does not have to be expressed through the increase of TFR, but eg. in a more favourable distribution of childbirths over women's life course, age specific birth order, age of mothers and other features of fertility.

Still, it is crucial to determine the spectrum of instruments which should be utilised by family policies. Worth noting is the fact that financial incentives are only the simplest of many ways to encourage people to parenthood. Gauthier (1999) proposes a division of policy tools into a narrowly understood family policy, limited to financial support for families, services and benefits addressed at working parents, and its extension to non-traditional elements related to health and education, family law and other services. After McDonalnd (2000, 2002, 2006), the instruments of family policies can be decomposed into financial incentives, support for parents to combine work and family, and broad changes in societal norms so that they are more conducive to procreation and parenthood. Hofaecker (2003) puts forward a polarised classification, in which family policies are divided into broadly understood financial transfers and various ways of supporting the reconciliation of family and professional life. A similar approach is presented by Sleebos (2003), who

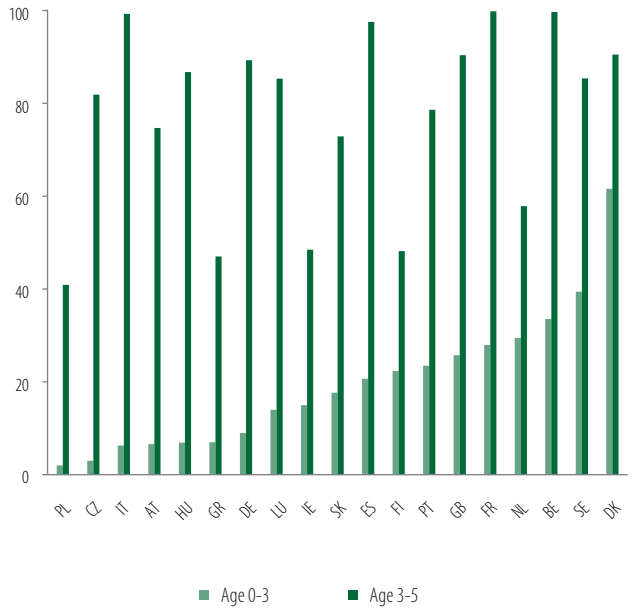
[31] E.g. the Rational Choice Theory (Becker 1960, 1965, 1993; Becker and Lewis 1973; Easterlin 1980) or the Value of Children Theory (Bulatao 1981, 1982; Fawcett 1983).

differentiates between direct policies (financial incentives for childbearing) and indirect actions targeted at other goals (e.g. supporting female employment, promoting dual earner families) which affect fertility choices (e.g. the availability of childcare facilities, maternity and parental leaves, the structure of tax and benefit system).

Having analysed the situation in the OECD countries,[32] d'Addio and d'Ercole (2006) concluded that fertility is higher in countries with (i) easier access to childcare, (ii) lower direct costs of having children, (iii) higher part-time availability, and (iv) longer maternity and parental leaves. Cash transfers addressed to families with young children and solutions enabling women to balance family and work duties make parenthood easier. It has been noticed that the easier the return to work after childbirth (and therefore to previous income, social contacts etc.), the higher the propensity to have children (Neyer and Andersson 2008). Seelbos (2003) points to the fact that financial instruments, in turn, exert a positive, though limited, influence on fertility decisions, while tax deductions have only a marginal effect[33] – their existence in many countries often results from politics, rather than from the evidence-based policy.[34]

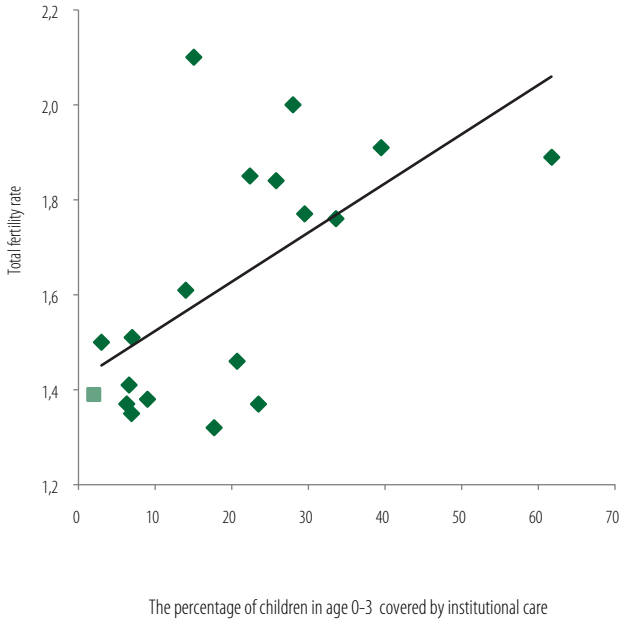
It is often emphasised that the costs of having children are influenced by policy instruments targeted at reconciliation of family and work duties, specifically the availability of institutionalised childcare (nurseries, kindergartens). Sleebos (2003) points to the positive and significant relationship between the scope of childcare provision (for children aged 0–3) and the total fertility rates (see Figure 1.25) across the OECD countries (despite significant diversification in quality and form of care provided in different countries). Most researchers arrive at the same conclusion, both on the basis of cross-country studies (Castles 2002, d'Addio and d'Ercole 2006) and analyses of individual countries.[35]

Figure I.25. Percentage of children aged 0–5 participating in formal care in childcare institutions in selected EU countries in 2008.



Source: Own calculations based on OECD data.

Figure I.26. Percentage of children aged 0–3 covered by institutional care in 2005 vs. the total fertility rate in selected EU countries in 2008.



Comment: Poland is highlighted.

Source: Own calculations based on OECD and Eurostat data.

[32] Based on econometric models estimates for cross-country and panel data.
[33] With the exception of France.
[34] The introduction of tax deductions is often easier than implementation of comprehensive policies based on targeted spending (e.g. cash payments) and their administrative costs are lower.
[35] Del Boca (2002) shows the influence of child care accessibility on the possibility to combine work and family duties in Italy, while Kravdal (1996) focuses on the probability of further births (in Norway). On the other hand, Hank and Kreyenfeld (2001) indicate that the availability of childcare does not affect the decision to have the first child in Western Germany. Weak correlation is found by Walker and Kravdal (1996) on the example of Sweden and Hungary.

Countries offering a virtually unlimited access to childcare (Denmark, Sweden, the Netherlands, Belgium),[36] record higher fertility rates as well as employment of mothers. The other extreme is constituted by countries where such availability is low, and so is fertility and labour supply of females in childbearing age (Austria, Germany, Poland, Hungary, Greece). In terms of the availability of nurseries and kindergartens, Poland fares worst in the EU – merely 2 percent of children attend nurseries and approximately 40 percent kindergartens, mostly in urban areas. This points to profound deficits in childcare infrastructure which, on the hand, limits mothers' labour force participation and on the other, discourages women from motherhood.[37] Financial transfers are paid in the form of benefits and accompany maternity and childcare leaves.

Maternity benefits in most European countries are related to wages received before childbirth (usually in its full amount, with a defined minimum and maximum rate), much less frequently these are lump sum payments. These characteristics of the benefit promote starting a family only after reaching financial stability. Just a few countries offer this kind of transfer to fathers if they *de facto* take care of the child. Childcare benefits are usually much lower and take the form of lump sum payments.

However, the generosity of transfers and the length of leaves as such do not determine the average number of children women tend to have in various countries. D'Addio and d'Ercole (2006) emphasise that the amount of benefits and the length of leaves reflect societal and cultural norms. Thus, in countries where raising children is perceived as primarily a woman's duty (and consequently, women's family role is seen as more important than her professional career and other roles), benefits and leaves are higher and longer. However, among the ten OECD countries with the longest maternity and child care leaves, only France enjoys a relatively high fertility rate. Thus, the key challenge for policy makers is to create a system of benefits and leaves that in the end will not burden its beneficiaries, and in particular will not increase the costs of hiring mothers relatively to childless females, leading to a reduced demand for mothers' labour and/or depreciation of their human capital (Sleebos 2003).

Reconciling parenthood and employment is heavily dependent on available legal solutions regarding possibilities to exchange leaves for a part-time job, divide the leaves between both parents and spread the leaves over time. In many countries the childcare leave may be allocated proportionally to part-time employment. This form of return to the labour market is offered e.g. in Finland, France, the Netherlands and Sweden. The regulations e.g. in Belgium, Estonia or Poland allow for its division but, due to organisational barriers on the part of the employer, the minimum period is usually specified.

Table I.17. Distribution of maternity benefits and the length of maternity leaves in the EU-27 countries.

Length (weeks)/ Amount (in % of previous remuneration)	52+	26–51	14–25	0–13
100 %			Austria, Denmark, France, Greece, Spain, the Netherlands, Lithuania, Luxembourg, Latvia, Germany, Poland, Portugal, Slovenia	
80–99 %	Bulgaria, The United Kingdom		Belgium, Finland	Sweden
0–79 %	The United Kingdom	The Czech Repulic, Ireland, Slovakia	Belgium, Cyprus, Romania, Hungary, Italy	
Lump sum	The United Kingdom			Malta

Note: data as of 1 January 2007. Length (represented in rows) = length of maternity leave for one (the first) child, Amount (represented in columns) = size of transfer. Data may differ depending on individual situation. In principle, minimum and maximum benefit amounts apply. Maternity and childcare benefits do not exhaust the spectrum of transfers offered by countries. Belgium, Finland: the amount of benefit decreases with time. The UK: first 6 weeks of leave – 90 percent, next 20 weeks – lump sum or 90 percent, next 26 weeks – unpaid. Hungary: minimum 4 weeks before birth – 70 percent, then – unpaid.

Source: Own work based on ELS OECD data.

[36] These countries have met the so-called Barcelona target of 33 percent of children aged 0–3 covered by institutional childcare.

[37] Flawed housing policies may form a similar type of barrier. Thus e.g. in France, housing allowances are considered an essential instrument of shaping fertility.

Table I.18. Distribution of child care benefits and the length of child care leaves in the selected EU-27 countries.

Length (years)/ Form	(2; 3]	(1; 2]	(0.5; 1]	(0; 0.5]
Percent of remuneration	Estonia, Lithuania	Hungary, Sweden	Denmark, Latria, Germany, Italy, Slovenia	Finland
Lump sum	the Czech Republic, Poland, Slovakia	Austria, Sweden	Belgium, Luxemburg	France
No leave / unpaid leave	Spain		Greece, Ireland	the Netherlands, Portugal, the United Kingdom

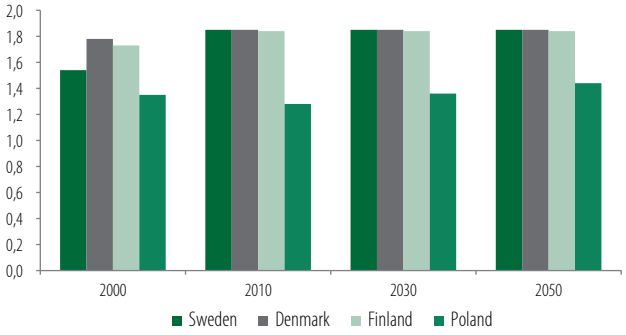
Note: data as of 1 January 2007. Length (represented in rows) = length of child care leave per one child, Form (represented in columns) = form of transfer payment. Data may differ depending on individual situation. Maternity and childcare benefits do not exhaust the spectrum of transfers offered by countries. Belgium: the benefit does not fully correspond with child care benefit. France: the benefit for the first child lasts for 6 months, for the second and each next child – 3 years. Spain: leave lasts for 3 years per child per parent. Sweden: the benefit changes its form after exceeding 390 days of leave.
Source: Own calculations based on ELS OECD data.

The right mix of policy instruments supporting parenthood and helping to reconcile work and family responsibilities depends not only on the existing financial support for parents and the childcare infrastructure, but also on cultural patterns and prevailing family models. European countries which developed their own, though differing policy frameworks, have managed to raise fertility rates (see Table 1.16). The French model focuses on the availability of institutional care, whereas the Scandinavian one stresses the gender equality both on the labour market and in participation in institutional arrangements related to childrearing.

Box I.7. Successful family policy – the case of Sweden.

The Scandinavian countries are characterised by relatively high fertility rates in comparison with other developed countries. There is a consensus among researchers that the reason lies in the policy model not focused directly on encouraging childbearing, but offering the citizens a number of amenities that make expanding a family less severe (financially and socially) than would be the case without any state intervention at all.

Figure I.27. Total Fertility Rate for Scandinavian countries and Poland in 2000 and the forecast for 2010, 2030, and 2050.



Source: Own calculations based on Eurostat data and forecasts.

Individual social rights and the principles of a social democratic welfare state are the priority in Scandinavia. The state strives therefore to ensure the social and gender equality, employment and care (also within family policies). As regards having children, the state in the first place supports young mothers' participation in the labour market and attempts to prevent parents' exit from employment by means of a proper allocation of child care leaves. Furthermore, professional childcare is widely available. A separate category of instruments enables to subsidize household income trimmed by parenthood and involves such measures as preferential taxation of the poorest families. However, it should be noted that this specific model promotes family formation only after reaching financial stability. Similar policies have been implemented in Denmark and Finland, where they also proved successful. Yet an innovative contribution of Sweden is the *speed premium* formula, which additionally rewards parents deciding to have the next child in a relatively short time (30 months). Although the solution was well received, its downside is the fact that the amount of payment is proportional to parents' previous income and thus subject to the business cycle. This implies an uneven distribution of fertility in time, with a heavy burden put on the state budget (e.g. by maintaining schools that are either alternately full or only partially used). The lack of the *speed premium* in Denmark and Finland contributed to the smoothing of fertility rates over time.

Source: Neyer and Andersson (2008).

In Part II of this report we discuss policies supporting parents in reconciling work and family. What should be mentioned here is that because the relationship between the economic activity and the number of children has reversed, the optimal family policy schemes should focus on instruments which, if properly settled in the economic context and within other policies and cultural norms, would help combine both roles and minimise the risk of polarising the engagement of women into family or professional career. On the example of Canada, Lefebvre, Merrigan and Verstraete (2009) demonstrate that even a temporary encouragement of mothers to combine these roles and of their relatively quick return to the labour market may foster labour supply over the entire life cycle. Lefevbre et al. (2009) also emphasise that this effect is particularly strong in the case of less educated mothers, who are especially threatened with long labour market exclusion after childbirth.

3.4. International migrations

Simulations presented in the preceding Section indicate that even a broad catalogue of reforms increasing economic activity and a more optimistic distribution of fertility rates are themselves not enough to prevent the working population in Poland from shrinking after 2030. In order to maintain employment at a level similar to the current one, it is necessary for Poland to become a net immigration country in the coming decade. Also the share of immigrants (and their children) in the Polish population should in 2050 resemble the one in Germany, Austria or Belgium.[38] Poland is a potentially attractive target country for migrants from the former Soviet Union countries outside the EU. This is due to (i) geographical proximity, (ii) relatively large income differentials and (iii) relatively close cultural affinity. On the other hand, (i) Poland has traditionally been a country of net emigration, which increased after the EU accession, and (ii) migrants are bound to come from the third countries (not EU members), which magnifies the risk of illegal immigration. Furthermore, (iii) Poland's share of foreign citizens in population is the lowest in OECD, (iv) just as is the share of immigrants with tertiary degree (von Weizsäcker 2008).

The challenges posed by a mounting immigration pressure from neighbouring countries, the global competition for highly productive workers and the necessity to assimilate immigrants, although common for the entire EU, are especially strong in Poland due to its current position. The scale of the potential influx in 2010–2050, forecasted in the previous Section, is not particularly large – the OECD data indicates that the stock of foreign born in the population of Ireland increased by more than 6 percentage points, and in Spain even by 9 percentage points only in the 1997–2006 decade.

One of the first challenges ahead of Poland involves a good management of the potential of return migrations of Poles. At the same time, it is noteworthy that these are largely immune to state policies. Firstly, they usually take place a few years after the initial outflows of population (Add et al. 2006), and the experiences of Ireland, Spain, Portugal and Italy point to them being largely connected with the economic catching up of the sending country, in particular with an improving labour market situation and narrowing wage discrepancies (Duszczyk, 2007). Secondly, they are determined by non-economic factors, which sometimes take the form of occasional impulses. While the crucial incentives for emigration are economic in nature, the potentially most effective policy schemes to intensify return migration are yet those aimed at improving general economic conditions (see Kaczmarczyk et al. 2008). Nonetheless, information policies addressed at migrants may also assist them in considering the return. Such policies should be preceded by the identification of deficit occupations in the national labour market, and encompass facts about the latest developments and reforms (Kaczmarczyk et al. 2008, Fihel et al. 2008).

Table I.19. Factors determining return migrations.

Positive	Negative
Family (children) in the home country	Acquiring good command of the language of the target country
Low job satisfaction and no perspectives of improvement	Establishing a household in the host country
Possibility of taking up a satisfying job in the home country	Major pay differences between the home and host countries (over 40 %)
Positive reception of changes (including political ones) in the home country	Good access to social security system, health care, education, etc. in the host country
Tertiary education	Low level of education

Source: Duszczyk (2007).

[38] This result should not come as a surprise. The total fertility rate in Germany has not allowed for generation replacement since the 1970s. Maintaining population size and its labour force for the next four decades was possible thanks to immigration on a scale comparable with the one that, according to simulations, is necessary in Poland to maintain its population size and labour force in a time horizon of 40–50 years, during which the fertility rate will most probably not allow for generation replacement.

In the next step, immigration policies should attempt to make the best possible use of the Polish membership in the EU and of the fact that only the EU, as an integrated economic area, can be a globally attractive target for migrants from the third countries, specifically the highly educated ones. Enabling skilled immigrants to move to work between the EU Member States will increase the odds of drawing these workers to Poland – the possibility of taking up another job in more developed EU countries will make Poland attractive as a starting point. This is the direction the European Blue Card is heading. No less vital is the necessity to introduce more university courses in English already at the B.A. level programmes. Moreover, the years spent at education institutions in Poland should be treated equally to the years of work in the applications for work/stay permits. Poland could also benefit from a better coordination of the policies controlling the influx of illegal immigrants from the third countries and from gradually expanding the opportunities of legal work for the citizens of the former CIS. Another element may involve considering the structure of labour demand in Poland according to occupations, especially in the case of low- and medium-qualified individuals. Furthermore, a need to assign substantial funds to integration policy should be expected. Due to cultural and socio-economic differences between the EU countries, this policy must be designed and implemented at the national level.

It should be emphasised that under the Act of 7 June 2007 on *Karta Polaka* (the Polish Card)[39], the citizens of the former USSR that can prove their Polish ancestry, after having received relevant may work without obtaining a permission, start a business and take advantage of free education and health care in Poland.[40] The number of persons entitled to receive the Card is unknown, but estimated at almost 1.5 million. Incorporating (some of) these individuals into the Polish labour market would clearly increase labour supply. At the same time, integration of such migrants into society may run much smoother than in the case of regular immigration from third countries. Unfortunately, no system monitors the actions of the Card holders in Poland – there is even no data regarding the numbers of such people enrolling in university education or entering employment.

3.5. Adequacy of institutional responses to demographic challenges in Poland

Sections 3.1–3.4 provided an overview of a wide range of various institutional responses to the main demographic challenge in developed countries, i.e. population ageing. As has been stressed in Section 1, it is mostly (but not exclusively) a consequence of (1) expanding life expectancy and (2) fertility below the replacement rate. The former poses a challenge primarily for the labour market policies, since maintaining the historically shaped economic activity patterns and expanding life expectancy (in itself positive) can upset the proportions between the numbers of employed and inactive adults. The latter challenge regards population, as in the long run less populous younger generations will not be able to fill the gap left by more populous older generations, which in turn will cause the total size of population to decline (despite expanding life expectancy). For that reason, the package of institutional reforms adequate for demographic challenges have to, firstly, address the necessity of filling the gap in the labour market, which keeps growing each year. The goal is to maximise the labour force participation and employment, and minimise the share of the inactive in population. Secondly, such a package should be aimed at making up for population losses by means of increasing fertility rates and/or intensifying immigration.

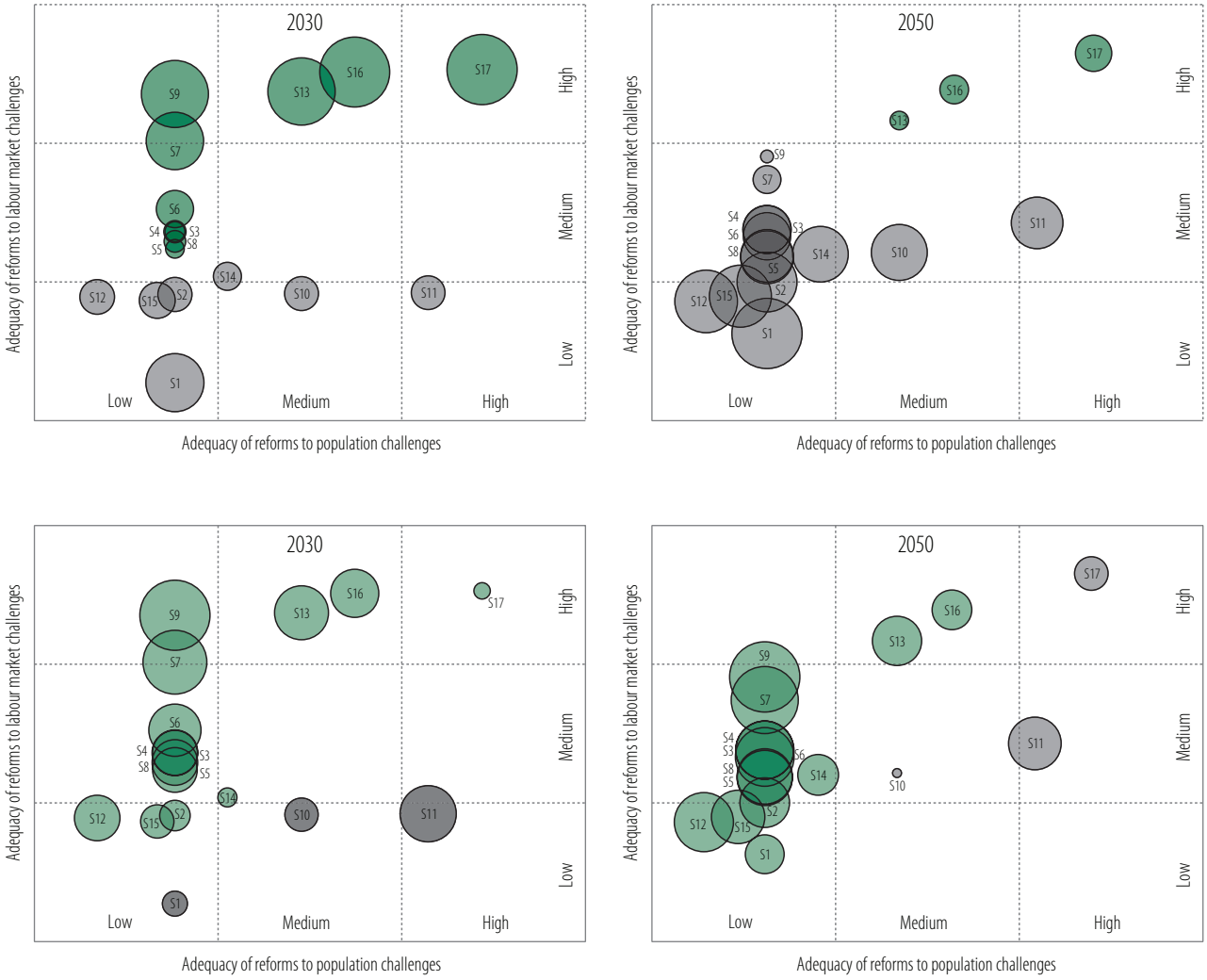
Section 2 includes 17 scenarios that can be directly linked to both examples of good practices described in Sections 3.1–3.4 and detailed institutional analyses presented in Parts II–IV (e.g. scenarios S3 and S4 postulate that Poland, similarly to other European countries, should raise and even out the retirement age of women and men, while scenarios S10 and S11 show the effectiveness of comprehensive reform packages regarding family policies, based on international experiences presented in Section 3.3, and more extensively in Part III. Each of these scenarios differently addresses the employment and population dimensions of demographic challenges, promising various economic results in the mid- and long-term. Figure 1.28 synthetically demonstrates the efficiency of the reform packages responding to both dimensions of the demographic challenges. It also indicates how each institutional scenario influences the economy, synthetically represented either by the level of global GDP or by GDP *per capita*.

As can be observed, while scenarios S7–S9 fully respond to the pressure exerted on the Polish labour market by demographic processes till 2030, they become insufficient in a perspective longer than 20 years. In turn, not implementing labour market reforms which increase the labour supply of youth, the elderly, prime-aged men and women, and instead limiting actions only to family (S10, S11) or immigration policies (S14, S15), actually allows to fill the population gap to a smaller (S14) or slightly larger (S10, S11) degree, but does not properly address the labour market problems caused by population ageing – neither in the perspective of 2030 nor of 2050. It is only comprehensive policy schemes in all of the mentioned areas of policy intervention (S13, S16 and S17) that stand a chance of coping with both types of demographic challenges (in the case of scenario S17 very high fertility and immigration rates comes with a certain drop in GDP *per capita*).

[39] Dz.U. (Journal of Laws) of 2007, No. 180, item 1280.
[40] This does not mean the right to enter Poland without having, in accordance with the principles of the Polish membership in the Schengen Agreement, a valid visa. Nor is it synonymous with the right to settle.

Achieving generation replacement fertility in 2030 seems unrealistic, even after the introduction of comprehensive institutional changes supporting childbearing and childrearing (their key elements are presented in the recommendations). Therefore, solely scenarios S13 and S16, assuming quick implementation of labour market reforms (complemented either only with reforms increasing fertility or also with those aiming at a positive, though moderate, net immigration) seem to be an optimal institutional responses to the demographic challenges that Poland is facing at the eve of the second decade of the 21st century.

Figure I.28. Adequacy of various institutional responses (reforms) to the labour market and population challenges implied by demographic processes and their impact on GDP (top panel) or GDP per capita (bottom panel) – projections for Poland up to 2030 or 2050.



Note: the greater the diameter of circles, the more positive/negative influence of a given variant of institutional response to demographic changes on the level of GDP (top panel) or GDP per capita (bottom panel). Red and green circles denote variants, in which a given package of reforms adequately responded to an economic challenge defined as obtaining a higher GDP (top panel) or GDP per capita (bottom panel) in comparison with a hypothetical scenario of "the frozen labour market and size of population from 2008". White colour indicates a variant, in which this objective has not been yet achieved.

Source: Own calculations based on SYMDEM 2.0 and EUImpactMod III models (IBS, 2010a, 2010b).

Conclusions

In Part I we have discussed how demographic processes may influence the economy over the long term. It has been revealed that the major challenge the Polish economy will be faced with in the future, will be the labour force gap caused by withdrawal of the post-war baby boom generations from the labour force over the coming two decades. We argue that increasing retirement age for both men and women and establishing it at 67 would strengthen the effects of the 1999 pension reform and abolishment of early retirement of 2009. These measures would also greatly alleviate a demographically induced decline in employment in 2010-2030. In addition, we prove that the effect could be much stronger if Polish youth (below 25 years) started to work two years earlier as it does today – just like their peers in the OECD countries. This, however, would require further actions targeted at fast-tracking young people's entry in the labour market. In the long term perspective, it appears evident that the outflow of the elderly from the labour market cannot be counterbalanced without the higher economic activity of prime-aged women, which would benefit not only the economy, but females themselves as well. Such a solution would expand their work seniority and increase professional experience, while limiting unemployment risk and boosting retirement benefits. Another way of offsetting population ageing is to prevent men aged 35-50 from early labour market exit. In this context, we also stress that the policy aimed at offering equal opportunities to men and women should focus primarily on eliminating barriers which make it difficult to balance family responsibilities with work.

The projected changes in the demographic structure in Poland are bound to take place on a large scale and at a great pace. Therefore, in the longest temporal perspective actions directed only at the labour market will not be sufficient to prevent a major decline in the employment rate and a change in the proportions between the working and the unemployed. If Poland is not ready to accept population shrinkage and a decline in the employment rate over the coming decades, it would have to resort to immigration and policies fostering fertility which are discussed in detail in Part III. It seems that Poland would benefit from a comprehensive reform increasing labour profitability, fostering family formation and reconciliation of work with parenthood, as well as boosting the country's attractiveness to migrant workers. Simulation results indicate that the overall effect of such a comprehensive reform integrating all of the above mentioned solutions would be stronger than the effect of implementing them independently. The need for interaction between different institutional components is inherent in the contemporary approach to the labour market (OECD, 2006; Bassanini, Duval, 2006). Population ageing entails a necessity to expand such interaction to other policies not directly targeted at the labour market. Therefore, an institutional response should also expand to factors determining the labour market and family formation, accumulation of human capital and economic activity, supporting workers' adaptability, making the Polish labour market attractive to immigrants and fostering their integration.

Part II. Youth and experience: rivals or allies

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Introduction

This part of the report focuses on age dimensions of the Polish labour market. We study the situation of young individuals (i.e. aged 15-24 or 15-29) and older people, who are still in working-age (i.e. aged 55-64), against prime-aged individuals (i.e. aged between 25/30 and 54).

The analysis is twofold. Firstly, we consider the discrepancy between labour force participation of these groups in Poland and other EU member states in 1998-2008. During the entire period in question, a different dynamics between aggregate labour demand and aggregate labour supply in all the age groups were a major cause of the employment gap between Poland and the EU-15, as well as the EU-27. Secondly, the analysis focused on the phenomena affecting the labour market situation of the considered age groups, in particular during the deep employment decline of 1998-2003 and the strong improvement of 2004-2008. We are interested both in developments related to economic and occupational structures, as well as in impact of individual characteristics (e.g. age, education level, workplace features) and contextual variables (e.g. business cycle fluctuations, regional labour market situation) on probabilities of employment. Hierarchical modelling is the prime econometric method used for that purpose. Another dimension of our analysis refers to the difference in earnings between the younger and older labour market participants, and its development over time. Specifically, standard wage-models and quintile regression are used to estimate age effects on wages. The Blinder-Oaxaca decomposition is employed to investigate the potential age discrimination in wages.

As demonstrated in Part I, Polish public policy will face three major challenges in the coming two decades. Given an extremely low economic activity of people aged 50-64 and the forecasted changes in the age structure of the Polish population (i.e. advanced population ageing accompanied by a significant drop in the number of working-age people), a rise of the labour force participation of older workers will be of great relevance. Section 3 of this Part examines factors stimulating the early exit from the labour market of people at immobile age. A particular attention is given to the impact of individual and institutional determinants, as well as of the workplace environment. Conclusions are drawn on the basis of our own research results, supported by findings of other studies.

Lastly, by taking into account the results of an experiment conducted for this purpose, an assessment of age discrimination in the Polish labour market is carried out. Correspondence testing (CT) is applied to check age effects on recruitment decisions.

The concluding section brings a diagnosis of the labour market situation of young and older participants in Poland, with the position of prime age workers also been accounted for. Some comments on the institutional determinants of the labour force participation are presented as well.

1. Youth, adults and older workers in the Polish labour market in the European context

This section contains to a comparison of the labour market situation of youth, adults and older workers in Poland and other European countries (defined in terms of the EU-15 and the EU-27) in the 1998-2008 time period. The following subpopulations have been defined to allow for cross-country comparisons according to age: 15-24, 25-54, 55-64. An overview of the latest changes in the size and age structure of the population aged 15-64 in Poland and the EU opens the discussion and is followed by an analysis of the labour force participation of people in the selected age groups in two sub-periods: 1998-2003 and 2003-2008. The analysis is based on Eurostat data.

Since mortality and fertility developments in the second half of the 20th century differ remarkably between the EU-15 and Central and Eastern Europe, the current age structures of relevant populations are different as well (see Part I). In Poland, the post-war baby boom was echoed in a high share of youth in the population at the beginning of the 21st century, when those born in the 1940s and 1950s were still at their prime age. In the EU-15 countries, the size of particular age groups after 2003 began to change more gradually and less dramatically. In Western Europe, the post-war baby boom occurred later and was not as strong as in many CEE countries, while the drop in fertility, attributed to the second demographic transition, took place earlier and was less rapid than in many CEE countries. Considerable shifts in the age structure in Poland resulted from a significant rise in the number of people aged 55-64, caused by post-war baby-boomers entering this age group. On the other hand, a dramatic drop in the number of births at the beginning of the transformation period contributed to a significantly faster reduction in the number of individuals aged 15-24 in Poland as compared to the EU-15 (see Table II.1).

Table II.1. Changes in the age structure of the population aged 15-64, 1998-2008, Poland – EU-15 – EU-27 (in percentage).

Age groups	UE27			UE15			PL		
	1998	2003	2008	1998	2003	2008	1998	2003	2008
15–24	20.2	19.2	18.5	19.1	18.3	17.9	24.5	24.1	21.0
25–54	63.8	64.4	63.9	64.5	64.8	64.3	62.3	62.6	61.8
55–64	16.1	16.4	17.6	16.4	16.9	17.7	13.2	13.3	17.3
15–64	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own calculations based on Eurostat data.

Table II.2. Changes in the size of the population aged 15-64 by age groups, 1998-2008, Poland – EU-15 – EU-27 (1998=100).

Age groups	Indices of population change (1998=100)					
	UE27		UE–15		PL	
	2003	2008	2003	2008	2003	2008
15-24	96,8	95,4	97,4	97,9	100,1	89,1
25-54	102,3	104,0	102,3	104,2	102,5	103,2
55-64	103,6	113,5	104,7	112,8	102,8	136,3
15-64	101,4	103,8	101,7	104,4	101,9	104,1

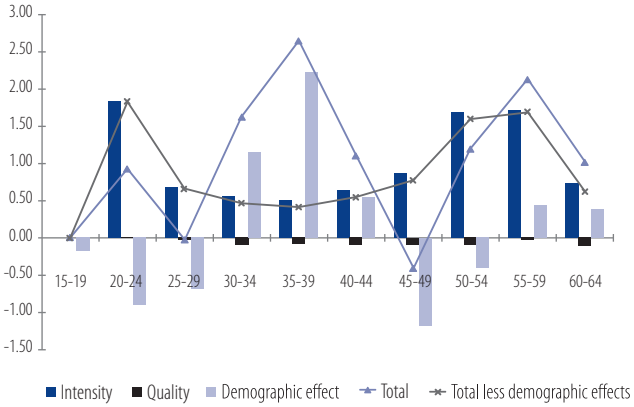
Source: Own calculations based on Eurostat data.

As compared to the EU-15, Poland differs both in terms of the labour market situation and the demographic structure. The Lisbon Strategy goals for 2010 seem a long way off. In 2008, the employment rate for the 15-64 age group failed to reach the 70 percent benchmark goal by 10.8 percentage points. Only Hungary, Romania, Malta and Italy achieved worse results. It must be stressed, however, that the EU-15 also failed to achieve the target level and outstripped Poland only by 3.5 percentage points. The same applies to the female employment rate. By the end of 2008, Poland's rate was by 7.6 percentage points lower than the 60 percent benchmark goal postulated in the Lisbon Strategy. Again, a greater employment gap was observed only in Hungary, Romania, Malta and Italy, as well as Greece, although the economic crisis, which hit the EU-15 countries harder, corrected the picture to Poland's advantage. It is worth noting, however, that this does not mean an improvement in absolute terms, as due to the crisis the whole Europe has downshifted from the Lisbon Strategy goals for 2010.

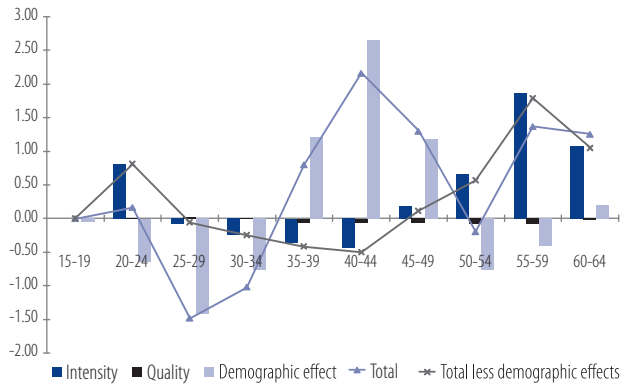
Previous editions of *Employment in Poland* presented a decomposition of the variation in cross-national labour force participation in terms of the impact of certain demographic and socioeconomic characteristics on the labour force and its use. Applying this method, Figure II.1 shows a decomposition of the differences in employment rates between Poland and the EU-15 average in mid-2003 (when the employment rate in Poland was at the lowest level in the decade) and in mid-2009. Differences in the employment rate were significantly reduced from over 10 to 3.5 percentage points. As indicated in the figure, in 2003 the employment gap could be ascribed almost entirely to a less intense labour use, i.e. lower employment rates of specific groups distinguished by gender, age and education. Owing to a lesser severity of the world economic crisis impact on Poland as compared to other European countries, in 2009 the employment rate for the prime-age group was high enough to narrow the gap between Poland and the EU-15. Therefore, the distance to the EU-15 derives from a low employment rate for people aged above 45 and for the 20-25 age group. The decomposition also suggests that over 80 percent of the difference in the overall employment rate between Poland and the EU-15 results from a low employment rate for individuals aged 45-64. This is significantly more than in 2003, when only half of that discrepancy could be explained in this way.

Figure II.1. Decomposition of the employment gap between Poland and EU-15, 2003 (left figure) versus 2009 (right figure) (percentage points).

Poland and EU-15 in 2003



Poland and EU-15 in 2009



Source: Own calculations based on Eurostat data.

The positive impact of the demographic factor on the employment gap between Poland and the EU-15 is linked to the relatively young population in Poland as compared to the EU-15. The age structure of the working-age population is shaped by two baby-booms: the post-war boom and its "echo" some years later. Since the age groups characterised by the highest employment rate are relatively less numerous, the age structure itself widens the overall employment gap between Poland and the EU-15. As shown in Part I of this report, this effect will be mitigated slightly when a larger number of those born in the 1980s enters prime age. On the other hand, due to the ageing of the post-war boomers, this positive effect will be countered by a negative one resulting from an increases in the number of people at pre-retirement and retirement ages. The above factors will lead to a rising number of people characterised by a low employment rate.

In Part I we have identified and discussed in detail the processes determining the demographic context of the Polish economy in the next 50 years. We have also indicated that women in Poland are less likely to participate in the labour market than men, which is mostly due to females' greater involvement in family responsibilities they find hard to reconcile with professional careers. Although these issues will be analysed in depth in Part III, at this point it is worth to emphasise that the female inactivity rate is exceptionally high in Poland. Over 40 percent of women aged 15-59 do not participate in the labour market as compared to 30.7 percent in the EU-15 and 32.3 percent in the EU-27. The inactivity rate among women aged 50-59 in Poland amounts to as much as 50 percent. Likewise, men in Poland are more likely to exit the labour market after they turn 50 (about 40 percent of those aged 50-64 remain inactive). Consequently, men and women at older working ages hardly ever remain unemployed.

Table II.3. Inactivity and unemployment rates by age, sex and education, 2008 (in percentage).

	Inactivity rate				Unemployment rate			
	15–59/64	15–24	25–49	50–59/64	15–59/64	15–24	25–49	50–59/64
Total	34.1	66.9	15.0	46.1	7.2	17.3	6.1	5.9
Women	39.0	70.4	21.2	52.5	8.1	19.9	6.9	6.1
Men	29.1	63.5	8.8	40.8	6.5	15.2	5.4	5.7
Primary	79.7	91.6	33.3	57.5	11.9	20.6	13.4	9.5
Secondary (vocational)	35.3	27.7	17.2	48.7	7.8	18.6	7.3	6.4
Upper secondary	39.9	52.5	14.6	44.2	7.3	16.3	5.5	6.0
Tertiary	20.0	26.6	6.1	26.7	3.8	16.8	3.5	1.3

Source: Own calculations based on the Polish LFS data.

In Poland, education exerts a strong influence on one's labour market position. Previous editions of *Employment in Poland* have already pointed out the improvement in average human capital of groups entering the labour market as a result of the socio-economic changes of the last two decades. Generally, people aged over 50 tend to remain below the education levels of younger age groups which, counting in their low activity to acquire new skills (see Part IV) contributes to their low mobility and adaptability to changes in the labour market. In fact, individuals with primary education are inactive and unemployed far more often than those completing further levels of education. Altogether, regardless of education levels, people aged over 50 are much more likely to leave the labour market. Moreover, the rise in the inactivity rate among individuals with tertiary education is particularly sharp among those aged over 50. The general trend is clearly observable in Table II.4, which presents the structure of inactive men and women by age and educational level. The positive relationship between age and inactivity is clearly visible.

Table II.4. Inactive working-age population by gender, age groups, and education, 2008, Poland (in percentage).

	Education				
Age	Tertiary	Upper secondary and post-secondary	Secondary (vocational)	Primary	Total
Men (total 3 761.1 thousand)					
15-24	0.5	12.8	1.7	30.9	45.9
25-34	0.6	2.0	1.9	1.4	5.9
35-44	0.2	0.9	2.1	1.3	4.5
45-54	0.7	3.4	7.0	2.7	13.7
55-59/64	2.2	7.8	12.7	7.2	29.9
Total	4.2	26.9	25.4	43.6	100.0
Women (total 4 862.7 thousand)					
15-24	1.1	13.7	1.4	22.7	38.9
25-34	2.5	5.8	4.1	2.0	14.4
35-44	0.5	2.9	3.6	1.7	8.8
45-54	1.0	5.8	6.6	3.7	17.1
55-59/64	1.6	8.5	5.9	5.0	21.0
Total	6.7	36.7	21.5	35.1	100.0

Source: Own calculations based on the Polish LFS data.

Another factor associated with the low employment rate in Poland is long-term unemployment. The LFS data for Poland indicate that in 2008 60 percent of the unemployed remained in that labour market status for longer than 12 months, with the number of women in that group slightly higher than that of men. Rising unemployment since mid-2008 inflated the unemployment stock by those who had just lost their jobs. This improved the picture of long-term unemployment in Poland, yet only in statistical terms. Although unemployment dropped by almost 2 million in 2004-2008, cutting by half the number of the unemployed for longer than a year, that group still counted as much as 700 thousand.[1]

Table II.5 demonstrates that long-term unemployment among the elderly tends to be less common than among individuals under 35, who comprised almost 2/3 of all the long-term unemployed in 2008. Even though people with upper secondary education are overrepresented in this group, it is noteworthy that the number of their counterparts with secondary and tertiary education is also relatively large. This suggests problems with a smooth labour market entry signalled by OECD (2008).

Table II.5. The unemployed for less and for more than a year by age and education, 2008 (in percentage).

Age	Education				
	Tertiary	Upper secondary and post-secondary	Secondary (vocational)	Primary	Total
	Unemployed for less than a year (total 474.5 thousand)				
15-24	0.5	13.9	7.0	5.5	26.9
25-34	9.0	10.2	9.6	2.3	31.1
35-44	0.7	5.8	7.6	2.2	16.3
45-54	0.7	7.2	8.1	3.7	19.7
55-59/64	0.5	2.4	1.8	1.2	5.9
Total	11.4	39.5	34.1	15.0	100.0
	Unemployed for one year and more (total 729.1 thousand)				
15-24	6.3	19.4	5.4	2.5	33.5
25-34	8.6	9.8	8.2	3.1	29.6
35-44	1.0	4.7	7.2	3.2	16.2
45-54	0.4	6.4	6.9	2.7	16.5
55-59/64	0.2	1.2	2.0	0.7	4.2
Total	16.6	41.5	29.7	12.2	100.0

Source: Own calculations based on the Polish LFS data.

An additional insight into the relative situation of young and older workers in the EU-15 and Poland is given by an analysis of economic activity rates and employment rates for 1998-2008. It is noteworthy that the labour market situation of the youngest participants evolved differently in Poland and in Western Europe (see Figure II.2 and Chart II.3). In the EU-15, raising employment rates for individuals aged 15-24, which reflected an upward trend in job growth for this age group (slightly stronger for women), slowed in 2003-2008. This trend was accompanied by a drop in youth unemployment, again slightly more evident among females. Between 1998 and 2008 (before the world economic crisis), the use of the youngest segments of the labour force in the EU-15 improved considerably. In Poland, a visible improvement in the situation of the youngest participants of the labour market took place during the period of economic expansion of 2003-2008. It was then that the gap in youth employment between Poland and the EU-15 was narrowed (but not eliminated). As the decomposition presented above has shown, the employment gap has not been closed and it should be attributed not so much to a higher education attendance (enrolment) as to a lower labour force participation of young people in Poland as compared to Western Europe.

[1] People who declared being unemployed for ten years or more before the survey were excluded (the fourth quartile of unemployed for a year or more in LFS for 2008). Such duration of unemployment is considered equivalent to inactivity.

Following the financial crisis of 2008, which hit the labour markets in Western Europe harder, the unemployment gap among the young between the EU-15 and Poland narrowed significantly; however, the unemployment rate for women in Poland still exceeds the EU-15 level by 5 percentage points (see Figure II.3).

Figure II.2. Employment rate of persons aged 15-24 by gender, 1998-2008, Poland, EU-15, EU-27 (percentage).

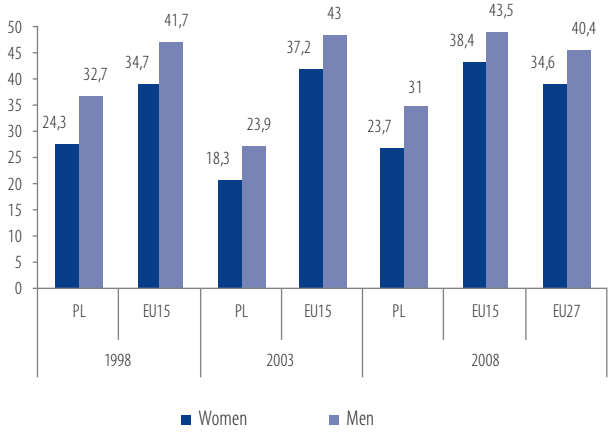
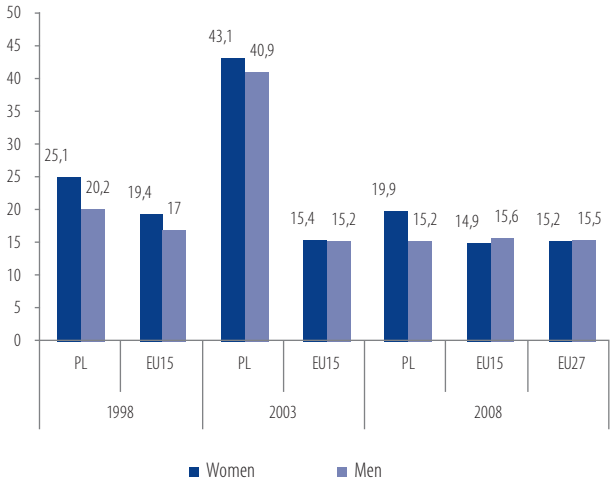


Figure II.3. Unemployment rate of persons aged 15-24 by gender, 1998-2008, Poland, EU-15, EU-27 (percentage).



Source: Eurostat, 2010.

Similar labour market developments were observed for the prime-age group in 1998-2008. In this case, the EU-15 employment rate also showed a continuous upward trend, but it was much stronger for women. At the same time, the number of people in this age group was increasing at a moderate pace. In Poland, despite an improvement in economic conditions after 2003, the negative employment gap for males between Poland and the EU-15 increased (from 2.7 percentage points in 1998 to 3.6 percentage points in 2008), whereas for females it turned from a positive 4.3 percentage points in 1998 to a negative 1.4 in 2008.

Figure II.4. Employment rate of persons aged 25-54 by gender, 1998-2008, Poland – EU-15 – EU-27 (percentage).

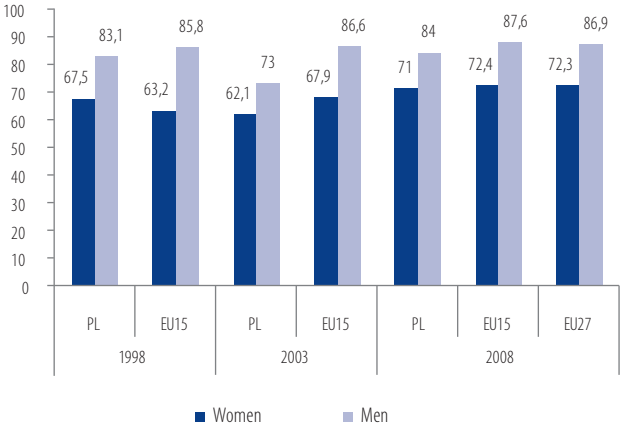


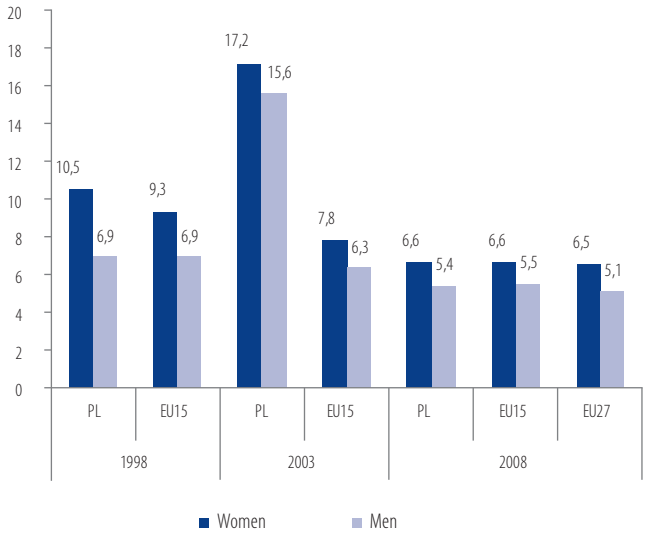
Figure II.5. Employment rate of persons aged 55-64 by gender, 1998-2008, Poland – EU-15 – EU-27 (percentage).

Source: Eurostat, 2010.

The EU-15 employment rate for people aged 55-64 has grown since 1998, following the rise in their economic activity, more pronounced for women and only a little less for men. At the same time, Poland experienced a reversed process: older individuals became increasingly less active in the labour market. Despite a slight improvement (mostly for men), Poland stands out in the EU-27 with one of the lowest employment rates for people aged 55-64, see Figure II.5. In 2008, the employment gap between Poland and the EU-27 for males of that age was 12.1 percentage points, whereas for women it reached over 18 percentage points. The increase in the size of that age group in Poland, remarkably stronger than in the EU-15 and EU-27, which is shown in Table II.2, additionally demonstrates how

important even a small increase of employment rates for older workers would be for reducing the burden to the working population created by those out of the labour market.

Figure II.6. Unemployment rate for persons aged 25 and more by gender, 1998-2008, Poland – EU-15 – EU-27 (in percentage).



Source: Eurostat, 2010.

It can be concluded that the economic upturn of 2003-2008 significantly improved the labour market situation of all age groups in Poland. However, the employment gap between Poland and the EU-15 not only did not narrow, but even increased in certain age groups. Nevertheless, the risk of unemployment shrunk, especially for persons aged 25 and more, approaching the EU-15 and EU-27 averages.

A comparison of the labour market outcomes for the youngest participants shows that young women in Poland face much greater difficulties in finding a job than men, whose situation in this respect is more comparable to that of their contemporaries in other EU countries. It should be borne in mind, however, that young people aged 15-24 are three times more likely to be unemployed than any other market participants. Thus, reducing unemployment in the youngest age group could translate into a much welcome employment growth.

An increased participation of adults and older people at working age can be achieved by reducing their inactivity. For this purpose, it seems essential to increase the economic activity of adults (i.e. individuals who have exited the market should be induced to return and those who have remained inactive should be encouraged to enter the labour market) and even more importantly, prevent older workers from an early exit. These issues will be discussed in more detail in the last section of this Part.

2. Changes in the labour market situation of youth, adults and older workers in 1998-2008

As mentioned above, the analysis of the impact of business cycles on the labour market situation of the three selected age groups was broken down into two periods: 1998-2003 – a period of economic slowdown, rapid employment slump and unemployment growth, and 2004-2008, when the Polish economy experienced a rapid expansion accompanied by aggregate employment increase and unemployment decrease.

In both periods, the size of the working-age population increased only slightly by 2 percent, but there were differences in changes experienced by particular age groups. In 1998-2003, the population of the youngest and the oldest age groups grew by 3 percent, whereas the size of the prime-age population remained stable. Over the next five years the number of people aged 15-29 dropped by almost 5 percent, the prime-age population started to shrink (by almost 1 percent), whereas the number of individuals aged 55-59 skyrocketed by 30 percent. In effect, the composition of the working-age population changed considerably: the share of the 15-29 age group decreased from 35 to 33 percent, and the share of older workers surged from 13 to 17 percent. It can be hence concluded that the labour market situation in Poland in the last ten years was shaped by two phenomena: changes in the age structure of the working-age population and business cycle fluctuations.

2.1. Employment by age, education and workplace characteristics in 1998-2008

2.1.1. Employment by age and economic sector

In the last decade, employment in the agricultural and non-agricultural sectors in Poland evolved in opposite directions. The years 1998-2003 saw a 10 percent drop in the number of people working in the non-agricultural sector, whereas better economic conditions in 2003-2008 boosted this number by 23 percent. In agriculture, on the other hand, employment decreased overall at a similar pace: by 17 percent for both genders in 1998-2003 and by 9 percent for women and 14 percent for men in 2003-2008. Economic fluctuations obviously have a stronger impact on non-agricultural employment, while employment in agriculture is determined by longstanding trends related to the adjustment of labour intensity in agricultural production to the European levels.

Table II.6. Employment by economic sector and gender (in thousands), 1998-2008, Poland.

Sectors/gender	1998	2003	2008	2003/1998=100	2008/1998=100
Non-agricultural	12551	11345	13869	90.4	110.5
Men	6890	6216	7617	90.2	110.6
Women	5661	5129	6253	90.6	110.5
Agricultural	2784	2373	2136	85.2	76.7
Men	1531	1304	1196	85.2	78.1
Women	1253	1069	940	85.3	75.0

Source: the Polish LFS, IV quarters 1998-2008, Information and Statistical Analyses, Warsaw, Central Statistical Office 1999-2009.

The poor economic performance of the Polish economy over the years 1998-2003 reduced the number of non-agricultural workers aged 15-24 (by approximately 30 percent) and prime-age workers (by approximately 10 percent), despite the fact that the population size of these two age-groups remained stable. At the same time, the number of farmers in the two remaining age-groups (i.e. 25-29 and 55-64), increased only slightly, even though the both age groups exhibited population growth.

However, during the period of economic prosperity (2003-2008), the highest increase in employment was observed in non-agricultural sectors among people aged 55-64 (76 percent increase for women and 93 percent for men). This tendency can be attributed to a change in the age structure of the working-age population (numerous age cohorts born in the 1940s and 1950s entered this age group) and to the general increase in the employment rate, especially among males.[2] It must be highlighted that this increase was substantial only in relative terms, since the baseline level was very low. In absolute terms, it accounted for only a modest contribution to the total employment growth. As regards the 25-29 age group, employment levels increased by 30 percent for women and 26 percent for men, while the size of this group grew slightly. In 2003-2008, the employment growth in the youngest age group continued, more for men (26 percent rise) than for women (18 percent), which could be due to a particularly strong demand for labour in the typically masculine sectors (industry, construction), offering in general jobs to young men. Non-agriculture employment of prime age persons, by far the largest of the considered age groups , went up by relatively the smallest percent (approximately 18-19 percent both for males and females).

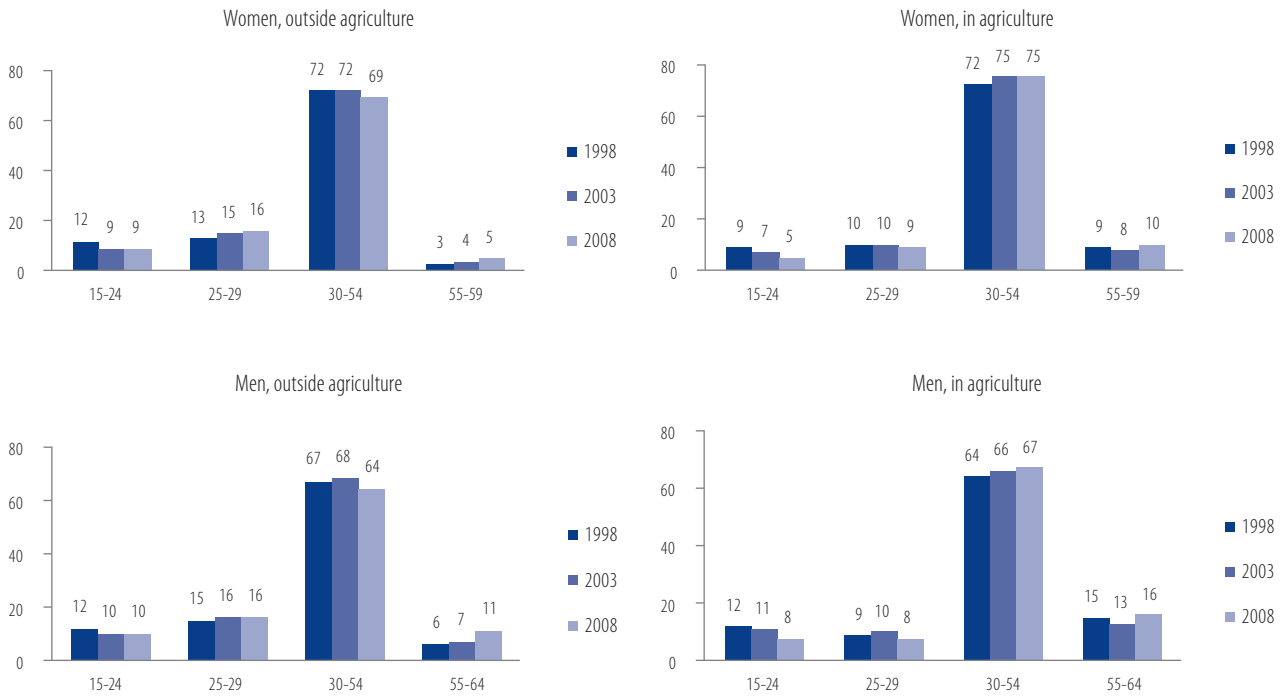
Employment trends in the agricultural sector were significantly different. In 1998-2003, the greatest drop in the number of farmers occurred among the youngest and the oldest individuals. Employment in this sector dropped by 27 percent for women aged 15-24 and by approximately 10 percent for men in the same age group. So pronounced differences between genders can be explained by a lower demand for jobs in non-agricultural sectors (construction, transportation) which typically offer jobs to young men with low qualifications. Another reason is that women, more frequently than men, decide to improve their education, which increases the likelihood of them finding a job outside agriculture. Contrary to youth groups, there was no substantial difference with respect to gender in employment dynamics among older workers. In 1998-2003, the number of working women aged 55-59 decreased by 12 percent, whereas male employment in this age group fell by 15 percent. This could have been caused by older people passing down their farms to younger generations and leaving the labour market. In fact, only the prime-age group did not experience a severe drop in employment during the economic slowdown - the number of agricultural workers among people aged 30-54 declined only slightly (by 2-3 percent). However, this downward trend in employment in agriculture took a different turn in 2003-2008, when the economic situation improved. The number of the youngest persons in agriculture dropped sharply (by approximately 28 percent for women and 36 percent for men). The more significant decline for men might be linked to an increasing demand for their work in other sectors of the economy and to the shrinking educational gap between males and females. It is also noteworthy that the years 2003-2008 brought an increase in the number of older farmers (by approximately 12 percent for women and 5 percent for men), which is only partially related to changes in the age structure of the working-age population. It appears that after accession to the EU, employment in agriculture has become relatively more attractive for the oldest labour market participants in Poland.

[2] The employment rate of men aged 55-64 increased from 34.1 percent in 2003 to 44 percent in 2008 and in the case of women from 19.4 to 20.7 percent respectively.

It seems that changes in the size of the selected age groups living in rural areas are only loosely related to workers' fluctuations in the agricultural sector, meaning it was not the age composition that induced changes in agriculture employment. The above analysis shows that employment among the youth, adults and older workers in both periods was more affected by changes in the economic conditions than by the age structure of the population. The result is attributable not only to cross-sector diversity in labour demand fluctuations and cross-sector differences in workers' age structure, but also to employers' behaviour, who find it easier to limit hiring than to dismiss workers when the economic situation deteriorates.

Changes in the working-age composition and employment patterns described above deepened the discrepancies in age structures of those employed in agriculture and non-agricultural sectors. Moreover, increasing enrolment in tertiary education and difficulties in entering the labour market in 1998-2003 were reflected in a smaller share of both men and women aged 15-24 employed in both sectors (Figure II.7). At the same time, more females aged 25-29 started to work in non-agricultural sector, whereas the share of 30-54 year-olds employed in this segment of economy remained stable. As regards the agricultural sector, the shrinking number of individuals aged 15-24 and the relative increase of older workers contribute to an advanced ageing of people employed therein.

Figure II.7. Non-agricultural employment by age and gender, 1998-2008 (in percentage).



Source: Own calculations based on the Polish LFS data, 1998-2008.

Modernisation of the employment structure by sectors, which is generally responsible for reducing the share of employment in agriculture and manufacturing in favour of the service sector, proceeded at a considerably slower pace during the economic slowdown. In 1998-2003, the drop in the number of men employed in agriculture and industry ceased and employment in services grew relatively slower. Together with age and gender differences in the sectoral employment structure in 1998, this development reinforced changes within the discussed employment groups.

In 1998, the youngest women most frequently worked in wholesale and retail trade, and in manufacturing (approximately half of the female work force). Other sectors employing large numbers of female workers included agriculture, health care and social work, as well as education. Young men's employment profile with regard to economic sectors was different: manufacturing ranked first, followed by wholesale and retail trade, construction and agriculture. Structural differences in employment with respect to gender became more evident in the period of economic downturn in 1998-2003. They were due to the fact that more significant changes occurred in women's employment structure (reducing the share of manufacturing, health care and social work and increasing the share of education in the total employment of females) than men's (reducing the share of construction and rising the share of wholesale and retail trade). Although the growing importance of the service sector in 2003-2008 deepened the employment diversification among the youngest women, they are still predominantly employed in wholesale and retail trade. The sectoral employment profile of the youngest men is less differentiated than the one of women and its changes are due mostly to the dropping number of the employed in agriculture as well as the fluctuating share of workers employed in construction, which is strongly dependent on business cycles.

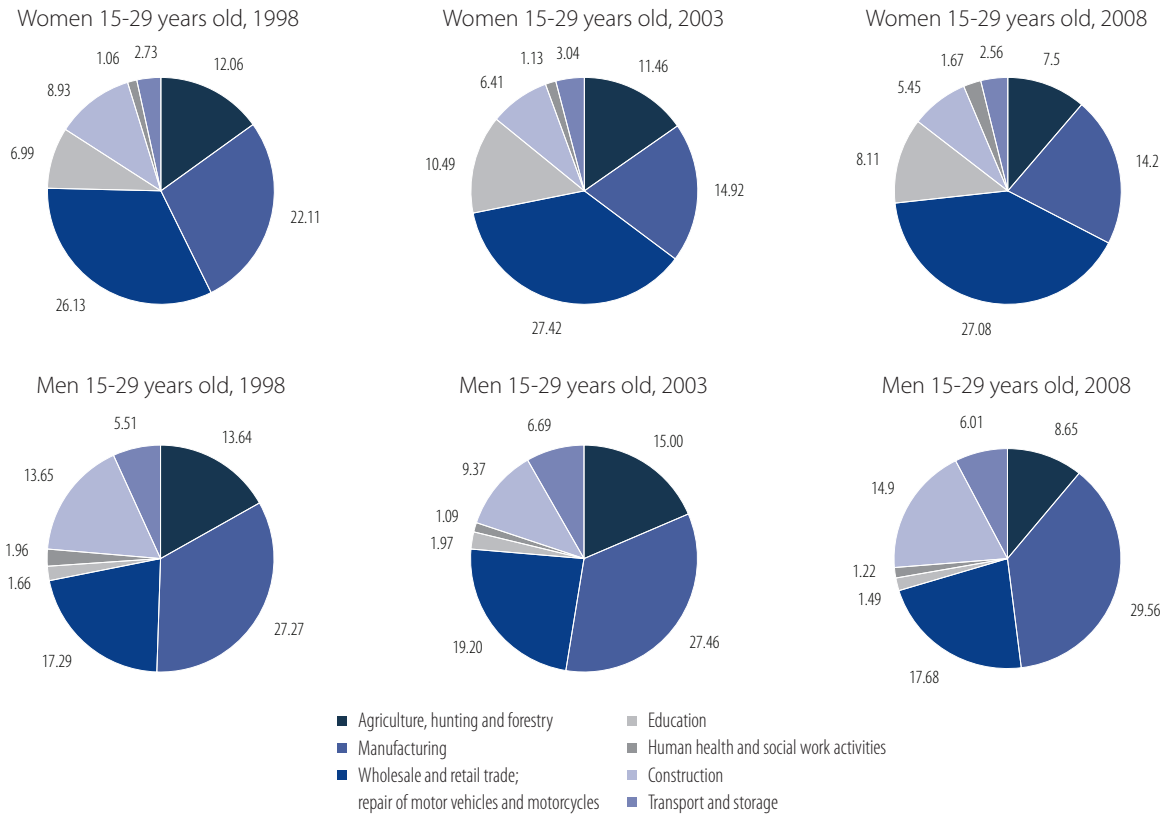
Whereas the employment structure of the youngest age group reacted strongly to fluctuations of labour demand in 1998-2008, changes for men and women aged 30-54 were only minor (especially in the period 1998-2003). The distribution of female workers by main economic branches was rather close to the uniform one: the relatively largest number of women worked in manufacturing and agriculture, followed by trade, education and healthcare. The modernisation of the employment structure during the economic recovery reduced the importance of agriculture and gave more prominence to trade. Prime-age men were still largely employed in manufacturing, increasingly more often in the construction sector and far less frequently in agriculture.

In 1998, older workers (both genders) were employed primarily in agriculture and then in manufacturing. Following the patterns of employment for younger groups, women in the oldest age group (55-64) were employed mostly in sectors linked to education, health care, social work, trade and industry. Men in this age group were mostly employed in manufacturing, whereas their employment rate in construction was two times lower than among workers in the youngest age group. The years 1998-2008 brought a significant drop in the employment rate in agriculture (for both genders), with the rate falling most drastically in 2003-2008. Nonetheless, agriculture remains the predominant workplace for older women, who also often work in education and trade, and slightly less frequently in health care and social work or manufacturing. The agriculture sector no longer provides the greatest number of jobs for men aged 55-64. The primary sector of employment for this age group is manufacturing, followed by construction, the prominence of which is growing continuously.

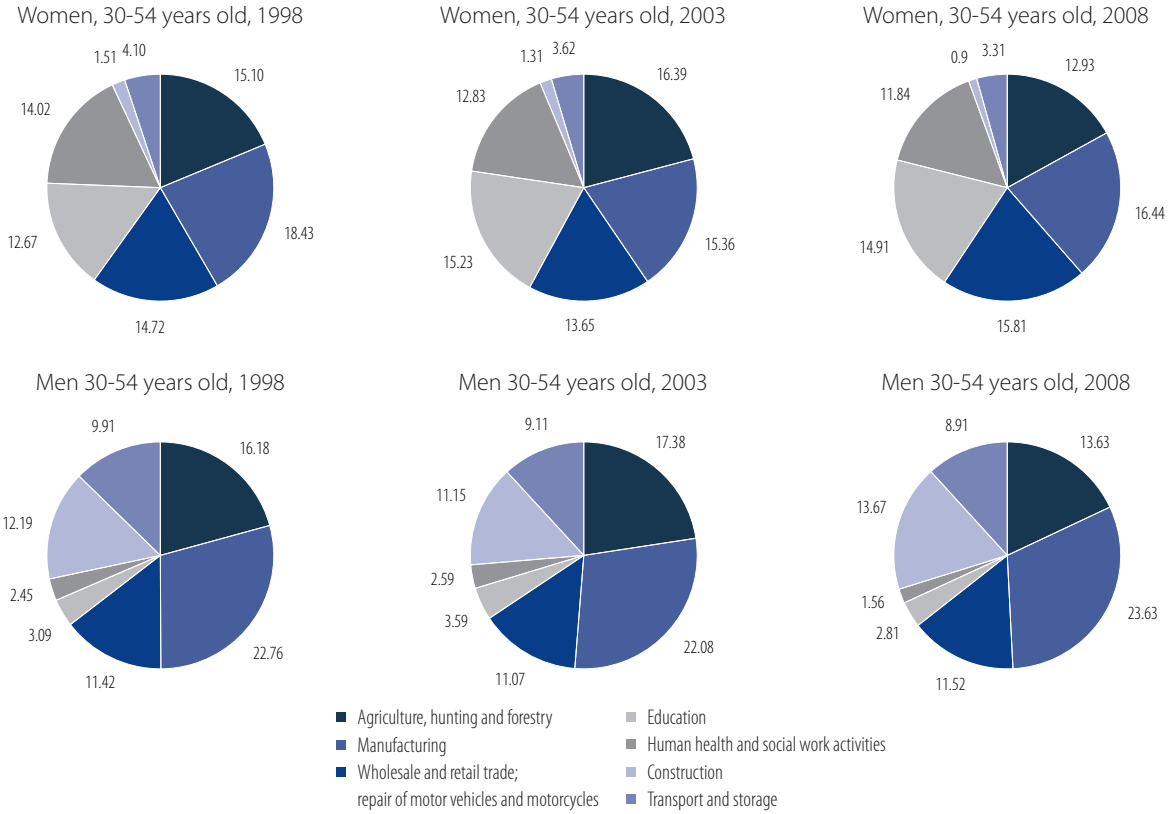
Changes in the employment structure over the past decade in Poland were significantly affected by a drop in employment in agriculture. The intensity of this process was different depending on workers' age and gender. Currently, young women are more likely to find jobs in services and only rarely in agriculture or manufacturing, although the latter still ranks second after wholesale and retail trade as regards total female employment. Women aged 55-59 usually face difficulties to find non-agricultural jobs, which is why, despite the dropping share of agriculture in female employment, it still remains their major place of work. Another possible cause is the large number of women employed in non-agricultural sectors leaving the labour market at that age. As regards men, the youngest groups who exit agriculture tend to find jobs mostly in construction and manufacturing. The older groups are much more likely to be employed in manufacturing than in construction. It needs to be emphasised that the lack of professional qualifications among people living in rural areas remains a strong barrier preventing them from finding jobs in sectors other than agriculture.

Figure II.8. Employment by age, gender and economic sector (according to Polish Classification of Activities), 1998-2008 (in percentage).

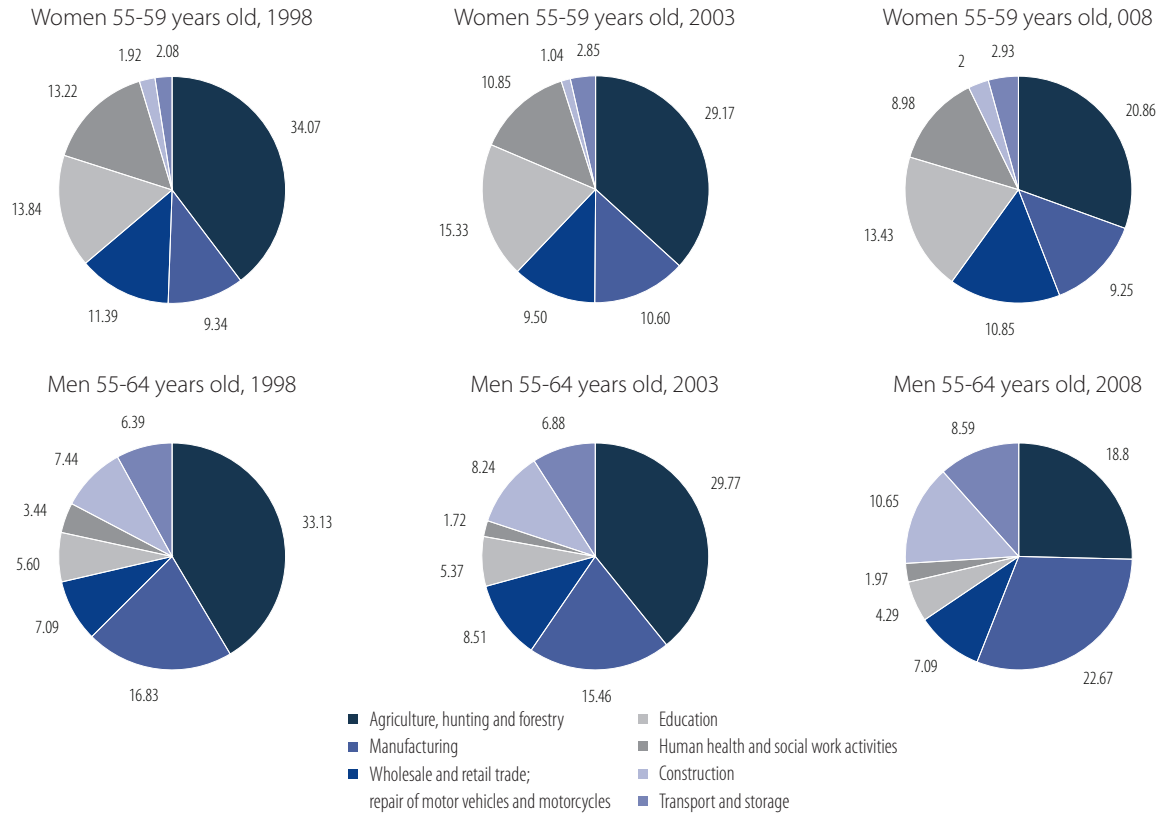
Youth



Adults



Older workers



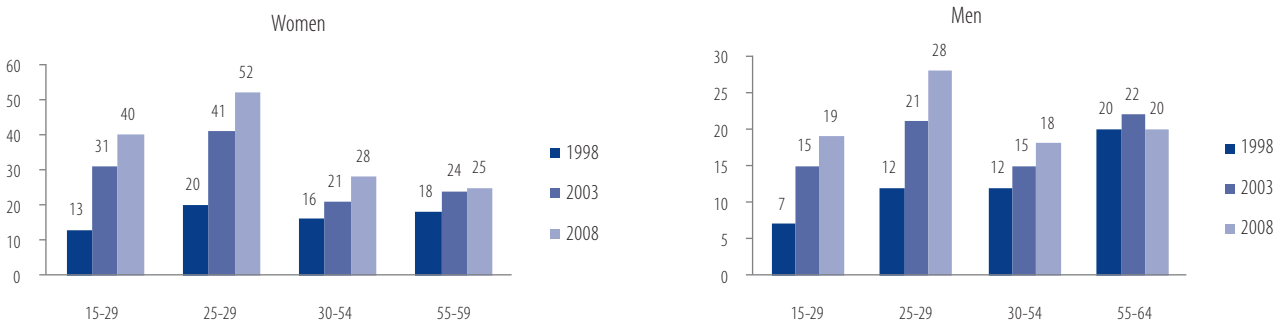
Source: Own calculations based on the Polish LFS data, fourth quarters 1998-2008.

2.1.2. Employment by age, education level and occupation

Apart from changes in the sectoral structure of employment, a rapid relative improvement in education of the age groups considered was, yet another important process having impact on the reorganization of the Polish labour market in the past decade. In 1998-2008, the share of workers with tertiary education increased from 13 to 24 percent and of those with upper secondary education from 6 to 9 percent, whereas the proportion of workers with secondary vocational education stabilised at 28-30 percent. The share of workers with the lowest formal qualifications dropped visibly (with vocational education down to 30 percent from 35 and primary education down to 11 percent from 15). These developments are much more apparent among women than men, this being linked to a strong advancement in educational levels among youth, specifically women aged 25-29. A continuously growing number of females among students creates an educational gender gap in the 30-54 age group. Its altered education structure is caused mainly by generation changes, i.e. increasingly better-educated younger cohorts entering this age group and older ones with lower formal qualifications leaving it. The same pattern may be observed in the case of older workers, although they are more (than other age groups) subject to the selection process, i.e. better-educated individuals with better earnings prospects are more determined to stay in the labour market.

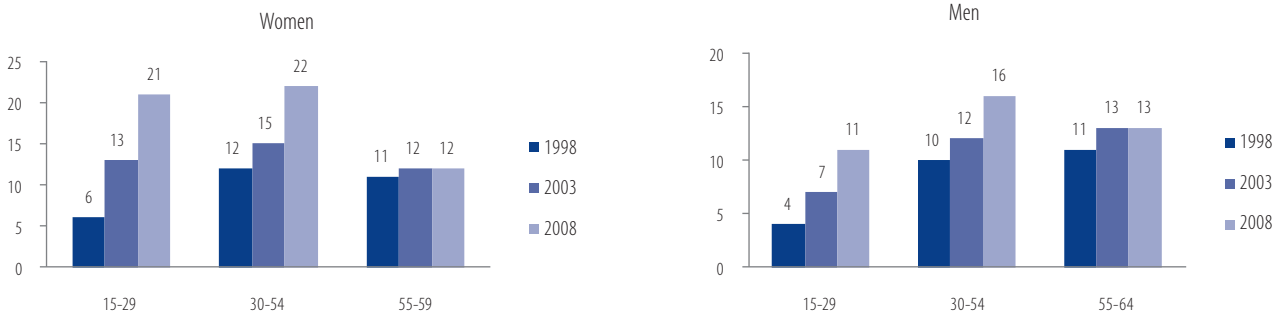
Changes in the occupational structure are another important dimension of the structural employment transformations in the selected age groups in Poland. Firstly, gender is the main differentiating factor in terms of occupational structures. Females are employed most frequently as personal service workers, sales assistants, office workers, mid-level staff and professionals, whereas men as industrial workers and craftsmen. Older age, on the one hand, is a strong indication of employment in agriculture, but on the other, it is reflected in a greater share in management and expert positions. Differences between percentages of individuals employed in the top occupations by age might be predominantly contributed to accrued work experience.

Figure II.9. Percentage of people with tertiary education among employed by gender and age, 1998-2008, Poland.



Source: Own calculations based on the Polish LFS, fourth quarters 1998-2008.

Figure II.10. Percentage of people with tertiary education in the population aged 15-59/64 by gender and age, 1998-2008, Poland.



Source: Own calculations based on the Polish LFS data, fourth quarters 1998-2008.

Improvements in the occupational structure, understood as more people working in relatively higher positions in the occupational hierarchy, took place in 1998-2008. These trends were characteristic of the population as a whole, as well as of the largest, 30-54, age group. The share of public authorities representatives and professionals was, however, the largest in the oldest age group and much greater than in the entire population. Furthermore, while farmers were the most represented among older workers until 2003, a decrease in their number in the age group above 54 was noticed during the period of economic recovery.

Changes in the employment structure were induced not only by sectoral modernisation, but also by economic fluctuations. Female employment structures (both among young and older workers) were more subject to changes during the economic downturn, while the male ones were more affected during the economic recovery. This phenomenon may be related to fluctuations in the demand for labour which are stronger in those sectors where employment is predominantly male, i.e. manufacturing and construction.

Economic slowdown generally 'favours' occupations positioned higher in the job ladder, while an increased demand for simple work during economic recovery encourages people to take up work ranked lower in the job hierarchy. In 1998-2003, a surge was recorded in the number of professionals in the youngest female group with a simultaneous and slightly less significant increase in the share of personal service workers and sales assistants; the number of manufacturing workers in this group dropped sharply. Among the youngest men, the number of professionals also rose (although to a lesser extent than in the case of the youngest women) and this was accompanied by a significant decrease in the proportion of manufacturing workers in the group. Women aged above 54 who remained economically active were more likely to take managerial positions or to be employed as professionals. Older men were employed more frequently as public officials or worked in personal services, or as sales assistants, but rarely in manufacturing.

Economic recovery brought about an increased share of males in the youngest and the oldest age groups, employed as machine operators and assemblers, as well as industrial workers. By contrast, the share of both male and female agricultural workers shrank. Also, the proportion of the youngest women employed as manufacturing workers plunged. At the same time, the share of female professionals and clerical support workers grew less vigorously than during the economic downturn. The labour market in Poland saw an entirely new phenomenon, not observed at the beginning of the decade – an increasing number of female technicians and mid-level employees. This might be explained by a gradual reorientation of women's educational patterns and vertical employment segregation.

2.1.3. Employment by age and other occupational characteristics

Despite the changes in the classification of ownership sectors introduced between 1998 and 2003, it is still possible to observe certain regularities in the structural changes occurring in employment within the selected age groups.[3] Still more women than men work in the public sector, and the difference persists even though the share of people employed in this sector is gradually increasing. This tendency might arise from the fact that significantly more women than men keep choosing to work as teachers or public officials, where the state is the major employer. Such gender discrepancies are not counterbalanced by the fact that men are overrepresented in the army and the police, which are also part of the public sector. Moreover, the importance of the public sector as a major employer increases with the transition to older age groups. As a result, gender differences tend to exacerbate with age. In 2008, 72 percent of women and 87 percent of men in the youngest age group worked in the private sector, while only 52 percent of women and 69 percent of men aged 30-54, and as few as 42 percent of women and 62 percent of men in the oldest group, found employment in privately owned companies.

There are at least two explanations to why so many young people are employed in the private sector. Firstly, formal requirements for jobs in the public sector constitute an effective barrier for younger applicants. And secondly, temporary contracts or part-time jobs most often desired by younger labour market participants are usually offered by employers operating in the private sector.

Discrepancies in the employment structure with regard to age may also be associated with employment status, type of contract and working time. Self-employment is most common among the oldest workers, which on the one hand may stem from the fact that many people in this age group take up agricultural work and, on the other, from the selection effect – people running their own business tend to be longer economically active.

Paid work is becoming increasingly significant for the youngest and the oldest workers. The share of the self-employed among young people dropped in 1998-2003, while it remained stable in other age groups. When the demand for labour increased (along with regular work contracts) in 2003-2008, self-employment became less popular in all of the discussed groups, especially among older workers. The percentage of employees climbed proportionally to the shrinking number of the self-employed. In 2008, it reached 88 percent for women and 86 percent for men aged 15-29. In the case of the 30-54 age group, the percentage of employees dropped during the economic slowdown, at the same time increasing the share of assisting unpaid family members; it then grew again to 76 percent for females and 80 percent for males. As already said, the most dynamic changes occurred in the oldest age group. A weak upward trend in 1998-2003 was intensified in the following years, so that by 2008 already 70 percent of women and 68 percent of men were employees.

In Poland, young people work as employees more frequently than persons at other ages, temporary contracts are also more often in use, while part-time employment or employment in the public sector is observed less frequently. As compared to men, women more often work part-time. These gender differences increased in 2003-2008, as less men worked part-time. The part-time model is most

[3] In 1998, four categories of ownership were classified: state-owned, council, private and collective-owned. In 2003 and 2008, the ownership classification distinguished only the public and private sectors.

popular with older workers (27 percent of women and 11 of percent men), clearly less among the young ones (12 percent of women and 6 percent of men), and it is least attractive for the 30-54 age group (8 percent of women and 3 of percent men). Part-time work over the past decade has shown a downward trend in all of the selected groups, except for women aged 55-59.

2.2. Employment determinants – individual and contextual factors affecting employment probabilities in different age groups

The impacts of individual characteristics, the general economic situation and other contextual determinants (e.g. regional labour market differences) were analysed by means of a multilevel logit model. First, a model for the working-age population as a whole was formulated and factors affecting the likelihood of being employed were examined (Box II.1). Then, models were estimated for selected subpopulations of youth, adults and older workers (females and males independently). Finally, we narrowed our analysis down to the non-agricultural sector of the economy (see Box II.2).

2.2.1. Employment determinants – a general model

The results of the general model (for the entire working-age population) are consistent with the macroeconomic picture of the labour market in Poland presented in Part I. The respective age groups mirror consecutive life stages of individuals' life courses, including their professional biography, individual characteristics (general and specific human capital, family situation and health), institutional settings (labour market regulations, social security system) and labour market structures (economic sectors, employment status, type of contract) (see Box II.1).

Compared to the reference group, i.e. men aged 55-64-and women aged 55-59, the probability of being employed is significantly higher for those of both genders aged 25-39. However, the highest probability of being employed characterises men aged 30-39, who have a visibly better employment outlook than 25-29 year-olds and the reference group. The tendency for women is not so widely differing, presumably due to childcare responsibilities; both the 25-29 and 30-39 age groups have the same relative chance of employment (compared to the reference group).

The household position (defined as the relationship to the head of a household) is also of paramount importance. In general, heads of households are more likely to be employed than other household members. If, however, men do not occupy this position (which is rare), they tend to be employed less frequently than women. Wives work more often than other female household members. Husbands married to household heads are also characterised by higher employment probabilities than other male household members, although it is lower than that of wives'. These relations are attributable to economic and cultural factors, and result mainly from a relatively ubiquitous breadwinner model. If there is a dual earner model, the gender wage gap usually makes the man the head of a household. Therefore, should a man not be a household head, it is usually due to his unemployment rather than to lower earnings. Household positions other than a household head are a particularly significant factor limiting employment prospects for people aged 15-29 and 30-54. These are usually adult children who, for economical or other reasons (education, health), have not formed their own household.

The estimated impact of schooling is in line with descriptive statistics presented in Part 1. For both men and women more education increases the probability of being employed. Yet the highest gender differentiation in terms of returns to education concerns the tertiary level: the chances for employment of females with tertiary education are significantly higher than of men (compared to the reference group, i.e. persons with primary education). The place of residence is another differentiating factor. Urban dwellers (especially those living in small towns) have on average lower employment chances than people living in the countryside (although the predominant sector offering employment in rural areas is agriculture). Men benefited to a greater extent from the economic upturn of 2004-2008. By contrast, female employment prospects did not change much in the two time periods under study, possibly due to occupational segregation with respect to gender, as well as to changes in the demand for labour in specific sectors of the economy. Generally speaking, better economic conditions improve the labour market situation for those working in construction and manufacturing, i.e. in male-dominated sectors.

Labour demand fluctuations in regional labour markets are approximated by the quarterly employment rate in each province (voivodeships). A growing employment rate appears to have more impact on the likelihood of being employed for older workers than for persons at prime-age (which is especially true of women). Therefore, a positive demand shock only slightly closes the employment gap between the oldest group and 30-54 year-olds. It should be borne in mind, however, that the disproportion between employment rates in both groups is still extensive, regardless of the business cycle phase.

Box II.1. Employment determinants (agricultural and non-agricultural sector).

In a multilevel logit model the dependent variable is defined as a dummy variable, taking the value of 1 if employed and 0 if not. The first level of this model involves individual characteristics (gender, age, education, place of residence, family environment) and general economic conditions (1998-2003, 2004-2008) as a contextual variable. The second level of the model takes into account a contextual variable regarding time-variant conditions on regional labour markets (employment rate – quarterly data provided by voivodeships).

The estimation was based on individual data originally from the LFS (BAEL) database. For the purpose of this report a special dataset was generated, containing: (1) standardised LFS data for the period 1998-2008, (fourth quarters) – first level of the model; and (2) indicators reflecting changes in the regional labour market conditions in Poland in 1998-2008 (quarterly data) – second level.

The first category of models was estimated for the population aged 15-59 for women and 15-64 for men. Subsequent models were estimated for men and women independently for the following age groups: 15-29, 30-54 and 55-59 (women) and 55-64 (men). A detailed description of the model specifications is presented in Appendix 2.

2.2.2. Employment determinants for youth, adults and older workers

In the previous section we presented the estimation results of a multilevel regression model explaining the probability of employment with age as one of the explanatory variables.

It can be assumed, however, that the impact of other independent variables varies across age groups. To test age effects, we estimated models independently for three subpopulations: those starting on a professional career (aged 15-29), prime-age workers (30-54) and older workers (55-64).

The results of the econometric analysis confirmed that the influence of other variables on the employment probability differs across age groups. The youngest, 15-24 year-olds (especially men), are less likely to be employed compared to 25-29 year-olds. Similarly, employment opportunities for males aged 30-39 are four times higher than those for males aged 40-54, but only 60 percent higher for females from these age groups (which, as shown in Part III, is related to family responsibilities of younger women). The likelihood of being employed drops sharply with age and is the lowest in the oldest age group. This concerns older women in particular because, as shown in Part I of this report, they tend to exit the labour market at a very early stage (long before the standard retirement age).

Compared to the general model, models estimated for three the subpopulations show a more significant influence of educational level on employment. Tertiary education (compared to primary education) has the biggest positive effect on employment opportunities for 30-54 year-olds and for the youngest age group, with this effect being greater for women in each of the age groups. Interestingly, secondary vocational education gives more returns on the labour market than general upper secondary education. Higher returns of secondary vocational education as compared to primary education vanish for 55-64 year-olds. And in general, in the oldest age group, the positive impact of education (on secondary and tertiary level) on employment prospects is considerably lower than in other age groups, in particular for women. In the prime-age group, males reap slightly greater benefit from education than females.

Place of residence influences employment opportunities to a similar extent in all selected subpopulations. City and especially small-town residents are less likely to be employed than village inhabitants, except for females aged 15-29 residing in big cities. This exception seems to be related to cultural and economic reasons (a less traditional family model and higher labour demand in urban areas).

Better macroeconomic outlook after 2003 notably improved employment opportunities for men, but with different intensity for each age group: the likelihood of employment increased most for the youngest men and least for the oldest. This can be explained (as mentioned in previous sections of this Part of the report) by sectoral variations in labour demand, especially in the case of specific occupations with preferences for the young because of working conditions or technical skills (machine operators and assemblers, manufacturing workers). For the youngest women, improving economic conditions appeared to have a positive impact on employment prospects. This effect was, however, not statistically significant, meaning that increasing labour demand could be translated into better employment prospects, yet to a lesser degree for women than for men. Reflecting changes in economic conditions, this variable proved to have a negative impact on the employment probability among the oldest women (0.1 significance level), suggesting that during the years of the economic recovery (2003-2008) they exited the labour market relatively more frequently, probably relying on a better labour market situation of their partners.

An additional contextual variable quantifying the situation on regional labour markets (employment rates in voivodeships) proves to exert a significant influence on the employment probability in all models estimated for specific subpopulations. The direction and scale, however, varies from the general model. The improving labour market conditions at regional levels increase the employment likelihood more for men than for women, both aged 15-29 and 30-54. By contrast, a better situation on the regional labour markets has

a negative effect on employment opportunities for older workers. Higher regional employment rates decrease the likelihood for older persons to be employed. The results are statistically significant, however, solely for men.

2.2.3. Employment determinants for youth, adults and older workers in the non-agricultural sector

The different nature of employment in agriculture as compared to the non-agricultural sector may potentially distort the impact of labour supply characteristics and contextual variables on the employment opportunities for the total population. It is for this reason that we model employment determinants with the exclusion of the agricultural sector in this section (see Box II.2).

Box II.2. Employment determinants in the non-agricultural sector.

The dependent variable is defined as a dummy variable taking the value of 1 for a person employed in the non-agricultural sector and 0 if not. Additionally, the population of the non-employed was defined differently for the youngest and for other age groups. The non-employed population in these models does not include people aged 30-54 and 54-65 whose last workplace was in agriculture. This was motivated by the fact that in these age groups labour flows between agriculture and other sectors of the economy are very rare, similarly to the flow from agriculture to unemployment (cf. Strzelecki, Kotowska, 2009). For the youngest age group (15-29 years), which registered the greatest flows between sectors, the non-employed population included all persons regardless of their last workplace.

The model specifications are very much like those described in Box II.1. The first level takes into account individual characteristics (gender, age, education, place of residence, family environment) and the general economic situation as a contextual variable (1998-2003, 2004-2008). The second level of the model accounts for the contextual variable of the time-variant conditions on the regional labour markets (employment rate – quarterly data provided by voivodeships).

The estimation procedure was based on individual data originally from the LFS (BAEL) database. However, as already mentioned, for the purposes of this project a specially designed database was generated, containing: (1) standardised LFS data for the period 1998-2008 (fourth quarters) – first level of the model; and (2) indicators reflecting changes in the regional labour market conditions in Poland in 1998-2008 (quarterly data) – second level. People linked to the agricultural sector were excluded from the dataset, in accordance with the principles described above.

All of the models were estimated separately for men and women in the following age groups: 15-29, 30-54 and 55-64 and 55-59 (women) and 55-64 (men). A detailed description of the model specifications is presented in Appendix 2.

Our findings based on the analysis performed exclusively for the non-agricultural sector are consistent with previous observations. There are, however, certain differences in how strongly age impacts the probability of being employed: e.g. people aged 15-24 are still less likely to be in employment than 25-29 year-olds, but contrary to previous analyses, the drop in probability of being employed is stronger for women than for men in that age group. Gender differences in educational levels may stand at the root of this situation. In the case of older workers, the likelihood to remain in employment decreases with age, but much more smoothly for males than for females. The household position has a similar effect on employment opportunities in the non-agricultural sector as in the models estimated for the whole economy.

Employment returns to education are much stronger in the models for the non-agricultural sector. This proves that additional qualifications and skills are rewarded much more in non-agriculture as compared to agriculture. In effect, a continuously changing educational structure of employment will provide stronger incentives for the better educated young people to leave agriculture. Previous findings concerning employment bonuses for different age groups deriving from educational achievement remain valid, that is, the 30-54 year-olds are better rewarded in this respect than the youngest and older workers, for whom this factor demonstrates a dropping tendency. It is noteworthy, however, that women, especially aged 15-29 and 30-54, benefit more from tertiary education. In the oldest age group, benefits from tertiary education are the same for both genders (Figure II.11).

Some of the outcomes regarding the impact of place of residence on employment prospects are worth emphasising. Among the youngest women, residents of small towns are characterised by almost the same probability of being employed as their village counterparts. However, females residing in bigger cities enjoy much better employment prospects than those living in middle-sized towns. On the one hand, it might be related to different modes of sharing family duties between spouses in large cities and towns or, on the other hand, to differences in absorbing women's labour supply by both types of labour markets. The first interpretation is supported by the fact that women aged 30-54 residing in large cities have a higher likelihood of being employed than their village counterparts, even though the regional differences are markedly lower than those for the youngest women. Even females residing in small towns stand better chances of finding a job than women living in villages.

For young men, differences in employment opportunities in the non-agricultural sector by place of residence are not so pronounced. Unlike women, young males from large cities are just as likely to be employed outside the agricultural sector as their counterparts from the countryside, while the probability of being employed for men in middle-sized and small towns in the non-agricultural sector is even smaller. This points to a relatively more difficult labour market situation of young men residing in cities. It may be correlated with their low level of human capital, constituting a strong employment determinant in this sector in cities. For males in the 30-54 age group, city size has no observable impact on their employment opportunities, which are close to those of their counterparts living in villages. The situation of males residing in large cities has changed – they enjoy better employment prospects than their village counterparts. Those from middle-sized and small towns are again less likely to find a job outside agriculture than their rural counterparts. As could be expected, chances for employment outside agriculture differ more significantly between older male workers residing in cities, especially the large ones, and those living in villages. In contrast, older women from middle-sized and small towns show similar probabilities to work in non-agriculture as women of that age residing in rural areas.

Figure II.11. Odds ratios by education and gender.

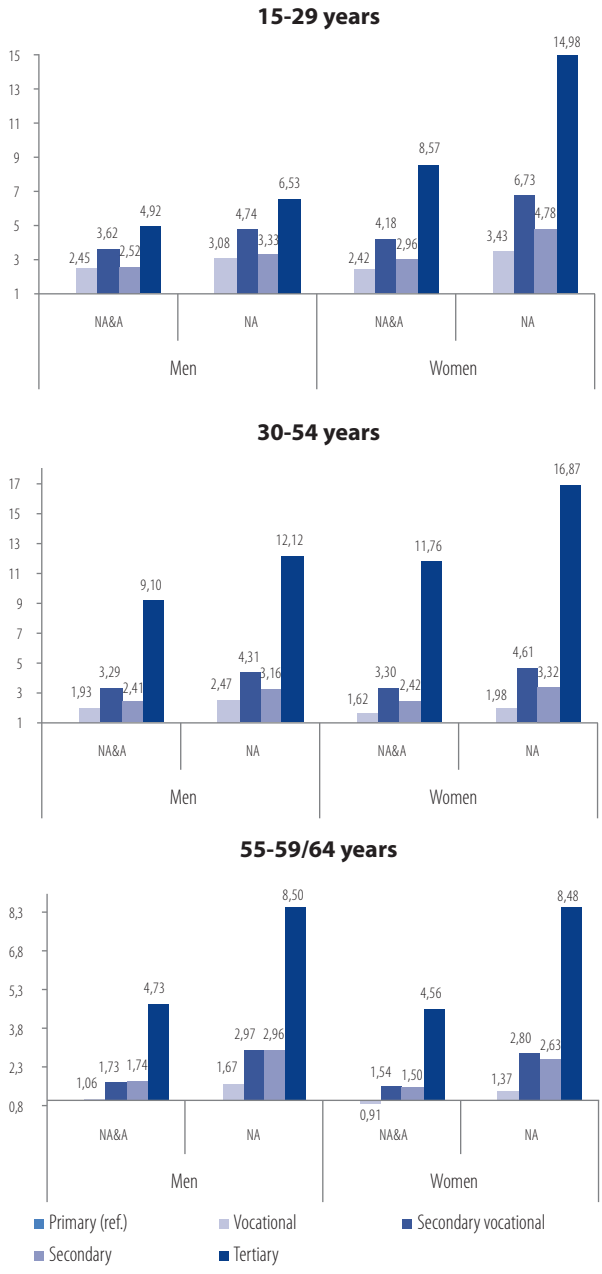
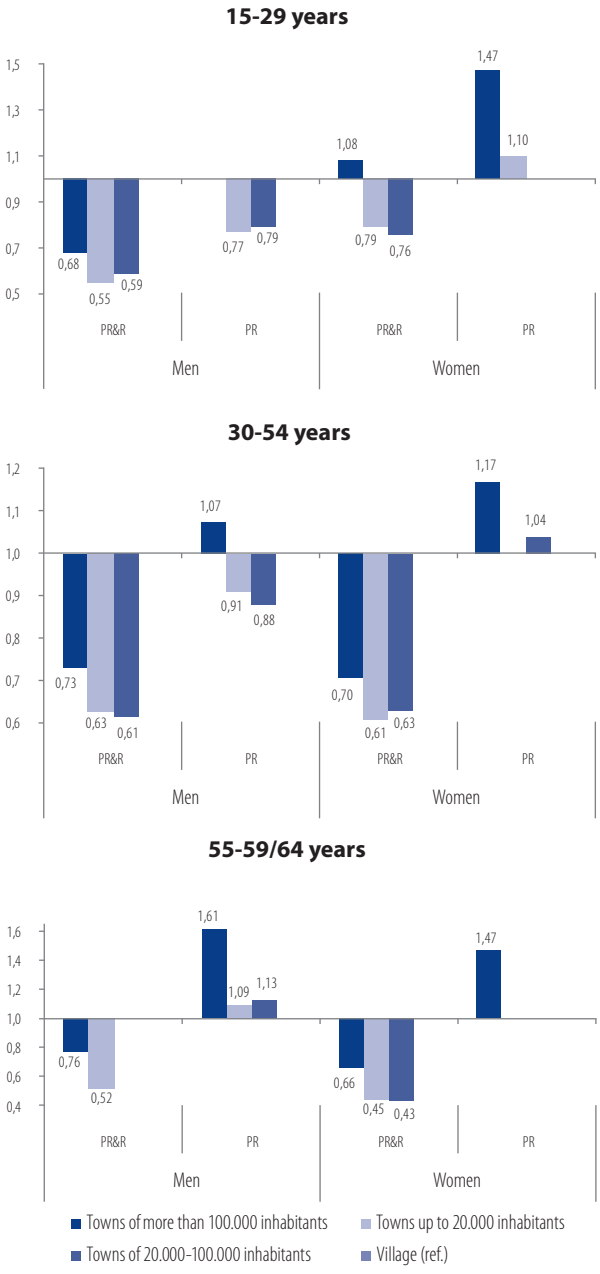


Figure II.12. Odds ratios by education, gender and place of residence.



NA – non-agricultural sectors, A – agriculture, NA&A – entire economy.

Source: Own calculations based on the Polish LFS data, fourth quarters 1998-2008.

The economic upturn of 2004-2008 had slightly different effects on the estimates for the non-agricultural sector than for the entire economy, this being linked directly to an increased demand for labour outside the agricultural sector. A better economic performance generally raises the chances for men to find jobs outside agriculture. The strongest employment effects of better economic conditions can be observed for the youngest age group. In the two remaining groups, employment probabilities for men rose by a comparable amount, mainly due to the fact that employment opportunities in the non-agricultural sector soared also for older workers. The improving situation in the regional labour markets raises the likelihood of employment outside agriculture for this group of men, contrary to the results of the model for both sectors. This points to a negative relationship between increases in the regional employment rates and the likelihood of members of this group to work in agriculture. For the oldest group of women, as found before, better economic performance reduces the probability of them finding jobs outside agriculture.

To sum up, the results generated by multilevel logit models used for the non-agricultural sector point to a stronger impact of specific individual characteristics (especially education levels and place of residence) when compared to outcomes of the models estimated for the whole economy. Education has a strong positive effect on the work record of women over their life course, which is particularly visible in younger age groups: better educated women start working earlier. Place of residence is another factor of paramount importance: females living in large cities (particularly the youngest and the oldest) are characterised by greater employment opportunities. The analyses have also shown a diversified impact of contextual variables, such as general economic conditions or the labour market situation in the regional markets. The groups that benefit most from the economic recovery are the youngest people (both genders) and the oldest men. The regional labour market situation improves the probability to find employment outside agriculture for persons aged 15-29 and 30-54 (both genders) and raises the likelihood of older men to remain in employment outside agriculture.

3. Wage differences over the life course

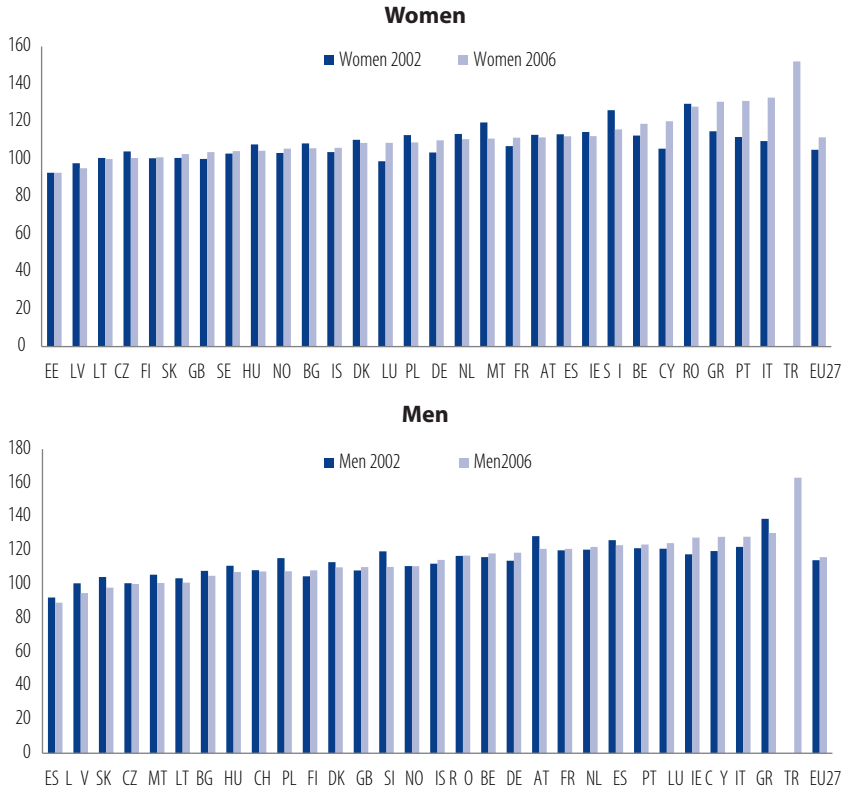
3.1. Age as wage determinant – Poland in the context of other EU countries

Age is one of those individual features that indirectly differentiate wages by strengthening or weakening impacts of other factors determining individual productivity (Skirbekk, 2003). On the one hand, the positive impact of age on productivity is explained mostly by its correlation with accumulated experience characteristic of people, whose human capital is highly valued (OECD, 2006). On the other hand, age hinders productivity of individuals, whose work requires skills that deteriorate with age (physical strength, perception and memory skills etc.). Secondly, age might be considered one of the cultural factors affecting the way people are treated at their workplace. Age might give advantage due to seniority, especially in Japan and Southern Europe, but it might also be a source of statistical discrimination on the part of employers associating it with lower productivity (regardless of the actual one). Thirdly, in countries that underwent transformation from a centrally planned economy to a market economy, a particular importance is attached to the depreciation of experience and human capital over the life course, heavily influenced by rapid technological changes in place when catching up with developed countries. Positively correlated with age, in these countries experience has a relatively less significant impact on the wages of older workers. This might be attributed to the fact that human capital accumulated by older people in the past relatively easily becomes inadequate to the needs of a rapidly changing labour market in a transforming market economy (Walewski, 2008).

People who remain in the labour market after turning 60 (at their own will) usually enjoy relatively high earnings. It follows that wages of people in an older stage of working age should be analysed for the 50-59 age group, which is relatively less characteristic of auto-selection, than for the 60-65 age group (see Box II.3). As shown in Figure II.13, both men and women of this age in almost all the EU countries earned more than average. The difference was clearly more transparent in the case of men. However, in 2002-2006, the wages of females aged 50-59 registered the highest increase, bridging the wage gap between genders. Wages earned by older people in the Baltic states were relatively low, while the highest earnings (especially among males) were observed in Southern Europe (Italy, Greece, Cyprus, Portugal). The proportion between average earnings of older females and the average wage in Poland is very similar to the ones recorded in the EU. For men that relation was slightly lower than noticed in the EU. The wage gap between 50-59 year-olds and the average wage diminished both for women and to even greater extent for men as compared to the situation in 2002.

Wage differences between the elderly and the entire population in the EU reflect the historically determined human capital stocks as well as cultural and institutional determinants (e.g. the way older people are treated in organizations, factors influencing professional careers of men and women, etc.). Post-socialist countries are a great example of possible historical influence since earnings of people aged 50 and above show that age guarantees a much lower advantage than in Western Europe. The effects of organisational culture are to be expected in Southern Europe, where wages earned by older individuals are much higher than national averages and this ratio is much higher than the EU average and it keeps growing. The joint influence that structural, institutional and cultural factors have on earnings is even more transparent in a tabulation of wages earned by workers in pre-retirement age (50-59) and at the beginning of their professional career (15-29) (Figure II.14). Only in Estonia and Latvia young people earn on the average more than workers in pre-retirement age. Other countries exhibit an inverse relation. In Poland, these differences were similar to the EU average in 2002, while four years later differences between average wages in these two age groups diminished.

Figure II.13. Average hourly wages of men and women aged 50-59 related to overall average wages in the EU, 2002 and 2006 (in percentage).



Source: Eurostat.

Figure II.14. Average wage gap between 50-59 and 15-29 age groups as a percentage of average wages, 2002 and 2006 (percentage).

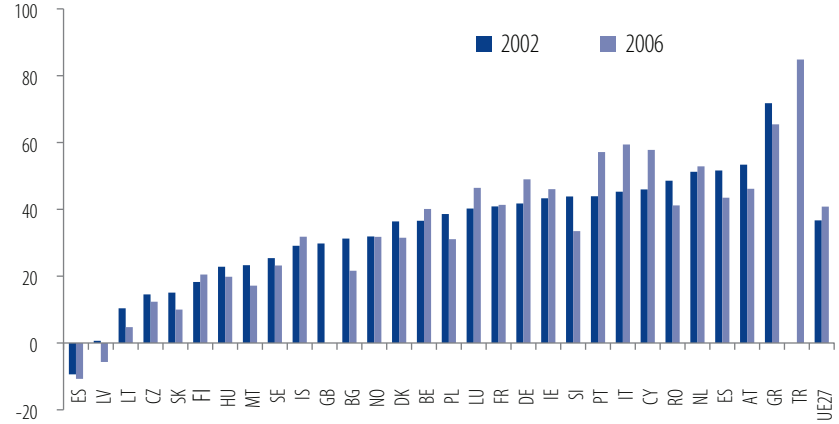
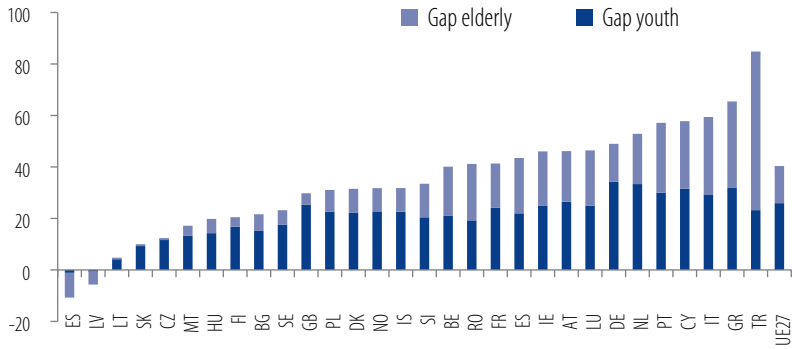


Figure II.15. Decomposition of the average wage gap between 50-59 and 15-29 age groups, 2006* (percentage).



*Data for the UK date back to 2002.

Source: Eurostat, own calculations.

Earnings at the beginning and at the end of the professional career are described by a decomposition of observed differences into a part related to on average lower wages of people starting their career and a part of on average higher wages earned by people at the final stage of their professional career (Figure II.15). In countries where no substantial differences between wages earned by youth and elderly are found, it is the wages of the first group that have the most prominent impact on the level of this difference. In the majority of countries, the discount related to young age does not exceed 25 percent of average earnings. In countries where wage differences are similar to the average, as is the case in Poland, it is in turn the advantage of age that serves as the differentiating factor. The significance of extremely low wages in the young age group is again greater in countries where these differences are vast.

Box II.3. Selection effects and wages – how does early retirement affect earnings of workers who remain in employment.

Analyses presented in this Part refer only to persons that are employed. Older workers' wages are to a large extent determined not only by their personal characteristics or of their workplace, but also by the selection process which allows them to remain employed. This selection positively influences their wages. Age-based selection might be caused by a variety of reasons: (1) biological – people remaining in employment and in the labour market are in good health, stay physically and intellectually fit, and probably receive wages exceeding the average, (2) institutional – legal regulations might encourage certain groups to an earlier exit from employment, (3) economic – a comparison of received wages and possible alternatives in the form of pension, benefits or other available allowance might influence the decision on economic activity at each age, but older people may choose from more possible sources of alternative income of relatively higher levels. As a result, only people with a relatively high income might remain in the labour market. This phenomenon can be controlled when estimating a model by the use of the Heckman's correction method. For this purpose, however, it is necessary to collect information not only on workers receiving wages, but also on the people who do not. Although the survey on the wage structure did not allow for such a correction, data from the earlier studies which accounted for it for 2005, indicate a correlation between the effect of age and job tenure on earnings similar to analyses based on the Structure of Earnings Survey (Polish SES). Estimates on the impact of job tenure on wages with controlled influence of sample selection (Newell, Socha, 2007) point to the fact that growth in wages was determined by professional experience and job tenure in 2005. Moreover, analyses using data from the SES and based on the SIMPL microsimulation model evidence a positive contribution of age on wages, controlled for sample selection bias (Myck, Nicińska, Morawski, 2009). The age effect was the largest for the 2005 data for the 39-44 age group and then decreased. A similar tendency can also be observed in Figure II.16 for 2006.

3.2 Changes in impact of age and job tenure on wages in Poland

It is not only age and job tenure that have impact on wages, but also characteristics of the workplace and of the workers themselves. We test the relative effect of these factors with an econometric model of the gross hourly wages. The focus is set at the interrelations between age, job tenure (both company-specific and overall labour market experience) and wages, and their changes in time (see Box II.4). We were especially interested to determine whether the effect of age and professional experience on wages is similar in the periods of economic slowdown and upturn.

The results of the estimated models show that the impact of age and professional experience (represented by job tenure) on earnings may be described with U- and L-shaped curves denoting marginal changes of wages influenced by a one-year growth in age or job tenure (see Box II.4). The influence of all the three discussed variables was estimated assuming that a person starts working at the age of 18 and continues until 60 years of age. The effects of experience on wages accumulate first in the initial period of employment and then after over 30 years of economic activity. The period between 20 and 30 years of job tenure (both in a company and in general) is not considerably significant for wage growth (U-shaped correlation).

The correlation between wages and age changed with time. In 1999, each year of age (regardless of job tenure) contributed to a considerable, but increasingly lower wage growth among people under 30 years of age, but once this level was passed, the impact of age diminished (L-shaped relationship). In 2002 and 2006 the relation between the both values was close to linear; the greatest growth was enjoyed by younger workers, while the 40-45 age group was even characterised by negative influence on wage growth, which strongly diminished the earnings of older people. The data for 2008 pointed to another change – age no longer had a positive impact on the younger workers' wages, while job tenure in general gained prominence. Age still had a negative and increasingly stronger impact on the wages of individuals who turned 40 (the hump-shaped relationship). It is noteworthy that age and job tenure remain strongly correlated and are also responsible for the most significant positive effects at the initial and final stage of one's professional career. On the other hand, positive effects of remaining in the same company, when the majority of people change their workplace at least a few times in their course of life, are determined less by age than by personal choices.

Box II.4. Age and other determinants of gross hourly wages.

The Specification of models estimating the logarithm of gross hourly wages is similar to the one used in the Employment in Poland report of 2007 (Part III). Explanatory variables included characteristics of hired workers (gender, age, job tenure in a company and in general, education, occupation), characteristics of the workplace (ownership sector, section of the economy, company size) and the regional labour market (voivodeship). To assess the impact of age, overall job tenure, and job tenure in one particular enterprise on hourly wages we used third degree polynomial functions, reflecting non-linear relations between these variables and the logarithms of hourly rates. In order to justify this approach, we also estimated models in which age was a categorised variable. The correlation between wages and age was similar in both regressions, but the latter models were characterised by a worse fit due to the averaging of values within each age category and jobs. The model was estimated on the basis of data from the Structure of Earnings Survey (SES) from 1999 and 2002 (the period of economic slowdown) and 2006 and 2008 (the period of economic upturn). Selected estimation results are presented below.

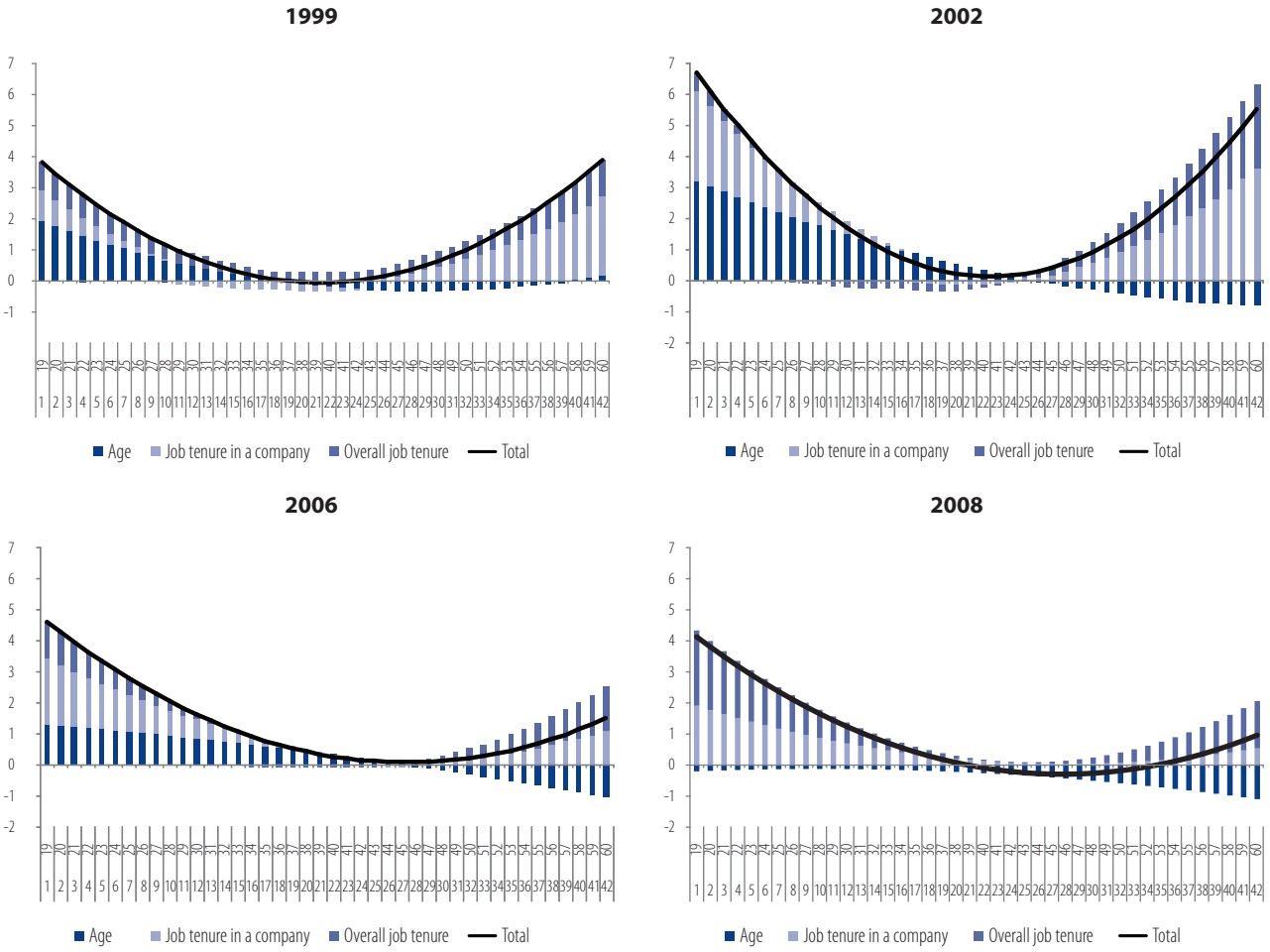
Table II.7. Selected parameters of hourly wages regression models for 1999-2008.

Chosen parameters of hourly rate regression models for 1999-2008		1999	2002	2006	2008
Gender	Women	–0.14**	–0.12**	–0.13**	–0.15**
Education (vocational-ref)	Tertiary and upper-secondary	0.26**	0.81**	0.42**	0.38**
	Secondary	0.05**	0.21**	0.09**	0.09**
	Junior high school and below	–0.05**	–0.08**	–0.01**	–0.01**
Age	Age^3 (/100)	0.01**	0.01**	–0.01**	–0.01**
	Age^2	–0.01**	–0.01**	–0.01**	0.01**
	Age	0.06**	0.08**	0.02**	–0.02**
Job tenure in a company	Tenure^3 (/100)	0.01**	0.01**	0.01**	0.01**
	Tenure^2	–0.01**	–0.01**	–0.01**	–0.01**
	Tenure	0.02**	0.04**	0.03**	0.03**
Overall job tenure	Tenure^3 (/100)	0.01**	0.01**	0.01**	0.01**
	Tenure^2	–0.01**	–0.01**	–0.01**	–0.01**
	Tenure	0.01**	0.01**	0.02**	0.04**
Adjusted R2		0.47	0.41	0.54	0.44
Sample size		740 622	653 054	660 353	687 686

**values considered significant at 0.01.

Source: Own calculations based on the Structure of Earnings Survey.

Figure II.16. Marginal growth rates of hourly wages with additional year of age, overall job tenure and company specific job tenure, 1999, 2002, 2006 and 2008 (percentage).



Source: Own calculations based on the Structure of Earnings Survey.

In sum, the estimated regression of the gross hourly rate for such variables as age, overall job tenure, and job tenure in a specific company point to the diminishing importance of age as a wage determinant in the case of young people, and an increasingly distinct negative impact of age on old people's earnings. Compared to the 1990s, in the present decade employers apparently tend to focus on actual professional experience rather than on age as a proof of job tenure and human capital when deciding on young workers' wages. This is a sign of normalisation in the Polish labour market. On the other hand, in the period of economic boom, the experience gained in general gave significant prominence to younger workers (and increasingly affected their wages) due to a relatively better labour market position of these young people who entered the market earlier than their counterparts. In 1999-2002, when lower labour demand made it difficult for many younger people entering the market to find a job, job tenure was of less importance.

In the last decade, age affected wages more and more negatively, specifically in the case of mature people aged over 50, yet without translating into a higher value of experience. This may be traced back to the introduction of new IT technologies and their negative effect on wages. Old peoples' work is valued lower due to less developed IT skills in this age group, all the more since older workers are also relatively less capable of acquiring new skills in this area than younger ones. Moreover, age may have negatively affected wages in the past, but this impact was then masked by the selection of better-paid people, whereas individuals with relatively lower wages could opt for pre-retirement allowances and exit the labour market. A limited access to the system of pre-retirement allowances and a relatively high number of low qualified jobs in 2003 weakened the selection effect, thus bringing out this long hidden relation.

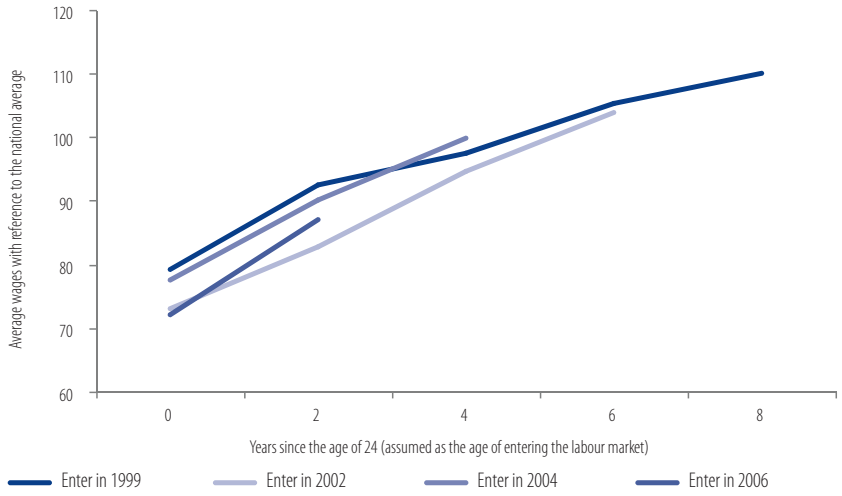
The present comprehensive wage analysis has focused on relations between age and earnings in a selected period (cross-section analysis). The approach would have been fully effective conditional on identical behaviour of each generation and subsequent age group entering the labour market. It has been observed, however, that different generations can vary constantly in terms of economic activity and wages. Easterline's hypothesis (1980) suggests that more populous generations experience relatively greater difficulties in achieving their desired financial status, which has a bearing on their matrimonial and recreational behavior and can limit the number of the planned offspring. On the other hand, economists consider the actual entering onto the labour market as a key determinant

of the future career. Entering the labour market during an economic boom enables workers to gain higher earnings and promotion prospects already at the beginning of their career. On the contrary, looking for job opportunities at the time of an economic slowdown leads not only to lower earnings and limited promotion prospects, but also increases the chance of unemployment causing a loss of accumulated human capital and reducing probabilities of higher wages.

The data on the earnings structure made it possible to carry out a cohort analysis of average earnings aimed at measuring what wages were earned by subsequent cohorts entering the labour market in 1999-2008. A comparison with the average earnings in each cohort gave an idea as to the impact of the labour market situation at the beginning of the career (for each cohort) on wages in the following years. The key results of the study are presented in Figure II.17.

The labour market situation at the beginning of the economic activity visibly differentiated average wages in cohorts entering the labour market at different stages of the business cycle. The cohort that entered the labour market in 2002, when the unemployment rate reached its peak, earned clearly lower wages than cohorts that embarked on activity in 1999 and after 2003. These conclusions seem to be consistent with research results obtained from the survey among Polish employers, which indicate that in Poland external conditions (not connected with job and personal characteristics) have a greater impact on wages of new employees than in other countries. A relatively large number of companies (15 percent) declared that during an economic slowdown they would offer new employees lower remuneration than their counterparts already employed in the company. By contrast, an economic upturn would lead 5 percent of employers to offer new employees higher wages than the current earnings of people with similar qualifications. (Galuscak et al., 2010). Wage gaps were sustained in subsequent years of work history, but the wage differences between the cohort that entered the labour market at the beginning of the crisis (1999) and the one that entered employment at its peak (2002) diminished with time.

Figure II.17. Average wages of cohorts entering the labour market in 1999, 2002, 2004, 2006, 2008 with reference to the national average (percentage).



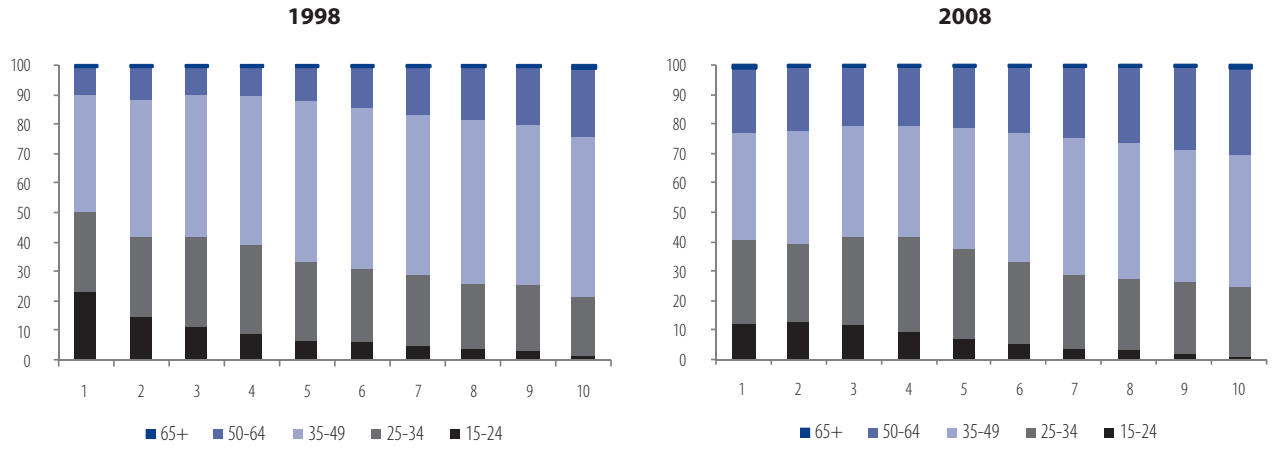
Source: Own calculations based on the Structure of Earnings Survey.

3.3 Age and wages of high and low earners

The analyses investigating the effect of age on wages, based on average values, can be extended by adding another dimension. Firstly, it is worth determining what is the position of people aged over 50 in the wage distribution. Secondly, having eliminated the influence of other variables, one could expect the impact of age to be different at the lower and higher levels of the wage distribution.

Without taking into account other variables, the comparison of wage differentials by age indicates that the share of individuals aged 50 and more among earners from a specific decile group increased along with higher wages (Figure II.18). In other words, the group of relatively high earners was composed of a greater number of older people than the group of low earners, which probably mirrors the auto-selection effect causing high earners to remain in the labour market longer than those who earn less. At the same time, a greater number of people aged 50 and more in all decile groups between 1998 and 2008 should be ascribed mostly to demographic reasons – the aggregate number of workers in this age group increased. Wage differential, however, decreased.

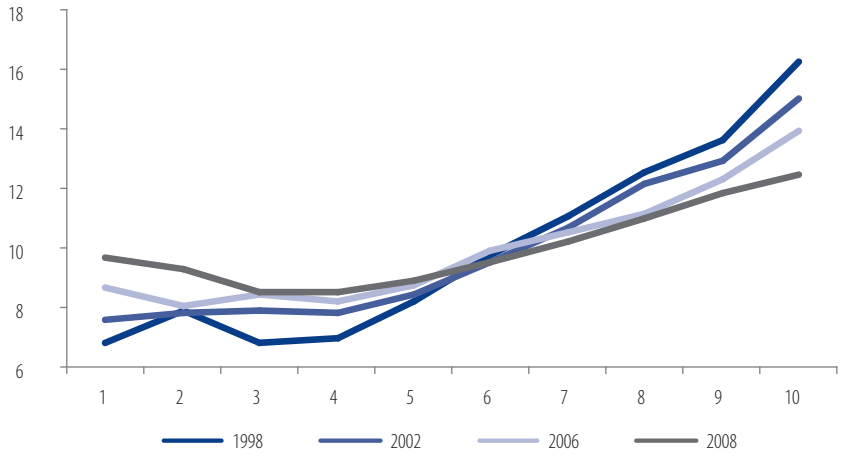
Figure II.18. Age structure of wage deciles, 1998 and 2008 (percentage).



Source: Own calculations based on the Structure of Earnings Survey.

In 1998-2008 lower wage variation in the 50–64 age group (and over) was related both to an increased share of older people among the lowest earners and a consistent drop in the share of high earners (Figure II.19). This may reflect the deteriorating situation of top earners in pre-retirement age or, and more likely, the diminishing selection effect associated with an increasing proportion of this age group being part of the employees' population and relatively little incentives to exit the labour market.

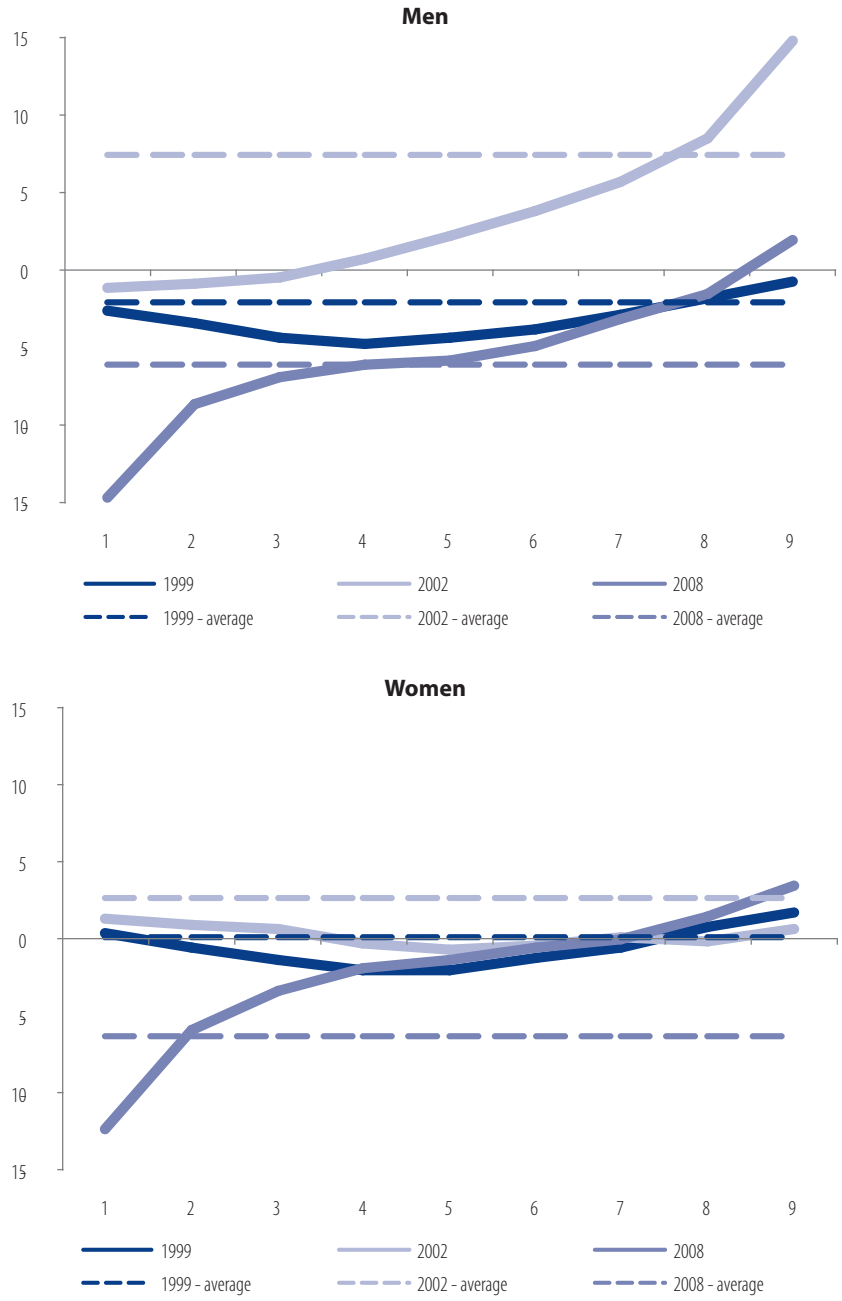
Figure II.19. Structure of 50+ age group by wage deciles (percentage).



Source: Own calculations based on the Structure of Earnings Survey.

The impact of age on earnings of people in different wage decile groups was analysed with the use of quantile regression. Tabulation of aggregate results for all the groups (Figure II.20) indicates that in 1999 an age of 50 and above negatively influenced average wages. This refers, however, mainly to people with earnings which were neither extremely low nor extremely high. Age was not relevant at all for the lowest earners, whereas for top earners a slight positive effect of age was observed. Poor economic conditions in 2002 strengthened the positive impact of age on men's wages, but the change was evident only for those earning more than the median. In 2008, when earnings kept ticking up due to high labour demand, the old-age effect on wages turned back to negative. This time it was yet correlated mostly with age exerting a negative impact on wages of 20 percent of the lowest earners. Although in 1999 and 2002 age played a less important role in determining women's wages, the emergence of the "age penalty" in 2008 in the group of the lowest earners was equally painful for males and females. The countercyclical changes in older people's relative earnings could be explained with their slightly increased economic activity leading to lower auto-selection (Box II.1) which, on the other hand, was induced by narrower opportunities for earlier retirement and harsher restrictions regulating pension (back in the 1990s) and pre-retirement allowances (in 2004).

Figure II.20. Impacts of age 50+ on hourly wages by wage decile groups and average wages, 1999, 2002 and 2008 (with reference to the 25-34 age group) (percentage).



Source: Own calculations based on the Structure of Earnings Survey.

3.4 Wage discrimination of older people

Wage differentiation over the life course is shaped by personal (gender, human capital, job tenure) and workplace characteristics (employment sector, section of economy, occupational group, company size), as well as other factors (e.g. region, wage dynamics). It has already been evidenced how age and job tenure affected gross hourly wages in Poland in 1998-2008. With time age becomes a weaker wage determinant for young people, while its negative influence is clearer in the case of older workers. Despite greater job tenure and professional experience, older people do not meet labour market needs due to inadequate human capital.[4] Wage discrimination may be yet another reason. This would be true if specific personal characteristics, workplace characteristics and other factors had different

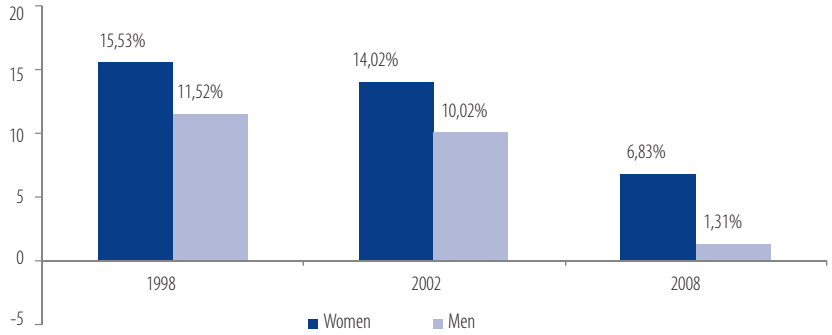
[4] Significant differences in human capital between the young and the elderly were confirmed by analysis using data from the Social Diagnosis 2009 research (Węziak-Białowolska, Kotowska, 2009). Human capital was measured by years of schooling, "civilisational competence" (computer use at work, at home and in other places, use of internet search engine, knowledge of English), as well as constant training and development.

impact on earnings of young and old workers and relatively lower wages among the latter group. However, the opposite situation, i.e. discrimination of youth, cannot be a priori excluded either. It should be emphasised that wage discrimination of old people would also be possible even if older workers earned on average higher wages, but the difference would not effectively mirror real differences in the human capital of both groups.

The assessment of the intergenerational wage gap in the scope of monthly and hourly pay in Poland was based on the *Structure of Earnings Survey* (SES). The results were analysed independently for both genders and two age groups were taken into account: 25-49 year-olds and 50-64 year-olds, referred to also as individuals "under and over 50" or "younger and older". The analysis made use of micro-data collected in 1998, 2002 and 2008, which allowed us to show the evolution of wage differentials during the economic slowdown (1998-2002) and the economic recovery after 2003.

Figure II.21 presents a monthly wage gap. In 1998-2008, individuals aged 50-64 earned on average more than 25-49 year-olds, with a bigger gap for females. The intergenerational wage gap demonstrates a clear downward trend, for women from a 15.5 percent gap between average wages in 1998 to 14.0 percent in 2002 and finally to 6.8 percent in 2008; for men starting from 11.5 percent in 1998, to 10.0 percent in 2002 and to 1.3 percent in 2008. In other words, the differences in wages of younger and older workers which used to benefit the latter, have greatly diminished over the last decade. The changes were particularly rapid during the economic upturn of 2004-2008.

Figure II.21. The intergenerational wage gap (persons under and over 50) for 25-64 year-olds in Poland, 1998, 2002 and 2008 (percentage).



Source: Own calculations based on the Structure of Earnings Survey.

Our analysis was further expanded using the Blinder-Oaxaca decomposition method to study the reasons for cross-group differentiation of a selected variable (in this case, wages). The Blinder-Oaxaca decomposition allows for distinguishing between two components of the wage gap: (1) wage differentials resulting from **cross-group differences in human capital and in other factors** which explain cross-group wage gaps, and (2) wage differentials ascribed to economically inexplicable **cross-group differences in returns to** human capital and other wage determinants**,** which is sometimes perceived as **an effect of wage discrimination**. The first component is commonly referred to as the explained component accounting for, by way of example, the effect of 50-64 year-olds having on average longer job tenure and, consequently, more experience, compared to 25-49 year-olds (which should have a positive effect on their real wages). The second, unexplained component takes into account e.g. the fact that employment in the private sector exerts a stronger, negative impact on wages of 50-64 year-olds. The results of respective Blinder-Oaxaca decompositions are presented in Table II.8 and Table II.9.

Our results show that almost the entire wage differentiation among women of different age may be explained by the factors accounted for in the regressions, whereas the role of potential age discrimination is minor. In particular, the most of the wage differentiation between younger and older women, diminishing in 1998-2008, may be explained by differences (and gradual change) in human capital and other wage determinants in both groups.

Table II.8. Decomposition of the monthly wage gap among women aged below and above 50, 1998-2008.

	Estimates of the age gap		
	1998	2002	2008
Intergenerational wage gap (percent), including:	15.53**	14.02**	6.83**
Explained component (percentage points)	14.31**	13.52**	8.93**
Unexplained component (percentage points)	1.22**	0.50	–2.10**
	Elements of the explained component (percentage points)		
Workplace size	0.05	0.04	–0.09
Job tenure	11.05**	11.01**	13.85**
Employment sector	0.17*	0.24*	0.74**
Place of residence (voivodeship)	1.31**	0.60**	–0.05
Education	0.15	–1.44**	–4.75**
Occupation	2.14**	2.76**	–0.73**
Section of the economy	–0.56**	0.31	–0.05
	Elements of the unexplained component (percentage points)		
Workplace size	–0.03	0.34	0.43*
Job tenure	–13.79**	–18.91**	–18.53**
Employment sector	–1.90**	–1.55**	–1.82**
Place of residence (voivodeship)	–0.73**	–0.48**	–0.77**
Education	0.73	0.93	–0.48
Occupation	1.54**	0.15	2.55*
Section of the economy	–0.27	0.01	1.93*
Intercept	15.67**	20.01**	18.46**

Comments: **, * refer to statistical significance at the level of 0.01 and 0.05 respectively. A positive number means that a specific element increases the wage gap between younger and older workers (raising relative wages of older workers), while a negative number denotes an element which diminishes the wage gap (raising relative wages of younger workers). Job tenure groups the total impact of such variables as "job tenure" and "job tenure squared". Elements such as "place of residence (voivodeship)", "education", "occupation", and "employment sector" group the total impact of variables defining place of residence (voivodeship), education, occupation and employment sector.

Source: Own calculations based on the Structure of Earnings Survey.

Moreover, in 2008, the value of the explained component in the model exceeded the total value of the wage gap. This leads to the conclusion that if the earnings of older and younger women had been shaped only by these wage determinants which are included in the model (such as education or job tenure), the intergenerational wage gap would have reached an even higher level, i.e. older women should have earned relatively more. The estimated models point to a slight discrimination of younger females in 1998, lack of discrimination in 2002, and minor discrimination of the older ones in 2008, thus not allowing to conclude unambiguously that the situation of either younger or older women permanently worsened in terms of processes determining their real wages. Age wage discrimination seems to be limited among females and prone to fluctuation over time.

A more detailed analysis of the estimated models demonstrates that job tenure differentials between younger and older women have a key influence on the size of the intergenerational wage gap. Had there been no difference, the wage gap between older and younger women would have been lower by 11-14 percentage points. Moreover, the intergenerational wage gap is strongly influenced by the employment sector (older females are less often employed in the private sector, which lowers their relative wages and decreases the wage gap), place of residence/voivodeship (in 1998-2002 older females resided on average more often in voivodeships offering them higher pays), education (in 2002-2008 it 'favoured' younger women, decreasing the wage gap with respect to their older counterparts) and occupation (in 1998-2002 older women were on average more often employed in better paid positions; in 2008, on the contrary, better paid positions were filled by younger women).

The unexplained components of selected Blinder-Oaxaca decompositions indicate that while a higher than average job tenure significantly raises average wages among women aged 50 and over, these persons receive lower returns on each consecutive year of job tenure. Interestingly, in the course of all years the effect is even stronger than the average job tenure differentiation accounted for in the explained component of the decomposition. Moreover, younger females benefit more from employment in the public sector and residence in a voivodeship in which wages are higher than the average.

Similar, but not identical processes were observed among men. Just as in the case of women, the intergenerational wage gap narrowed over the period from 1998 to 2008. Interestingly, the explained component of the decomposition dropped at a significantly slower rate (from 16.35 percent in 1998 to 10.66 percent in 2008) and remained higher than the wage gap per se. This means that had any of the analysed groups been discriminated in the Polish labour market, it would have been males aged 50-64, and the wage discrimination of these workers (in favour of younger ones) would have strengthened over time (this hypothesis is yet to be verified by use of the Juhn-Murphy-Pierce decomposition). This conclusion is even more surprising, as men in this group earned on average more in 1998-2008 than their younger counterparts. At first, the fact that it is the older men that are subject to discrimination might seem to contradict intuition. Nevertheless, results presented above suggest that the wage gap between older and younger males should be even greater, provided that wages were shaped by the determinants included in the model, such as job tenure or education in each of the selected age groups.

A further analysis of the explained components of the Blinder-Oaxaca decomposition leads to the conclusion that, similarly as for women, the key to understanding the wage gap among men is the intergenerational differentiation in average job tenure – this alone generated a 14.81 percentage wage gap in 2008. Furthermore, its value increases given that young men tend to relatively more frequently find employment in the private sector, while the older ones relatively more often reside in voivodeships with a better labour market situation (except for 2002 when this effect is not statistically significant) and pursue better paid occupations. On the other hand, the value of the intergenerational wage gap is diminishing, since young males are more often employed in the sections of economy guaranteeing wages higher than the average. It is noteworthy that while in 1998-2002 the wage differential between older and younger male workers was caused in part by a better education of the former, in 2008 the situation was the opposite, with the education structure in favour of young men. This phenomenon reflects the educational boom that took place in the course of the political transformation (additionally reflected in a different education structure of respondents in the Structure of Earnings Survey in the following years). In 1998, 22.61 percent of men aged 50-64 and 14.31 percent of those aged 25-49 could boast a tertiary education, in 2002 these rates changed to 23.85 and 18.36 percent, and in 2008 to 21.14 and 28.46 percent respectively.

Table II.9. Decomposition of the monthly wage gap among men aged below and above 50 years of age, 2002-2008.

	Estimates of the age gap		
	1998	2002	2008
Intergenerational wage gap (percent), including:	11.52**	10.02**	1.31*
Explained component (percentage points)	16.35**	16.28**	10.66**
Unexplained component (percentage points)	–4.83**	–6.26**	–9.35**
	Elements of the explained component (percentage points)		
Workplace size	–0.47	0.20	–0.36*
Job tenure	10.36**	11.26**	14.81**
Employment sector	0.50**	0.64**	0.70**
Place of residence (voivodeship)	1.32**	0.18	–0.38**
Education	2.58**	1.71**	–2.68**
Occupation	4.1**	4.38**	0.06
Section of the economy	–2.04**	–2.10**	–1.48**
	Elements of the unexplained component (percentage points)		
Workplace size	0.93**	0.54	1.17*
Job tenure	–7.69**	–23.13**	–17.00**
Employment sector	–0.49	–3.09**	–2.60**
Place of residence (voivodeship)	–1.11**	–0.50*	–1.11**
Education	0.12	1.97**	0.54
Occupation	–0.56	–0.06	–1.51
Section of the economy	0.37	0.57	1.29
Intercept	3.60	18.59**	9.88**

Comments: **, * refer to statistical significance at the level of 0.01 and 0.05 respectively. A positive number means that a specific element increases the wage gap between younger and older workers (raising relative wages of older workers), while a negative number denotes an element which diminishes the wage gap (raising relative wages of younger workers). Job tenure groups the total impact of such variables as "job tenure" and "job tenure squared". Elements such as "place of residence (voivodeship)", "education", "occupation", and "employment sector" group the total impact of variables defining place of residence (voivodeship), education, occupation and employment sector.

Source: Own calculations based on the Structure of Earnings Survey.

Additionally, in the case of males, the value of the unexplained component is heavily influenced by the intergenerational differentiation in returns to job tenure. This factor has greater impact on the younger men's wages than on that of their older counterparts. Moreover, workplace size affects especially earnings of older men (except for 2002 when this effect is insignificant), whereas young men gain more from employment in the public sector and residing in voivodeships that offer relatively high average wages. Sensitivity of our results with respect to the definition of the dependent variable was tested by estimating models with the same set of explanatory variables, but with hourly wages instead of monthly wages as the dependent variable for the 2002 and 2008 data sets. The relevant Blinder-Oaxaca decomposition results are presented in Table II.10.

Table II.10. Decomposition of the hourly wage gap among women and men aged below and above 50 years of age, 2002 and 2008.

	Estimates of the age gap			
	Women		Men	
	2002	2008	2002	2008
Intergenerational wage gap (percent), including:	11.98**	3.00**	11.40**	0.46
Explained component (percentage points)	11.44**	5.18**	17.54**	9.93**
Unexplained component (percentage points)	0.54	–2.17**	–6.14**	–9.48**
	Elements of explained component (percentage points)			
Workplace size	0.03	–0.07	0.19	–0.30*
Job tenure	10.76**	13.39**	11.23**	14.31**
Employment sector	0.28**	0.90**	0.65**	0.78**
Place of residence (voivodeship)	0.59**	–0.06	0.19	–0.38**
Education	–1.48**	–4.69**	1.73**	–2.69**
Occupation	0.76**	–4.25**	5.38**	–0.37
Employment section of the economy	0.51**	–0.04	–1.82**	–1.42**
	Elements of unexplained component (percentage points)			
Workplace size	0.09	0.26	0.27	1.00*
Job tenure	–20.86**	–19.23**	–24.70**	–17.33**
Employment sector	–1.23**	–1.28*	–2.31**	–2.77**
Place of residence (voivodeship)	–0.49**	–0.67**	–0.68*	–1.07**
Education	0.89	–0.49	1.98**	0.28
Occupation	0.14	1.89	–0.10	–1.81
Section of the economy	–0.25	–2.00*	–0.91	1.15
Intercept	22.25**	19.34**	20.31**	11.07**

Comments: **, * refer to statistical significance at the level of 0.01 and 0.05 respectively. A positive number means that a specific element increases the wage gap between younger and older workers (raising relative wages of older workers), while a negative number denotes an element which diminishes the wage gap (raising relative wages of younger workers). Job tenure groups the total impact of such variables as "job tenure" and "job tenure squared". Elements such as "place of residence (voivodeship)", "education", "occupation", and "employment sector" group the total impact of variables defining place of residence (voivodeship), education, occupation and employment sector.

Source: Own calculations based on the Structure of Earnings Survey.

The analysis of the decomposition results for hourly wage gaps allows for the conclusion that the estimation results for monthly pay presented above are generally not sensitive to changes in the measurement method of the dependent variable. The magnitude and direction of the key determinants of the intergenerational wage differentiation in Poland remain generally unchanged. Particularly significant is therefore the fact that older workers can boast an on average longer job tenure and that the impact of increases in job tenure on pay is nonlinear in time. The importance of educational structure in both age groups and the fact that younger workers are more and more frequently employed in better paid occupations has also been proved. Moreover, the relatively improved situation of older workers is caused in part by their frequent employment in the public sector, while a relative improvement among their younger counterparts is ascribed to a stronger impact of employment in the public sector and residence in the voivodeships offering relatively high average wages.

The hypothesis regarding rising wage discrimination against males aged 50 and over in 1998-2008 was verified using Juhn-Murphy-Pierce's (JMP) decomposition technique which identifies determinants of changes in the wage gap across groups. The JMP method

distinguishes between the effects of changes in human capital levels and other wage determinants, changes in return to human capital, changes in wage discrimination, as well as changes in inequality of wage distribution (understood as inequality remaining after all known wage determinants controlled in the model have been taken into account). The results of the Juhn-Murphy-Pierce decomposition carried out separately for both genders and monthly and hourly pay are presented in Tables II.11 and II.12.

Table II.11. Decomposition of changes in the monthly pay gap among people aged under and over 50 years of age, 1998-2008.

	Men		Women	
Studied period	1998–2002	2002–2008	1998–2002	2002–2008
Wage gap in the first period (percent)	11.52	10.02	15.53	14.02
Wage gap in the second period (percent)	10.02	1.31	14.02	6.83
Change in time, including (percentage points	–1.50	–8.70	–1.51	–7.19
changes in human capital levels	0.08	–9.71	–0.20	–7.75
changes in returns to human capital	–1.62	3.29	0.11	0.89
changes in "wage discrimination"	0.41	–2.44	–1.42	–0.26
changes in the inequality of the wage distribution	–0.37	0.16	–0.01	–0.07

Comments: A positive number indicates that a specific element widens the wage gap between older and younger workers in time, while a negative number means that a specific element narrows the wage gap in time.
Source: Own calculations based on the Structure of Earnings Survey.

The presented results point to the reason behind the diminishing intergenerational differentiation in average wages in 1998-2008. Changes observed in 1998-2002 were relatively small and it is difficult to indicate their main causes. A more considerable development took place in 2002-2008, mainly following the relative improvement of average human capital endowment and other determinants of productivity of 25-49 year-olds. In 2008, young workers adjusted relatively better to the labour market demands than in 2002, which narrowed the wage gap between the young and the old. On the other hand, the change was slower because the 2008 labour market gave larger premiums to human capital that was relatively more common among older workers, especially men. The presented results also seem to confirm the hypothesis that males aged over 50 are discriminated on the Polish labour market (it is, however, also possible that the observed effect is due to the relative decrease of their human capital endowments that have not been controlled for in the estimated model).

Table II.12. Decomposition of changes in the hourly pay gap among people aged under and over 50 years, 2002-2008 (in percentage).

	Men	Women
Studied period	2002-2008	2002-2008
Wage gap in the first period (percent)	11.40	11.98
Wage gap in the second period (percent)	0.46	3.00
Change in time, including (percentage points):	–10.94	–8.97
changes in human capital levels	–11.30	–9.70
changes in returns to human capital	3.28	1.35
changes in "wage discrimination"	–3.63	–0.68
changes in the inequality of the wage distribution	0.71	0.05

Comments: A positive number indicates that a specific element widens the wage gap between older and younger workers in time, while a negative number means that a specific element narrows the wage gap in time.
Source: Own calculations based on the Structure of Earnings Survey.

The present analyses confirm the existence of the intergenerational wage gap in the Polish labour market. In 1998-2008, older men (aged 50-64) received higher wages than their younger counterparts (aged 25-49), and older women earned on average more than the younger ones. The wage differential was higher for females, but it was diminishing in time for both genders. Intergenerational wage gaps (for both genders) were heavily influenced by the longer job tenure of older workers compared to the younger ones. The intergenerational wage gap narrowed in time mostly due to the gradual improvement of the younger worker's average human capital endowments and, in the case of males, a possible increase in wage discrimination against older men. The impact of the chang-

ing education and occupational structures is of paramount importance – younger people tend to be better educated and to follow better-paid professions.

4. Selected determinants of economic inactivity

Discussions on employability, which is believed to be the basic determinant of the employment rate in the older age groups, frequently focus on the idea of work capacity and the factors shaping it (e.g. Ilmarinen, 1999, 2008). Fundamental reasons for older people to exit the labour force include individual factors (age, gender, human capital, required care, health), factors related to the social security system, workplace characteristics and social environment which is associated with the norms and attitudes towards the elderly (see also Piekkola, 2004, Peulet 2004, Kotowska 2003).

The econometric analysis conducted for the purpose of this Part not only confirmed the strong impact of education and age on economic inactivity (similarly to the results discussed above), but also pointed to other important determinants (health, care duties, workplace). Our analysis was based on data obtained from a representative survey "People in pre-retirement age exiting the labour force" conducted in 2007 (Box II.5).[5]

Box II.5. Determinants for people in pre-retirement age to remain employed, based on the survey "People in pre-retirement age exiting the labour force".

The dependent variable is defined as a dummy variable valued at "1" for a worker and "0" for those not at work. The analysis is limited to people with state social security (ZUS). Models were estimated separately for both genders (women aged 50-65, men aged 55-70), including individual factors (age, education, required care, self-reported health), as well as workplace characteristics (subjective evaluation of earnings, number and flexibility of working hours, strenuous work, commuting to work, employment stability), while controlling the impact of the following factors: sector of the economy, occupation, age, retirement entitlement. Multilevel logistic regression was employed in this analysis.

Estimation results suggest that the positive self-reported health status considerably improves employment chances, especially in the case of women. The significant impact of health on economic activity of older individuals has also been confirmed by other international studies (e.g. Survey of Health, Ageing and Retirement in Europe - SHARE,[6] European Working Conditions Survey[7]).

Contrary to our initial assumptions, it turned out that older people providing care are characterised by the same probability of being employed (as those who did not), regardless of gender.[8] Caring for grandchildren or elder parents does not pose a barrier to economic activity for representatives of the so-called *sandwich generation*. This leads to the conclusion that older individuals exit the labour force earlier due to institutional and structural rather than cultural reasons. This claim finds support also in Part I of this report. It has been demonstrated that the institutional context is a key factor in determining the transition from work to inactivity in Poland. It is not clear to what extent the expected rise in the fertility rate of younger generations, accompanied by more rapid population ageing in the next two decades (especially in 2010-2020), will generate additional barriers for the economic activity of older people given inadequate supply of care services.

The strong influence of workplace characteristics on the transition to economic inactivity revealed in the analysis indicates the necessity to adjust the workplace environment to the needs of older people. The work environment needs to be less strenuous, and work organisation and workload more attuned to the needs of older workers. This factor seems to exert a generally lesser impact on women's employment than men's, which could be related to differences in the sectoral employment structure by genders and the occupational polarization of workers in this age group. Not only did older males work more often in the sectors of the economy characterised by relatively difficult working conditions (manufacturing, construction), but they also worked more frequently in the four lowest occupational groups (50 percent of males compared to 30 percent of females).

The relevance of work organisation and self-reported health status for continued employment of older workers has also been confirmed by a comparative analysis based on data provided by the European Working Conditions Survey (Grabowska, 2009). Factors such as flexible working hours, organisation fostering both cooperation and independence and strenuous work have significantly

[5] The study commissioned by the Ministry of Labour and Social Policy was carried out in 2007. The sample consisted of a random representation of men aged 55-70 totaling 2 500 individuals and a random representation of women aged 50-65 totaling 4 500. Additionally, all respondents had to have state or agricultural state social security (ZUS/CRUS) (either paying premiums or receiving pensions/benefits) (see: Sztanderska (ed.), 2008).

[6] Survey of Health, Ageing and Retirement in Europe (SHARE) is an international study providing data on socio-economic status and family networks of over 30 000 respondents aged 50 and over. In 2004 (the first edition), the survey was carried out in 11 countries: Denmark, Sweden, Austria, France, Germany, Switzerland, Belgium, the Netherlands, Spain, Italy and Greece. In 2005-2006, the survey was also conducted in Israel. Three more countries: Ireland, Poland and the Czech Republic, took part in the second edition in 2006-2007 (see Myck, Bohacek, 2008).

[7] European Working Conditions Survey was conducted by the European Foundation for the Improvement of Living and Working Conditions. Data used in the study go back to 2005. The total number of respondents reached 30 000 people aged over 15 in 31 countries: EU-27, Norway, Croatia, Switzerland and Turkey. Research results are discussed in Vollosio et. al 2008.

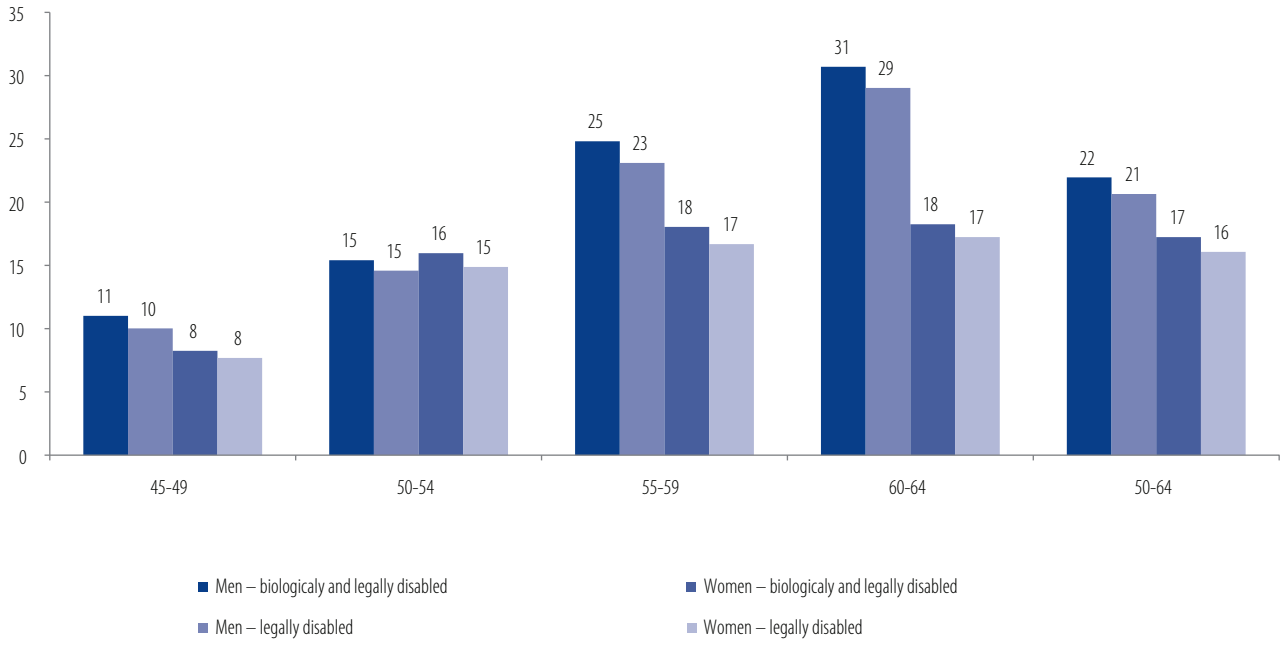
[8] The results of yet another survey "Care and other factors determining increased economic activity of older working people" suggest that women who are the major providers of care, adjust care to working hours. Moreover, women declared that they do not consider care a problem and did not opt for replacement in providing it (Kotowska, Wóycicka (ed.), 2008).

influenced the way respondents aged 45-60 residing in the EU subjectively assessed their chances of remaining employed in the same position at the age of 60 (stronger impact was observed in the case of workers in Central Eastern Europe).

This assessment corresponds to the results of the SHARE survey which included Poland for the first time in 2008. Questions regarding job satisfaction were asked only to workers over 50. The share of respondents satisfied with their work was slightly higher in Northern Europe and in the Czech Republic (approximately 92 percent) than in Southern Europe and in Poland (approximately 88 percent) (Myck, Bohacek, 2008). However, Polish workers tended to indicate the workplace characteristics pertaining to a certain degree of freedom in performing one's job and to employment stability relatively less frequently (57 percent of respondents pointed to relative freedom and 60 percent considered employment stability as high, compared to 77 and 85 percent respectively in Northern Europe). Also, the least Polish respondents considered their work to be physically demanding as compared to Northern and Southern Europe and the Czech Republic. Moreover, Poland ranked last in six of the nine workplace categories listed. Polish respondents were least satisfied with opportunities for professional development and promotion prospects in the last stage of their professional career.

An objective evaluation of the health status of the Polish population in immobile age carried out on data provided by the Social Diagnosis 2009 survey (Strzelecki, Kotowska, Abramowska, 2009) indicated that the disability incidence in the 45-64 age group is relatively low, especially among 45-54 year-olds (Figure II.22). It means that health does not limit economic activity at this age. On the other hand, a higher disability incidence in the two subsequent age groups, specifically among men, is mostly due to the higher number of people with light disability (men) or moderate disability (women) among 55-59-year-olds and a higher percentage of those affected by severe disability among the 60-64 year-olds (Figure II.23). The differences in employment and unemployment rates for those with no disability and for the disabled show that disability considerably reduces employment prospects. These findings are consistent with the abovementioned comments regarding the impact of workplace characteristics on continued employment (which is also in line with the discussion about the impact of public policies on the economic activity of older people). Therefore, a better adjustment of the workplace environment in Poland to the abilities of 55-64 year-olds, conditioned also by their health status, is a crucial factor affecting the continued economic activity of this group.

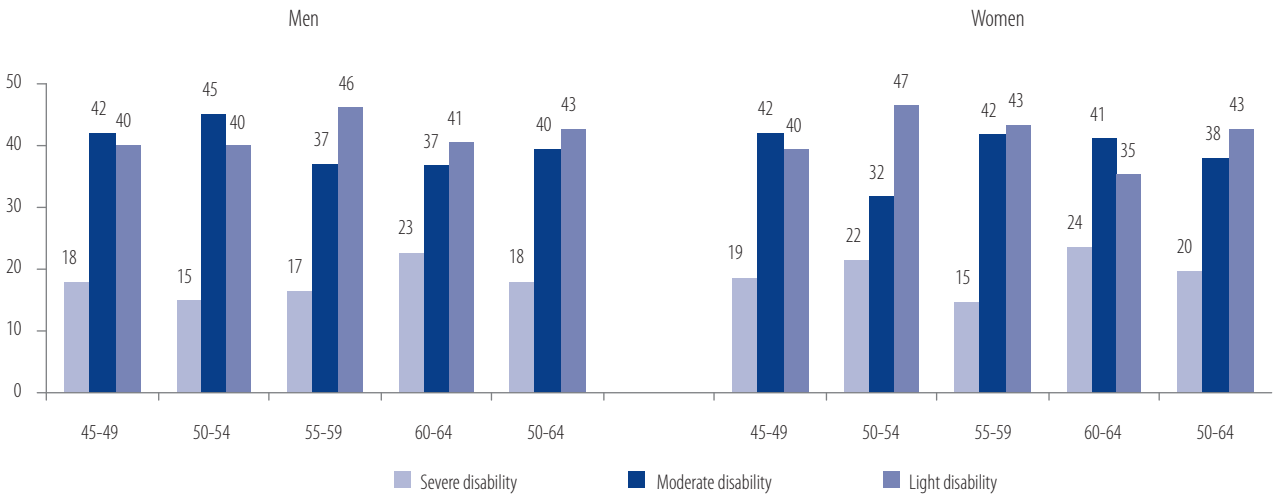
Figure II.22. Disability incidence among people in immobile age by gender and age, 2009 (percentage).



Note: The share of legally and biologically disabled among persons of given age and gender. The legally disabled are defined as holders of a valid disability certificate, whereas the term "biologically disabled" refers to individuals who stated that their disability or illness partially or entirely limits their ability to carry out such activities as learning, working or running a household, but who do not possess a Medical Board certificate. This group also includes the remaining categories of disability (Strzelecki, Kotowska, Abramowska (2009).

Source: Own calculations based on the Social Diagnosis 2009 survey.

Figure II.23. Legally disabled by gender, age and degree of disability, 2009 (percentage).



Comment: Severe disability denotes holders of certificates confirming severe disability or complete incapacity to work and function independently, or stating the first group of disability. Moderate disability refers to holders of certificates proving their moderate disability or general incapacity to work or the second disability group. Light disability indicates holders of certificates stating their light disability or partial incapacity to work, or advising retraining or certifying the third disability group.

Source: Strzelecki, Kotowska, Abramowska (2009).

5. Employment discrimination: experiment results

5.1. Introduction

Discrimination in the labour market manifests itself not only in wage and employment differentials of people who are equally productive, but also in occupational segregation. The persistence of discrimination may result from reluctance on the part of the employer, customers or other workers towards persons belonging to certain socio-economic groups. Therefore, individuals with identical abilities but belonging to different groups may not have equivalent career paths because of the average productivity of the group they belong to. This phenomenon is referred to as statistical discrimination.

It was first described by Phelps (1972) and Arrow (1973), who have shown that the roots of this kind of discrimination may lie in information asymmetry. Unable to fully estimate the productivity of job candidates, employers may use information about the average quality of applicants coming from different pools (town, ethnic group, age, gender, etc). In this case, the employers' optimal recruitment policy may involve offering different employment conditions to workers coming from pools with diverse average ability. Thus, employers may be less willing to offer a job to a woman, believing that women, who are more involved in family life and household duties, might be less productive than men. Older people might as well be discriminated due to a common belief that their knowledge is not up-to-date, their attitudes less flexible and physical condition worse.

Correspondence testing (CT) allows to assess the scale of discrimination directly. Applied for the first time in research on ethnic discrimination in the United Kingdom (Prescott-Clarke, Jowell, 1970), the experiment involves fabricating a few fictitious CVs and cover letters differing in only one or two features that might be a potential source of discrimination. Such applications are sent in response to real job offers and all invitations to job interviews are then registered. This procedure makes it possible to estimate the scale of occupational discrimination against a specific feature. The CT method allows for control of all the parameters that employers take into account when deciding to invite a candidate for an interview. In this way the problem of sample selection bias is avoided, which is usually not possible in other research methods investigating discrimination. It is noteworthy that CT has been used not only to investigate discrimination against gender or ethnicity, but also body weight (Rooth, 2007), sexual preferences (Antecol, Jong, Steinberger, 2007), marital status (Albert, Escot, Fernandes-Cornejo, 2008), personality (Weichselbaumer, 2000) and even beauty (Heilman, Saruwatari, 1979).

Numerous empirical studies dedicated to age and gender discrimination have proved to be inconclusive (see Table II.13). The CT results usually confirm the existence of discrimination only in gender-dominated occupations. Women are generally discriminated in male-dominated professions (engineers, gardeners, construction workers), whereas men are discriminated in female professions (secretaries, receptionists). In the case of occupations not dominated by any gender (e.g. accountants, IT specialists) discrimination was either rare or affected different genders in various countries. The highest discrimination levels favouring men (in professions dominated by women) and women (in the ones where men are over-represented) were found in the United Kingdom, where the difference between invitations to interviews sent to women and men reached as much as 43 percentage points.

Table II.13. Studies on employment discrimination using the CT method.

Author	Place, year	Analysed occupations	Outcomes
Riach, Rich	Australia (1987)	IT specialist, gardener, accountant, human resources staff, manager	The research based on 991 applications confirmed the existence of discrimination against women in such occupations as gardener, accountant, and IT specialist. The greatest disproportion reaching 12 percent was observed in the callback rate for IT specialists. Men were discriminated against when applying for the position of a human resources staff member or a manager.
Neumark, Bank, Van Nort	USA (1995)	waiter/ waitress	130 applications were sent to three types of restaurants (expensive, moderately priced, cheap). Women were markedly more often (28 percent) invited to job interviews to cheap restaurants and slightly less frequently (4 percent) to the expensive ones.
Weichsel-baumer	Austria (2000)	Computer programmer, network technician, accountant, secretary	Employers' responses to 351 applications confirmed a considerable gender discrimination. Employers treated men more favourably in the case of network technicians (females face 10-15 percent net discrimination of access to this occupation) and favoured women for secretaries (net discrimination of men between 24-26 percent). The remaining two occupations showed insignificant proof of discrimination.
Lahey	USA (2005)	Various	The study focused on age and gender discrimination. 7992 applications were sent in total, confirming the existence of a slight net discrimination (1.6–2 percent) against older women in favour of younger ones, and discrimination against women in favour of men (interview probability for females was 4.2 to 7.7 percent lower than for males).
Riach, Rich	UK (2006)	IT specialist, engineer, accountant, secretary	The experiment pointed to discrimination against women applying for the position of IT specialist (the highest value of net discrimination against females reaching 35 percent) and engineer. Discrimination of men was recorded in such jobs as secretary (43 percent) and accountant.
Riach, Rich	Spain (2007), France (2007)	Waiter	**The study based on 680 applications proved the existence of a considerable net discrimination (64.5 percent in Spain and 58 percent in France) against older men (47 year-olds) in favour of younger males (27 year-olds) in the waiter occupation in both countries.**
Riach, Rich	UK (2007)	waiter, retail manager	The experiment involving 1190 applications showed that when looking for retail managers, employers discriminate against younger women, however, once looking for waiters, they discriminate against older men..
Carlsson, Rooth	Sweden (2008)	IT specialist, driver, construction worker, teacher (at different schools), sales assistant, nurse, waiter, sales representative, cleaner, accountant	3228 applications were sent in response to job advertisements. The number of registered invitations for job interviews indicates that females face on average 3-percent lower chances to attend an interview for the position of driver, construction worker or nurse. Males were discriminated when applying for IT specialist or sales representatives posts. No discrimination was observed in the response of employers looking for teachers and sales assistants.
Albert, Escot, Fernandez-Cornejo	Spain (2008)	sales specialist, marketing specialist, accountant, secretary, receptionist	The analyses of the sample of 10620 applications found out that men are discriminated in such jobs as secretary and receptionist, whereas it is more difficult for a woman to find a job as an accountant. Moreover, older persons were discriminated in the recruitment process for all of the above-mentioned jobs. The probit model showed that women are 0.28 to 20.76 percent less likely to be invited for a job interview depending on the occupation.

Source: Own calculations.

Age discrimination was confirmed in almost all the examined occupations, but it appeared to be generally stronger against men (especially for the waiter posts) than women. Nevertheless, in most studies the discrimination ratio did not exceed a few percentage points. It must be also borne in mind that some of the studies categorised individuals slightly over 40 as old (e.g. Rich, Riach 2007). Moreover, CT allows for discrimination to be assessed on the basis of the first recruitment stage – invitation to a job interview, but does not provide data for conclusions regarding the final results of the recruitment process.

5.2. Experiment description

In order to estimate the scale of occupational discrimination in the Polish labour market an experiment applying the CT method was carried out.[9] The study involved 1000 job offers regarding ten occupations (100 offers per each occupation): cashier, sales representative, financial advisor, truck driver, accountant, English teacher, IT specialist – programmer, data analyst, marketing specialist, construction engineer. Four applications on behalf of men and women aged 40 and 54 were sent for each job offer (for a detailed description of the application procedure see Box II.6).

The experiment was planned in such a way so as to minimise the risk of making a mistake. The procedure involved the following stages:

1. **Finding a job offer.** The search started with browsing internet webpages with job offers: pracuj.pl; praca.pl; gazeta.praca.pl, jobpilot.pl; e-gospodarka.pl, etc. Offers from all over Poland were accepted for the experiment, conditional on their correspondence to qualifications listed in CVs for specific occupations. Only offers posted directly by employers were accounted for, as most recruitment agencies use integrated databases which would prevent control over the experiment's results.
2. **Registering job offers in a database.** Selected job offers were registered in a shared database. Entries included company's name, identification data (address/ sector) and offered position.
3. **Before sending experimental applications to a company, researchers checked the database to avoid sending two applications to the same employer.**
4. Following the registration of a job offer researchers **prepared applications** for a particular offer. First, the general application package was copied to a folder with the name of the recruiting company. Applications were then, if necessary, tailored to the requirements listed in the job offer (in uniform way) and the cover letter was properly addressed.
5. **Sending applications.** Having prepared the applications, researchers sent them to potential employers via specially created email accounts. Applications were not emailed all at once, but sequentially in the course of two days, so as to avoid raising suspicions among employers. CVs and cover letters were sent in constantly altering sequences in order not to give advantage to any individual one.

In addition to sending offers, four researchers were constantly available on the phone to register invitations to interviews. Applicants' email accounts were also constantly monitored. For the purpose of the experiment the employers' responses were registered in the database.

Box II.6. Creating the CT experiment applications.

The experiment started with the creation of four fictitious identities of individuals applying for jobs in different occupations. The applicants were:
Hubert Dąbkowski – male, married, born on 13 December 1969 in Warsaw;
Kamil Pogorzalski – male, married, born on 18 April 1955 in Warsaw;
Anna Bolecka – female, married, born on 28 July 1969 in Białystok;
Aneta Baranecka – female, married, born on 24 June 1955 in Warsaw.

Then, all of the above identities received a mobile phone number (in reality belonging to the researchers) and special email accounts (hubert.dabkowski@gmail.com; kamil.pogorzalski@tlen.pl; anna.bolecka@interia.pl; aneta.baranecka@wp.pl).

The next stage involved the creation of four sample CVs and cover letters for all of the 10 researched occupations. Samples within one occupation had similar content regarding education and experience, but differed in layouts, which limited the risk of employers becoming aware of the experiment.

Ready applications were generated by random assignment of fictitious identities to sample CVs and cover letters. Since there were 4 identities and 4 sample CVs, 16 different applications for each of the 10 occupations could be prepared (altogether 160 applications). Applications were ordered in groups of four, containing one application of each identity in a given occupation, with each application in the group representing a different sample. Every occupation was represented by 24 applications (4!), which, in total, made 240 application packages used directly to reply to job offers. Such a make-up of the experiment assured a random assignment of identities to applications.

[9] The experiment was conducted by a team of researchers: Karol Pogorzelski (coordinator), Horacy Dębowski, Jan Gąska, Adam Pigoń, Agata Siembida, Kamil Stroński, Aleksandra Szymańska, Aleksander Śniegocki and Marcin Zienkiewicz.

Each sent application was labelled with four binary variables:

- **age** valued at "1" for a younger person (aged 40), and "0" for an older person (aged 54);
- **gender** valued at "1", when the applicant was a woman, and "0" when the applicant was a man;
- **position** valued at "1" for a job offer not requiring tertiary education (financial advisor, sales representative, cashier, truck driver), and "0" otherwise;
- **invitation** valued at"1", if the employer's response to an application was positive, and "0" otherwise;

The above-described variables were included in logit models constructed to test the hypothesis about the impact of gender and age on the probability of receiving an invitation to an interview (callback rate).

5.3. Experiment results

Table II.14 presents the aggregate results of the experiment. The total callback rate amounted to 10.15 percent, i.e. in response to 3864 applications sent, 406 were invited to an interview.

The callback rate was higher for jobs that do not require tertiary education (15.9 percent of all sent applications), whereas applications with such requirements met had a lower number of invitations (6.3 percent). The difference in the number of men and women invited to the next stage of the recruitment process was insignificant in both occupational categories. Larger differences in callback rates were registered between older and younger candidates (see Table II.14).

Table II.14. Callback rate by selected characteristics of job applications.

Jobs	Total	Gender		Age	
		Males	Females	Younger	Older
All jobs	10.15	10.10	10.20	11.10	9.20
Jobs requiring tertiary education	6.29	6.10	6.40	7.58	5.00
Jobs not requiring tertiary education	15.93	16.00	15.87	16.37	15.50

Table II.15. Estimation results of progit models of the probability of callback for an interview (marginal effects).

Model/ Explanatory variables	Gender	Age	Job category	Likelihood ratio
For all jobs				
Model 1	0.7 proc. (0.896)	1.96 proc. (0.033)*	9.66 proc. (0.000)**	100.28 (0.0000)**
Model 2		1.96 proc. (0.033)*	9.66 proc. (0.000)**	100.26 (0.0000)**
For jobs requiring tertiary education				
Model 3	0.2 proc. (0.797)	2.58 proc. (0.009)**		6.9 (0.0317)*
Model 4		2.58 proc. (0.009)**		6.84 (0.0089)**
For jobs not requiring tertiary education				
Model 5	0.1 proc. (0.948)	0.8 proc. (0.633)		0.23 (0.89)

**significance level at 0.01, * significance level at 0.05.

Five different progit models were used to analyse the probability of being invited to an interview for males and females according to their age. All models used the callback dummy as the dependent variable reporting the effect of discrete changes in the explanatory dummy variables.

The first model (model 1) took into account all available characteristics of the applications and job offers. In its general form, model 1 runs as follows:

$$P(invitation\_i_i=1)=\Phi(\alpha+\beta_1 gender_i+\beta_2 age_i+\beta_3 job\_categogry_i+\varepsilon_i)^{10}$$

The second model (model 2) omits the gender variable, since the statistical verification of model 1 suggests the relevance of a combined impact of gender, age and occupation category on the callback rate, at the same time excluding the impact of gender. Models 3 and 5 are estimated independently for jobs requiring tertiary education and those that do not. Model 4 regresses the callback dummy on the applicant's age alone. Table II.15 reports all estimation results.

A statistical analysis of the CT experiment does not support the existence of gender discrimination in the labour market in Poland. By contrast, the callback rate is strictly dependent on age. If recruitment concerns a job requiring higher qualifications, candidates aged 54 are on average less likely (by 2.58 percentage points) to receive an invitation than 40 year-olds. Since the chance to receive such a response is low (the response rate for younger persons equals 7.58 percent and reaches 5 percent for their older counterparts), the level of age discrimination in the Polish labour market may be considered high. It must be kept in mind, however, that age discrimination in our study is limited only to jobs requiring tertiary education. In other occupations (cashier, truck driver, sales representative, financial advisor) no discrimination was recorded.

[10] "P(invitation=1)" denotes probability to receive interview invitation (callback rate); "Φ(x)" denotes the value of the distribution function at x; "i" denotes the number of the application from 1 to 4000.

Conclusions

Despite a significant improvement in the labour market situation in Poland in 2004-2008, the employment gap between Poland and the EU-15 has widened. This is mostly attributable to low employment rates among older people and, to a lesser extent, among younger groups. Indeed, dropping unemployment in Poland has left prime-age and elderly workers face a comparable risk of being without employment as their counterparts in the EU countries. Although the labour market situation of the young has improved, this group is still notorious for its high unemployment rate. Additionally, long-term unemployment is most transparent among 35 year-olds despite their relatively higher education. It follows that embarking on a professional career in Poland remains a difficult task, which has also been highlighted in reports published by OECD (2008) and the European Commission (2007).

A gradual improvement has been noted in the labour market situation of the young. The driving factor behind this change is a considerably higher human capital accumulation observed in this group, especially when compared to older workers. Human capital in this context is understood not only as educational attainment but also as civilisation skills (computer literacy, internet browsing, foreign languages, participation in lifelong learning). Once started on a professional career, workers quickly reap benefits from employment and gain professional experience, which later translates into a higher probability of being employed. The educational employment premium is the largest for 30-39 year-olds, men in particular. Generally, the lowest returns to education have been observed among elderly workers. Not surprisingly, benefits from education are more apparent for people employed outside agriculture, where the number of workers aged 55-64 is lower.

A cohort analysis of average wages has also pointed to a gradual improvement of the young workers' situation in the labour market. While it is true that cohorts entering the labour market during the economic slowdown were offered lower wages compared to those starting their careers in a better economic situation, these differences have narrowed over time. Thus, the impact of the business cycle on labour market entry patterns has lessened.

Changes in the wage structure during the period in question have led to the relatively worse situation for the elderly. In 1998, approximately 15 percent of workers aged 50 and over constituted one fifth of top earners in the economy. In 2008, the same proportion amounted to 12 percent and the share of older people in the group of lowest earners (receiving wages in the first two deciles) rose from 15 to 19 percent. At the same time, the impact of age, overall seniority and company specific seniority on wages, observed in 1999 with regard to the wages of people embarking on a career and regular workers aged 50 and over, was reduced in favour of the individual workplace tenure.

At the end of the 1990s, older workers earned on average more than individuals aged 25-49. At the same time, the intergenerational wage gap was bigger for women. However, over the next years the gap was narrowed, more significantly for males. These changes were due to the improved human capital of the young and possibly increased wage discrimination against older men. In 2002-2008, and especially in 2006-2008, pays of older workers plummeted in comparison to pays of their younger counterparts.

The deteriorating situation of older participants in the labour market has also been demonstrated by the CT results, which point to the relatively strong age discrimination in the recruitment process for positions requiring tertiary education. The discrimination was apparent already at the initial stage of the recruitment process, that is, in callback. Gender discrimination, however, was not observed at this stage, possibly due to gender equality policies enforced with growing effectiveness by this state.

The narrowing distance between average wages for older and younger people can be attributed to changes in the sectoral employment structure and the occupational structure. The years 1998-2008 saw a rapid modernisation of the economic structure which was heavily affected by a drop in the number of people employed in agriculture, especially for the young. Consequently, an improvement of the occupational structure has been observed, understood as more people working in relatively higher positions in the occupational hierarchy and less in the lowest. In the period of economic downturn, this change was relatively stronger for women, both in the youngest and in the oldest age groups.

The assumption that both individual characteristics and contextual factors can have different impact on employment probabilities separately for the young, the adults and the elderly has been verified by the application of multilevel logit models. It has been proved that fluctuations of labour demand have a particularly strong effect on the employment chances of the youngest workers and the oldest men. The improved general economic conditions and better prospects on the regional labour markets positively affect employment in both groups. Tertiary education is generally a more relevant employment determinant for the youngest women compared to men. The educational wage premium is higher for the 30-54 age group, especially for males, at the same time narrowing the gap between the genders. The positive impact of education on female employment prospects in the non-agricultural sectors is very transparent, mostly in the case of younger age groups. Moreover, the youngest and the oldest women residing in large cities retain significantly higher chances for continued employment outside agriculture, as compared to female residents of small towns and villages.

Additional empirical analyses estimating factors influencing the employment of the elderly in Poland have confirmed conclusions of international research on the importance of health and workplace environment (work conditions, organisation and workload) for the older workers' likelihood to remain in employment. An objective evaluation of the health condition of 45-64 year-olds and activity rates by disability shows how crucial is it to adjust the workplace to the job abilities of these groups so as to prevent their exit from the labour force. Keeping older people in the labour market requires action on the part of both the workers and the employers, a determination that has also been demonstrated in Part I of this report.

Part III. Men and women in the labour market

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Introduction

Population ageing, as shown in Part I, is set to affect all OECD and EU-27 countries over the coming decades. These developments leading to labour force shrinkage will be challenging not only for economic growth, but also for general welfare in all developed countries. One of the most promising ways to counteract the negative effects of this process is to raise the participation of women in the labour market. Irrespective of the country, women are generally less economically active than men and gender differentials in labour markets persist. In 2008, the gender participation gap in the EU-27 amounted to 14.1 and the gender employment gap to 13.7 percentage points. As compared to men, women are more likely to find employment in the public sector or in typically female-dominated professions, and their average wages are lower. Wage and employment gaps between men and women may suggest that there are barriers to female participation in labour markets, which may be caused by family responsibilities, differences in education and skills or discrimination. Recognizing and addressing these barriers is crucial from both the labour market and family policy perspectives, since participation in the labour market should not limit couple's reproductive plans.

The main objective of this Part is to analyse and explain the differentials between position of males and females on Polish labour market. We have focused on the three areas where disparities are most visible: the chances of finding and maintaining employment, wage gap and occupational segregation. Since age differentials in the labour market position have already been discussed in Part II, the analysis in this Part is limited to individuals aged 25-44, i.e. in the childbearing age (25-34) and childrearing age (35-44). It is at this stage in the life course when gender differences in the labour market are most likely to form, influencing the future employment prospects of women and men.

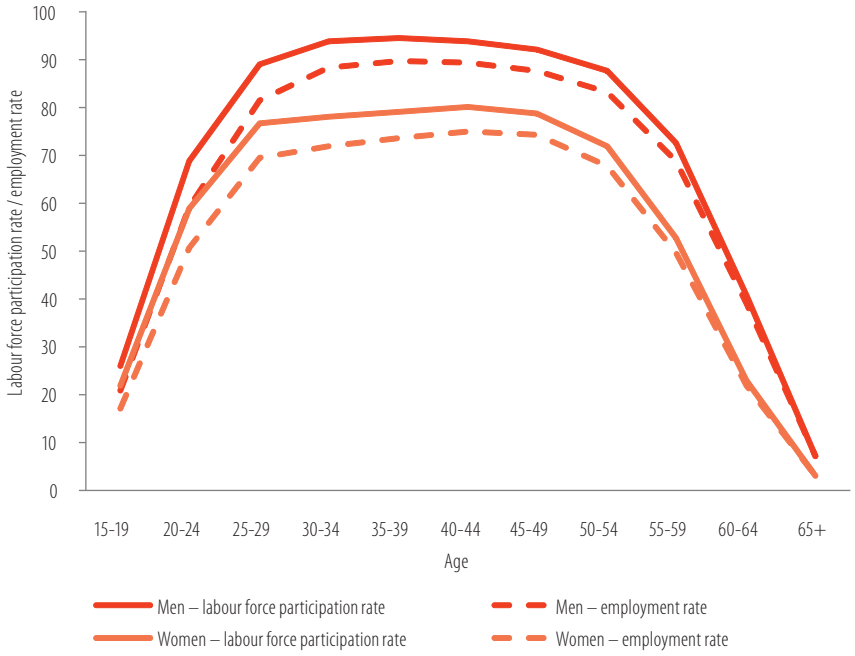
Part III is structured as follows: Section 1 describes the position of men and women in the Polish labour market as compared to other EU-27 Member States. Sections 2-4 use individual data to identify the key determinants of the observed disparity in the professional positions of women and men in Poland. Section 5 discusses the effectiveness of public policies designed to ensure equality between genders in the labour market. In this context, we also briefly present the institutional and cultural environment which shapes individual occupational choices and decisions regarding having children, thus determining the intensity of the work-family life conflict.

1. Position of men and women in the labour market

1.1. International context

Labour force participation of both men and women reaches its peak when they are between 25 and 44 years old (i.e. at the childbearing and childrearing age). According to data for 2008, the labour force participation rate in this age group in the EU-27 countries reached 78% for women and 92% for men. By contrast, the participation rate for the 15-24 age group amounted to 41% (women) and 48% (men), and for those aged 45-64: 58% (women) and 75% (men). Interestingly, whereas gender-based differences in participation rates are relatively small among those aged 15-24, once the family formation process starts, they diverge sharply and remain stable until the retirement age. In 2008, gender participation and employment gaps for people aged 25-44 stood at around 14 percentage points.

Figure III.1. Labour force participation and employment rates, men and women by age, EU-27, 2008 (percentage).



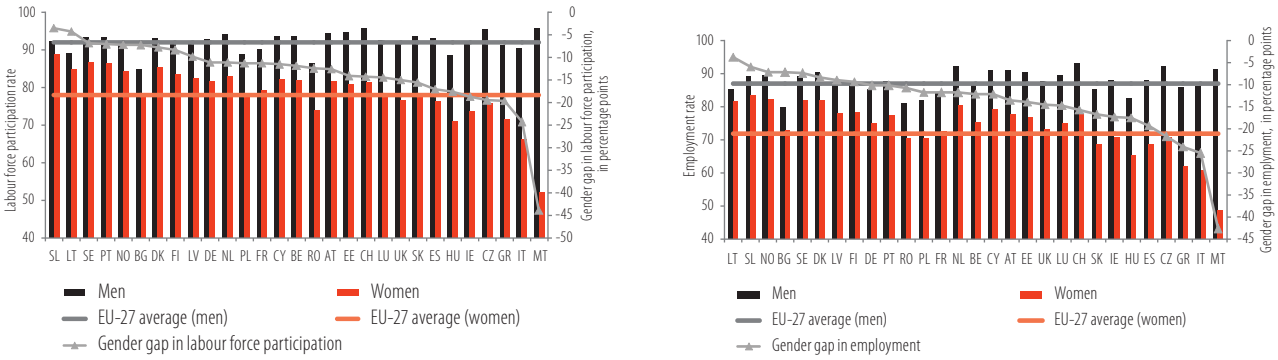
Source: Own calculation based on LFS and Eurostat Statistics Database.

Although employment and economic activity rates of women in childbearing and childrearing age vary across the EU countries, they are generally lower than among men. It is worth noting that cross-country variations in gender employment gaps result to a large extent from differences in the level of women's economic activity. The employment and participation gap for men across countries is much narrower.

The lowest gender activity and employment gaps (below 10 percentage points) are observed in the Nordic countries (Norway, Sweden, Finland and Denmark) and in some post-socialist countries (Slovenia, Lithuania, Latvia and Bulgaria). At the same time, these countries (except Bulgaria) are characterised by high female employment (78%) and participation rates (82%).

The differences in employment and labour supply between women and men appear to be highest in the Mediterranean countries (Malta, Italy, Greece and Spain), Ireland and three post-socialist countries (Czech Republic, Slovakia and Hungary). The gender employment gap in these countries exceeds 15 and in Italy and Malta even 20 percentage points. Moreover, just as Poland and Romania, all of these countries display relatively low female employment rates, up to 70 percent. Poland is therefore an interesting case in Europe – it is characterized by moderate gender employment and participation gaps (both at the level of 11-12 percentage points) and a relatively low employment rate for the 25-44 age group, regardless of gender.

Figure III.2. Labour force participation (left panel) and employment (right panel) of women and men aged 25-44 in EU-27, Norway and Switzerland in 2008 (percentage).

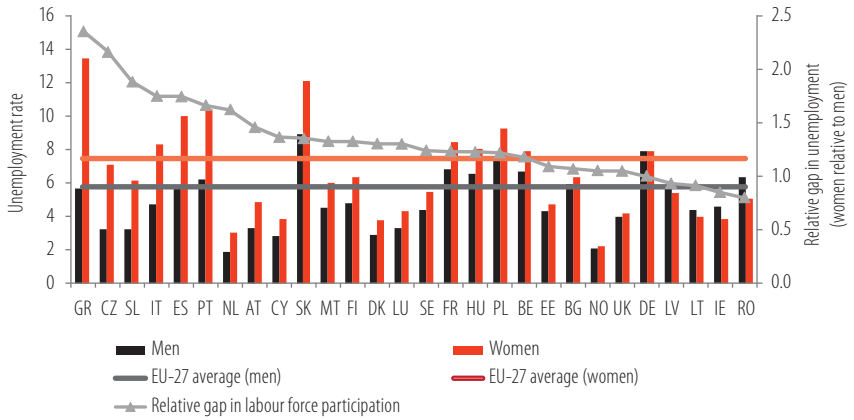


Source: Own calculation based on LFS data and Eurostat Statistics Database.

In all EU Member States, employment and labour supply of men exceed that of women, whereas the unemployment rate is usually higher among women (Figure III.3). The largest gender disproportions in unemployment are observed in Greece and the Czech Republic, where unemployment rates are twice as high for women as they are for men. Relatively high unemployment of women in relation to men is also noted in Slovakia, Southern European countries (Italy, Spain, Portugal) and the Netherlands. It is only in Lithuania, Latvia, Ireland and Romania that the unemployment rate is lower for women than for men, yet the difference does not go beyond 20 percent.

Poland is characterised by a relatively small gender unemployment gap. In 2008, the unemployment rate of women aged 25-44 was 20 per cent higher than that of men in the same age group. However, the overall unemployment rate was very high at that time. Poland ranked third in Europe in respect of the male unemployment rate (after Slovakia and Germany), and fifth with regard to that of females (after Greece, Slovakia, Portugal and Spain).

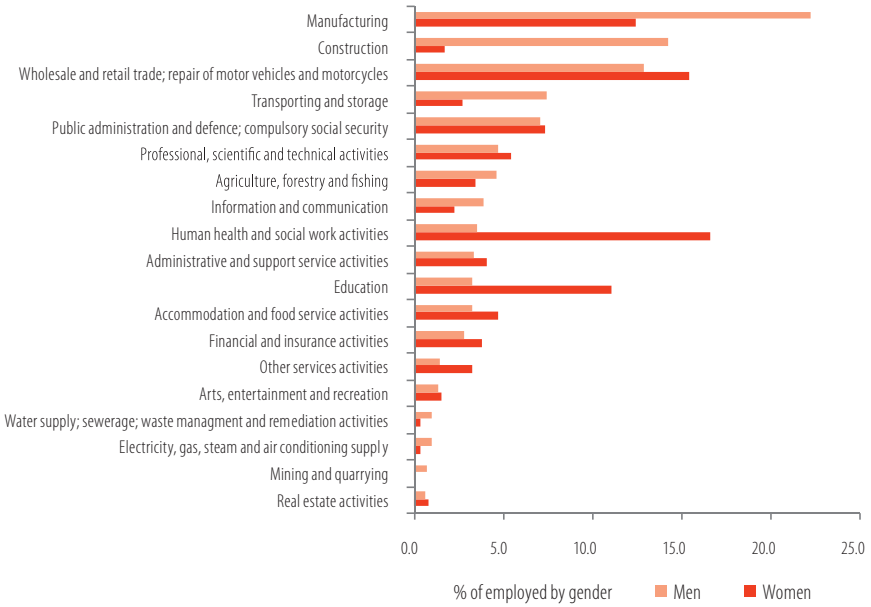
Figure III.3. Unemployment rate of men and women aged 25-44 in EU-27, Norway and Switzerland in 2008 (percentage).



Source: Own calculation based on LFS and Eurostat Statistics Database.

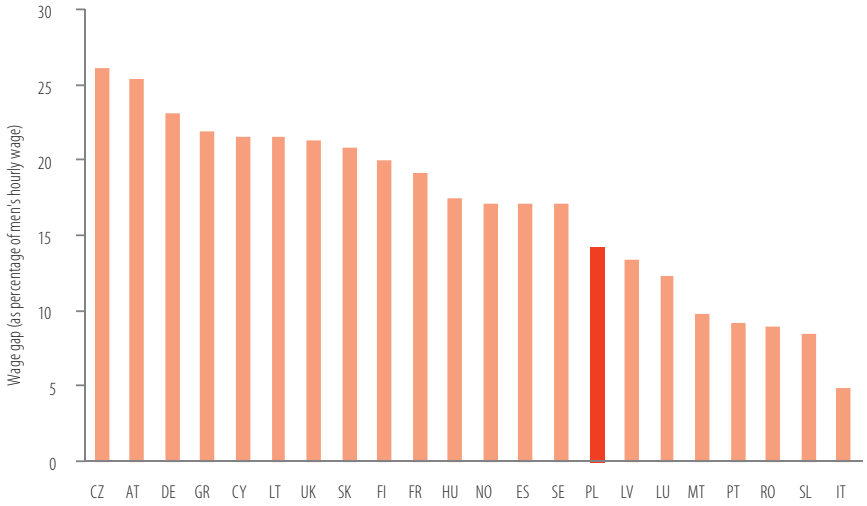
Gender differences in the EU labour markets are reflected not only in participation and unemployment rates, but also in the occupational distribution. Females are more likely to work in the public sector, education, social welfare and health services, i.e. occupations which offer greater stability and are more resistant to business cycles (Figure III.4). At the same time, in all EU-27 countries women's average wages are lower than men's (Figure III.5). The magnitude of this phenomenon is not uniform. In 2008, the highest gender wage gap was observed in the Czech Republic and Austria (over 25 percent) and the lowest in Malta, Portugal, Romania, Slovakia and Italy (below 10 percent). A relatively small gender wage gap was reported also for Poland (14.3%). Interestingly, wage differences between men and women are smaller in countries with low female employment. It must be noted, however, that the gender wage gap presented here does not take into account gender differences in other employment characteristics, such as occupation, sector of the economy, level of qualifications or work experience. In countries with low female employment rates, economically active women are on average better educated than men (see OECD 2001, MPiPS 2007).

Figure III.4. Employment structure by NACE for poeple aged 25-49, EU-27 in 2008.



Source: Eurostat Statistics Database.

Figure III.5. Gender wage gap for people aged 15-64 in EU-27, Norway and Switzerland.

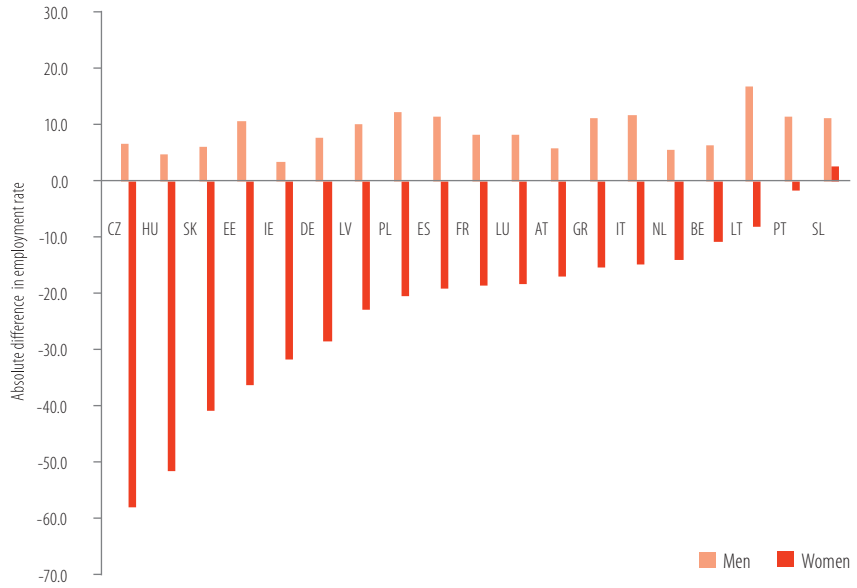


Notes: The gender wage gap is defined as the difference in average hourly wages between men and women, expressed in relation to the average male hourly wage. It does not include individuals working in public administration.
Source: Eurostat Statistics Database.

The above-presented data point to significant differences in labour market positions of men and women. These disparities can to some extent be explained by women's greater involvement in childcare. In the EU countries the employment rates for mothers with young children (i.e. below 5 years old) are generally lower than for females without offspring. Inverse (but weaker) relationship has been reported for men (Figure III.6). The employment rate of mothers with young children is lowest in post-socialist countries (except for Lithuania and Slovenia, where women employment rates are high in general). A sharp drop in female labour supply associated with giving birth to a child is observed also in Germany and Ireland.

In Poland, the employment rate among mothers with young children is 20 per cent lower than for women aged 25-44 who are childless. Given the fact that in countries like the Czech Republic, Slovakia or Hungary discrepancies between the two female groups exceed 40 percent, this is a rather moderate result. At the same time, Poland belongs to the group of countries where employment rates of fathers with young children are significantly higher than for men who do not have children aged 5 or less. This may suggest that Polish fathers are still strongly assigned to the role of breadwinners, with its importance even greater in households with a young child.

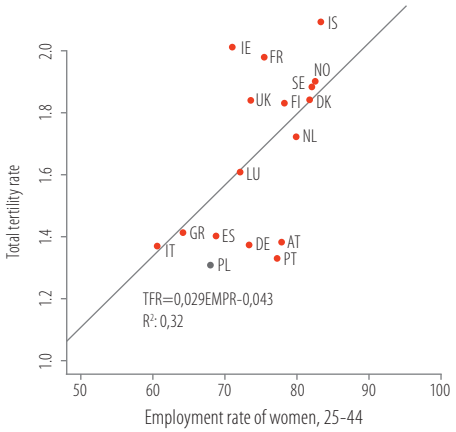
Figure III.6. Employment gap between parents with young children (aged 0-5) and non-parents, selected EU-27 countries, 2004.



Note: The employment gap is calculated for those EU-25 countries for which the European Labour Force Survey contains information on all household members (such information is not collected for the Scandinavian countries). The presented data refer to individuals between 25 and 44 years old.
Source: Own calculations based on European Labour Force Survey, (see Matysiak 2008).

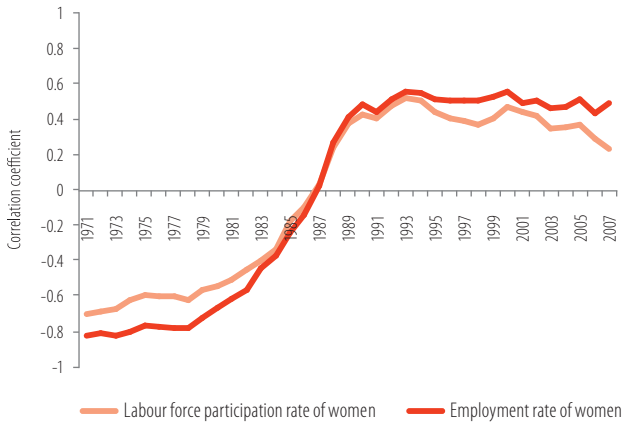
Interestingly, countries with high fertility rates do not necessarily experience lower female employment. On the contrary, the EU-15 countries with the highest proportion of working women, display the highest fertility rates (Figure III.7). Likewise, countries with the lowest female employment are characterized by the lowest fertility. The cross-country correlation between women's employment and total fertility in Western Europe turned from negative to positive around 1985 (Figure III.8) and has remained roughly stable ever since (Ahn, Mira 2002). The reversal in the correlation sign results from cross-country variation in the magnitude of an upward trend in women's employment and a downward trend in fertility rates (Kögel 2004). In other words, countries where female employment grew relatively slowly (Italy, Spain, Greece), experienced a much sharper decline in fertility rates than those in which women's involvement in paid work grew rapidly (Nordic countries).

Figure III.7. Cross-country correlation between employment rate of women aged 25-44 and total fertility rate, EU-15, Iceland and Norway, 2007.



Notes: Linear regression on the sample of the EU-15 countries, Iceland and Norway.
Source: Own calculation based on LFS (OECD Employment Database) and Eurostat Statistics Database (fertility indicators).

Figure III.8. Cross-country correlation between participation rate of women aged 25-44 and total fertility rate, EU-15.



Source: Own calculations based on LFS (OECD Employment Database) and Eurostat Statistics Database (fertility indicators).

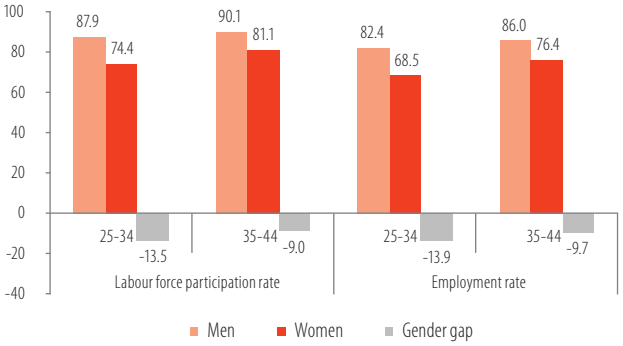
A similar regularity was not observed for Central and Eastern Europe, where over the last 20 years very low fertility rates have coincided with regional discrepancies in female employment. It must be noted, however, that changes in fertility rates are relatively new in this part of Europe. Additionally, they are heavily affected by tempo effects. It is therefore too early to draw conclusions regarding the relationship between fertility rate and women's economic activity in Central and Eastern Europe[1].

As mentioned above, since the mid-1980s the EU-15 countries with the highest female employment have been characterised by the highest total fertility rate. This phenomenon may be explained by cross-county differences in conflict between work and motherhood, which are dependent on labour market and family policies in a given country, as well as commonly acknowledged gender norms (Engelhardt et al. 2004, Matysiak 2008, Rindfuss et al. 2004). Incompatibilities between family and occupational roles are often comparatively strong in countries where women's low employment coincides with low fertility (Southern Europe), but weak in countries with high female employment and high fertility (Nordic countries). This issue is analysed in detail in Section 5.

1.2. Men and women in the Polish labour market

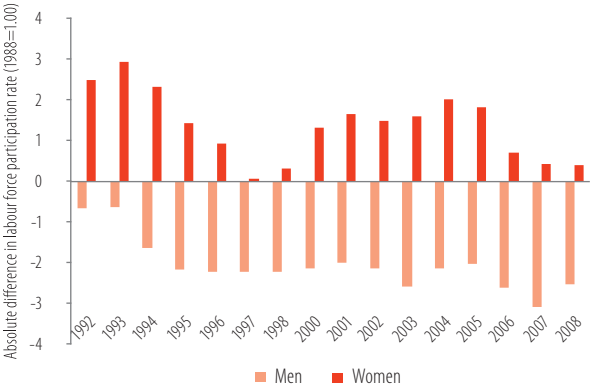
Compared to other EU-27 countries, Poland is characterized by relatively low employment and labor force participation rates of individuals in childbearing and childrearing age (i.e. between 25 and 44). Interestingly enough, in contrast to women in other European countries, Polish females are doing better in the labour market than men. In 2008, Poland was last but three in terms of men's economic activity rate (only Bulgaria, Romania and Hungary scored worse), whereas it ranked tenth regarding women's employment rate. As already mentioned, gender wage and employment gaps in Poland remained at a moderate level of 11-12 percentage points. Surprisingly, gender gap is slightly higher for individuals in childbearing age (13.5 percentage points) than for those in childrearing age (9-9.5 percentage points). This difference may result from a decline in women's family responsibilities and an increase in their labour force participation as children grow up (see Figure III.9).

Figure III.9. Labour market participation and employment of men and women aged 25-34 and 35-44 in Poland, 2008.



Source: Own calculation based on LFS and Eurostat Statistics Database.

Figure III.10. Absolute change in labour force participation rate by gender as compared to 1988, Poland 1992-2008.



Source: Own calculation based on LFS (1992-2008) and NSP-88, ILO Labor statistics.

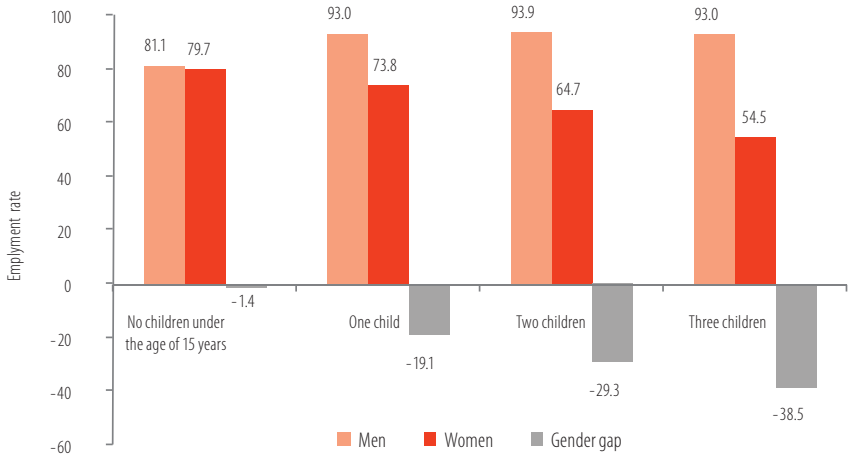
Already in the 1980s women in Poland were less active in the labour market than men. This gender gap began to narrow after the political transformation of 1989, when labour force participation rate of men aged 15-44 started to decline and labour supply of women in the same age group slightly increased (Figure III.10). These opposing trends persisted despite the fact that reconciling work with childcare has become increasingly difficult due to larger competition in the labour market, greater employers' demands regarding workers' mobility and availability, as well as increased importance of education in securing a competitive position in the labour market (Kotowska and Sztanderska 2007). Several factors could have contributed to the bridging the gender gap in labour force participation, one of them being growing female employment in the public sector and in occupations generally more resistant to business cycle (in the field of education, health and welfare), or a lower proportion of women running their own businesses (Sztanderska and Grotkowska 2009). Nevertheless, it must be noted that the gender participation gap narrowed only among people aged 25-44, whereas it widened in the older age groups (Matysiak 2008). Some authors argue that the relative increase in economic activity of women in comparison to men was caused by their strong determination to remain in the labour market (Sztanderska 2005, Kotowska and Sztanderska 2007, Matysiak 2009). According to one of the hypotheses explaining this phenomenon, women developed several strategies aimed at maintaining their position in the labour market despite major difficulties to reconcile work and family. One of such strategies consisted in reaching a lower family size, while another was aimed at increasing investments in education in order to acquire higher skills and consequently a better protection against job loss (Sztanderska 2005).

[1] Period total fertility rate is sensitive to shifts in women's childbearing age. When women postpone motherhood, period fertility rates underestimate the complete fertility (the so-called tempo effect).

In fact, fertility decreased sharply in Poland since the beginning of the transition. In 1989, the total fertility rate was at 2.08 children per woman (in fertile age), in 2003 it bottomed out at 1.23. It was not until recently that the fertility rate in Poland ticked up to 1.39 (2008), but it still remains at a rather low level.

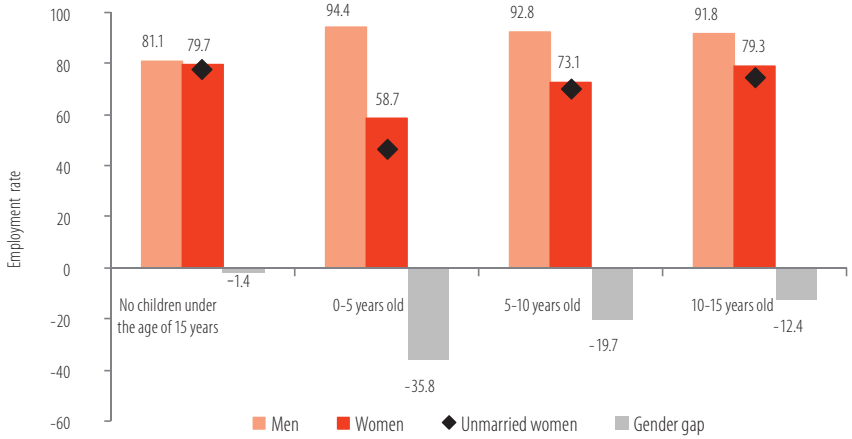
Figure III.11. Employment of mothers and fathers aged 25-44, Poland 2008 (percentage).

a) by the number of children



Source: Own calculation based on LFS.

b) by the age of the youngest child



Source: Own calculation based on LFS.

A lower propensity to procreate could have been caused by women's inability to reconcile work with parental responsibilities or concerns about losing job after childbirth. In Poland, employment rate of mothers is lower than that for childless women aged 25-44, but no similar pattern in observed for men. While the gender employment gap for people without children up to 15 is close to zero, it jumps to 19.1 percentage points for parents with one child in this age group (Figure III.11a). The gap widens even further as the number of offspring increases and reaches 38.5 percent for parents of at least three children.

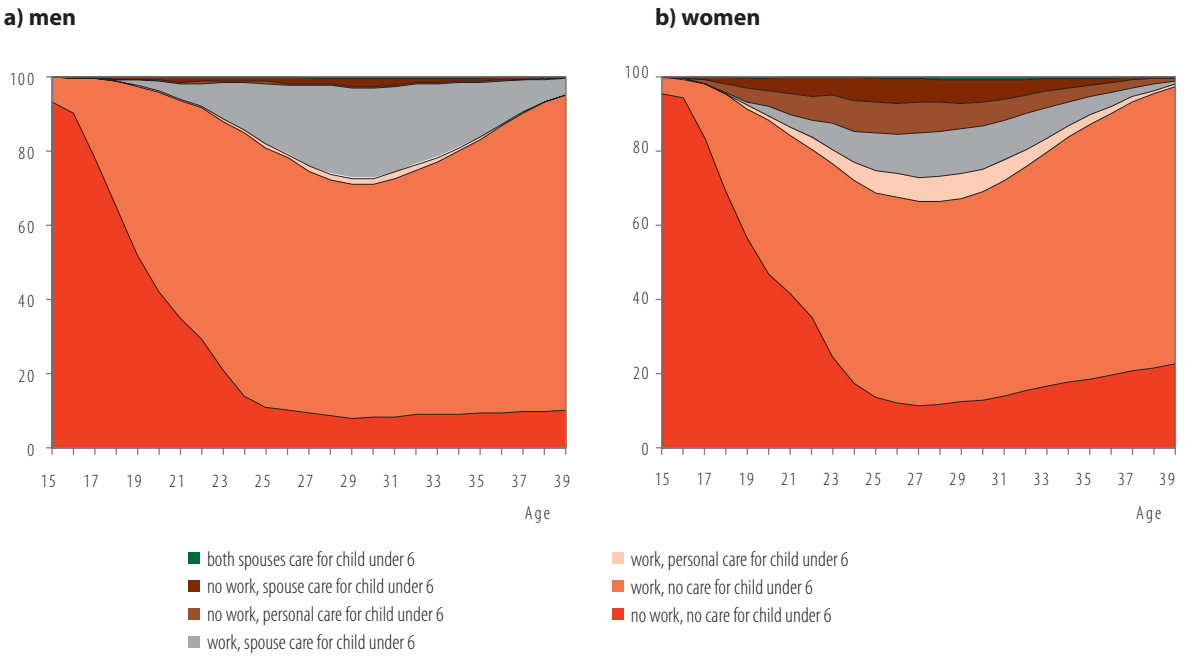
The challenge of combining employment with childcare is related not only to the number of children but also to their age. The employment rate of mothers with a child aged 0-5 is 21 percentage points lower comparing to women without children younger than 15 (Figure III.11b). However, as the youngest child grows, women's employment rate increases, which may suggest that their withdrawal from the labour market is only temporary. A similar relation between employment rate and age of the youngest child is also recorded for single mothers. The only difference is that a young child affects the employment rate of lonely mothers more significantly. On the other hand, the employment rate of single mothers with children aged 10-15 is the same as for unmarried women who do not have children. What follows is that, despite difficulties in balancing work and motherhood, single mothers also try to return to the labour market.

Box III.1. Distribution of family and occupational responsibilities over the life course of men and women in Poland.

Figure III.12.a-b shows the distribution of family and occupational responsibilities between spouses over the life course of males and females born in 1969-1984.

In Poland, men and women enter the labour market at a similar age. The vast majority of young people begin their occupational career as they reach the age between 17 and 25. Figures below show women's and men's involvement in the care of children aged 0-6 (i.e. in age when they require most attention). The share of females assuming the childrearing responsibilities is markedly greater than males', with their greatest involvement in childcare when aged 24-34. Hence the gender employment gap in this age group can to some extent be explained by the fact that women are more likely to carry the childrearing burden. It is also the reason for the gap being even wider as regards employment rates of mothers and fathers. Having a small child does not influence men's employment rate, because women take over their family responsibilities. Men in early productive age can thus devote more time to their occupational careers than women do.

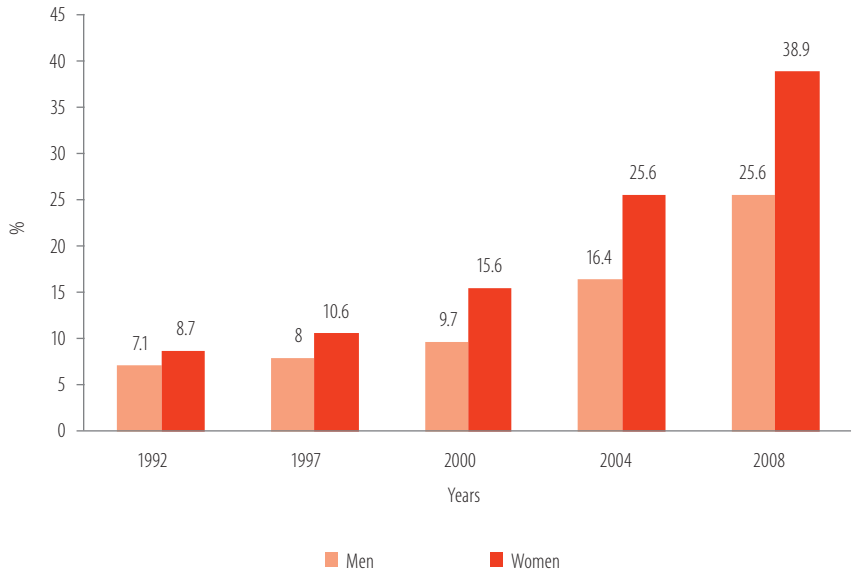
Figure III.12. Distribution of family and occupational responsibilities in the life courses of men and women, birth cohorts 1969-1984 (percentage).



Note: Respondents were allowed to indicate several ways of organising childcare, including childcare provided personally or by the partner. If in the multiple-choice question at least one of these methods was selected, then the person was counted as applying this particular mode of childcare. The above results were obtained with the use of the sequence analysis approach (method described in Appendix II).
Source: Own calculations based on data from the survey: Family, Educational and Occupational Biography of Women and Men in 2009 (description of the study in Appendix III).

Another strategy employed by women struggling to maintain their occupational position in the ever more competitive labour market are increased investments in human capital. Between 1992 and 2008, the percentage of women aged 25-34 with tertiary education increased almost fourfold, from 8.7% to 32.5%. An increase in educational attainment was also observed among men, but it was only threefold (from 7.1% to 22%). Female investment in education has paid off. As shown in Table III.1, the gender gap in labour force participation and employment is lowest for those with tertiary education, standing at 6.5 percentage points, and grows rapidly with a decrease in educational attainment. The gender gap for those with only basic vocational training exceeds 20 percentage points. As a result, women with higher education account for as much as 40 percent of the total female labour force, whereas persons with only basic vocational education predominate among working men (42,9%).

Figure III.13. Percentage of men and women with tertiary education in the total population aged 25-34, Poland 1992-2008.



Source: Own calculations based on LFS data.

Table III.1. Economic activity and employment of individuals aged 25-44 by gender and educational attainment, Poland 2008.

Highest education level attained	Men		Women		Gender gap: Women-Men	
	Labour force participation rate (percentage)	employment rate (percentage)	Labour force participation rate (percentage)	employment rate (percentage)	Labour force participation rate (percentage)	employment rate (percentage)
Tertiary education	97.0	93.4	90.5	86.8	-6.5	-6.7
Upper secondary	93.2	89.4	76.5	70.8	-16.6	-18.6
Basic vocational education (lower secondary)	92.9	86.5	70.7	64.3	-22.2	-22.2
Primary education	77.9	65.8	52.3	44.7	-25.7	-21.1

Source: Own calculations based on LFS data.

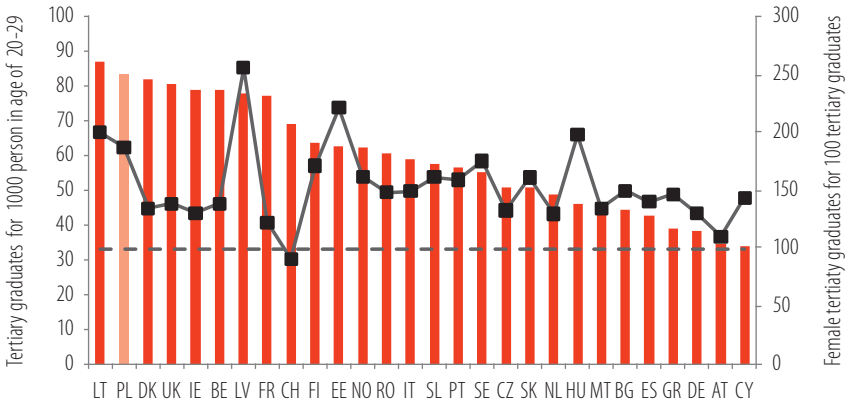
Against this background, Sztanderska and Grotkowska (2009) argued that during the economic transformation Polish women put much more effort into maintaining their labour market position than men, struggling to balance work with childcare and intensifying investments in education. The following chapters offer a deeper insight into possible factors differentiating occupational positions of males and females in the childbearing and childrearing age, with a focus on family responsibilities and gender discrimination.

Box III.2. Tertiary education graduates in Poland as compared to EU-27.

Since the early 1990s, Poland has experienced an educational boom, which resulted in a rapid increase in the educational attainment of Polish citizens. As a result, every third person aged 25-34 currently holds a university degree and Poland ranks second in the EU-27 as far as the number of graduates with tertiary education is concerned. A comparable level of participation in education at tertiary level is observed in Denmark, the United Kingdom and Ireland; in the CEE countries - only in Lithuania.

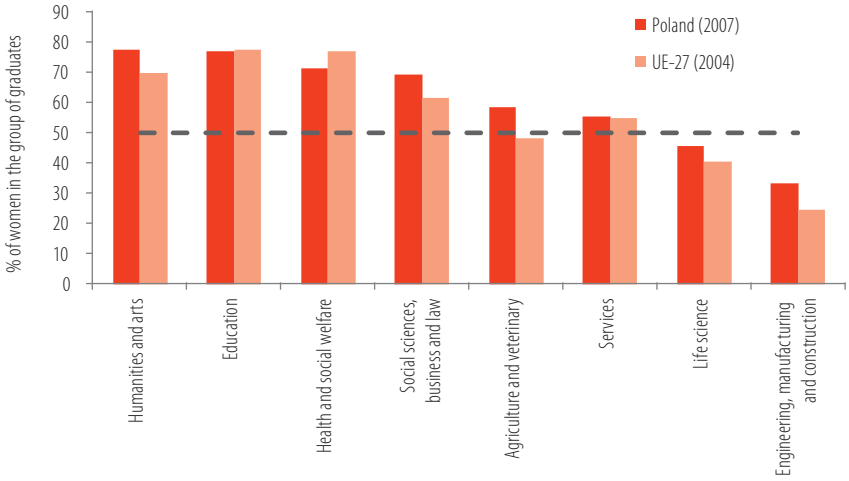
Tertiary education is appealing especially to women, who constitute the majority of university graduates in Europe and, in particular, in the CEE and Nordic countries (apart from Denmark). In Poland, every 100 male graduates is matched by 187 female, which places Poland fifth in the EU-27.

Figure III.14. Tertiary education graduates, EU-27 (2007)



Source: Eurostat Statistics Database.

Figure III.15. Share of female tertiary education graduates in the total number of tertiary education graduates by field of study, Poland (2007) and EU-27 (2004) (percentage).



Source: Eurostat Statistics Database.

Significant gender differences persist with respect to the field of study. In all EU-27 countries, disciplines such as humanities and arts, health and welfare, or education and training are pursued mostly by women (70 percent of all graduates in these fields). Men are more likely to choose engineering, manufacturing and construction, as well as mathematics and computing. Interestingly, when compared to the European average, Poland ranks quite well in terms of women choosing the "typically male" disciplines. In 2007, females constituted 45 percent of graduates from natural science, mathematics and computing, which placed Poland sixth in the EU-27, after Romania, Bulgaria, Italy, Greece and Malta. It should be noted, however, that in Poland, women predominate in natural science, with relatively few of them pursuing courses in computing. In addition, every third graduate of engineering, manufacturing and construction in Poland is a woman. These fields are more popular with women only in Greece, Denmark, Estonia and Bulgaria.

Although this box concerns only tertiary students, similar gender differences with regard to field of study exist also at lower levels of education.

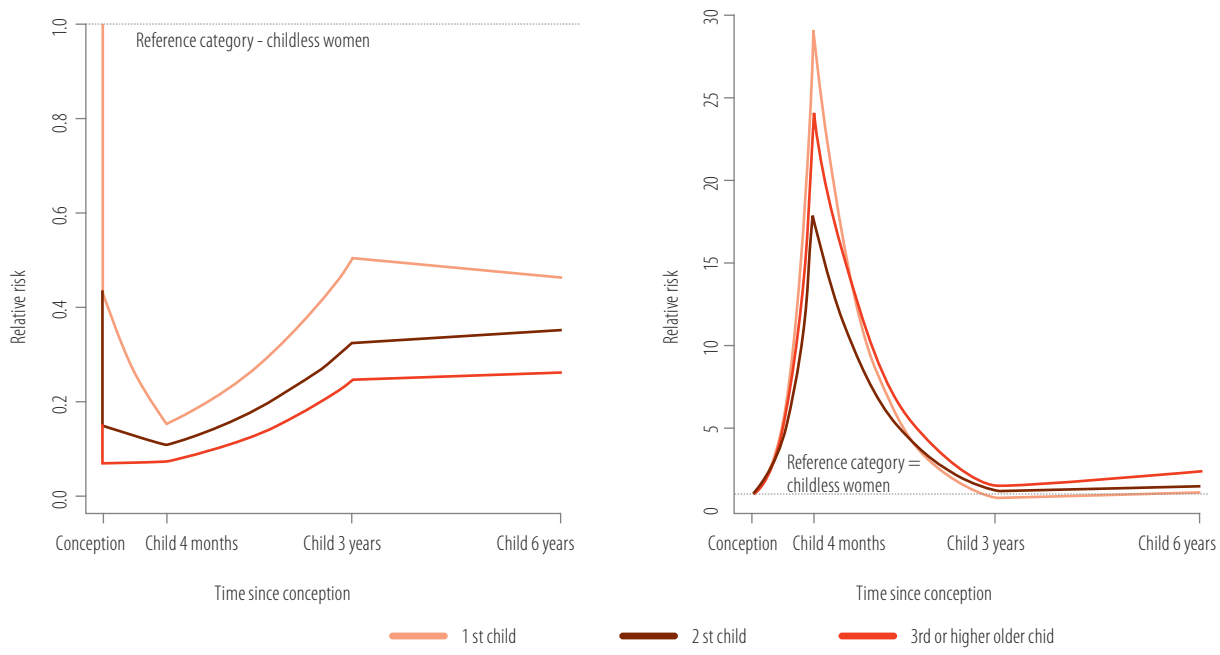
2. Employment opportunities and family responsibilities

Having children implies additional expenditures. Given that men are generally assigned to the social role of "breadwinners" rather than "homemakers", parenthood is expected, at least in theory, to increase their labour market participation. The impact of having a child on women's labour supply is more complex. It depends on benefits a mother and a child derive from her staying at home, on opportunity costs of not working (such as loss of earnings, depreciation of human capital or missed career opportunities), as well as on childcare costs in case a mother decides to reenter the labour market.

Empirical studies conducted in developed countries show a clear negative relationship between having young children and employment, especially that of women. This effect strengthens with an increase in husband's earnings (Blossfeld and Drobnič 2001) and weakens with child's age (Leibowitz et al. 1992) and better access to childcare systems (Rønsen and Sundström 2002). In Poland, having a young child significantly reduces women's employment opportunities. Figures III.16a)-b) show the net effect of the youngest child's age on mother's risk of entering and exiting employment, after controlling for female educational level, work experience, social origin and orientation toward work and family.

Figure III.16. Effects of child's age on female employment entry (panel a) and employment exit (panel b) in Poland, cohorts 1971-1981.

a) employment entry **b) employment exit**



Note: The Figures show results of a multi-process hazard model (method described in Appendix 2). The presented log hazards are standardised for a woman's current age, calendar year, time since employment entry/exit, work experience, woman's educational level, place of residence, woman's social background, and woman-specific unobserved propensities to work and to have children.
Source: Own calculations based on the data obtained in Employment, Family and Education Survey conducted in Poland in 2006 - see Matysiak (2009).

Pregnant women and women with young children (under 3 years of age) have the lowest chances of entering employment. Even 7 months before delivery, women expecting a baby are twice less likely to take up a job than their childless and non-pregnant counterparts. The probability of entering employment decreases during pregnancy and bottoms out 4 months after birth. It then starts to increase, to level off 2,5 years after childbirth. Even so, the probability of entering employment among mothers whose only child is at least 3 years old is approximately twice as low as among childless females. The intensity of employment entry for women with two children where the youngest is 3 years old, is reduced by additional 35 percent.

Having a young child (less than 3 years of age) diminishes the risk of both getting and holding onto a job. The risk of employment exit increases gradually during pregnancy and reaches its peak for women with a 4-month-old child. At this point women acquire the right to parental leave, which is probably the reason for the observed upsurge in the intensity of employment exit. As the child grows up, the hazard of a woman leaving employment gradually declines and bottoms out when the child is 3 years old. A mother

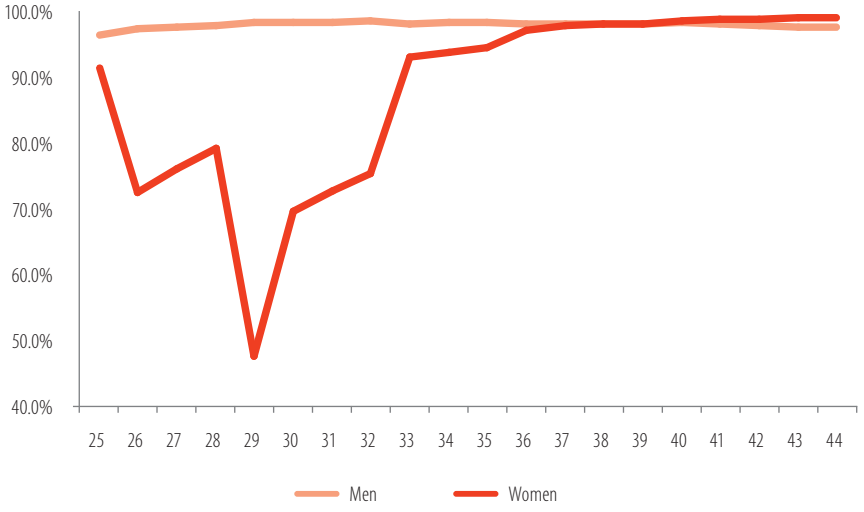
of an only child in this age bracket has similar chances of exiting employment as a childless female does. In contrast, mothers of at least two children where the youngest is 3 years old, face a 30-50 percent higher risk of leaving employment depending on the parity. Moreover, the risk of exiting paid work does not decline further with the age of the youngest child. This means that the risk of employment exit is significantly greater with a mother of at least two children than a childless female or a woman with one child.

While women experience considerable career interruptions due to parenthood, the probability of taking up a job among men increases steadily since education exit (Box III.3). This leads inevitably to the widening of the gender employment gap.

Box III.3. Male and female employment over the life cycle - case study.

Figure III.3 illustrates hypothetical probabilities of being in employment over the life cycle of males and females with similar socio-economic characteristics: both man and woman entered the labour market at the age of 25 as already married persons, with a degree in social sciences and no prior work experience. They live in a city of 50-100 thousand inhabitants in the Podlasie voivodeship (north eastern corner of Poland). Both have two children born when the mother/father were 26 and 29 years old respectively. Neither of them has experienced unemployment or inactivity due to illness or educational activities.

Figure III.17. Age-specific predicted probabilities of employment for a women and a man with similar socio-economic characteristics.



Notes: The graph shows hypothetical probability of employment, based on logit model estimates.
Source: Own calculations based on LFS data.

The graph clearly shows that having children in different measure influences the probability of employment for men and that of women. When children are born, the probability of employment increases slightly for men and sharply falls for women (at first from 91.5 pp to 72.7 pp, then it slightly rises and falls again to 47.72% at second birth). Interestingly, the probability of taking up a job for women exceeds that for men when they are over 39 years of age.

As shown in subsection 1.2, gender employment gap for persons aged 25-44 amounted to about 11 percentage points in 2008. The greater part of this gap (9.8 percentage points) can be explained by gender differences in characteristics relevant to employment opportunities (Table III.2). Due to their family responsibilities, women more often than men choose to exit the labour market (temporarily or permanently). Consequently, the fact of being economically inactive a year before the survey reduces women's relative chances of finding employment by 6.1 percentage points. What also adds to the gender employment gap is females' shorter average work experience.

It is worth noting that the disparity in employment opportunities for women and men is significantly higher in the childbearing age (25-34 years) than in the childrearing age (35-44 years). Moreover, in the latter age group the gender employment gap is to a lower extent caused by family responsibilities. This may result from the fact that it is usually women in the childbearing age that take such breaks.

Table III.2. Decomposition of the gender employment gap, Poland 2008.

	Decomposition estimates (percentage points)		
	Total	Aged 25–34	Aged 35–44
Overall gap, including:	11.26	15.08	6.12
Explained component	9.80	12.53	6.02
Unexplained component	1.46	2.55	0.10
	Selected elements of explained component		
Work experience	2.40 **	2.74 **	0.83 *
Work experience squared	–0.78 *	–0.71 *	0.33
Unemployment a year before the survey	1.01 **	0.95 **	1.08 **
Inactivity caused by education or training a year before the survey	0.47 **	0.78 **	0.04 **
Inactivity due to family responsibilities a year before the survey	6.10 **	7.50 **	3.32 **
Number of children aged 0–3	0.03	0.14 **	–0.11 **
Educational attainment	–1.07 **	–0.23	–1.36
Field of study	1.95 **	1.62 **	1.53 *

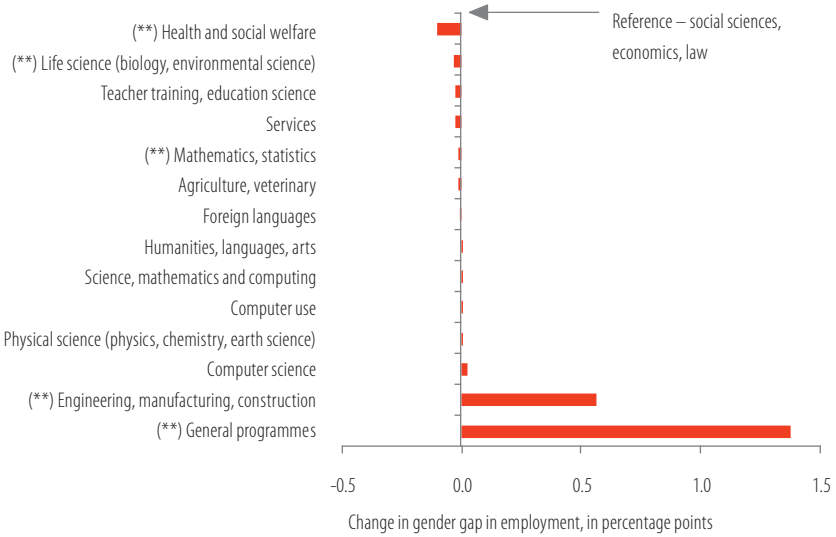
Notes: Decomposition of the gender employment gap was calculated using an extension of the Blinder-Oaxaca decomposition proposed by Fairlie (2005). The *educational attainment* and *field of study* variables show a compound impact of years in education and field of study. Moreover, the model includes the following variables: age, age squared, economic inactivity caused by disability a year before the survey, economic inactivity due to other reasons a year before the survey, number of children aged 3-6, number of children aged 6-10, number of children aged 10-15, number of children aged 15-18, place of residence (voivodeships), size of the place of residence, marital status.
**, * denote statistical significance at the 1- and 5 percentage level
Source: Own calculations based on LFS data.

Family obligations are only partly responsible for the gender employment gap. Lower employment of women may also arise from the fact that they are more vulnerable to unemployment and more often withdraw from the labour market to participate in educational programmes. However, the skills women acquire are less adequate to the needs of the labour market. In result, even though better educated than men, females have a lower chance of getting and maintaining a job (Box III.4).

Box III.4. Effects of the field of study on male and female employment prospects, Poland 2008.

Despite the fact that more Polish women obtain higher education than men, inadequate profile of qualifications reduces their relative chances of entering employment. Gender differences relating to the field of study have a stronger effect on women's relative chances of employment than gender differences in educational attainment. it is significant that more females complete general educational programmes, which lowers the relative probability of finding a job (resulting in an increase of the gender employment gap by 1.38 percentage points). At the same time, a relatively small proportion of women receives education in engineering, manufacturing processes or construction, i.e. occupations that increase the chances of finding a job (resulting in an increase of the employment gap by 0.56 pp).

Figure III.18. Impact of differences in probabilities of choosing specific fields of study on the employment gap between men and women, Poland 2008.



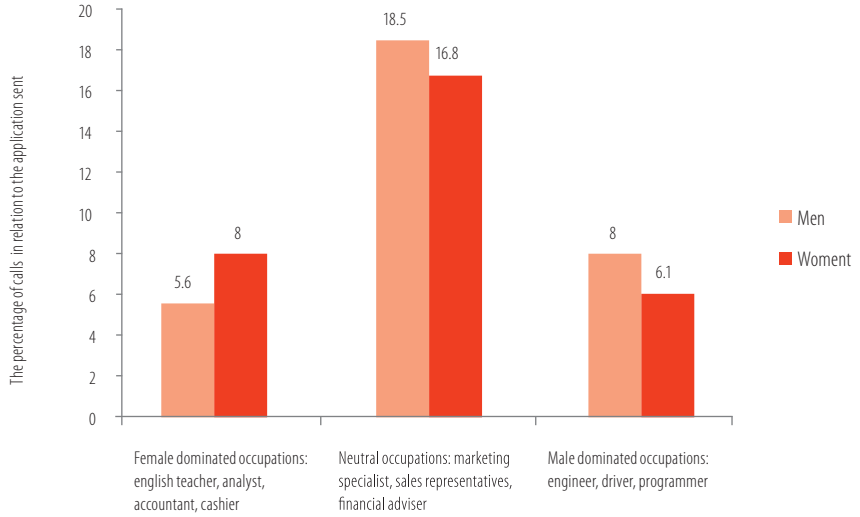
Notes: Selective results of a gender employment gap decomposition, calculated using an extension of the Blinder-Oaxaca decomposition proposed by Fairlie (2005) (see Note for Table III.2) ** – significance at 1 percent level.
Source: Own calculations based on LFS.

The gender employment gap caused by high female participation in general programmes and their under-representation in technical disciplines narrowed slightly due to the women's relatively high interest in health and welfare, natural sciences (biology, environment), mathematics and statistics. Nevertheless, the educational structure of women in Poland with respect to the field of study is still far less conducive to employment.

The above results identify parenthood as one of the major factors responsible for the gender employment gap. Lower employment opportunities of women, especially these in childbearing age and mothers of young children, may well arise from external factors, such as discrimination in employment or difficulties in combining work with childcare, as well as the internal ones, with mothers showing a higher propensity to withdraw from employment than childless women.

The experiment (using the CT method) described in Part II, did not provide any evidence for gender discrimination in employer responses to job applications in Poland. In other words, men and women were found to be equally frequently invited to job interviews. Nevertheless, it must be remembered that since the CT method takes account only of the first part of the recruitment process, the experiment itself cannot fully exclude the gender discrimination in employment. Moreover, the collected data seem to indicate that both genders show a slightly higher probability of being invited to an interview when they decide to apply for a job generally performed by persons of the same gender as theirs, i.e. women have greater chances in female- and males in male-dominated occupations.

Figure III.19. Response rate to a job application, by gender of the applicant and occupational groups, CT results, Poland 2009–2010 (percentage).



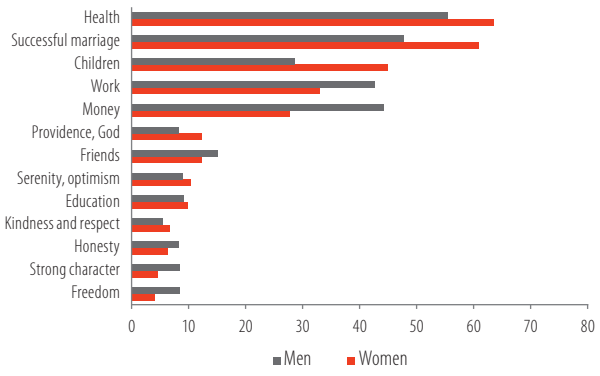
Note: A male or female dominated occupation is defined as an occupation in which more than 60 percent of employees are representatives of one gender. Over 800 job applications were sent for female-dominated occupations, 600 job applications for male-dominated occupations, and 600 for neutral ones.

Source: Own calculations based on CT experiment.

Despite the fact that having children lowers considerably the chances of women's employment, Matysiak (2009) shows that mothers are strongly determined to return to the labour market. Even though the likelihood of their entering employment is much lower as compared to childless women, they do not want to remain economically inactive. Matysiak (2009) also indicates that in spite of the important incompatibilities between fertility and economic activity, employment does not constitute a barrier but rather a precondition for having a child. The situation differs in many European countries, especially the southern ones, where working women are more likely to postpone childbearing and to refrain from subsequent births. In Poland, no significant differences in this respect are observed between employed and non-employed women. Work is an important determinant in deciding whether to have a child among women with higher education (Matysiak and Vignoli 2010).

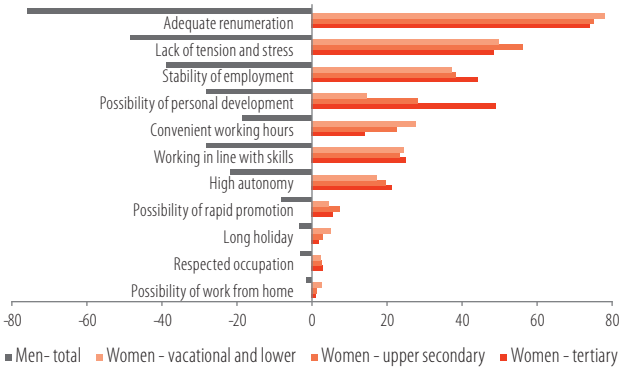
According to the data obtained from Social Diagnosis (2007), Polish men and women aged 20-35 indicate employment as the fourth most important determinant of a happy life. For females these determinants are: first – health, second – successful marriage, third – children, fourth – paid work, and fifth – money. Men's hierarchy of values is similar, with the only difference that money and work are valued more than children. For both men and women high interest in paid work may be primarily driven by material considerations. This could imply that further improvements in the standards of living of Poles may encourage women to give up their careers after childbirth. However, as Figure III.21 shows, women with tertiary education value work not only for financial reasons, but also for it being an opportunity for personal development and self-fulfillment. Given the recent educational boom in Poland, one may expect this career aspect to gain on importance, with an increasing number of women eager to combine work with family responsibilities.

Figure III.20. Determinants of a happy life, men and women aged 20-35, Poland 2007 (percentage).



Source: Calculations based on Social Diagnosis (2007) – Matysiak and Mynarska (2009).

Figure III.21. Most important aspects of professional career, women and men aged, Poland 2007 (percentage).



Source: Calculations based on Social Diagnosis (2007) – Matysiak and Mynarska (2009).

3. Occupational segregation

As shown in Section 1.1, significantly more women than men in Europe are employed in such NACE branches as education, human health and social work activities, as well as in trade and repair and services. Men, on the other hand, account for the vast majority of employees in manufacturing, construction, transportation as well as information and communication. These gender differences in employment by NACE sections imply that some occupations are typically female (female-dominated), typically male (male-dominated) or neutral. A high concentration of persons of one gender in different occupational groups is referred to as occupational segregation.

There are many explanations for the existence and persistence of gender occupational segregation. Some theories suggest that occupational segregation may be caused by gender differences in preferences or job-related skills. These differential characteristics (preferences and skills) may stem from either inborn qualities of individuals or from the socialization process. On the other hand, women may opt for occupations which are more compatible with childbearing and childrearing. As women may anticipate shorter and less continuous work lives than men, it is in their interest to choose professions which require smaller human capital investments and impose lower wage penalties for the time spent out of the labour market. These occupations may also offer shorter working hours or the possibility of working partially at home (e.g. in teaching), better opportunities for flexible working arrangements, lower risk of overtime work, or greater job stability (a general characteristic of professions associated with the public sector).

Occupational segregation may also result from the factors on the demand side of labour market. Because of imperfect and incomplete, statistical discrimination may arise when employers, coworkers or customers assume that women are on average less productive in "male" jobs. Employers may however have tasted for discrimination against the equally qualified women in the recruitment process, and/or promotion in traditionally male jobs.

Occupational segregation is most often measured by a segregation index, also called the Duncan index, which gives the percentage of women (or men) who would have to change profession for the occupational distribution of the two groups to be the same (Duncan and Duncan 1955). Figure III.21 shows that occupational segregation is predominant in all of the analysed countries. According to the ISSP (International Social Survey Program) data, the Duncan index in 2006 ranged from 40 percent (Denmark and Canada) to 60 percent (Latvia).

Figure III.22. Occupational segregation of men and women aged 20-54 in selected countries, 2001 and 2006 (percentage).

Note: Occupational segregation was analysed with the Duncan index providing information on how many employed women (or men) would have to change profession for the occupational segregation to be entirely eliminated.
Source: Own calculations based on ISSP data.

According to the LFS data (2008), the most male-dominated occupations in Poland include: armed forces, miners and construction workers, drivers and vehicle operators, workers and mechanics, foresters, fishermen, machine operators of mining and processing equipment. The female-dominated occupations are: cashiers, tellers and related clerks, marketing and customer service specialists, specialists of natural sciences and health care, education professionals, unskilled workers in trade and services, as well as models, salespersons and demonstrators (Table III.3). Interestingly, representatives of public authorities, senior officials, managers of large and medium-sized companies, i.e. occupational groups generally regarded as male-dominated, are not in fact dominated by men in Poland, at least not in the analysed age group.

Table III.3. Occupation-specific occupational segregation indices, Poland 2008.

Occupational group	over-representation of men (in percent)	over-representation of women (in percent)
Armed forces occupations	44.72	
Chief executives, senior officials and legislators		14.81
Managers of large and medium-sized organisations	9.29	
Managers of small organisations	6.64	
Physical, mathematical and engineering science professionals	27.60	
Life science and health professionals		39.30
Teaching professionals		34.62
Other professionals		17.55
Technicians and associate professionals	20.18	
Life science and health associate professionals		23.23
Teaching and associated professionals		13.60
Other associated professionals		12.30
Office clerks		12.29
Cashiers, tellers and related clerks		40.03
Personal and protective services workers		13.95
Models, salespersons and demonstrators		26.65
Market-oriented skilled agricultural workers		2.31
Market gardeners		5.22
Market-oriented skilled forestry, fishery and hunting workers	34.06	
Subsistence farmers and fishers		12.88
Miners and building trades workers	44.65	
Metal, machinery and related trades workers	41.53	
Precision, handicraft, printing, and related trade workers	1.91	
Other craft and related trades workers		1.79
Plant and machine operators and assemblers	31.85	
Machine operators and assemblers	11.72	
Drivers and mobile-plant operators	42.46	
Sales and services elementary occupations		27.29
Agricultural, fishery and related labourers	8.97	
Labourers in mining, construction, manufacturing and transport	5.47	

Note: Presented indices inform how many women (or men) employed in a specific occupation would have to change it for the occupational segregation to be entirely eliminated, but without affecting the total number of the employed in specific occupational groups.

Source: Own calculations based on LFS data.

The observed concentration of men and women in specific occupations does not present, however, the full mechanism governing occupational segregation. This phenomenon may be caused by three overlapping processes:

a. **educational segregation**, resulting from gender differences in fields and levels of study;
b. **increase in occupational segregation** based on gender, caused by the fact that men and women with similar qualifications (both with respect to fields and levels of study) find employment in male-dominated and female-dominated occupations respectively. This phenomenon occurs when e.g. a woman with an upper secondary education is employed as a sales assistant in a supermarket, while a man with equal qualifications takes up a job of a bus driver;
c. **decrease in occupational segregation**, which may result from two different phenomena. Firstly, a number of women and men with the same qualifications (with respect to fields and levels of study) find employment in male-dominated and female-dominated occupations respectively. For example, a female chemistry graduate may become a manager of a large cosmetics company, while her university colleague may start working as an expert in education. Secondly, occupational segregation is weakened when a number of women who have graduated from a female-dominated field of study and a number of men educated in male-dominated fields find employment in the same occupational groups. This is the case when e.g. a female linguistics graduate and a male physics graduate both find a job in marketing.

Borghans and Groot (1999) suggested to decompose the general index of occupational segregation into the abovementioned components. This method requires a transformation of the Duncan index into the one proposed by Karmel and Maclachlan (1988). The Karmel and Maclachlan index is equal to the total share of the employed that would have to change occupations for the gender occupational segregation to be entirely eliminated with the overall size of each occupational group remaining unchanged. This index is usually equal to approximately half the value of the Duncan index. Table III.4 presents the index values estimated using both methods.

Table III.4. Indices of gender occupational segregation, persons aged 25-44, Poland 2008.

	Duncan index (percentage)		
	Total	25–34 age group	35–44 age group
Duncan, Duncan (1955)	43.56	42.80	45.52
Karmel, Maclachlan (1988)	21.61	21.16	22.66
	Decomposition of the Karmel-Maclachlan index		
(a) educational segregation	22.58	22.71	23.09
(b) increase in occupational segregation	10.03	10.19	11.21
(c) decrease in occupational segregation	-11.01	-11.75	-11.64

Note: Borghans and Groot decomposition method is described in Appendix 2.
Source: Own calculations based on LFS data.

Over-representation of women in female- and men in male-dominated occupations respectively observed in the Polish labour market seems to be principally caused by supply factors, in particular by educational segregation (see Table III.4a). Usually men and women pursue education in different disciplines, which limits their occupational choices and causes occupational segregation. It is noteworthy that the immense impact of male and female educational decisions does not in itself imply that the gender employment discrimination does not exist. Reasons for the educational segregation remain unexplained. Should gender discrimination in employment really exist (which is partially suggested by our experiment, see Figure III.19), it may affect educational decisions of both genders. It is also possible that representatives of a given gender are more predisposed to work in professions traditionally dominated by that specific gender and therefore choose the corresponding fields of study. They are also automatically being more eagerly employed in these occupations.

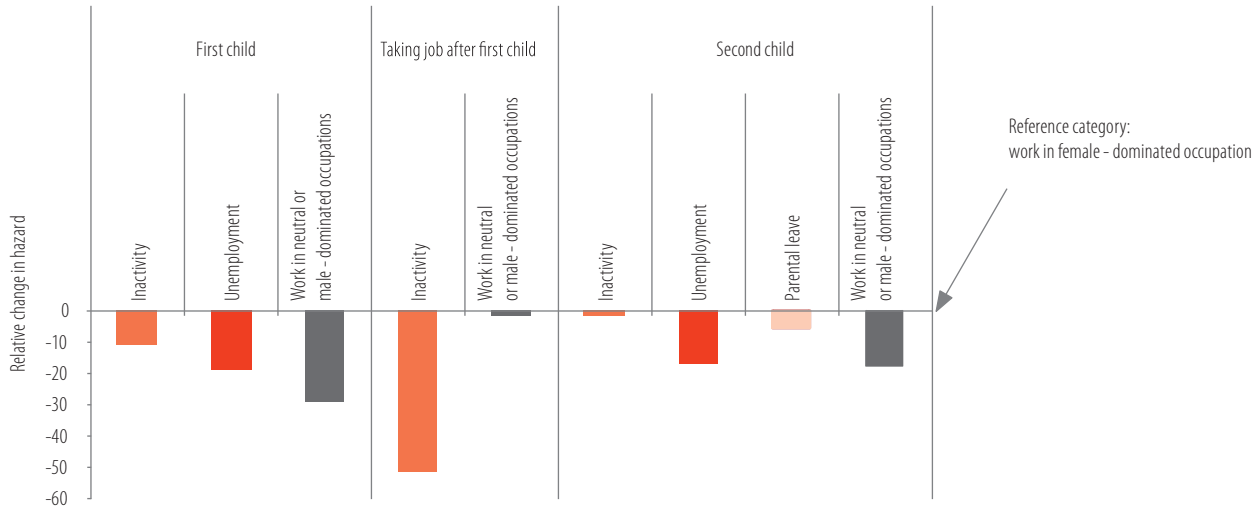
Educational segregation is, however, not the only factor explaining over-representation of genders in particular occupations. The phenomenon is to some extent also caused by the fact that a part of equally educated (with respect to the level and field of study) men and women find employment in male- and female-dominated occupations respectively (Figure III.4b). This mechanism confirms the existence of the classical occupational segregation based on gender. Hence there must be reasons why some occupations are more

attractive to men, while others are preferred by women, even if both genders have identical educational attainment in terms of the level and field of study. It is yet difficult to determine to what extent employing identically educated women in female-and men in male-dominated occupations is caused by obstacles faced by job seekers (demand factors) and to what extent it results from their own decisions (supply factors).

Interestingly, the effect of classical occupational segregation is fully neutralized, since some men and women with the same educational attainment (in terms of the level and field of study) find employment in professions dominated by the other gender (Chart III.4c). This suggests that in its classical form, occupational segregation does not constitute a serious problem in the Polish labour market, since it is offset by opposite processes. Thus, educational segregation seems to be the major cause of occupational segregation.

As already mentioned, one of the reasons for women to opt for female-dominated fields of study and professions may be the fact that these occupations offer much better chances of reconciling work and family life. In-depth analyses on retrospective data coming from the Education, Family and Employment Survey suggest that women employed in female-dominated occupations enter motherhood earlier and progress to the second child more quickly than their counterparts in male-dominated or neutral occupations[2] (Figure III.23). Interestingly, chances of returning to employment after the first childbirth do not vary across female-dominated, male-dominated and neutral occupations.

Figure III.23. Transition to the first and second child and transition to employment after the first childbirth by labour market status and occupational group at conception, Poland, female cohorts born in 1966-1981 (percentage).



Notes: The chart presents results of an intensity regression model estimated for women born in 1966-1981 (Method described in Appendix II).The results are standardised for age, educational attainment, social background, calendar year. Additionally, in the model for transition to second child they are standardized for the age of the first child and women's labour market position at first conception. The model for transition to work after childbirth is standardized for work experience prior to first childbirth and for the age of the first child. Occupations are classified as female-dominated if occupational segregation coefficients provided in Table III.3 exceed 10 percent in favour of women, and as male-dominated if they exceed 10 percent in favour of men.

Source: Own calculations based on "Professional, educational and family biographies".

These results can be interpreted in two ways. According to the first hypothesis, female-dominated occupations may indeed foster family formation and facilitate combining family and professional career. This is the case when these occupations generate relatively low opportunity costs of childbearing, such as loss of professional skills, loss of income, lack of promotion prospects or poor chances of employment reentry, but at the same time encourage mothers to return to work by offering good conditions to balance work and motherhood (e.g. shorter or more flexible working hours). On the other hand, it is also possible that male- and female-dominated occupations do not differ in opportunity costs of childbearing. This happens only if a relatively high intensity of transition from first to second birth observed among women working in female-dominated occupations follows a selection process: family-oriented women tend to choose female-dominated occupations more often because, for instance, they have skills useful in typically female jobs (e.g. care skills). Since one cannot exclude such a hypothesis, it is difficult to draw conclusions on the causal relationship between occupational choices and family formation on the basis of our analysis.

[2] Due to a low number of women employed in male-dominated occupations, the 'male-dominated occupations' category had to be merged with 'neutral occupations' in the sample.

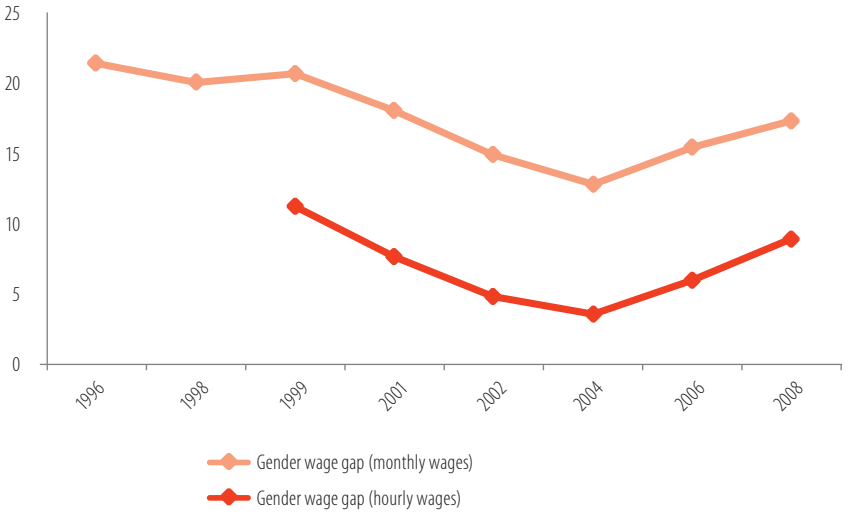
4. Wage differences between men and women

The analysis of the role of gender in the labor market would be incomplete if it did not include issues related to the wage distribution between both genders. It does not suffice to say that men earn on average higher wages than women without trying to understand the economic, social and cultural factors responsible for this situation.

Firstly, we must answer the question whether male and female subpopulations differ notably in terms of human capital and other wage determinants. Secondly, one should not a priori exclude the possibility that observed differences in wage distributions between genders are in a certain measure caused by wage discrimination against women. The term *discrimination* refers in this context to a situation when men and women of identical or equivalent individual and professional characteristics receive different wages[3]. Finally, wage differentials between men and women may be additionally aggravated by general inequality in wage distribution in a particular labour market or during a particular period. A more frequent position of women at lower levels of the wage distribution results in the increase in the differences between male and female earnings, in case the distribution further spreads in reaction to factors other than those already mentioned (see Blau, Kahn 1997).

The term *gender wage gap* has proved very useful to compare discrepancies in earnings offered to women and men in various labour markets or over different periods of time. Calculated in percentages, this statistic denotes the difference between average earnings in male and female subpopulations. The gender wage gap for 25-44 year olds in Poland is presented in Figure III.23. It illustrates the evolution of the gap in hourly wages in 1999-2008 and in monthly wages in 1996-2008. It can be observed that the gender gap in monthly wages is largely explained by differences in the working time. This conclusion is justified by the fact that throughout the entire analysed period the hourly wage gap was approximately 10 percentage points narrower than the monthly wage gap. Strong domination of females in the educational sector, where the average working time is relatively short, can serve as an explanation of this phenomenon (see MPiPS 2007)[4]. Nevertheless, even with working time differences taken into account, the gender wage gap is still evident in Poland – in the last decade it reached on average 7 percentage points. It is noteworthy, however, that differences in hourly wages earned by both genders in Poland are not greater than in many other EU-27 countries. As shown in Section 1.1, in 14 EU countries the differences in hourly pay offered to men and women are larger than in Poland (see Figure III.5).

Figure III.24. Gender wage gap for 25-44 year olds, Poland 1996-2008[5] (percentage).



Source: Own calculations based on Structure of Earnings Survey.

[3] It hast to be emphasized that the proposed definition of wage discrimination leaves aside the problem of employment discrimination (also limiting women's access to specific occupations) and factors leading to differences in human capital among males and females.
[4] Official teachers' working time provided by the Structure of Earnings Survey might not ideally reflect the time actually devoted to work in this profession. On the one hand, a part of teacher's work is carried out at home (and this time is not accounted for in the Structure of Earnings Survey), on the other – the number of working weeks during the year is on average lower than in other occupations.
[5] According to Eurostat, in 2008 the gender wage gap in Poland reached 14.3 percent. This value differs from the one presented in Figure III.24, since Eurostat calculates the gap for populations of workers aged 15-64, excluding those employed in public administration.

Table III.5. Evolution of the gender gap in hourly wages, Poland 1999-2008.

Wage gap	1999-2004	2004-2008
At the beginning of the analysed period (%)	11.22	3.51
At the end of the analysed period (%)	3.51	8.92
Difference in wage gaps, with respect to (percentage points):	-7.72	5.42
Changes in the level of human capital and other observable wage determinants	-5.11	0.33
Changes in the returns to human capital and other observable wage determinants	-0.21	2.68
Changes in the level of unobservable wage determinants or wage discrimination	-2.77	1.62
Changes in the "inequality of wage distribution"	0.38	0.79

Note: Changes in the gender wage gap were decomposed into four factors according to the Juhn-Murphy-Pierce decomposition method (see Appendix 2). Other wage determinants include: age, place of residence (voivodeship) sector of the economy, occupation, workplace size.
Source: Own calculations based Structure of Earnings Survey.

Between 1996 and 2008, the gender wage gap in Poland narrowed during the economic slowdown and showed an upward trend in the period of economic recovery. In 1999, women's hourly wages were on average 11.2 percent lower than men's. In 2004, when economic slowdown of 2001-2003 was already over, the gap narrowed significantly reaching 3.5 percentage points, only to tick up again to 8.9 percentage points later in the economic boom of 2005-2008. This proves that gender wage gap is procyclical which has also been observed in other countries (see Park, Shin 2005). The gap narrowed in 1999-2004 mainly due to a relative improvement in women's human capital and other observable wage determinants (such as age, place of residence (voivodeship), workplace size, sector of the economy) as well as a relative improvement in unobservable factors determining wages of females (e.g. career attitude). Another reason may be a potential decrease in gender wage discrimination (see Table III.5). The situation changed after 2004, when the Polish economy started recovering. The relative increase in women's human capital was completely stopped and either wage discrimination strengthened or unobservable determinants of women's wages deteriorated. Moreover, in 2004-2008 employers offered an ever lower remuneration for those components of human capital and other wage determinants that were relatively more characteristic of women than of men. This can, but does not have to, be a kind of indirect discrimination against women or an effect of a possibly greater propensity of wages in masculine occupations to follow the business cycle pattern (see Park, Shin 2005).

Regardless of their educational attainment, women in Poland generally earn less than men. Gender wage gap in hourly earnings (Figure III.26) is the smallest for people with tertiary education, then slightly larger for those with upper secondary and primary education, and the largest for people with only vocational education (secondary level). Moreover, each of the selected educational groups shows a trend characteristic of the entire population – the wage gap narrowed in 1999-2004, only to expand again in 2004-2008. It is noteworthy that the gender wage gap in each educational group largely exceeds the value of the gap for the entire population in selected periods. It results from a high representation of women among individuals with tertiary and upper secondary education and large representation of men in the group with vocational education (which guarantees on average lower wages than tertiary or upper secondary education) in the total number of workers.

What are the reasons for wage disparities between men and women in Poland? Do they result from gender differences in human capital possession (including components other than educational attainment), or are they an effect of occupational segregation, or maybe wage discrimination? To answer these questions we employ the Blinder-Oaxaca decomposition method (Blinder 1973, Oaxaca 1973) to decompose the gender wage gap into two separate components:

a. **explained component**, which is an estimate of the effect of gender disparities in average human capital and other wage determinants on the gender wage gap,
b. **unexplained component**, reflecting gender differences in returns to human capital and other wage determinants; originally the unexplained component was interpreted as part of the wage gap that may be due to discrimination, but it in fact accounts for both potential wage discrimination and gender disparities in other unobserved wage determinants.

Box III.5. Gender wage differentials in various age groups.

The gender wage gap in Poland is wider among people of childbearing age (35-44) than among those in childrearing age (25-34). This difference was stable across the entire analysed period. For instance, in 2008 the gender gap in hourly earnings equaled 8.2 percent for the younger age group, and 11.1 percent in the older one (Figure III.24).

Figure III.25. Gender gap in hourly earnings for 25-34 and 35-44 age groups, Poland 1999, 2004 and 2008 (percentage).

Source: Own calculations based on Structure of Earnings Survey.

Table III.6. Gender wage gap in hourly earnings among 25-34 year olds and 35-44 year olds, Poland 2008.

Wage gap	Value
In the 25-34 age group (%)	8.24
In the 35-44 age group (%)	11.06
Difference in wage gaps, with respect to (percentage points):	2.82
Changes in the level of human capital and other observable wage determinants	4.02
Changes in the returns to human capital and other observable wage determinants	-1.56
Changes in the level of unobservable wage determinants or wage discrimination	0.20
Changes in the "inequality of wage distribution"	0.17

Note: Changes in the gender wage gap were decomposed into four factors according to the Juhn-Murphy-Pierce decomposition method (see Appendix 2). Other wage determinants include: age, place of residence (voivodeship) sector of the economy, occupation, workplace size.
Source: Own calculations based on Structure of Earnings Survey.

The gender wage gap remained wider among people aged 35-44 than among 25-34 year olds, mainly because women in the older age group are equipped with less profitable components of human capital and other characteristics crucial from the perspective of wage formation (e.g. employment sector, job position), see Table III.6. However, this effect is mitigated by the fact that employers offer higher wages for human capital components and other wage determinants possessed mainly by women in the 35-44 age group, but not in the younger one. Were it not for this regularity, the wage gap among people in childrearing age would be over 4 percentage points higher than among the ones in childbearing age.

It is hard to point exactly to the reasons why human capital resources of working men and women in the 35-44 age group are more differentiated than among the 25-34 year olds. One of the possible explanations might be the breaks in professional career because of childcare. Experienced more often by females in childbearing age, this factor depreciates one's human capital as compared to somebody who continued their economic activity. Yet another reason involves employers choosing women with the highest qualifications and motivation among individuals in childrearing age i.e,. when women's economic activity is lower.

Figure III.26. Gender gap in hourly wages by educational attainment, Poland 1999, 2004 and 2008 (percentage).

Source: Own calculations based on Structure of Earnings Survey.

Table III.7. Determinants of the hourly gender wage gap for people aged 25-44, Poland 1999, 2004 and 2008.

	Estimates of the gender wage gap		
	1999	2004	2008
Gender wage gap, including:	11.22 **	3.51 **	8.92 **
explained component	-5.31 **	-12.08 **	-9.18 **
unexplained component	16.53 **	15.59 **	18.10 **
	Decomposition of the explained component		
workplace size	1.36 **	0.30	-0.03
work experience	-0.24 **	-0.32 **	0.04
age	0.11 **	-0.24 **	-0.19 **
sector of the economy	-0.37	-0.82 **	-1.53 **
place of residence (voiveodship)	0.05	0.14	0.14
highest educational level attained	-6.66 **	-7.52 **	-6.78 **
occupation	-6.25 **	-7.92 **	-6.18 **
section of the economy	6.68 **	4.30 **	5.36 **
	Decomposition of the unexplained component		
workplace size	-0.36	2.10 **	0.76 *
work experience	-2.51 *	-1.00	-0.63
age	33.19 **	26.31 **	-0.59
sector of the economy	-2.39 **	-1.18	1.63
place of residence (voivodeship)	0.91 **	0.34	0.63 *
highest educational level attained	0.90	0.96	-0.59
occupation	-1.61 **	-2.68 **	1.26
section of the economy	0.90	-0.47	-3.73 **
intercept	-12.50	-8.81	19.36 *

Notes: **, * denote the significance level at 0.01 and 0.05 respectively. "Age" shows the compound impact of "age" and "age squared" variables and so does "work experience". "Place of residence (voivodeship)", "highest educational level attained", "occupation", and "section of the economy" show the compound impact of place of residence (voivodeship), education, occupation and section of the economy variables. Decomposition was calculated following the Blinder-Oaxaca method (see Appendix 2).

Source: Own calculations based on Structure of Earnings Survey.

Table III.7 shows that in all analysed years (1999, 2004 and 2008) the unexplained component exceeded the value of the wage gap itself (Table III.7). Such outcomes suggest that the gender wage gap cannot be accurately explained by the gender differentiation of human capital and other observed wage determinants such as age, voivodeship, workplace size, sector and section of the economy. If in analysed years men and women had been characterised by identical average educational attainment, identical average work experience, identical average age, had been employed at companies of identical average size, had been equally likely to work in particular sectors of the economy, and their proportion among inhabitants of all voivodeships had been the same, the gender wage gap would still have reached 16.5 percent in 1999, 15.6 percent in 2004 and 18.1 percent in 2008, i.e. in all cases it would have exceeded the actual values. This means that should there be no wage discrimination in the Polish labour market and males and females should not be differentiated in any other way than assumed in the econometric model, women's average wages would be higher than men's (by 5.3 percent in 1999, 12.1 percent in 2004 and 9.2 percent in 2008).

So does wage discrimination against women have a strong bearing on the gender wage gap in Poland? As already shown, there is no definitive answer to this question. It is possible that some essential wage determinants (favourable for men) have not been accounted for in the above decomposition (being impossible due to limitations of the available data set). However, the magnitude of the unexplained component is excessive compared to the gender wage gap in all analysed years, which seems to support the claim that to a certain, but unknown extent, wage discrimination against women is indeed present in the Polish labour market.

The magnitude of the explained component in all analysed periods was in a large measure determined by educational attainment, occupation and section of the economy. Higher average educational attainment of women narrows the gender wage gap even by 6.7-7.5 percentage points, depending on the analysed year. Men are relatively more frequently employed in those sections of the economy, which offer higher wages, while women follow occupations offering higher hourly earnings. It must be stressed, however, that the latter effect does not hold for analyses of monthly wages. The most viable reason of such a situation is high representation of women in occupations providing relatively low monthly and at the same time relatively high hourly earnings (especially in the teaching profession, which is highly dominated by women and offers a relatively small number of official working hours). Additionally, the fact that females are relatively more frequently employed in the public sector narrows the gender wage gap, this impact being relatively stable in time. As has been pointed out in the previous edition of Employment in Poland (MPiPS 2007), the public sector guarantees higher average wages to people with upper or lower secondary education (Magda and Szydłowski 2007), thus diminishing the discussed disparity by 0.8-1.5 percentage points in 2004-2008 (in 1999 this effect was statistically insignificant).

Comparison of the structure of the unexplained component in analysed periods yields surprising results. It seems that in 1999 and 2004 men and women gained different returns to age, and the scale of this phenomenon was unprecedented. Such a situation might point to wage discrimination against women on the grounds of age. Amazingly enough, by 2008 the effect was no longer discernible. The problem is discussed in greater detail in Part II.

Box III.4. Impact of the occupational segregation on the gender wage gap.

The data presented in Table III.7 allow to assess the impact of the occupational segregation on the gender wage gap. Necessary information is provided by two elements of the explained component – occupation and section of the economy; and two corresponding elements of the unexplained component. On the one hand, women are less frequently employed in sections of the economy offering higher hourly wages, which expands the gender wage gap by 4.3-6.7 percentage points, depending on the analysed year. On the other, women frequently choose occupations offering higher hourly wages, which translates into the narrowing of the gender wage gap by 6.2-7.9 percentage points. The effect might be explained by the high representation of females in occupations with relatively low monthly wages and, at the same time, relatively high hourly wages (especially in the teaching profession, which is highly dominated by women).

At the same time, over the years 1999 and 2004 the gender wage gap was significantly diminishing as employment in occupations offering higher wages more effectively increased women's wages than men's. A similar phenomenon was observed for the employment sectios in 2008. In general, the overall impact of the occupational segregation on the gender wage gap is complex. It might be the case that the impact of employment in specific occupations and specific sections of the economy on male and female wages offset one another.

5. Institutional and cultural context of men's and women's labour force participation

Previous sections pointed out clear differences in the relative situation of men and women in the Polish labour market. Although females of childbearing and childrearing age are strongly determined to participate in the labour market, their chances of obtaining and sustaining employment are lower than men's. Moreover, despite their higher average educational attainment, women earn lower average wages than men. One of the major reasons for this situation is the division of family responsibilities existing in Poland. Women more often experience employment breaks, which reduces their future chances of finding and holding on to a job, and limits earning opportunities. Likewise, assigning women to the role of caregivers, might also be a source of wage discrimination and educational segregation in Poland.

What can be therefore expected is that creating better conditions for reconciling careers with family life and partially relieving women of their care duties might significantly improve their labour market position without preventing them from realizing fertility intentions. In this section we discuss the key policy measures aimed at easing the conflict between motherhood and market work. Other aspects such as child's emotional and cognitive development are also considered. It is against this background that we present the Polish institutional and cultural context, in which individuals decide whether to have children and undertake both parenthood and economic activity at the same time. Finally, we discuss recommendations for future reforms.

5.1. Which institutional solutions can help reduce the gender gap in labour market performance?

With the aim to reduce gender disparities in the labour market, a whole array of institutional solutions have been developed supporting parents in a successful work and family reconciliation. These are mainly family policies (childcare institutions, maternity and parental leaves) or labour market policies (flexible working hours and removal of barriers to the labour market entry). Other solutions include campaigns promoting gender equality and anti-discrimination policies aimed at improving gender equality in employment and childcare.

Childcare services

Childcare services may be organised and financed in different ways. They may be provided by independent childcarers or by specialised childcare institutions; they may be either offered in the market, or financed by the state or employers. Analyses of childcare services most often emphasize their costs for parents, availability (based on the number of available places per 1000 children in a particular age) and opening hours. Empirical research clearly shows that in general an easy access to inexpensive childcare services facilitates women's return to employment after childbirth (Leibowitz et al. 1992, Ribar 1992, Kimmel 1995, Powell 1998, Gustafsson and Stafford 1992, Rønsen and Sundström 2002, Del Boca 2002).

Another important aspect of childcare system is the quality of the services offered, a factor which affects both parent's childcare decisions and children's cognitive and social development. Childcare quality is measured by the number of children per employed staff, size of groups (both in nursery and kindergarten), carers' education and staff turnover rate (Blau and Currie 2006). Integration of institutional care with pre-school education into one comprehensive system also plays an important role (OECD 2006). This type of solution may bring benefits at the macro-level, such as the increase in female employment, higher tax revenues, reduction in poverty among families with young children, as well as improvement in social cohesion (OECD 2006, Lynch 2004). Centers offering both care and education are especially beneficial for children brought up in families with low educational attainment and social capital.

The state may increase availability of childcare services by: financing and organising specialised institutions, encouraging employers to establish childcare centers at workplaces or organising and subsidising care provided at home. Empirical research shows that quality of childcare services tends to be higher in countries with a well formulated, relevant policy, than in those relying only on market forces (Esping-Andersen et al. 2002: 75, Lewis and Giullari 2005: 96). In the former countries, public funding is often accompanied by a system of accrediting childcare providers, while in the latter, where the system is underdeveloped, care may be provided by unqualified individuals without employment contract and/or insurance.

France can serve as an example of a country with a conscious long-term policy in this area. A broad range of childcare services provided in France has been adjusted to various needs of working parents and children in all ages (see Box III.7). What is crucial is that employers are also engaged in arranging childcare services e.g. by creating childcare centers at workplaces and co-financing childcare in external care institutions. In 2003, France enforced an act allowing employers to deduct up to 60 percent of the cost of running childcare centres from taxes. By giving employees a possibility to reconcile work with care, employers benefit from lower absence and turnover rates.

Box III.7. Case study: availability and variety of childcare services in France.

France can serve as an example of a country with a conscious long-term policy concerning childcare, offering a wide variety of childcare services:

- **children 0-1**: public nurseries (crèches collectives); accredited services of private or communal nurseries (crèches parentales) – parents using such services may benefit from tax exemptions; nurseries at workplaces (crèches d'entreprise); family nurseries (crèches familiales), in which children are looked after by accredited carers (assistantes maternelles);
- **children 1-3**: care centres open 10-12 hours a day (approximately 21.5 percent of young children are enrolled to these institutions); home kindergartens, (haltes-garderies) – care centers allowing to leave a child for a few hours;
- **children 2.5-5**: free care offered in the so-called écoles maternelles; although not obligatory, they are attended by almost all children aged 3-4. Apart from care, écoles maternelles offer a form of early education for children in pre-school age. Classes are based on curricula approved at the State level and assure proper child development, simultaneously preparing them for primary education;
- **children 6-11**: primary school (école élementaire): schools are open 6 days a week from 9:00-5:00 with an hourly lunch break. Classes do not take place on Wednesday and Saturday afternoons. Day care facilities are available for children before the school opening hours, as well as after classes.

The French system ensures a great diversity, imposes accreditation requirements and controls the quality of services. As a result, parents of young children may use care services to the extent and in a form that best suits their demand depending on age, development and individual needs of their child.

Source: OECD (2006).

Although the role of childcare services has been thoroughly discussed in the EU, the after-school care has not been given much attention. All this despite the fact that classes in primary schools finish much earlier than kindergartens close. Hence the conflict between professional career and childrearing intensifies suddenly as children reach the school age. Only some EU countries (e.g. Denmark, see Box III.8) developed a system of day care facilities for children in school age (6-10) (see OECD 2006) However, even if such a system is in place, it is usually organised around providing care to children before and after classes, without offering additional curricula. This should be pitied, as such a solution would give children chances for a better development and equal educational opportunities to the ones from different social groups.

Box III.8. Case study: day care facilities in Denmark.

In Denmark children in school age (6-10) are looked after at 'Fritidshjemmet' (after-school leisure time facilities). These facilities are mostly located within primary schools. Since young children finish classes early in the afternoon, they can stay at the facilities until 5.30 PM. Parents whose children attend day care facilities pay fees dependent on their family income. OECD (2006) reports that such institutions are used by 81 percent of children aged 6-9.

Danish day care facilities for children in school age offer mostly safe leisure time attractions. Recent reforms, however, require that they also offer help with homework and set framework for cooperation with other institutions providing early care and education, such as primary schools, sport clubs or music schools.

Source: Cederberg and Lingärde (2008); OECD (2006).

Maternity and parental leaves

Maternity leaves offer young mothers conditions for biological regeneration after childbirth, whereas parental leaves enable parents to look after their young children on their own. Maternity and parental leaves are available for both mothers and fathers, but are more commonly used by women.

In general, taking a leave from work by parents is conducive to children's health and lowers accident rate among young children (Ruhm 2000, Tanaka 2005). On the other hand, leaves may have a negative influence on the future employment prospects of a parent. Empirical research on the impact of leaves on labour supply points to the fact that 17-18 week-long leaves after childbirth (equal to most maternity leaves in European countries) do not affect women's labour market participation. If mothers were deprived of such leaves, they would resort to unpaid leaves of similar duration with the employer's consent (Baker and Milligan 2005). The impact of child care leaves on labour supply is more complex. It is believed that well-paid but short leaves exert a positive effect on labour market

participation. They do not affect parent's human capital, at the same time increasing women's attachment to the labour market for two reasons. Firstly, they encourage females to commence employment before having children. This is of essential importance when such allowances are dependent on previous work tenure (Baker and Milligan 2005). Secondly, well-paid and short parental leaves might also shorten the time spent out of the labour market – once they are over women can return to their workplace immediately. Mothers not entitled to this type of leave remain outside the labour market not only during the period of childcare, but also later, when searching for a job. Empirical research conducted in the USA, where maternity leaves were introduced only in the 1990s and where employers could decide whether to offer a pregnant women an unpaid leave or not, shows that females who were entitled such a possibility returned to work much sooner than the ones who had to give up their jobs (Berger and Waldfogel 2004, Klerman and Leibowitz 1999, Waldfogel, Higuchi and Abe 1999). The authors of the research highlight, however, that the positive effect of leaves could be a mere statistical artifact. There is a chance that women planning to form a family and reconcile it with professional work choose employers who do not discriminate against young mothers and offer both - leave programmes and the chance to come back to work after childbirth.

It must be pointed out, however, that excessively long parental leaves have a clearly negative influence on parents' future employment prospects (Rønsen and Sundström 2002, Jaumotte 2003) and earnings (Albrecht et al. 1999, Beblo and Wolf 2002). Long leaves cause significant loss in human capital, which is crucial especially in the era of rapid technological development requiring individuals to continuously improve their skills. Special policies have been developed in order to counteract the negative effects of long parental leaves on parents' employment prospects. These are: (1) training for employees on a leave, (2) possibility to use the leave in smaller parts, (3) opportunity to work part time during the leave.

Parental leave is predominantly used by females, although it is usually available to both parents (since 1996 both mothers and fathers in the EU countries are entitled to at least three months of unpaid leave). To counter gender disparities in the labour market and give fathers equal right to look after their children, more and more governments have decided to introduce paternity leaves (as fathers may be less inclined to use leaves traditionally assigned to women). The idea was first implemented in Scandinavia, where in the mid-1990s rights to parental leaves were individualised and fathers were granted a special monthly leave, designed exclusively for them and not transferable to mothers. What is more, fathers were also granted relatively high replacement rates at 80-90% of their previous earnings to avoid the situations when they resign from their right to a parental leave for financial reasons.

In the recent years, leave entitlements have been individualised also in other countries. In 2001, fathers were granted a three-month paternity leave in Slovenia and in 2007 an analogical two-month leave was introduced in Germany. In other European countries paternity leaves last 1-2 weeks, but the offered replacement rates differ. In practice, fathers eagerly resort to special paternity leaves as opposed to leaves available to both mothers and fathers. Following the individualisation of leave entitlements in Norway, more males entitled to the leave actually decided to use it. As a result, the rate of fathers taking the leave soared from 5 to 85 percent over eight years (Lappegard 2008). Similar raise was observed in Sweden (Sundström and Duvander 2002). Men markedly more often decide to take the leave if they can count on higher replacement rates. In countries with high replacement rates (over 50 percent), the rate of fathers taking advantage of leaves is higher and reaches 70 percent (O'Brien 2009).

Despite the increasing popularity of paternity leaves, the solution itself is relatively new. Hence a small number of empirical studies explores the consequences of paternity leaves for female position in the labour market. Empirical research conducted for Scandinavian countries indicates that paternity leaves are more often used by men whose partners are employed. Such a trend may exert positive effects on female employment in the macro-context (Sundström and Duvander 2002, Lappegard 2008). Duvander et al. (2006) proved that couples in which the father decided to go on paternity leave are more likely to have another child. However, as the authors point out, this result may not necessarily be a direct positive impact of men's choice on women's fertility decision, but may well be a selection effect of family oriented fathers into paternity leaves. Finally, it was shown that once the leave is over, fathers who spent some time on a leave with a child to a larger extent participate in household duties (Haas and Hwang 1999, Brandth and Kvande 2009).

Part-time work and flexible working hours

Numerous European countries focused on developing part-time work, counting on the positive impact of this form of employment on women's integration in the labour market. A particularly high part-time employment rate, especially with respect to mothers of young children, has been observed in the Netherlands, the UK and Germany. Undoubtedly, favourable opportunities of working reduced hours fostered women's labour supply in many Western European countries (Del Boca 2002, Jaumotte 2003, Aaberge et al. 2005). However, an increasing number of researchers argue that this form of employment pushes females to the inferior segments of the labour market. It appears that part-time workers often receive lower average hourly wages, have a more difficult access to training and face a higher risk of job loss (see OECD 1999, Ermisch and Wright 1993, Connolly and Gregory 2005). Research carried out in the UK and Western Germany showed that part-time employment hardly ever is a stepping stone to full-time employment, mostly ending either in persistent part-time work or unemployment (Connolly and Gregory 2005, O'Reilly and Bothfeld 2002). Interestingly, it has been proved that part-time work does not necessarily facilitate childbearing. Del Boca et al. (2009) suggested that only high quality part-time jobs (i.e. stable, with hourly wage rates comparable to those offered to full-time workers, entitling to social insurance) might actually encourage women's decision to have a child.

Another frequently suggested solution aimed at reconciliation of work and care involves stimulating flexible working hours, i.e. allowing workers to start and finish work at different hours and even to work at home. The relationship between flexible working hours and the incongruities between professional career and family among hired workers has been hardly studied though. At the same time, a range of studies were devoted to the female self-employment and its relationship with childrearing, with the idea that the self-employed enjoy a better control over their time than hired workers. Research conducted in the USA shows that mothers of young children indeed tend to set up their own companies relatively frequently (Boden 1999, Hundley 2000, Wellington 2006). In contrast, a study conducted by Hildebrand and Williams (2003) indicates that only in two out of eleven analysed EU countries mothers running their own businesses devote more time to childcare than hired women. It is therefore difficult to definitely state whether stimulating female self-employment can indeed partially solve the problem of balancing work with family life and increase women's participation in the labour market. It is most probably dependent on legal regulations governing the labour market and running one's own business in specific countries, as well as on women's professional qualifications and aspirations.

Social norms and anti-discrimination policies

Social norms defining men's and women's professional and childcare responsibilities play an important role in the actual division of these duties, thus influencing women's position in the labour market. On the basis of the ISSP1994 data, de Laat and Sevilla Sanz (2006) created an egalitarian index for eleven OECD countries referring to opinions on division of household duties. Outcomes of the study indicate that women living in more "egalitarian" countries are more inclined to work professionally and have children. Algan and Cahuc (2006) reached similar conclusions working on the data from the World Value Survey. It is noteworthy, however, that the relationship between "egalitarian" social norms and female employment yielded by the two studies is not necessarily causal.

In general, social norms change very slowly and any attempts to change them too rapidly are usually unsuccessful and spur controversy. There are nevertheless instruments like social debates or campaigns that may influence social attitudes. Moreover, public policy can stimulate solutions improving gender equality by individualising rights to parental leaves or implementing anti-discrimination mechanisms guaranteeing equal access to education and employment, as well as equal wages. Declaring discrimination illegal might challenge social mentality and change the way firms make decisions regarding personal policy. Further positive effects of anti-discrimination policies may be observed in the realm of women's educational and professional choices by assuring that they are legally protected against discrimination, even if they choose "typically male" disciplines (Pissarides et al. 2005).

The first anti-discrimination laws were introduced in the 1960s and 1970s in Europe and the US. Their efficiency was hardly ever empirically tested. Among available studies we can point to Beller (1992) who showed that regulations introduced in 1964 banning discrimination in the USA led to a reduction in the wage gap and weakened occupational segregation among men and women in 1967-1974. Zabalza and Tzannatos (1985) proved that the anti-discrimination law introduced in the 1970's in the UK had a positive impact on wages and female employment. However, these studies should be interpreted with care, as it is difficult to isolate the effect of the introduced laws from other mechanisms in the labour market (Chiplin and Sloane 1988).

Income policies

Apart from policies stimulating female labour supply, we can also distinguish policies that discourage women from economic activity. Such are effects of some tax systems characterised by high marginal effective tax rates. They impose a surprisingly high tax burden on couples with two employed partners, as compared to couples with only one working spouse. These systems often grant tax allowances for a non-employed partner and allow joint taxation. Marginal effective tax rates are also generated by social benefit systems based on means-testing. In such systems social benefits are withdrawn once the couple's income exceeds a certain threshold, which may discourage women from entering employment. Negative effect of marginal effective tax rates on economic activity was proved in many empirical studies (Gurgand and Margolis 2005 for France; Hoynes and MaCurdy 1994 for the US; Schneider and Uhlendorf 2004 for Germany).

Right *policy-mix*

Empirical research points to a relatively high effectiveness of policy measures aimed at combining professional life with care in order to increase female employment. It is noteworthy, however, that implementing policies which are poorly integrated with the entire social policy system must not necessarily end in success. For example, shortening parental leaves may bring limited effects in a country with poor access to childcare services. On the other hand, investing in the development of care institutions might not give expected results in a country with high marginal effective tax rates. Discussions on institutional solutions directed at increasing female employment should be focused on implementing coherent welfare, employment and tax policies, i.e. a proper *policy-mix*, aimed at equalising men's and women's opportunities in the labour market and in performing care responsibilities.

Table III.8. The proper *policy-mix*.

<table>
<tr>
<td>Institutional child care
• A wide range of services adjusted to the needs of children of all ages (e.g. care provided by qualified carers at home, developing care centres at workplaces and public child care facilities);
• Available for the youngest children (below 3), at pre-school age and early school age;
• Long and flexible opening hours, adjusted to parent's working hours;
• Parents do not incur excessive costs for childcare services;
• High quality of services provided, special attention to children's emotional and cognitive development</td>
<td>Parental leaves
• Short;
• Benefits received by parents on a leave dependent on earnings before the leave; leaves are well paid and benefits are universal, not selective;
• Flexibility of leaves – leaves may be taken in parts, possibility of part-time work on a leave with full entitlement to parental benefit;
• Individualised entitlement to a leave – introducing paternity leaves; high replacement rate of benefits.</td>
</tr>
<tr>
<td>Part-time work
• May be helpful to parents with young children;
• Part-time work should not discriminate with respect to access to social security, training etc.</td>
<td rowspan="2">Social norms and anti-discrimination policies
• Anti-discrimination policies banning gender discrimination with respect to wages, access to education, employment and promotion;
• Social campaigns informing on rights that both genders enjoy in the labour market, including parental rights;
• Social campaigns promoting a fair division of child care duties between parents.</td>
</tr>
<tr>
<td>Income policy
• Social benefits and tax system yielding low marginal effective tax rates.</td>
</tr>
</table>

Source: Own calculation.

The importance of the right policy-mix is clearly visible when analysing cross-country differences in public policies, women's employment and fertility rates. As shown in Section 1.1 of this Part, high female employment does not have to be accompanied by low fertility rate. On the contrary, since the mid-1980s the cross-country correlation between these two variables has been positive (Figure III.7 and Figure III.8). It seems that high female employment coexists with high fertility in countries where parenthood does not conflict strongly with occupational obligations. This pertains to the Nordic countries, France and Belgium which have invested in the development of institutional childcare a long time ago. Additionally, the policies in the Nordic countries were designed and implemented with the idea of ensuring gender equality. Parental leaves in those countries are short and benefits paid to parents on such leaves strictly depend on wages earned before the leave. This kind of solution aims at encouraging women to enter employment before childbirth. The Nordic countries also pioneered in introducing individualised entitlements to social benefits aimed at reducing marginal effective tax rates, as well as individualised entitlements to parental leaves. The proportion of fathers making use of their rights to parental leaves is thus the highest in this region of Europe and mothers' employment is socially accepted.

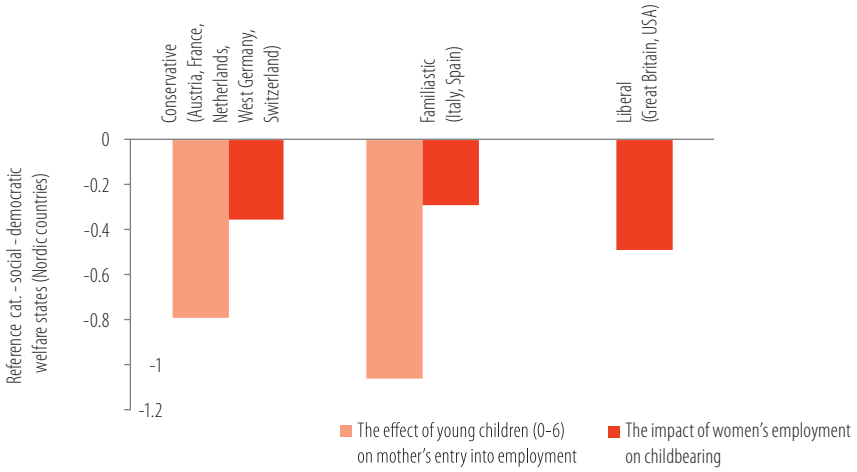
An entirely different family policy model was developed in Germany and Austria. However, it should be mentioned that recently governments of the two countries have launched far-reaching reforms in this field. Even so, Germany and Austria are still characterised by poor childcare provision, particularly for the youngest children. Opening hours of care centers are rigid and short, which hinders full-time employment of parents. Germany and Austria are also well known for high marginal tax rates and a relatively traditional perception of gender roles. Until recently, both countries offered lengthy and low paid parental leaves. Female employment in Germany and Austria is lower than in the Nordic countries, but keeps growing. The Total Fertility Rate, on the other hand, remains at a low level of 1.3-1.4 children per women in childbearing age.

The worst situation was observed in Southern Europe, where access to care centres is poor and working hours fixed. Additionally, dual labour market in those countries is characterised by strong barriers to employment entry. Social acceptance for women's employment is low and the family is mainly responsible for the care of its weaker members (children, sick and disabled individuals) with only little support from social services. The Total Fertility Rate in these countries is very low (1.3-1.4 children per women in childbearing age), as is the female employment rate.

Box III.9. Incongruities between paid employment and motherhood.

The conflict between female employment and motherhood was studied by many researchers who used various analytical methods and various data sources. In order to synthesize empirical findings on the topic, Matysiak and Vignoli (2008) conducted a meta-analysis of these research works, with particular focus on two effects: the impact of women's employment on childbearing and the effect of young children on mother's entry into employment.

Figure III.27. Incongruities between paid employment and motherhood.



Note: The relation between women's employment and fertility is negative in most empirical studies, thus the lower the coefficient values, the stronger the conflict.
Source: Matysiak and Vignoli (2008).

The conflict between work and motherhood is least visible in the Nordic countries which are characterised by a well-developed system of social services aiming at e.g. supporting parents in combining work with childcare and reducing gender disparities in the labour market. In his typology of welfare states, Esping-Andersen's (1990) classified these countries as **social-democratic welfare states**. Moreover, attitudes towards men's and women's social roles are relatively egalitarian there (Lueck and Hoffaecker 2003).

The UK and the US, **liberal welfare states**, rank second. Ideological premises of this political model assume as little state intervention as possible and put great faith in the market forces. The state offers support only to the poorest. This equals scarce support offered to working parents who have no choice but to purchase childcare services in the free market. The possible conflict between work and childcare is partially reduced by the flexible labour market enabling mothers a relatively quick entry to employment.

Central European countries (France, Western Germany, Austria) rank third with respect to the conflict between work and motherhood. They are deemed **conservative welfare states**, where the state long supported the traditional role division between men and women. Public care institutions are underdeveloped there (although France is an exception) and mothers are discouraged from economic activity e.g. by high marginal effective tax rates. Attitudes towards working females are usually less favourable in this part of Europe than in the Nordic countries.

The last group displaying the strongest conflict between motherhood and paid work is composed of Southern European countries. Although Esping-Andersen qualified them as conservative, many researchers have pointed to a specific "**familialistic**" character of these states. Care in Southern Europe is mainly provided within a family, institutional care is underdeveloped, barriers to labour market entry are strong and social acceptance towards working women low.

5.2. Working parents in Poland – policy challenges

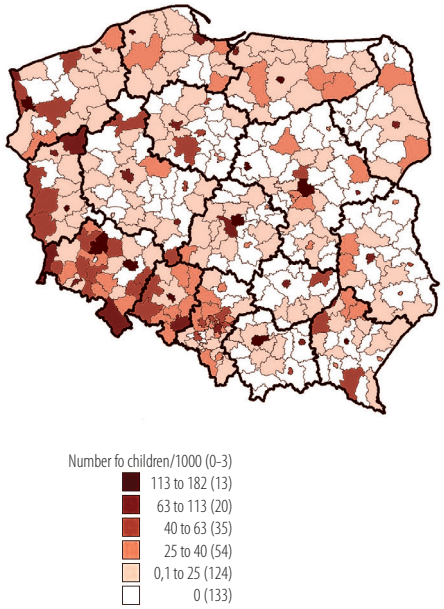
Neither the institutional setting nor the cultural context of Poland are supportive to mothers' employment. After childbirth, the major obstacle parents have to face is poor access to public childcare. According to the CSO data, only 2.6 percent of children younger than 3 in Poland attended public nurseries in 2008, as compared to 64 percent in Denmark, 48 percent in Sweden, 40 percent in Norway and approximately 30 percent in Belgium and France (Neyer 2003). Poland also ranks very low with regard to public childcare provision for pre-school children, although this type of care is slightly better developed. In 2008, 65 percent of pre-school children attended childcare centres, whereas in Belgium, France, Denmark, Italy and the Netherlands this rate exceeded 90 percent (Neyer 2003). It is

noteworthy that the availability of kindergartens is better in city areas, where approximately 80 percent of children attend public day care centers, compared to 40 percent in villages. No data is available on public after-school care, which to a large extent was closed in the 1990s. Still, children in early school age finish classes around noon and the obligation to provide care after school is shifted to parents. This problem will intensify after the new reform of the education system, lowering the age at entry to education, is launched.

Access to child care services in Poland varies across regions. In 2007, there was no single nursery in 174 poviats (over 45 percent) (Map III.1), while only 0.25 percent of children aged 0-3 were taken care of in public institutions in 30 percent of the remaining poviats. Only in 10 poviats this proportion ranged from 1.13 to 1.82 percent. The access to public childcare for children in pre-school age is slightly better. There is, however, a marked difference between the east and west of Poland in this respect (Map III.2). Poviats surrounding Warsaw and Upper Silesia are characterised by the highest coverage rates. Depending on the poviat, about 60 percent of parents of pre-school children can count on such care services. The situation is the worst in South-Eastern Poland.

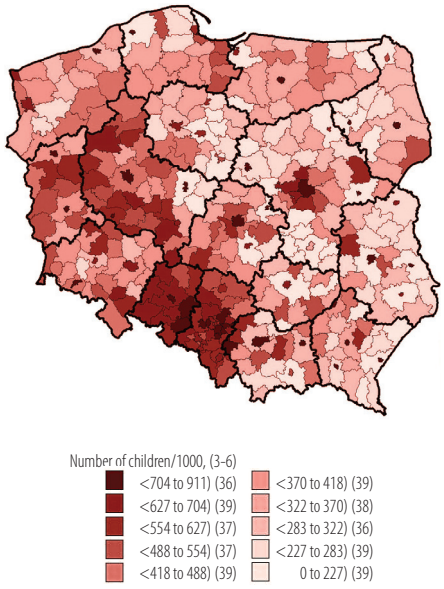
Availability is not the only problem of the childcare system in Poland. Yet another barrier are costs that need to be borne by parents making use of public care services, i.e. around 30-40 percent of the total cost of running a childcare institution (Balcerzak-Paradowska et al. 2004). Before the economic transformation these costs did not exceed a few percent. Fees for care services do not encourage female employment, especially as regards women with low earnings potential.

Map III.1. Number of children in nurseries per 1000 children aged 0-3 lat, Poland 2007



Source: Regional Data Bank of the Central Statistical Office.

Map III.2. Number of children in kindergartens per 1000 children aged 3-6, Poland 2007



Source: Regional Data Bank of the Central Statistical Office.

Low accessibility of care centers is compensated by long parental leaves allowing parents to look after their children personally. The fact that these leaves are relatively long and badly paid constitutes a major drawback of the parental leave system in Poland. Using the entire leave means remaining outside the labour market for over three years, which leads to a serious depreciation of mother's human capital and hinders women's return to employment. Benefits are granted only to the poorest and do not depend on a pre-birth salary. Consequently, women do not feel encouraged to establish their position in the labour market before the planned pregnancy. Such leaves are used mostly by women of low qualifications entitled to child care benefits and are far less attractive to women with a tertiary degree (Matysiak 2007a)[6].

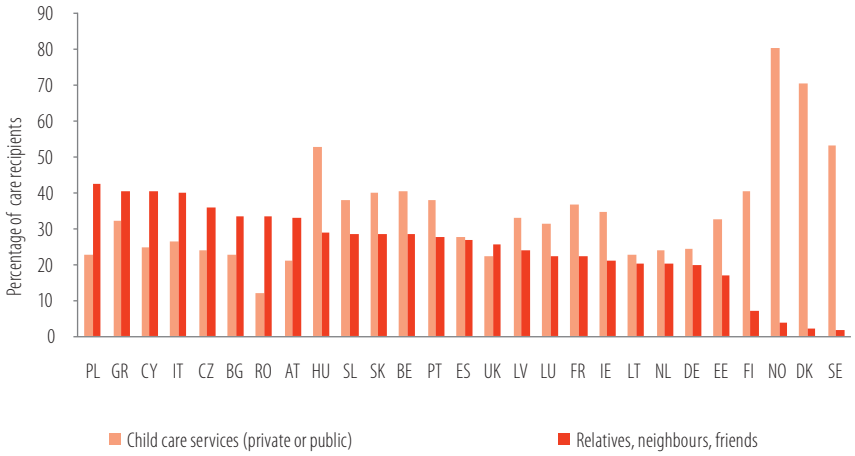
Although parental leaves are available to both parents, fathers in Poland hardly ever make use of them. According to the survey "Reconciliation between work and family"[7] conducted in 2005 and to the data obtained from Social Diagnosis 2009, only 2-2.5 percent of entitled men actually take advantage of this opportunity (Matysiak 2007a, Strzelecki and Kotowska 2009). Moreover, until recently, Poland was one of the few European countries (together with Austria, Czech Republic, Estonia, Ireland and the UK) that did not offer special paternity leaves reserved only for men and aimed at increasing fathers' participation in childcare (O'Brien 2009). This type of leave was introduced only as of 2010. It is only one week long (it will be expanded to two weeks in 2011).

[6] In 2005, only one in three women with tertiary education took a parental leave, compared with 61 percent of women with vocational education. 70 percent of women taking the leave decided also for a parental leave benefit (Matysiak 2007a).

[7] Commissioned by Eurostat, the survey "Reconciliation between work and family" was conducted by the Central Statistical Office in the second quarter of 2005 on a representative sample of 37,350 Poles aged 15-64. It was an *ad-hoc* module of the Labour Force Survey.

Parents of young children with no access to childcare facilities who are determined not to break their professional careers have to count on relatives. In fact, about 40 percent of working mothers in Poland rearing children aged up to 14 used this kind of support in 2005. Parents residing in villages and towns of less than 100 thousand inhabitants more often rely on the support provided by relatives than on the services offered by specialised childcare centres (Matysiak 2007a). This data illustrates the shortage of childcare supply in small towns. Poland together with Southern European countries ranks first in kin involvement in childcare (Figure III.28). By contrast, in the Nordic countries, no more than 7 percent of parents ask relatives for help. Instead, public or private care services are used.

Figure III.28. Working mothers of children up to 14 using external child care, EU-27, 2005 (percentage).



Source: Eurostat Statistics Database.

A more in-depth analysis on retrospective data from the Education, Family and Employment Survey suggests that kin support in care is used as a surrogate rather than a complementary solution to external childcare institutions. This situation stems from the underdevelopment of care services in Poland, which forces parents to find alternative solutions. However, not everyone can count on support from relatives in this respect. Women whose parents are well educated and thus more likely to be still economically active or those who changed their place of residence before childbirth are rarely supported by relatives and resort to institutional care. This refers to mothers of younger children (0-3) and children in pre-school age (Figure III.29 and Figure III.30). Given the expected employment increase of persons in pre-retirement age and intensifying migration processes, we may thus expect an increase in the demand for external care services.

Figure III.29. Use of kin versus institutional care for children 0-3 as compared to care provided by parents, cohorts born in 1966-1981.

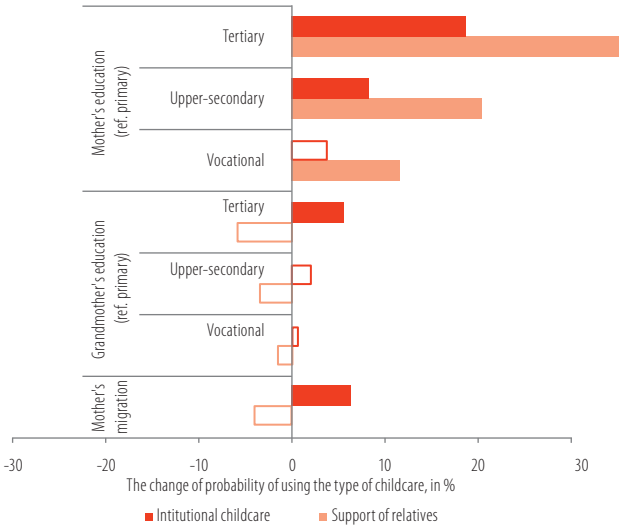
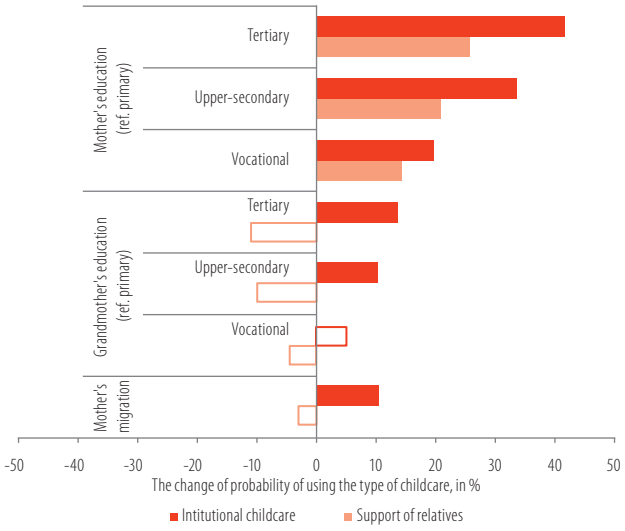


Figure III.30. Use of kin versus institutional care for children 4-6 as compared to care provided by parents, cohorts born in 1966-1981.

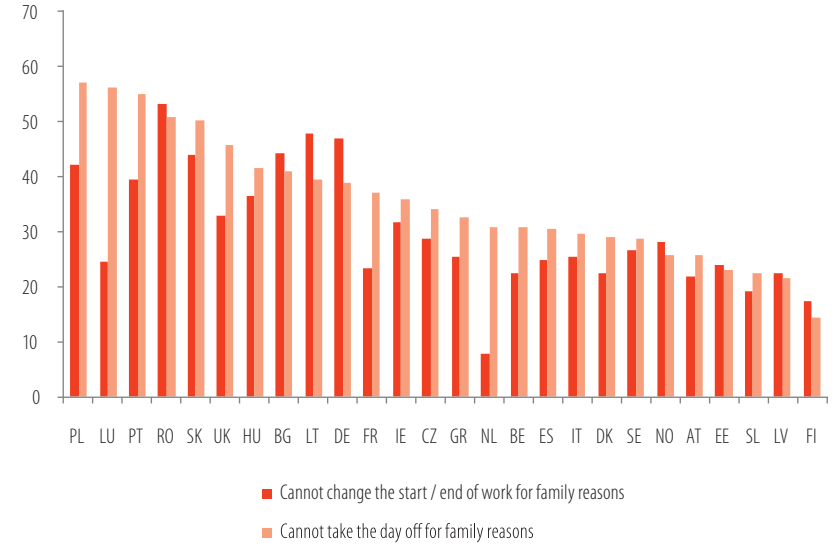


Note: Probit model estimates for women born in 1966-1981. Empty bars denote insignificant effect.

Source: Own calculations based on "Professional, educational and family biographies".

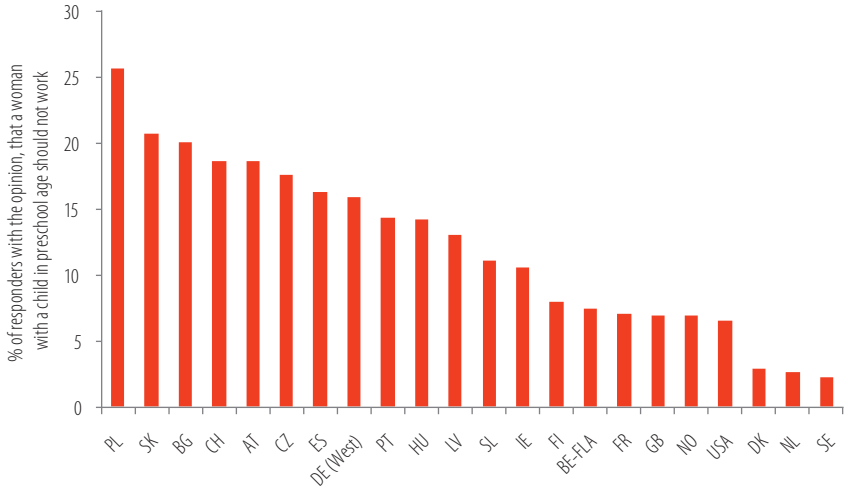
Apart from poor access to childcare services, Poland is also characterised by low part-time employment. Since the beginning of the 1990s, women's part-time employment rate fluctuated between 7.5-10 percent, while the EU-15 average exceeded 30 percent. Interestingly, Poles are not willing to work part-time. In the survey "Economic activity, education and family"[8] (2005) almost 75% of women declared that they would not like to work part-time, mostly as they were afraid their income would be reduced (Matysiak 2007b). Although no corresponding research has been conducted in Poland recently, also other post-socialist countries show little interest in shorter working-hours (Hobson et al. 2010, Kanjuo-Mrčela 2010). This suggests that such a solution will not be very effective in this part of Europe, at least in the next few years.

Figure III.31. Flexible working hours, EU, 2005 (percentage).



Source: Data from "Reconciliation between work and family", Eurostat Statistics Database.

Figure III.32. "A pre-school child suffers if the mother works…", 2002.



Source: Own calculations based on ISSP 2002.

Contrary to part-time work, flexible working hours are popular among Poles (Matysiak 2007b). However, employees find it difficult to adjust working hours to child care duties in Poland. Compared to other European countries, it is relatively hard to change the daily working hours or take a day off for family reasons without shortening one's holiday (Figure III.31). Whether more flexible working hours would really translate into a higher female employment rate in Poland, or a rise in fertility rate is yet hard to determine. They could undoubtedly help to reconcile family and work and consequently contribute to improving parents' lives.

[8] The survey "Economic activity, education and family" was conducted in 2005 on a representative sample of 5,547 Poles aged 18-64.

Finally, the conflict between work and care might be further intensified by the fact that the society is still not eager to accept working mothers. It is commonly acknowledged that mothers of young children should refrain from work while rearing a child. Although such a belief functions in all European countries, in Poland its scale seems to be exceptional (Chart III.32).

To sum up, the institutional and cultural setting of Poland against which individuals make employment and fertility decisions does not support work and family reconciliation. Hence the difficult labour market position of women aged 25-44 and low fertility rate do not come as a surprise. What is needed is a reorientation of the Polish family and employment policies. In particular three issues deserve attention. Firstly, it is crucial to prepare a coherent strategy for the development of institutional child care. A serious improvement is needed in childcare services for children of all ages, and especially for these aged 0-3 and for children in pre-school age. The strategy should limit regional differentials in availability of such services, minimize costs incurred by parents (in particular those with low income) and ensure a high quality of services. Secondly, the Polish system of parental leaves needs to be adjusted to the present labour market needs. Parental leave must be shortened, benefits should depend on income and entitlements to parental benefits should be made universal. A degressive parental leave benefit, whose level declines with leave duration, is also worth considering. Finally, it is crucial to shift attention in the social and political debate toward fathering and fathers' role in childcare and child's development. Cultural change definitely needs to be supported by specific institutional solutions (e.g., paternity leaves) accompanied by informational and promotional campaigns. First steps in this direction have already been taken. Unfortunately, they stand in contradiction to the prolongation of the maternity leave, especially its obligatory part. This leave is available to both mothers and fathers, but its name seems to imply the contrary. One cannot expect men to take 'maternity' leave, whose name explicitly addresses it to women.

Conclusions

The employment and activity rates of men and women of childbearing and childrearing age (i.e. aged between 25 and 44) are much higher than these of individuals below 20 or above 45. At the same time, the scale of gender disparity observed in this age group is more significant than among younger people. Females are far less likely to find and sustain employment, and even if they are successful, their wages are considerably lower than men's. Even though women's average educational attainment is higher than men's and their motivation to participate in the labour market is strong, in 2008 the gender employment gap in Poland remained at approximately 11 percentage points and the disparity in hourly earnings between men and women equaled 8.9 percentage points. There are three major factors responsible for this situation.

Firstly, **women tend to pursue education in fields which do not guarantee high employability**. This observation regards all educational levels, starting from the secondary one. Whereas men usually choose to study such disciplines as science, mathematics and computing as well as engineering, manufacturing and construction, women are more likely to take up studies in health and welfare, teacher training and education, humanities, art and social sciences. These educational decisions, taken early in life, are a major source of occupational segregation in the Polish labour market. The magnitude of occupational segregation in the Polish labour market is yet similar to that in other European countries such as the UK, Sweden, the Netherlands and France. According to empirical research, the fact that women and men choose typically female or typically male fields of study and subsequently female- and male-dominated occupations may be explained by gender discrimination in the recruitment process. When recruiting for positions typically occupied by one of the genders, employers seem to discriminate against the gender that is untypical for the job. The scale of this problem in Poland is yet difficult to assess. Occupational segregation may also be fuelled by other factors, such as gender differences in skills and innate abilities or preferences toward certain types of activities. Women may also choose female-dominated occupations simply because it is easier to balance these jobs with childbearing and childrearing.

An excessive concentration of men and women in university programmes preparing for the typically male and typically female occupations respectively reduces women' employment chances. It has not been established, however, to what extent occupational segregation affects gender-based wage disparities. On the one hand, women dominate in occupations offering higher hourly pay and on the other, they are often employed in those sectors of the economy which offer lower average monthly wages.

Secondly, females aged 25-44 are in a worse labour market position in Poland due to **career breaks devoted to childbearing and childrearing** which they are more likely to experience than men. Such breaks lower women's chances of finding and sustaining employment. They are also responsible for a shorter, on average, work experience of females than males, which is further reflected in women's lower wages. In addition, the Polish institutional and cultural settings make it difficult to combine work with childbearing and childrearing. The major problems are: (1) low accessibility of child care services especially for children aged 0-3 and children in early school age (the problem is particularly severe in smaller towns and villages as well as in eastern and south-eastern Poland); (2) long parental leave combined with parental leave benefit which is not at all related to a parent's earnings prior to leave uptake; (3) traditional division of care duties between men and women and lack of any debate aimed at redefining the father's role in the child's upbringing, accompanied by insufficient institutional solutions supporting the father's involvement in childcare. Despite the difficulties in combining family and work, young Polish women are strongly determined to participate in the labour market and to return to work after childbirth. Employment is often an important prerequisite for starting a family, particularly for females with tertiary education.

Finally, the fact that women are offered relatively lower wages in the Polish labour market may be attributed to **discrimination**. The exact scale of this problem remains yet unknown. The gender wage gap in Poland cannot be fully explained by differences in human capital or other observable wage determinants such as age, place of residence (voivodeship), workplace size and employment sector, occupation and section of the economy. The size of the unexplained component of the gender gap lends support to the hypothesis that wage discrimination against females is present in the Polish labour market. Moreover, analyses for 1998-2008, presented in Section 4 of this Part, suggest that women's average wages rose with respect to men's during the economic slowdown but tapered off during the recovery. An increase in the gender wage gap in a fast growing economy was largely caused by lower returns to human capital and other wage determinants, relatively more often possessed by women. In addition, an increase in the unexplained component of the gender wage gap further supports the claim that wage discrimination against women rises in better economic conditions.

Part IV. Lifelong learning in a changing economy

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Introduction

An active participation in socio-economic life and a dynamically changing modern world forces individuals to constantly expand their knowledge and develop new skills, not only during formal education, but also afterwards. This process is commonly referred to as lifelong learning. Currently, over 20 percent of adults in OECD countries systematically improve their skills. Poland, with the adult participation rate in lifelong learning at around 5 percent, is at the bottom of the list. In the fourth Part of *Employment in Poland 2008* we attempt to determine why Polish workers so rarely invest their time in increasing their skills after completing formal education at school or university. What are the reasons for this situation (financial, psychological, institutional)? Is it worth changing? If so, what can be done to significantly increase participation rate in lifelong learning? We will begin our analysis by determining the group that already continuously upgrades their skills in Poland, what they learn and for what reasons. We will then seek to estimate the impact of adult training on labour market performance. These issues will be discussed against an international background and findings of the theory of economics.

Consequent sections discuss public policies supporting lifelong learning (i.e. institutional solutions aiming at encouraging people to learn continuously). We begin by asking if such policies are at all justified, and if so, on what terms and it what form. The report then moves on to solutions commonly applied in Poland. In the last few years lifelong learning has received substantial funding from public resources, the EU funds in particular. While considering the effectiveness of mechanisms adopted in Poland, we also examine policies supporting lifelong learning across Europe. This comparison enables us to identify instruments which can improve the quality and efficiency of the Polish lifelong learning system.

1. Lifelong learning

Theory of economics holds human capital for one of the key factors influencing economic growth and social development in the long run. From the general social perspective, an average level of education and competence among members of the society (average human capital) has an effect on the quality of the labour force, thus also on productivity and aggregate growth (Barro 2003; Cahuc Zylberberg 2004). As a matter of fact, a high quality of human capital in a given society not only stimulates economic growth and innovations, but also strengthens social cohesion and contributes to citizens' wellbeing (not only those with the highest skills) and mutual trust among people (OECD 2001b, Field 2005, Jarvis 2009). From an individual's perspective, investing in education reaps benefits such as higher earnings, better promotion prospects and improved position on the job market translating into a lower probability of job loss. The larger the income inequalities in a society, the higher the return on such investments (Goldin, Katz 2007). In OECD countries, the labour market situation of the people who received the least education and training is the worst, both in terms of employment chances and average wages. The higher qualifications one has, the higher their earnings, the more stable employment they enjoy (OECD 2007). Poland is not an exception. Numerous studies show a positive relationship between adult training and a better health condition (Hammond, Feinstein 2006), as well as greater happiness and well-being (KE 2006; Sabates, Hammond 2008, IFLL 2009).

Box IV.1. Lifelong learning – evolution of the concept.

The concept of lifelong learning has been developing from the beginning of the 1970s.[1] At that time, international organisations such as UNESCO, OECD and, to a lesser extent, The Council of Europe contributed to producing first reports on lifelong learning, which attracted much publicity and attention, even if solely among academics back then.

It was in 1972 when UNESCO published a report entitled *Learning to be,* which proved crucial for the development of the concept. A group of international experts headed by Edgar Faure (former Prime Minister of France and Minister of Education) produced a report on lifelong education – an idea referring to humanism and offering people a chance of self-realisation. These aims were to be attained among others by amending the way the educational system functioned. Instead of a rigid system of formal education, the report postulated a flexible system (of formal, informal and non-formal education) introduced at different stages in life. As understood by UNESCO, lifelong education should also take into account such factors as health, environment and culture, and encompass all aspects of an individual's life.

At the time when UNESCO proposed the idea of lifelong learning, OECD was developing its own term i.e. *recurrent education*, which referred so much to the development of the society and the idea of humanism, but rather to the relation between education and human capital quality and labour market productivity. Recurrent education applied mostly to adults, and not to an integrated process stretching over all stages of life. Whereas UNESCO perceived lifelong learning as a natural right of each individual, OECD emphasised the role of education in increasing worker's productivity, its impact on labour market productivity and economic position in the world of global competition.

Despite the attention that both concepts had initially attracted, they did not make their way into any policy. Economic recession in the 1970s and 1980s hampered the development of the lifelong learning concept, although it was still discussed in academia, as well as at UNESCO and OECD. It was not until the 1990s that the idea actually became a part of policy making.

These years brought not only an economic, but also a political change. First of all, the European Commission, equipped with more powers thanks to the Treaty of Maastricht, more actively contributed to the development of lifelong learning and encouraged national governments to get involved in this process. The European Year of Lifelong Learning in 1996 was a key to popularisation of the idea. At around the same time the concept was defined in new important publications *Learning: the treasure within* (UNESCO 1996) and *Lifelong learning for all* (OECD 1996).[2] The debate also spread to G8 countries and the World Bank.

In *Memorandum on Lifelong Learning* published in 2000, the European Commission put forward its strategy for lifelong learning and defined it as: *all purposeful learning activity, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence for the development of citizenship, social cohesion and employment*. It seems that the EC stance on lifelong learning is in a way a synthesis of the UNESCO approach, which stressed the importance of social development, with the OECD perspective emphasising productivity, competition and economic growth.

Although today there is no common definition of lifelong learning, and practically every organisation and/or country applies a different interpretation, the general understanding of the concept is similar to the one presented by the European Commission. Depending on their character, organisations differ in their perception of lifelong learning, placing more emphasis either on social and civic issues or on productivity, competition and innovation.

[1] Still, the concept of lifelong learning emerged at the beginning of the 20th century and can be associated with Basil Yeaxlee's report *Lifelong Education*. To read more on lifelong learning see: Field (2001), Lee, Thayer, Madyun (2008).
[2] These publications, however, offered a similar perspective as previous reports issued by these organisations.

Due to a rapid technological development and modernisation, people attach greater importance to education. An active participation in social life requires one not only to acquire relevant skills at school, but also to continuously upgrade competences at different stages in life (lifelong learning). This is also reflected in the labour market, where demand for qualified workers keeps growing at the expense of demand for workers with lower competencies. For this reason, the issue of continuous skills enhancement is of paramount importance for economies similar to the Polish one, undergoing rapid structural and technological changes. As described in Part I, the rapid process of population ageing is believed to be one of the greatest socio-economic challenges Europe will have to face in the forthcoming decades. The elderly, whose skills and knowledge acquired at school age often require updating, constitute a larger proportion of the labour force than ever before. As a result, problems with adaptation to the labour market needs by workers aged over 50 are bound to escalate.

Europe and Poland desperately need to promote lifelong learning and stress its importance. This is crucial from the point of view of public policies aimed at developing effective institutional and legal solutions, as well as from the perspective of firms and individuals that in many countries still display low motivation to invest in education and development of human capital.

Lifelong learning should be understood as a broad concept, encompassing all forms of education (formal, informal and non-formal) from kindergarten to retirement, in accordance with the priorities of the EU labour market policies and the Lisbon Strategy (see Box IV.1). In this report, however, the issue of lifelong learning shall be limited to adults aged 25-64. There are two major reasons for this limitation: the size of this report and the fact that formal education of people aged up to 25 has already been discussed in one of earlier editions of *Employment in Poland* (see MGiP 2005).

2. Patterns of participation in lifelong learning

2.1. International experiences

Despite a relatively high overall level of educational attainment of people aged 25-64, few Poles participate in lifelong learning. According to Eurostat, only 4.7 percent of this age group participated in formal or non-formal education in 2008[3] (see Box IV.2). This means that Poland ranks extremely low in Europe and does not meet the 12.5 percent benchmark required by the Lisbon Strategy.

Box IV.2. Forms of learning.

Formal education (at school) is a process of teaching (learning) within the education and training systems aimed at acquisition of qualifications universally recognized in a given legal system (formal system of qualifications).

Although non-formal learning is an institutionalised process, it takes place outside the formal system of qualification acquisition. This type of education involves all organised educational actions not defined as formal education i.e. not provided by the formal education institutions. Unlike formal education, non-formal learning does not induce changes in the nominal education level and is usually organised in the form of courses or trainings (at a workplace or out of it).

Unlike formal education and non-formal learning, informal training is a non-institutionalised process of intentional self-learning geared at acquiring knowledge or upgrading skills, which does not involve a teacher. Not organised by institutions providing formal or non-formal education, self-learning is based on the following: (a) support of relatives, friends, co-workers; (b) printed materials (books, press, etc.); (c) software, educational programmes available on the radio or television.

Source: EC 2005, GUS 2009.

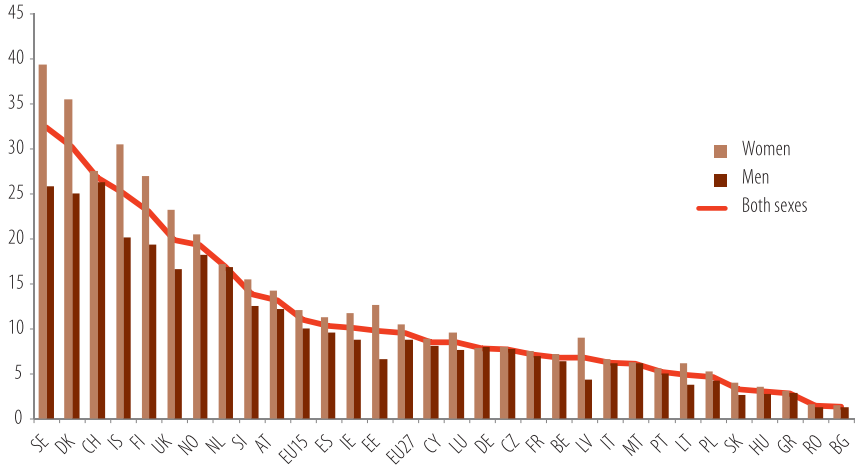
Scandinavian countries, Switzerland and the United Kingdom, where 25 percent of the adult population invest their time in further education or training, experience the highest participation in lifelong learning (see Figure IV.1). Among the new EU member states, the highest participation is recorded in Slovenia (13.8 percent) and Estonia (9.8 percent), with only these two EU new member states exceeding the EU-27 average. Almost everywhere across Europe (except Germany) women are more active than men in pursuing lifelong education. In EU-27, the female participation rate in education exceeds that of men by an average of 2.6 percentage points.[4] The Scandinavian countries display the most substantial disproportion in this respect, with an average of 10 percent more women participating in education than men.

With the population ageing, education among workers aged over 50 will exert a key influence on the functioning of labour markets. At the same time, it may be conjured that this age group will feel relatively least inclined to take up this type of activity due to a short

[3] According to Eurostat, a person aged 25-64 may be considered to have participated in lifelong learning if they took part in formal education (school) or non-formal learning. As of 2004, the definition of lifelong learning does not include self-learning (informal education).
[4] The difference in arithmetic means among the EU-27 Member states.

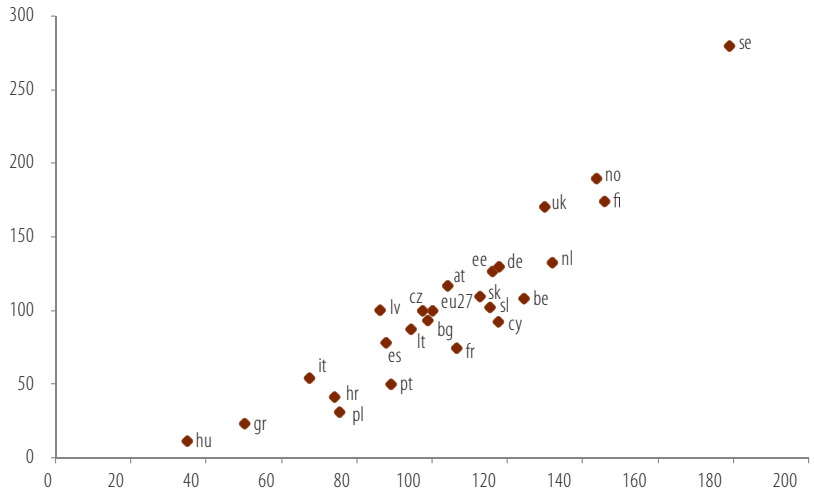
period of time left to reap potential benefits from additional qualifications (cf. Cahuc, Zylberberg 2004). Nevertheless, as shown in Figure IV.2, countries where participation in lifelong learning is generally high, at the same time enjoy a greater number of elder people upgrading their qualifications. Factors explaining the majority of such differences will be discussed later in this Part.

Figure IV.1. Participation in lifelong learning - percentage of population aged 25-64 participating in formal or non formal education in four weeks prior to the survey, in 2008 (percentage).



Source: Own calculations based on Eurostat data (Labour Force Survey).

Figure IV.2. Participation in lifelong learning (formal or non-formal education) compared to the EU-27 average (EU-27 average=100) a year before the survey, in 2007. Horizontal axis for the 25-64 age group, vertical axis for the 55-65 age group (percentage).



Source: Own calculations based on Eurostat data (Adult Education Survey - ad hoc module, 2007).

Employer engagement is a crucial part of lifelong learning. This issue has evolved thoroughly over the last thirty years in developed countries. In late 1970s, only a scarce number of enterprises financed workers' education or invested in on-the-job training. For instance, in the UK or Sweden, which now enjoy the highest number of adults training, less than 20 percent of participants in adult education were sponsored by their employer i.e. three times less than today (Boudard, Rubenson 2003, OECD 2000). In Poland, the employers' share in upgrading their workers' competences is still very low, especially as regards the work-related training. In 2005, such programmes were introduced in only one third of enterprises (EU-27 average reaches 60 percent) and in only one fifth of firms employing less than 20 workers[5] (EU-27 average being 49 percent). As for the largest employers providing jobs to at least 250 workers, differences between Poland and EU-27 are narrower, yet still significant – in Poland 80 percent of such employers declare that they sponsor or organise training schemes increasing their workers' qualifications (compared to 91 percent in the entire EU).

[5] For firms employing exactly 10 to 19 workers.

Box IV.3. Educational attainment of adult population (25-64) in Poland compared to other European countries.

Educational attainment of adult population (25-64) in Poland does not stand out against the OECD average. Compared with other European OECD countries, Poland boast less individuals with education below upper secondary level, but also has fewer holders of tertiary degrees. On the other hand, significantly more Poles can pride on upper secondary education (see Table IV.1).

Table IV.1. Distribution of the 25-64 year-old population, by highest level of education attained in selected OECD countries in 2007.

	Below upper secondary level of education	Upper secondary level of education	Tertiary level of education
Czech Republic	9	77	14
Denmark	25	43	32
France	31	42	27
Germany	16	60	24
Greece	40	37	22
Hungary	21	61	17
Poland	14	68	19
Sweden	15	53	31
United Kingdom	31	36	32
OECD 19	29	46	24

Source: OECD 2009.

With respect to the number of people completing tertiary education, Poland is quickly narrowing the distance to other developed countries. According to the OECD data (OECD 2009), in the period 1998-2006 the number of graduates with a tertiary degree in Poland increased by 7.1 percent per year, thus exceeding the OECD average of 4.5 percent.

Figure IV.3. Average annual growth rate in the number of 25-64 year-olds with tertiary education related to the increase in attainment levels and to the overall population growth in 1998-2006 in OECD countries (percentage).

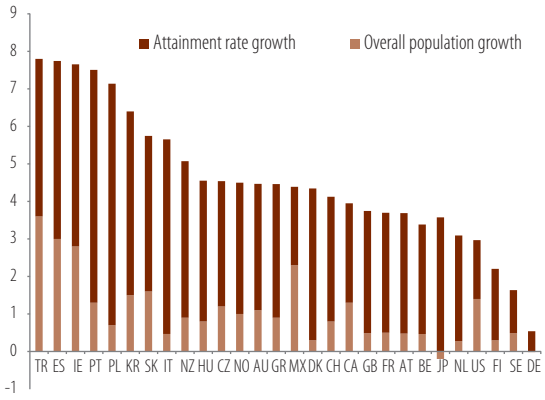
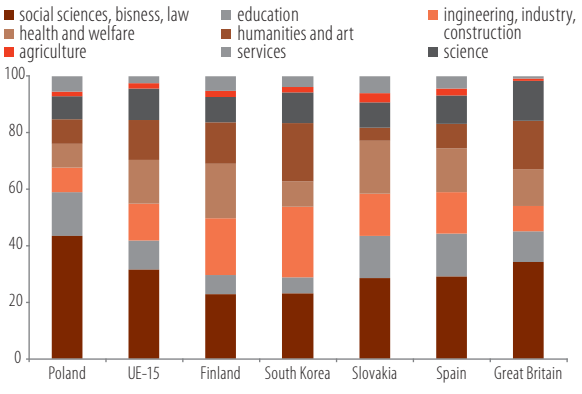


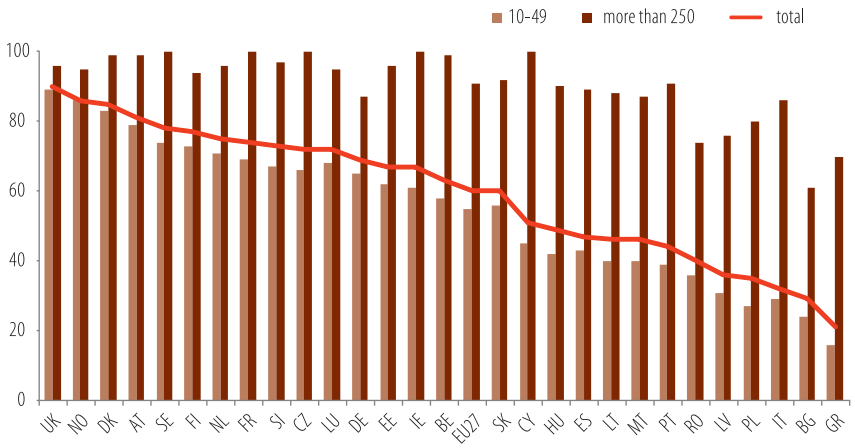
Figure IV.4. Education structure by field of studies (number of graduates of a selected discipline compared to the total number of graduates) in selected OECD countries in 2007 (percentage).



Source: OECD 2009.

Despite comparable student enrolments in tertiary education, Poland differs from other OECD countries in terms of the fields of studies graduates opted for. Social sciences, business, administration, humanities, art and pedagogy seem to be the first choice of Polish students. In 2007, over 67 percent of graduates specialised in these disciplines, whereas only 17 percent graduated from courses in science (although this number has slightly increased since 2005). By comparison, in South Korea these proportions come to 50 and 36 percent respectively, in Finland – 44 and 28 percent, whereas in the EU-15 member states – 56 and 24 percent (see Figure IV.4). Moreover, some authors (MGiP 2005, Thieme 2009) emphasise the low quality of teaching at tertiary and secondary levels in Poland.

Figure IV.5. Percentage of enterprises organising training schemes by the number of employees in 2005.



Source: Own calculations based on Eurostat data (CVT3 Survey).

While Polish firms train only 21 percent of the entire labour force, the EU-27 average reaches one third of all workers. Compared with EU-27, where 24 percent of employees aged over 55 participated in training organised at their workplaces, Poland stands out negatively with just 13 percent. Such a small share of older workers in Poland improving qualifications at their workplace is largely caused by their early exit from the labour force.[6] Expecting an early exit from the labour force of their older workers, employers are less inclined to invest in their additional qualifications, as they would serve them for only a short period of time. Furthermore, a small number of individuals over 55 in Poland are still economically active, which additionally affects a limited participation of this group in lifelong education.[7]

On the other hand, not too many Polish entrepreneurs fully appreciate the benefits of on-the-job training in general. Research conducted by Management Observatory shows that only 11 percent of all company owners were strongly convinced of the necessity to upgrade skills relevant for managing and carrying out business activities, whereas 21 percent were only partially convinced. Almost two thirds believed there is no such need at all. Also a Eurostat study confirms that the lack of training programmes at Polish workplaces stems from the lack of awareness among managers rather than insufficient financial measures (see CVT3 Survey). Almost 80 percent of Polish firms reluctant to organise training revealed that the lack of educational programmes can be ascribed to their workers already possessing the necessary qualifications. Additionally, 58 percent believed that they have employed a qualified personnel and only 29 percent were not eager to invest in training due to its high cost.

It must be stressed, however, that modest human capital investments of Polish firms may also result from information barriers. These are due to a great number of education institutions in the Polish market which often provide low quality training. It is therefore almost impossible for entrepreneurs to assess the quality of a given offer before the training (Boni 2007, Konieczny, Schmidtke 2007, PSDB 2008).

It is especially SMEs (small and medium enterprises) that may feel inclined to give up training, since even state funding does not minimise the risk of a bad investment. Sending workers to low quality training is believed to be more harmful than resignation from all forms of learning (Konieczny, Schmidtke 2007).

What employers also take into account, is the possibility that their workers, having completed a training programme and gained additional skills, may start to look for employment elsewhere in order to win higher wages. While organising training programmes for specific skills usually decreases worker turnover rates (Elias 1994, Casas-Arce P. 2004, Gathmann, Schönberg 2007), Martin's research (2003) on the UK indeed indicates that in case of companies that provided their workers with training in general skills turnover rates were higher.

[6] In Poland workers exit the labour force at the average age of 59.3 – around two years earlier than in EU-15.
[7] Economic activity rate for the 55-64 age group in Poland reaches 33 percent, whereas in EU-15 – 50 percent.

Box IV.4. Specific vs. general skills – when do companies benefit from training workers.

Skills that are decisive for human capital may be divided into two categories: general and specific. General skills involve processing information (conscious reading), its application in problem solving and further learning. Specific skills, on the other hand, include mastering specific technologies or manufacturing processes, useful in a given job or workplace.

Economic theory assumes (Becker 1993) that companies differ in the motivation for cost reimbursement, depending on the type of training (e.g. whether it develops general or specific skills), regardless of the fact that both types of training contribute to workers' productivity. Since general training may also be used when working for a different employer and employees stand a chance of changing their job at any time, the companies that organise general trainings may not see return on the investment that they made. Workers with additional skills might reap more benefits in a different workplace, enjoying higher salaries. In contrast, since specific training cannot be utilized in any other workplace in the labour market, companies organising this type of trainings benefit from higher productivity of their workers and do not run the risk of losing them. One could hence assume that financing specific training is more advantageous for companies.

In the real-world, however, employers often do finance general trainings. This is most often explained by the existence of labour market imperfections (Acemoglu, Pischke 1998, Boeri, van Ours 2008), i.e. the fact that having attained additional general skills, workers might not find a better paid job. This, in turn, may result from the asymmetry of information in the labour market – other employers are unable to evaluate the exact quality and content of the training, therefore they are less inclined to compensate workers for these additional skills. Moreover, high transactional costs of employment contract conclusion and the cost of a job search constitute further barriers for workers to reap the benefits from additional general skills. As a result, there is a long list of reasons why companies actually benefit from providing workers with general training.

Polish companies may be less keen to organise training also due to the fact that, in comparison to other EU countries, they have a relatively small number of instruments geared at supporting lifelong learning at their disposal. This relates not only to financial aid, but also to policies targeted at limiting the asymmetry of information on the education market (company consulting, accreditation system for education institutions, etc.). Such assistance can be crucial for SMEs that might find it difficult to assess the quality of services on the education market, which has expanded significantly over the last decade (Edukacja ustawiczna 2005, Sztanderska et. al. 2007, PSDB 2008). These issues have been discussed in further details in section 3.2.

2.2. Lifelong learning in Poland

As has been already shown (see Box IV.3), Poland boasts a relatively high educational attainment of adult population (although not as high as in some developed countries). However, unlike in EU-15, only a small number of Poles upgrade their qualifications later in life, after completing formal education.

LFS indicates that in 2008, over a million individuals in Poland aged 25-64 participated in some kind of education (for sources and methodology see Box IV.5).[8] More than 59 percent expanded their knowledge within the education system, 36 percent took part in non-formal training and the remaining 5 percent combined both methods. The numbers indicate that the group of young people is clearly overrepresented – almost half (46 percent) of adult learners were 25-29 years old (although they constitute only 14 percent of the 25-64 age group). People aged 30-44 made up 39 percent, whereas the 45-54 group accounted for 11 percent of learners. The oldest age cohort (55-64) was represented by only 3 percent of all adults participating in lifelong learning. The age structure of the participants depends on the type of training. In the case of formal education, learners are usually younger than 30, with non-formal learning attracting mostly 30-40 year-olds.

It is mostly workers (80 percent), and the inactive (16 percent) that take part in lifelong learning, but hardly any of the unemployed (only 4 percent). Moreover, in the groups of the unemployed and inactive, again only young people improve their qualifications, mostly in formal education system. A high rate of economically inactive individuals who pursue training results from the fact that numerous young people tend to extend their formal education (usually at the tertiary level) while remaining outside the labour market. This is one of the dysfunctions of the Polish education system and labour market. Unlike other European countries, Poland is notorious for an extremely low labour market participation among young people. Even though 20-24 year-olds participate in tertiary education, the fact of them remaining at the same time economically inactive, should not be considered as positive. A great number of students in Poland does not bear any cost of their tertiary education, which artificially prolongs their time of schooling. As a consequence, many young people decide to be economically inactive, even though their labour market productivity does not increase in the course of consecutive years of learning. Additionally, tertiary education in Poland starts a year later than elsewhere in Europe and far too rarely concludes at the level of B.A. This negative trend is also aggravated by the fact that combining formal education with employment is not a common practice in Poland.

[8] It is noteworthy that, unless indicated otherwise, age in this Part is calculated by the year of birth and not by the exact date of birth, which makes it easier to compare lifelong learning rates over consecutive years (the exact date of birth has been taken into account in LFS only since 2006). Lifelong learning data for Poland are thus slightly different from the ones provided by GUS or Eurostat.

Box IV.5. LFS and other sources of data on lifelong learning in Poland.

LFS is an essential source of data for any analysis of lifelong learning in Poland. The LFS questionnaire consists of questions allowing to assess the size and structure of the labour force, as well as to investigate basic facts related to formal education (in the education system) and non-formal learning (extra-curricular courses, training programmes, seminars, etc.).

LFS is a panel questionnaire aimed to collect information on the economic activity of people aged 15 and above in a selected quarter. Each quarterly sample is made of four elementary samples which are partially exchanged each quarter according to the following rule 2-(2)-2: two-quarter in study, two-quarter pause, two-quarter in study (for details see Bracha 2003). LFS may thus be used to assess changes in population preferences with respect to learning and verify the extent to which education influences the situation of individuals in the labour market (wages, employment, etc.).

Following the Eurostat methodology, LFS defines a participant of the lifelong learning process as a person aged 25-64, who 4 weeks prior to the survey took part in (or has started) training in a formal or non formal education system. Such a definition makes it possible to compare data for different countries. Furthermore, whereas it is possible to forget details of one's learning that took place a long time ago, it is far less likely in the case of training that has preceded the survey by no more than a month. On the other hand, especially outside the education system, the training period is usually short (may not even exceed a week). As a result, a person who completed training more than 4 weeks prior to the survey will not be taken into consideration. Hence the lifelong learning participation rate might be systematically understated.

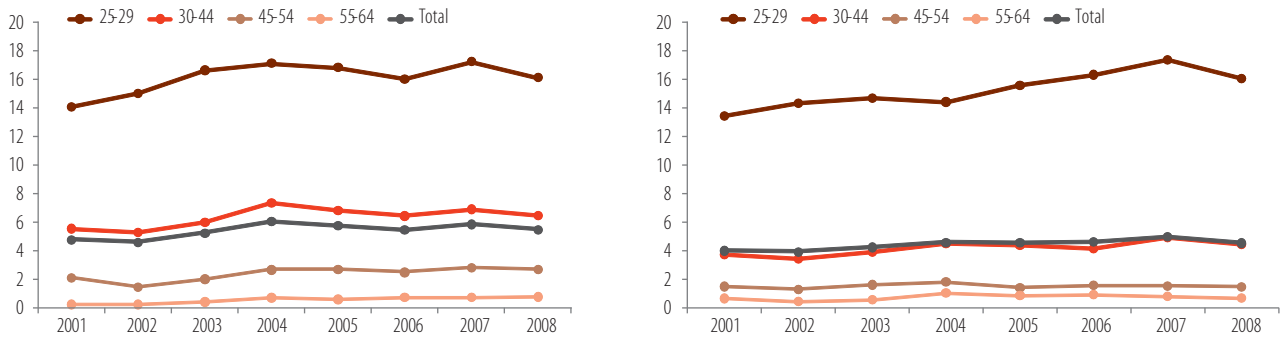
LFS data used for the lifelong learning analysis may be complemented with results of single, ad hoc studies carried out by the Ministry of Economy and Labour in 2003 regarding the educational activity among the population (*Badanie Aktywności Edukacyjnej Ludności*), and another study on adult learning (*Kształcenie Dorosłych*) conducted by the Central Statistical Office (GUS) at the turn of 2006. Both studies were parts of the Community research programmes coordinated by the Statistical Office of the European Communities (Eurostat). The above-mentioned studies differ from the LFS questionnaire mostly in definition of the lifelong learning participant, which in the two later studies is expanded to a person who took part in formal education, non-formal or informal training in the year prior to the study. Consequently, the results are different from LFS, mostly because more people declare participation in non-formal learning (i.e. trainings and courses). And yet, the structure of individuals pursuing education (with respect to age, gender, place of residence and education) is similar. Moreover, the latter studies included questions concerning informal learning, and are thus complementary to LFS.

Social Diagnosis (Diagnoza społeczna) constitutes another important source of data. It is a panel study of a relatively long time span (the first study was carried out in 1999 and is repeated on average every 2 years). Although not directly related to lifelong learning, it includes questions regarding educational activity of the respondents.

Figure IV.6 shows that the lifelong learning participation rate has not increased since the beginning of the decade. This refers to the form of learning (formal education, non-formal learning), age and gender. In Poland, as in other EU-27 countries, it is women who pursue learning most often, which is clearly visible across all age groups regardless of the education system. The discrepancy between education attainment rates is most striking for males and females aged 30-44 and amounts to 2.04 percentage points. This difference is most likely caused by the fact that more women enrol in non-formal training programmes. This in turn results from the fact that training programmes are usually organised by large enterprises and those operating in the sector of non-market services such as education, health and social care, which in Poland employs mostly women (in 2008, 60 percent of all employees hired in the public sector were female). In the remaining age groups, still slightly more females pursue education.

Figure IV.6. Lifelong learning participation rates in 2001-2008, 25-64 age group, by type of learning (left figure) and age groups (right figure). Vertical axis indicates the percentage of people participating in lifelong learning in a selected category.

Figure IV.7. Lifelong learning participation rates for women (left figure) and men (right figure) in 2001-2008, with breakdown by age groups (percentage).

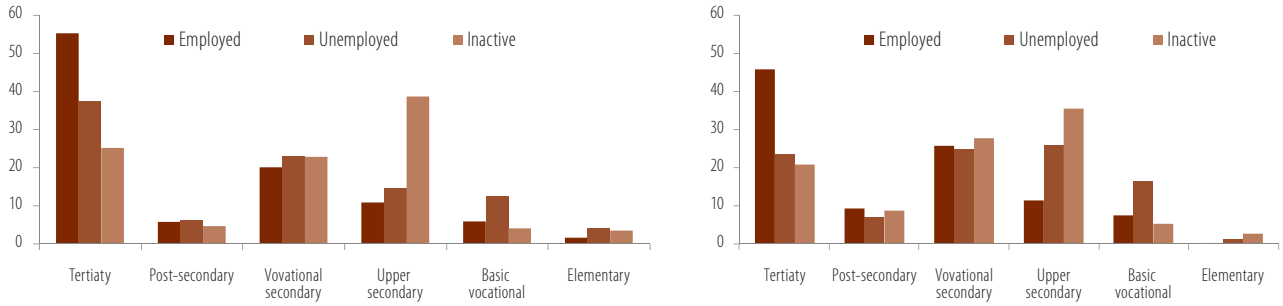


Source: Own calculations based on LFS data.

Lifelong learning is relatively unpopular among the unemployed with low qualifications and older people with bleak prospects in the labour market (see MGiP 2005). These groups very rarely undertake any attempt to change or improve their qualifications. Education is favoured by young employees (below 30) with upper secondary and tertiary education. It is expected that this group will reap most benefits from education, as the time spell of their future employment is still long. This group is also most likely to dedicate to parenthood, which may hamper their educational attainment. Liwiński (2007) showed that the presence of an infant significantly limits the chances of the parents' education (see section 2.4).

Among employees it is usually graduates with tertiary degree that take up training, in the case of the unemployed and inactive persons learning is popular among the ones with upper secondary education. This is inextricably linked with the fact that the unemployed and inactive group are often composed of students attending schools of higher education, still awaiting their degree or choosing to enrol in yet another degree course. Figure IV.8 indicates that the lifelong learning participation rate among the employed, unemployed and inactive with a tertiary degree has been on the rise for a few years at the expense of other groups. Despite the fact that such an increase may be explained by a growing number of graduates in the total population, the situation where only those individuals who enjoy a comfortable position in the labour market pursuit education, has not yet been reversed in Poland.

Figure IV.8. Lifelong learning structure for people aged 25-64 with respect to attained education and status on the labour market in 2008 (left figure) and 2002 (right figure) (percentage).



Note: The vertical axis indicates the percentage of people who participate in lifelong learning. All categories (colours): employed, unemployed, inactive add up to 100 percent.

Source: Own calculations based on LFS data.

The fact that adults do not actively engage in lifelong learning in Poland, as discussed above, may be related to the situation in the training service sector, a company's training policy, or the lack of awareness, motivation and/or insufficient financial measures. While an astonishing 80 percent of the adult population in Poland declares readiness to run their own business, which is one of the best results all around the world (see Blanchflower et al. 2001), quite paradoxically a small number of adults considers it vital to improve their skills. Research conducted by GUS (GUS 2009) shows that almost 70 percent of adults have not taken up lifelong learning because they were not willing to. The situation does not improve despite a constantly rising skill premium. According to CASE (2008), the rate of returns to education (i.e. an increase in wages for each additional year of schooling) in 1996-2004 boosted in all job categories (see Strawiński 2006). Even though it is employees with top qualifications that reap the greatest benefit (managers, experts, technicians), training is becoming ever more essential also for factory workers and craftsmen (the rate of returns to training in this period reached 22 percent), as well as for machine operators (17 percent), see section 2.4.

Apart from low motivation, also financial reasons may be limiting. Individuals who did not take part in training, but were willing to improve their competences (regardless of labour market status) blamed mostly high cost of training (61.3 percent) and the lack of training schemes in the vicinity of their place of residence (31 percent). This is precisely the reason why the role of government policies for increased accessibility of training programmes cannot be underestimated. They are crucial for people who are willing to upgrade their competencies, but lack opportunities to do so. The government should also stress the importance of qualifications for the individual performance in the labour market. In this context, of great importance would be policies targeted at people with lowest qualifications who can benefit the most from acquiring additional skills, but have hardly any motivation for this kind of activity and are least capable of financing it (see GUS 2009, Illeris 2006). This is especially vital in the case of Poland since here, as pointed out by Bukowski et al. (2007) and Liwiński (2005), training is one of the most efficient labour market policies in providing better employment prospects for the unemployed. It is worth mentioning that better qualifications exert a particularly profound effect on the poorest households. Despite obvious benefits, government's involvement in education and training within ALMP is relatively inconspicuous in Poland. In 2006-2007 barely 5 percent of the Labour Fund was allocated to training programmes, whereas graduate apprenticeship programmes received a 13-16 percent support (MPiPS 2009). Moreover, Kaluzna (2009), Bukowski et al. (2007) claim that the decentralisation of Public Employment Services proved to be unconducive to the quality of the lifelong learning programmes targeted especially at high-risk groups.

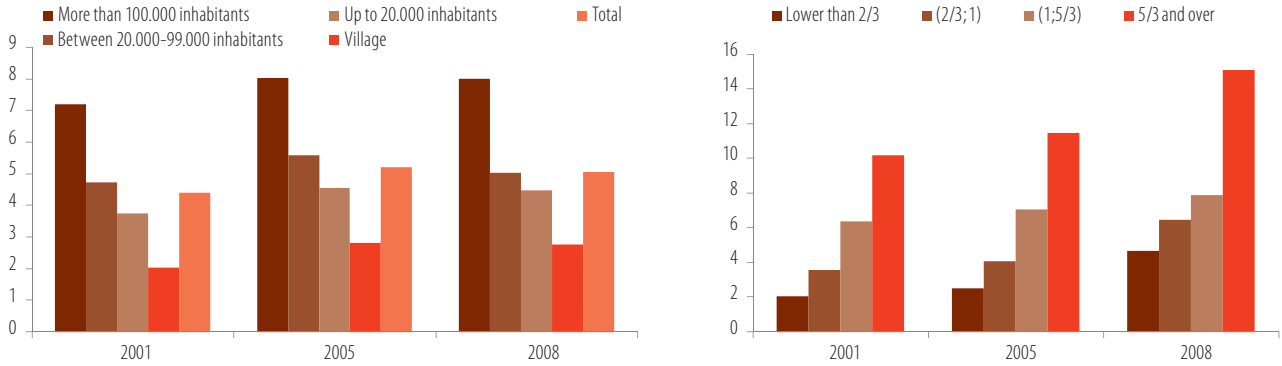
The lifelong learning public policies might be effectively supported by social partners both at central and sectoral levels, during trilateral negotiations, as well as at the level of individual companies. One must emphasise the fact that since social partners have more comprehensive knowledge of the training needs, at the central level they could efficiently contribute to development and implementation of policies related to lifelong learning, targeted especially at people with lowest qualifications. Although an analysis of social dialogue at the company level highlights common benefits from organising training for employees and entrepreneurs, it is noteworthy that each of the parties will have different requirements as to the content of the training.

In general, entrepreneurs will show interest primarily in specific training useful only in selected workplaces, but they will also invest in highly qualified employees. Trade unions usually care about equality in training (they seek for participation of the least qualified workers) and general training useful in different workplaces. Consequently, companies with well-organised unions enjoy a greater offer of training (Winterton 2007), higher investment in general training and, which is of paramount importance, a rise of participation among the least qualified workers (Ork 2003, see Jarvis 2009). The Polish model of social dialogue does not involve frequent talks on lifelong learning at the central or sectoral level (Gardawski et al. 2009). On the other hand, unions are badly represented at the firm level, and almost completely invisible in smaller entities. The positive impact is therefore severely limited in this respect.

A comprehensive analysis of the participants of lifelong learning in terms of place of residence indicates that city dwellers take up learning far more frequently than inhabitants of towns and villages. It is obvious that cities (due to the structure of the labour force, education centres and research institutes, etc.) create a high demand for the qualified labour force. From individual perspective, living in a city translates into a high return on investment in human capital. At the same time, city dwellers earn on average more than residents of towns and villages, and are more likely to afford training and enjoy a better access to training services.

According to LFS data, in large cities (above 100 thousand inhabitants) training attracts 8 percent of the population aged 25-64, whereas in medium-sized cities (20 thousand to 99 thousand) and small towns (below 20 thousand) this rate reaches 5.0 and 4.5 percent respectively. In the countryside only 2.7 percent of adults participate in training. The advantage of large cities in this respect is time-invariant, and has slightly increased in the few previous years (see Figure IV.9), which may be attributed to the fact that a greater number of young and well educated people migrate to cities. The Polish National Census carried out in 2002 showed that the greatest outflows of population were from the least developed regions with the greatest share of agriculture, and inflows into large cities that offer better living and work conditions.

Figure IV.9. Lifelong learning participants aged 25-64 by size of the city of residence (left figure) and net wages with respect to average net wage (right figure) in 2001, 2005 and 2008.



Source: Own calculations based on LFS data.

LFS data indicate that a higher participation rate is observed among workers earning higher wages, see Figure IV.9. Bearing in mind all limitations of the LFS questionnaire when calculating wages,[9] LFS data shows that there are three times more people pursing education or training in the group earning 5/3 of the average wage than in the group whose wages constitute mere 2/3 of the average wage.

Formal education

In Poland, formal education is a vital element of lifelong learning. Over 64 percent of individuals aged 25-64 who decided to upgrade their qualifications (55 percent of women and 45 percent of men opted for formal education). Participants of formal education are by and large young (below 30) and frequently decide to remain outside the labour market.

The structure of formal learning with respect to school category and years of education has remained unchanged for the last decade. Most common are B.A. and M.A. courses. The total number of people attending all tertiary studies, Ph.D. or postgraduate courses in 2008 reached 86 percent of all those, who enrolled in any form of formal education at the age of 25-64 (19 percent for full time programmes, 76 percent for extramural courses, 4 percent at evening classes).

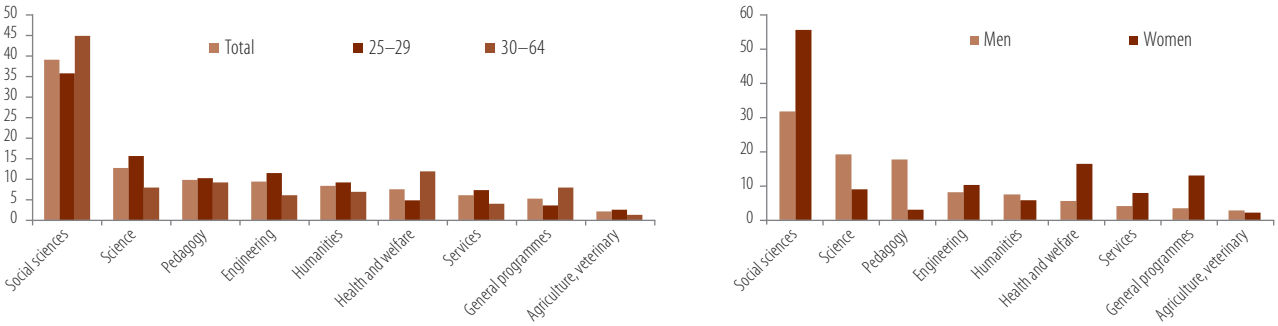
Table IV.2. Lifelong learning adult participants (aged 25-64) in formal education, by level and type of education.

year	Tertiary education (M.A. programme)	Tertiary education (B.A. programme)	Postgraduate courses	Upper secondary education	Post-secondary (non-tertiary)	PhD courses	Vocational schools (secondary education)
2001	41.1	28.0	14.3	5.4	4.7	3.5	3.0
2008	38.7	29.6	15.1	5.2	4.7	4.3	2.1

Source: Own calculations based on LFS data.

Figure IV.10 shows that social sciences are the most frequently chosen disciplines in formal education. These disciplines are the first choice of almost 40 percent of adults pursuing lifelong learning in each age group. Next come courses in science, teaching, pedagogy, engineering, health and social care.

Figure IV.10. Participation of adults (aged 25-64) in formal education by disciplines in selected age groups (left figure) and gender (right figure) in 2008 (percentage).



Source: Own calculation based on LFS data.

Learning profiles of adults enrolling in formal education point to a visible gender differentiation. Social sciences, e.g. pedagogy or health and social care, constitute predominantly female choices. Conversely, men more frequently opt for science and engineering. This largely mirrors decisions taken already at the upper secondary school level. First of all, compared to males, females far more often embark on general education; in 2007 they constituted 60 percent of all general secondary school students. What is more, females attend mostly human science programmes. It should be noted here that most of the secondary level students (regardless of gender) demonstrate a low level of mathematic skills and little motivation to study science. At lower secondary and upper secondary levels, Polish students experience more difficulties with mathematics and science, which is confirmed by PISA results, as well as a low number of students choosing mathematics at advanced level at high school leaving examinations ("matura" exam). As a result, upper secondary school graduates are rarely motivated and equipped with necessary skills to pursue further education (at tertiary level) in science. There is yet another salient factor here. A vast majority of Polish students aged both below and above 25 continue education at extramural

[9] The LFS questionnaire is not an entirely reliable source for absolute estimation of individuals' income. It might be conjured, however, that LFS mirrors differentiation of net income among households relatively well. It should be added that incomes presented in LFS data might be underestimated by 20—30 percent.

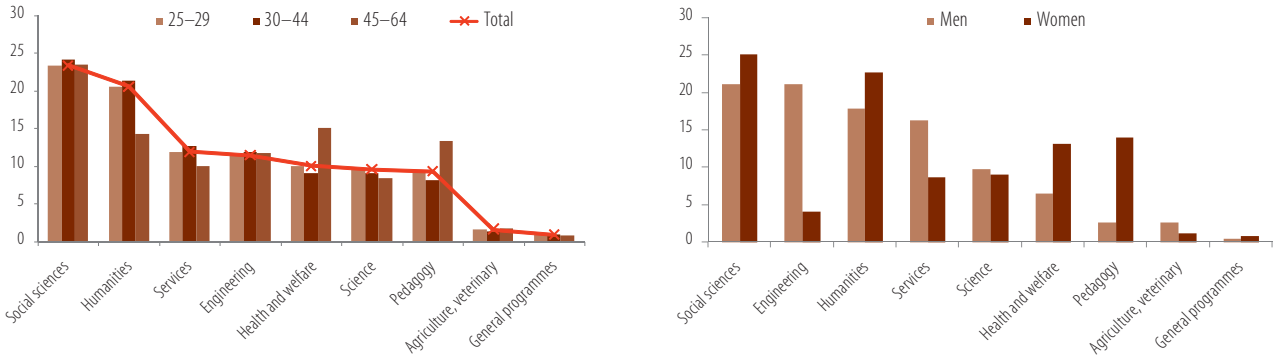
and evening programmes which have to be paid for. The high cost of opening and running science and engineering programmes that require laboratory and computer facilities could mean higher tuition fees, which might be difficult for students to pay. Financial barriers, both on part of the students and the universities, can therefore be one of the reasons explaining why the entire educational boom of the 1990s concerned only a few disciplines, such as marketing and management, economics, sociology, pedagogy and sociology (see: Bukowski et al. 2005, Sztanderska 2008).

Non-formal learning

In 2008, over 426 thousand people aged 25-64 (40 percent of all participants of lifelong learning) declared being involved in non-formal learning. Contrary to formal education, non-formal learning attracts mostly individuals aged over 30 and employed (over 92 percent of participants had a job), see Figure IV.11. Non-formal learning is usually a means of improving skills rather than acquiring new ones. According to LFS, the major reason for taking up non-formal learning is the will to improve professional qualifications (73 percent), with other motives including individual interests (13 percent), acquiring new professional qualifications (11 percent), and finally, retraining (only 3 percent). This situation is largely caused by the fact that most training programmes were organised and financed by employers, who by definition tailored them to specific job needs. In 2008, 58 percent of persons taking up non-formal learning declared that the training programme they enrolled in was initiated by their employer, 38 percent claimed participation of their own accord and 4 percent were obliged by labour offices. At the same time, 91 percent of training programmes organised by employers were also fully financed by them. The duration of half of the training programmes (51 percent) was not longer than a week (i.e. relatively short), whereas the time span of more than 81 percent of them extended to less than 6 months.

Similarly to formal education, programmes attracting the highest interest in non-formal learning, regardless of age groups, are social and human sciences. It is clear that more men pursue training in engineering and science. Women, on the other hand, opt for pedagogy, health and social care and (to a lesser extent) for human and social sciences.

Figure IV.11. Participation of adults (aged 25-64) in non-formal education by disciplines in selected age groups (left figure) and gender (right figure) in 2008 (percentage).



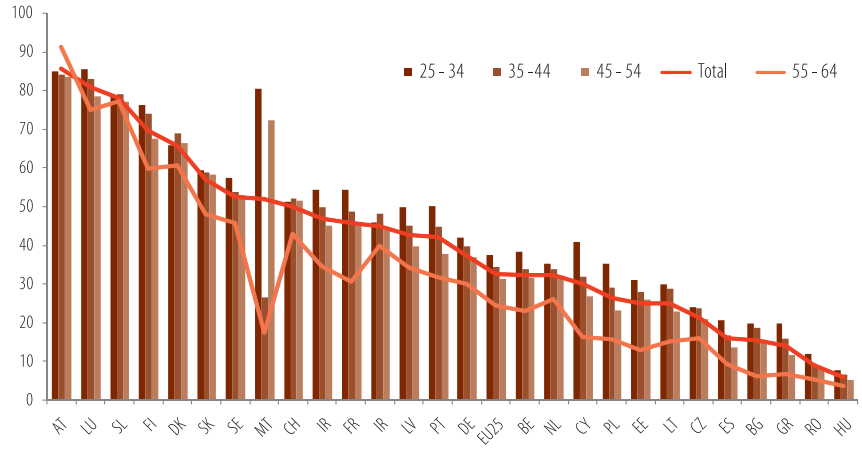
Source: Own calculations based on LFS data.

Informal training

Self-learning (without a tutor) is more popular among respondents in Poland than any other form of learning, yet still not as much as in other EU countries (cf. Figure IV.12). A study conducted by GUS (2009) shows that 25 percent of adults resorted to self learning in the course of the previous year. Informal training is popular among young, well-educated people, employed and residing in large cities, and more frequently among males than females.

When analysing the self-learning participation structure by place of residence, one may conclude that the most frequent method of education with both city dwellers and country residents requires printed materials (books, specialised magazines), as opposed to visiting museums and research institutes, which is the least popular. Moreover, city dwellers far more often use software and the Internet, whereas countryside residents refer to relatives and radio programmes (see Table IV.3).

Figure IV.12. Percentage of people aged 25–64 participating in informal training a year prior to the study, in 2003.



Source: Eurostat, Life Long Learning, ad hoc module 2003.

Table IV.3. Percentage of people aged 25–64 participating in informal training by methods, place of residence and gender.

	Persons who supported the self-learning process with:					
	Help of relatives	books, specialised magazines	computer software and the Internet	radio pro-grammes	visits to museums	visits to research institutes
Total	35.2	80.7	67.3	44.5	12.4	25.0
Men	34.4	79.6	70.0	42.7	9.8	20.0
Women	36.0	81.8	64.9	46.2	14.9	29.6
City	33.6	81.5	73.3	40.6	13.6	27.1
Men	32.7	80.4	77.0	38.2	10.8	22.4
Women	34.5	82.4	69.8	42.8	16.2	31.4
Countryside	39.9	78.5	50.2	55.8	9.1	19.1
Men	39.5	77.1	50.0	55.5	6.8	13.5
Women	40.2	79.9	50.2	56.0	11.2	24.5

Comment: selected methods of self learning do not add up to 100 percent since the respondents could indicate three methods
Source: GUS 2009.

2.3. Determinants of lifelong learning in Poland

Whereas the two previous sections described the patterns and scale of lifelong learning in Poland, this one concentrates on its determinants. By resorting to logit models, we attempt to determine a set of factors (determinants) which have the greatest effect on the probability of an adult person taking up learning.

Variables influencing adult participation in education and training are believed to fall into two major categories: family influence *(the long arm of the family)* and the characteristics of one's job *(the long arm of the job)* (Boudard, Rubenson 2003). Extensive research confirmed that educational attainment significantly influences adult participation in learning (Belanger, Tuijnman 1997; Kern, Friedman 2009). The more initial education and training a person receives, the greater the likelihood of their continuing learning in adult life. Since choices concerning educational attainment are often made under family influence (Saha 1997), although indirect, its impact on adult learning appears to be very important.

Poland belongs to a group of the OECD countries where socio-economic background exerts far-reaching influence on individuals' choices related to education. Using PISA study, Mateju et al. (2007) estimated the impact of social background and skills of fifteen-year-old students from OECD countries on their declared plans concerning education (i.e. whether they intend to pursue tertiary education or not). Poland was classified as a country where skills have an average influence on students' decisions. What proved very influential though, was parents' socio-economic status. This mirrors the fact that the learning process in Poland promotes those of good social

standing, aggravating the problem of social stratification. In Poland, children from families in difficult socio-economic situation have relatively fewer opportunities to access higher education than in other European countries.

On the other hand, the number of children in a family is likely to hamper parents' investments in education. In particular, the presence of a young child that needs constant care, substantially limits the amount of time parents devote to their education and reduces the income of their household. As a result, financial resources available for education are reduced. What follows is that, at least in theory, parents' investments in education should be inversely related to the number of children.

Participation in lifelong learning is also influenced by the nature of one's job, including company characteristics. International research points to the firm size and type of industry in which it operates as the strongest determinants of participation in lifelong learning (Betcherman, McMullen, Davidman 1998, Boudard 2001). Large enterprises operating in non-market services sectors such as education or health care are organising training most commonly. Likewise, firms competing on international markets and those undergoing restructuring or business profile change provide their workers with many training opportunities. Occupational status matters as well – managers, financial supervisors and all those employing literacy skills at their work participate in trainings more often than the remaining workers, especially *blue collar workers* (Boudard, Rubenson 2003).

Logit model results

We explore the determinants of lifelong learning using logit models. The results will help identify and explain factors influencing the likelihood of taking up lifelong learning by individuals aged 25-64. Models presented in this section summarise and complement the discussion of lifelong learning in Poland in section 2.2.

Following the theoretical assumptions discussed above, the group of determinants has been divided into three categories:

1. **core variables**, including age, gender, education, place of residence (city size, village);
2. variables related to **family background**: marital status, children aged up to 15;
3. variables related to **labour market position**: labour market status (unemployed, inactive, employed), occupation, size of workplace, sector of employment (private, public sector), category in Polish Classification of Economic Activities (PKD), working time (full, part), additional job.

Two logit models were built in order to analyse the probability of participation in lifelong learning. Our estimation strategy was to start by considering the effect of core variables and family background on the likelihood of a person to undertake lifelong learning (model 1). We then added variables describing the individual's labour market position (model 2). Definition of lifelong learning has been restricted to formal education and non-formal learning (excluding informal training). In our analysis we use LFS data for 2007 and 2008 (see Box IV.5).

Table IV.4 shows results relating to modelling the decision to undertake lifelong learning. As pointed out above, the models are standard logits with the participation dummy as the dependent variable, and the table shows average marginal effects (AME) of each variable. The dependent variable takes the value of one if a person participated in lifelong learning, and zero otherwise. The first two columns describe categories of variables and their levels. An asterisk (*) in the second column denotes the reference variable. The third column shows estimations of model 1 for all individuals aged 25-64, whereas the fourth one presents the estimations of model 2, which are restricted to the group of employed. An asterisk in the third and fourth column indicates the significance level. It should be remembered that if a category in the third or fourth column is not accompanied by an asterisk, then the level of this variable is not statistically different from the reference level (marked by asterisks in column 2). To be more precise, the value 7.8 percent in the second column for the variable *at least tertiary education* variable, means that once controlled for all other individual characteristics (e.g. age, gender, number of children, etc.), if the entire population had tertiary education, then the average probability of participating in lifelong learning would be 7.8 percent (i.e. 78 persons per 1000 would pursue lifelong learning in total population). The value 5.9 percent in the third column for the *postgraduate education* variable means that, if the entire population had postgraduate education, then the average probability to participate in lifelong learning in total population (controlled for all other characteristics) would reach 5.9 percent. In other words, the reference variable allows to assess the significance level of other variables in the same group. For instance, *at least tertiary education* is the reference variable in the group of variables linked to the level of education.

The results of the first model confirm the theoretical assumptions and demonstrate that the probability of participation in lifelong learning is strongly affected by gender – being a women increases the probability by 0.5 percentage points as compared to man, and educational attainment – the higher the education, the greater the probability of participation. Adults with vocational education are 8 times less likely to undertake lifelong learning than those who completed tertiary education. Participation in lifelong learning visibly decreases with age – the average participation rate of people aged 55-64 is only 0.9 percentage point, whereas among 25-34 year-olds it is at the level of 7.8 percentages points.

The place of residence also influences the participation rate, however, to a lesser extent than age or education. Being a resident of a small town (20- 100 thousand inhabitants) lowers the probability of lifelong learning participation by 1 percentage point compared to the cities with over 100 thousand inhabitants. Importantly, the difference in lifelong learning participation with regard to the size of the city narrows when we estimate the model only for those who work (model 2). This is related to the fact that economic activity is greater in big cities.

Moreover, model 1 shows the negative impact of having children on the probability of participating in lifelong learning. Having a child under 15 years old reduces the likelihood of acquiring new qualifications by parents. Interestingly, the number of children (not shown in Table IV.4) is not relevant, what matters is the fact of having a child.

It is noteworthy that the model has identified a strong influence of marital status on the probability of taking up lifelong learning. The married and the widowed are less likely to get involved with learning. With respect to married people, this may be explained by more family duties they have to assume. The case of widowers is more complex and requires further research.

Model 2 repeats the analysis but adds occupational and firm characteristics, therefore allowing to estimate the impact of the *long arm of the job*. Most estimates are similar to the previous ones, however, the differences between estimates within each category of variables shrunk.

When workplace is taken into account, the gender variable is less relevant, but still statistically significant. This may confirm earlier observations that in strongly feminine jobs (in public sector, non-market services, education, health care, etc.) all workers generally undergo more training.

What is interesting, when only the employed are taken into account, the probability of participation in lifelong learning is higher (although statistically not significantly) for individuals with upper secondary education than for those with at least tertiary. This situation may be linked to the fact that a vast number of young people (below 35) with upper secondary education continuously upgrade their qualifications at schools of tertiary education.

As expected, firm size and job title exert a considerable influence on the likelihood of participating in lifelong learning. Employees who work for large companies (over 250 workers) are 3.3 percentage points more likely to participate in lifelong learning than those in firms employing less than 11 workers. It is the managers, professionals and technicians who are characterized by the highest probability of participation in lifelong learning. The lowest probability is observed among agricultural and elementary workers. The fact of being employed in the public sector has a strong positive effect (although weaker than the influence of firm size). Public ownership increases the probability of lifelong learning participation by 0.4 percentage point. Among categories of the Polish Classification of Economic Activities (PKD), the only relevant influence may be ascribed to the non-market service sector (as compared to industrial sector which is the reference variable in this category), which increases lifelong learning chances by 2.4 percentage points. The above results confirm former observations that Polish workers take up training in large companies, rather public than private, mostly in the non-market service sector, and when holding managerial positions.

Model 2 shows that, interestingly, individuals working part time enjoy greater lifelong learning opportunities. In a considerable measure this might be caused by the fact that the group of part-time workers is frequently constituted by young people with upper secondary education, but no tertiary diploma, who combine learning and work. This result might also explain the high probability of participation in lifelong learning of workers with upper secondary education. If the analysis was limited only to the on-the-job training (excluding formal education), then the positive influence of part-time work on learning probability proves insignificant.

Table IV.4. Determinants of participation in lifelong learning.

Name of variable	Level	Model 1		Model 2	
Gender	man*	3.8%		4.4%	
	woman	**4.3%**	**	**4.7%**	
Age	25-34*	**6.2%**		**6.9%**	
	35-44	4.9%	***	5.3%	***
	45-54	2.3%	***	2.8%	***
	55-64	**0.9%**	***	**1.7%**	***
Education	at least tertiary*	**7.8%**		**5.9%**	
	postgraduate	**5.9%**	**	**5.7%**	
	upper secondary (technical)	3.6%	***	4.0%	***
	upper secondary (general)	**5.6%**	***	**6.0%**	
	upper secondary (vocational)	1.0%	***	2.0%	***
	secondary or lower than secondary	1.3%	***	2.4%	***
Labour market status	employed*	**4.3%**			
	unemployed	3.4%			
	inactive	2.9%	***		
Marital status	bachelor/maiden*	**5.5%**		**5.6%**	
	married	3.5%	**	4.3%	***
	widow/ widower	4.9%	*	3.6%	***
	divorced	**5.0%**		**5.5%**	
Place of residence	100 thousand + *	**5.0%**		**5.1%**	
	20-100 thousand	4.0%	**	4.6%	**
	2-20 thousand	4.0%	**	4.9%	
	village and towns below 2 thousand	2.9%	***	3.8%	***
Children aged up to 15	yes	3.7%	**	4.2%	***
	no*	4.4%		5.0%	
Company ownership	public *			**4.7%**	
	private			4.3%	
Occupation[10]	Armed forces			3.9%	**
	Managers*			**5.9%**	
	Professionals			**6.2%**	
	Technicians and associate professionals			**6.1%**	
	Clerical support workers			4.6%	***
	Service and sales workers			2.7%	***
	Skilled agricultural, forestry and fishery workers			2.0%	***
	Craft and related trades workers			2.5%	***
	Plant and machine operators, assemblers			2.7%	***
	Elementary occupations			2.4%	***
Size of a workplace	<11 workers *			3.8%	
	10-49 workers			4.2%	*
	50-250 workers			4.7%	***
	>250 workers			**7.1%**	***
Working time	full time*			4.6%	
	part time			5.2%	*
Additional work	yes*			**6.6%**	
	no			4.4%	***
Polish Classification of Economic Activities (PKD)	agriculture			3.1%	
	construction			3.7%	
	industry*			3.9%	
	market services			4.1%	
	non-market services			**5.4%**	***
Sample size		106072		69410	
Total relevance of variables (Lagrange multiplier test)		1174	***	4183	***
R2		17%		16%	

Notes: AME denotes mean probability of taking up education if all individuals in a sample were characterized by a given feature, controlled against other variables. An asterisk (*) in the second column denotes the reference variable, but in third and fourth column *, **, and *** indicate the ten, five and one percent significance level respectively, with respect to the reference variable.

Source: own calculations.

[10] According to ISCO

2.4. Effects of lifelong learning on employment and wages

The importance of education, as one of key factors determining labour market position (i.e. productivity, wages and unemployment risk) is well documented in literature (Cahuc, Zylberberg 2004, Barro, Nomura 2007, Dias 2008). Lifelong learning as well, being targeted at enhancing and upgrading human capital, plays a crucial role in improving the economic performance and prospects of individuals.

The positive effects of adult learning on wage increase were pointed to by Jenkins (2003), Dearden et al. (2005), Marcerano-Guiterrez, Vignoles (2007) and others, while Blundell et al. (2000), Feinstein et al. (2004), Jenkins et al. (2003), Jenkins (2006) investigated the influence of adult learning on the likelihood of finding employment. The results of these studies provide evidence of positive employment effects associated with lifelong learning. Numerous analyses also point to the fact that adult learning affects other social outcomes such as health (Schueller et al., 2004), accumulation of social capital (Field 2009), social cohesion (Green et al. 2006) and well-being (EC 2006; Kern, Friedman 2009).

In order to identify impact of lifelong learning on labour market outcomes in Poland, we conduct a two step analysis. Firstly, we construct standard logit models and then compare the results using the propensity score matching (PSM) method.

Since PSM shows a close link to experimental setting, it allows to partially control for selection bias, i.e. a situation when the most motivated individuals are more likely to participate in lifelong learning, thus having a higher probability of receiving better labour market outcomes (finding a job, higher earnings, etc). PSM's basic idea is to find, in a large group of nonparticipants in lifelong learning, those individuals who are similar to the participant in all relevant characteristics. This way differences in labour market outcomes of this adequate control group (i.e. non participants in lifelong learning) and of participants can be attributed to the relevance (or lack of relevance) of lifelong learning.

For the purpose of the analysis 14 models were estimated, allowing to answer the following questions:

1. Does lifelong learning have any impact on the probability of being employed? (models 1-3)
2. Does lifelong learning influence labour force inactivity? (models 4-5)
3. Does lifelong learning influence wage gains and career opportunities? (models 6-7)

A detailed description of each model is presented in Table IV.5. As mentioned above, we constructed one logit and one PSM model for each problem (altogether 14 models). Figure IV.13. reports the results.

Table IV.5. PSM and logit models analysing the effects of learning.

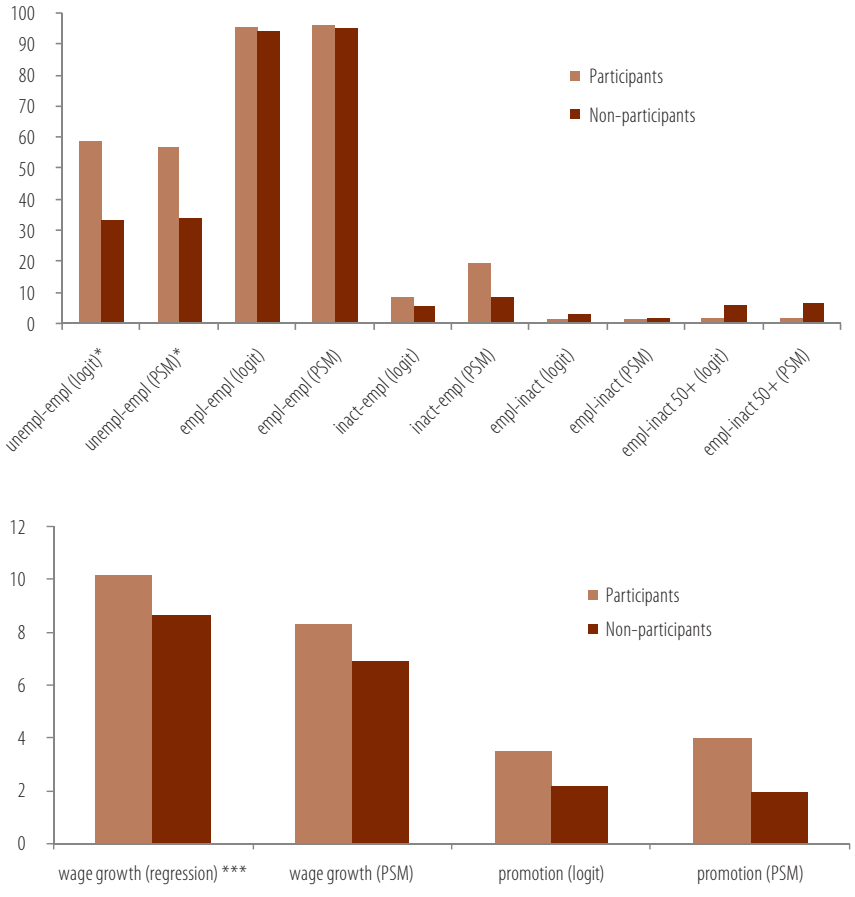
Model	Dependent variable	Control variables
Does lifelong learning have any impact on the probability of being employed?		
Model 1	Transition from unemployment to employment	Gender, age, unemployment spell, general seniority (education statistically irrelevant)
Model 2	Maintaining employment status	Gender, age, education, sector, profession, children aged less than 15
Model 3	Transition from inactivity to employment	Gender, age, education, marital status, children aged less than 15
Does lifelong learning influence labour force inactivity?		
Model 4	Transition from employed status to inactivity	Gender, age, education, place of residence, sector, profession
Model 5	Transition from employed status to inactivity in the case of a person aged 50 and above	Gender, age, education, place of residence, sector, profession
Does lifelong learning influence wage gains and career opportunities?		
Model 6	Wage growth rate over a year	Gender, age, education, place of residence, sector, wages, general seniority, company seniority, children aged less than 15
Model 7	Dependent variable was presented as a dummy variable, which assumed the value of 1 when an individual started supervising other workers in the course of a year, and the value of 0 when an individual does not and did not supervise other workers.	Gender, age, education, place of residence, sector, profession

Source: Own calculations.

Figure IV.13 provides evidence of employment effects of lifelong learning, which vary depending on the model components. The estimates of model 1 (both logit and PSM) show that lifelong learning raises the probability of transition from unemployment to employment (by 100 percentage points). On the other hand, lifelong learning has a very weak and statistically insignificant impact on the likelihood of remaining in employment (model 2). Model 3 shows that lifelong learning has a fairly strong positive, yet statistically insignificant, effect on returning to the labour market for inactive individuals. This may result from the small sample size of inactive individuals who have taken up employment. Participation in lifelong learning tends to decrease the likelihood of leaving the labour market (model 4). This effect is stronger, but again statistically not significant, for individuals over 50 years of age (model 5). Lifelong learning also provides a wage premium for adults. Model 6 shows that adults who undertook learning enjoyed stronger growth of earnings (by 1 percentage point) as compared to those who did not participate. Lifelong learning also has a positive, although insignificant, impact on career progression. Finally, model 7 shows that participants are more likely (by 1 percentage point) to be promoted, but again this result is not significant.

In summary, our main result is that lifelong learning in Poland has positive but moderate (it must be remembered that most variables were not statistically significant) labour market effects. Undertaking lifelong learning is associated with an increase in the labour force participation (by enhancing the probability of transition from unemployment and inactivity to employment and by reducing the probability of leaving the labour market), as well as improvement of the individual position in the labour market (by increasing wage gains and the probability of career progression).

Figure IV.13. Average effect of lifelong learning on labour market outcomes (upper figure) and on wage growth and career progression (lower figure) (percentage).



Notes: The figure presents results of models described in Table IV.5. (m1. - denotes model 1, etc.). Bars stand for an average promotion probability (right figure), conditional on all individuals in a sample pursuing learning or not. * , ***indicate 10 and 1percent significance of the difference.
Source: Own calculations based on LFS data for 2007 and 2008.

3. Policies supporting lifelong learning

The fundamental question regarding public policies supporting lifelong learning is whether they are at all justified. In other words: are there any important reasons why adult learning should be subsidised by the state? From an economic point of view, such a policy would be justified if its social returns were higher than the private ones. This could in turn lead to suboptimal private investments in adult learning. Such a situation would be possible if lifelong learning was a public good or if it generated positive externalities not priced by its participants. The former scenario has been analysed in the following box, the latter will be elaborated later on in this Part.

Economists have long attempted to evaluate the externalities of education. Much of the modern growth theory puts human capital at centre stage, arguing that presence of positive externalities of a better educated workforce is an engine for growth. Empirical research conducted so far is not, however, conclusive in this respect. There are arguments proving the existence of externalities of education, as well as studies pointing to their scarce relevance (Lange, Topel 2006). Their significance seems to be greater at initial stages of education, when children acquire skills needed for an active participation in the social life. Adult training, usually geared at specific skills useful in professional life, brings more benefits to individuals rather than society. In this case state subsidies to adult learning might be considered ineffective, with public funds used for services that motivated individuals could pay for themselves. Furthermore, according to the concept of signalling role of education (Spence 1974), such policies could even lead to excessive investment in adult learning. This theory implies that when searching for potential workers, employers are not able to evaluate the candidate's real skills. What follows is that highly productive individuals are motivated to undergo training not to acquire new skills, but rather to prove the ones they already possess. By sending such a signal to employers, candidates gain a competitive edge in the labour market.

Box IV.6. Is lifelong learning a public good?

Economic theory distinguishes four basic types of goods with respect to their rivalry in consumption and excludability. A good is said to be excludable when individuals can be prevented from using it. Rivalry of consumption refers to the degree to which one person's consumption of a good prevents another one from consuming it. Goods are non-rivalrous if they can be consumed by others without additional costs. The table below presents different types of economic goods and along with examples.

	excludable	non-excludable
rivalrous	Private goods: cars training services	Common goods: fishing grounds city parks
non-rivalrous	Club goods: golf courses cable TV	Public goods: national defence fireworks display

How should lifelong learning be classified? Let us have a closer look at a single training course. If the number of participants is low (e.g. 10), then allowing one more person to join would not generate any additional costs. However, it is not possible to add an infinite number of participants. For a course to be effective, especially in the form of a workshop, it cannot be attended by more than a dozen of people. Lifelong learning should be therefore classified as a rivalrous good. It is also excludable, since any person may be deprived of the right to take part simply by not being let in. In consequence, the nature of lifelong learning is similar to that of private goods.

Although entirely convincing economic arguments for the public provision of lifelong learning have not yet been found, this policy could be justified on other grounds, e.g. with the need to provide equal access to training services or to counteract social exclusion. People with small income and low motivation to learn may either be unwilling to take up training or unable to afford it, even if this could enhance their well-being in the long run. Such persons usually find themselves in a difficult labour market position, which also makes them the most frequent recipients of unemployment benefits and other forms of social welfare services. Instead, they could be supported by being offered access to appropriate training that would improve their employment prospects. This kind of solution is not only relatively inexpensive, but it could also generate budget savings by cutting down the number of people on unemployment benefits. Econometric analysis conducted in the previous section showed that lifelong learning raises the probability of transition from unemployment and inactivity to employment. By acquiring new skills, those in a difficult labour market position, could cease to rely on social welfare services.

Regardless of individual or social effects of adult learning, its provision and promotion is one of the most important goals of economic policies in many modern countries, with a range of institutional solutions having been developed in this area. In the following sections we undertake to evaluate the usefulness of lifelong long learning policies. Their assessment will be based on the following criteria:

1. **Equalising access to training services**. It is postulated that instruments supporting lifelong learning should be directed mostly at removing barriers to training services for people in an unfavorable labour market position.
2. **Influence on the education market**. It is vital that public instruments have a positive effect on the education market, and in particular on its competitiveness, as well as on diversity of the services offered and better information policy.
3. **Influence on the labour market**. Lifelong learning policies should improve employment prospects, especially of individuals with low qualifications. It is crucial that policies induce the training of skills most needed in the rapidly changing labour market.

Regardless of the scale of the introduced policy supporting adult learning, it is its direct **participants** who play the key role in its financing. This solution is economically justified, since the increase of wages and better employment prospects make participants the main beneficiaries of training. What is more, a system based on private financing is quite efficient (Palacios, 2003), because the individuals involved are highly motivated to search and opt for the best training institutions, which triggers competition on the education market. However, such a financing method is not flawless. The benefits of training are not immediate, whereas costs have to be borne in advance. As a consequence, benefits are frequently underestimated, which lowers people's motivation to take up or continue training. The solution to this problem lays in dedicated financial instruments, such as education loans or the so called Human Capital Contracts, which synchronize costs and profits in time, diminishing the risk of making wrong educational decisions (Palacios, 2001). These instruments, however, function only on developed financial markets, e.g. in the United Kingdom or the US. Hardly available in Poland, they are mostly limited to preferential student loans (available only for the ones from low income families), and loans for MBA programmes, offered exclusively by a couple of commercial banks.

Employers are the second source of funding. Firms frequently send their employees to training in order to equip them with skills necessary at their job. In many countries, such company policies are encouraged and rewarded with tax exemptions.

The third group of stakeholders are non-governmental organisations (universities of the third age, charity and religious institutions). They either support learning or organise free training programmes themselves. Although very generous, this kind of support reaches only a limited number of people (Palacios, 2003).

The fourth method of financing lifelong learning is through **state subsidies**, which can be distributed in two forms:

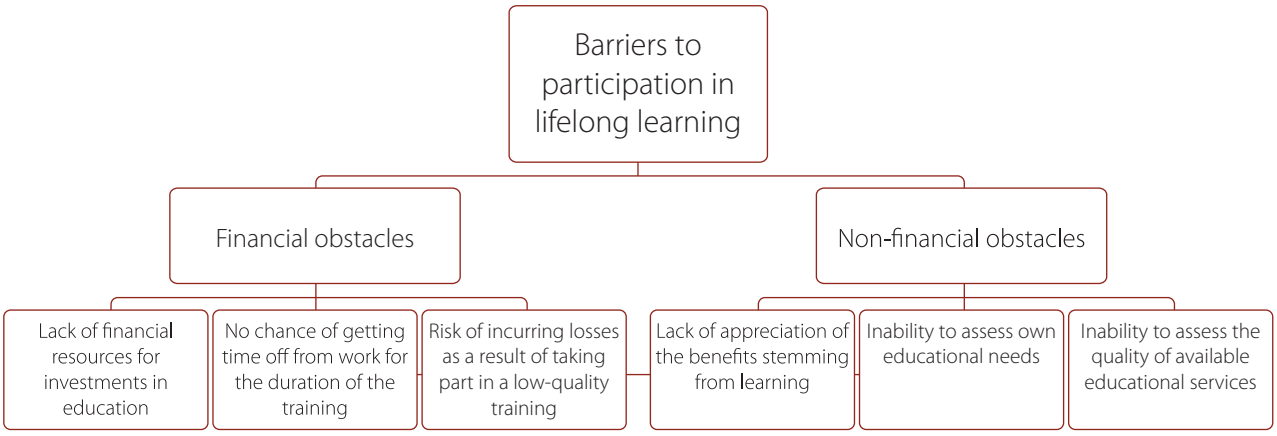
- **supply-side financing**, i.e. support given to schools and institutions of lifelong learning offering training services on preferential terms to specific social groups;
- **demand-side financing**, i.e. direct support offered to participants either by means of cost reimbursement or by subsidising participation in training (e.g. individual education accounts or training vouchers, or co-financing of loans taken for educational purposes).

A separate set of public policies is directed at **removing nonfinancial barriers to education** (see Diagram IV.1). Low participation in lifelong learning is very often due to information barriers, which arise in two situations. Firstly, since workers' qualifications are difficult for employers to assess, acquiring new skills does not always translate into higher wages or better employment prospects. Secondly, even if specific skills are recognised in the labour market and their acquisition brings notable benefits, training participants do not necessarily recognise this. Consequently, they find it difficult to choose a high-quality educational institution and adequate training programme. Both of these barriers may cause workers to give up lifelong learning.

Governments can attempt to counter non-financial barriers to lifelong learning in the following ways:

- **Developing professional qualification standards**, indicating specific skills that one has to acquire in order to receive a state certificate. This solution makes recognising and comparing workers' skills easier and cheaper for employers. Workers, in turn, could be offered a wide choice of forms (e.g. e-learning) and durations (full-time, part-time, etc.) of training.
- **Introducing an information system on the education market** that facilitates the process of comparing and evaluating the quality of the education offer of different training institutions (e.g. by certification). The system should be complemented by a career consultancy service set up to help individuals make proper education choices.
- **Introducing a legal framework decreasing the negative consequences of asymmetry of information on the labour market,** e.g. providing support for firms' training schemes and engaging social partners (unions and non-governmental organisations) in lifelong learning.

Graph IV.1. Obstacles to participation in lifelong learning.



Source: Own elaboration.

In conclusion, there is a range of financial and non-financial instruments supporting lifelong learning, summarised in the table below.

Table IV.6. Instruments supporting lifelong learning.

Type of instrument (policy)	Financing party	Beneficiary
Learning accounts	Participants of lifelong learning, government, companies, non-governmental organisations	Participants of lifelong learning
Scholarships and education vouchers	Government, non-governmental organisations	
Tax exemptions on lifelong learning expenses	Participants of lifelong learning, government (indirectly)	
Education loans	Government	
Professional qualification standards and information system about the education market	Government, non-governmental organisations	
Lifelong learning funds	Companies	Employers
Subsidies and tax exemptions on expenses related to employee training	Companies, government	
Subsidies to public and private training institutions	Government	Public and private training institutions

Source: Authors'.

In the following sections of this Part, we will apply the above-presented theories to discuss policies supporting lifelong learning in Poland. The topic of individual learning accounts will be given most attention, as it raises great hopes for dissemination of lifelong learning.

3.1. Public support for lifelong learning in Poland.

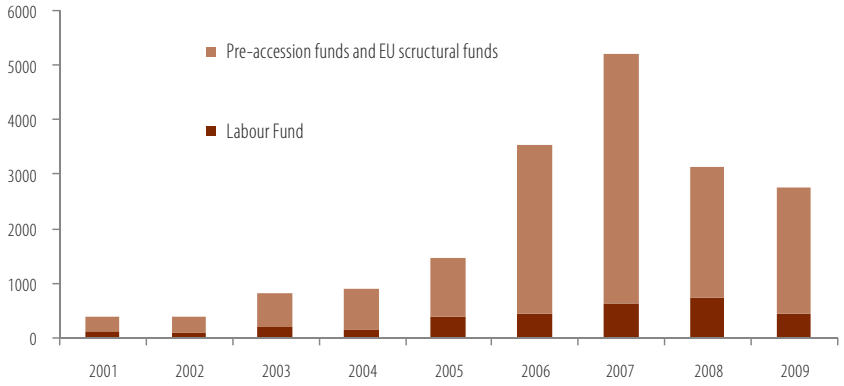
For many decades supporting lifelong learning has been placed very low on the list of Poland's socio-economic priorities. However, as Poland begun its preparation to join the European Union, the situation started to change. The funds allocated to the development of human capital have been steadily growing ever since. Initially, funding was provided under the pre-accession PHARE[11] programme, Programme for the Activation of Rural Areas, and the Reorientation Training Programme supported by the World Bank. In 2004, after Poland's accession to the EU, the country gained access to an even greater amount of aid from structural funds. The following programmes supporting lifelong learning became available: Sectoral Operational Programme Human Resources Development (SOP HRD) (Priority I and II), EQUAL (theme A, F and I) and Integrated Regional Operational Programme (IROP). In the current EU financial perspective, support for learning is provided under Operational Programme Human Capital (Priorities I, II and partly III, V, VIII and IX) and

[11] PHARE 2000 ESC, PHARE 2001 ESC HCD, PHARE 2002 ESC HCD and PHARE 2003. The funds were implemented in 2003-2006.

Regional Operational Programmes. Moreover, there are also domestic resources aimed at co-financing lifelong learning. These include: part of the Labour Fund, local self-governments' support for public schools for adults, and funds from central offices' budgets allocated to the training of their staff (e.g. government officials, doctors, teachers, soldiers, etc). The figure IV.14 shows estimated data on financial support for lifelong learning from public sources in Poland.

Available data show a significant growth in the amount of funds devoted to lifelong learning after 2006 (from approximately PLN 400 million in 2001 and 2002, to about PLN 5 billion in 2007). It is expected that in the nearest future (approximately by 2015), a further implementation of EU funds will stabilise the amount of public expenditures in this area at the level of PLN 2.5-3 billion annually. It is difficult to assess to what extent these figures are comparable to support provided to lifelong learning in other EU member states. Eurostat data provide information on total public expenditure on education solely according to the ISCED classification (International Standard Classification of Education), i.e. excluding lifelong learning. Only a few EU member states collect and publish information on their spending. For instance in Denmark, the country with the highest participation level in lifelong learning, in 2006 the policies aimed at adult learning received an equivalent of around PLN 9 billion (Facts and Figures 2007),[12] which is three times more than in Poland (although Polish GDP adjusted for the purchasing power standard (PPS) is three times higher than the Danish one).[13]

Figure IV.14. Public financial support for lifelong learning in Poland [PLN million].[14]



Source: Own calculations.

On the other hand, still in 2006, Spain (46.5 million inhabitants) devoted an equivalent of approximately PLN 1.43 billion to adult education, which is far less than Poland. Clear disproportions in allocation of public funds to lifelong learning not only mirror factual differences between countries, but also point to the lack of universal standards of statistical data collection. It is therefore impossible to draw any comparative conclusions concerning the relationship between the scope of lifelong learning policies and the number of participating adults.

3.2. Instruments available to training institutions

Having discussed the financial aspects of state support for lifelong learning in Poland, we will now take a closer look at the way in which these resources are actually used. The majority is distributed as subsidies for organising trainings, postgraduate studies and other education services for people in a difficult labour market position such as:

- the long-term unemployed;
- countryside residents;
- the disabled;
- individuals employed in sectors undergoing restructuring;
- persons at risk of social exclusion;
- women entering or re-entering the labour market.

[12] Annual average value of Danish Krone in 2006 (NBP), prices as of 2009.
[13] In 2006, Danish GDP reached approximately USD 191 billion, whereas Polish GDP equaled USD 561 billion (according to OECD data).
[14] Due to the lack of data allowing for a precise calculation of public expenditure on lifelong learning policies in Poland, the presented figures are only estimates. The following assumptions were used in the above calculations:
- resources allocated to lifelong learning within EU Funds were utilised at the same pace as all EU Funds (according to reports on implementation of the National Development Plan produced by the Ministry of Regional Development (2004-2006) and National Strategic Reference Framework 2007-2013),
- EU funds were spent at an average annual EUR exchange rate for a given year, provided by the National Bank of Poland,
- all values in the figure are expressed in prices as of 2009.

Labour offices use resources from the Labour Fund and Structural Funds to organise and finance training programmes, apprenticeships and scholarships for further training targeted at the unemployed and those facing the risk of unemployment. Public funds are also spent on schools and lifelong learning centres addressing their offer to adults. Also private training institutions receive public funding, especially from the EU Structural Funds. They can apply for public support for purposes such as infrastructure modernisation (e.g. computers) or organisation of trainings targeted at specific social groups (mainly the unemployed or those at risk of unemployment). Companies, either on their own or in cooperation with training institutions, can as well apply for financial aid for their internal training projects. State support can also be granted through indirect actions aimed at fostering pro-learning attitudes among adults (e.g. career counselling) and at improving quality and accessibility of education offers of training institutions. Alongside these instruments, a lifelong learning supervision system has been developed. Its main components are the central Register of Training Institutions (built in the framework of the Syriusz project) and accreditation and certification system for non-formal learning.

Table IV.7. Instruments supporting lifelong learning in Poland.

Instrument	Target recipients
Training programmes financed or organised by Labour Offices, including apprenticeships and traineeships in enterprises	People in a difficult labour market position: the unemployed, persons aged above 50, women re-entering the labour market, people with low qualifications, reserve soldiers, etc.
Labour Fund co-financing trainings for employees of companies with training funds	Employees
Subsidies for public training institutions within the framework of state budget subventions for education	Persons willing to upgrade their education (e.g. at lower secondary school or upper secondary school for adults) or acquire new qualifications (e.g. in professional improvement centres)
Financing for public and private training institutions from EU Structural Funds	Primarily people in a difficult labour market position
System supervising training institutions' activity (register, accreditation, professional qualification norms)	All entities on the market of training services

Source: own elaboration.

It can be concluded that instruments supporting adult education in Poland are mostly targeted at the supply side of the lifelong learning process (i.e. labour offices as well as private and public training institutions). In view of the nature and scale of this policy, it seems reasonable to question its effectiveness. Are the incurred costs adequate to the achieved results? The lack of relevant data and a subtle character of the problem makes it difficult to give an unambiguous and definite answer.

Nevertheless, there are numerous theoretical and empirical arguments against the current model of supporting lifelong learning in Poland. Its inefficiency is best proved by the fact that despite large subsidies (almost PLN 12 billion from 2006 to 2008), the lifelong learning participation rate did not change significantly, and in 2008 remained at the level from 2004. Three factors should be blamed for this situation. First of all, public spending on lifelong learning induced a noticeable rise in trainer's remuneration and board and lodging costs in training centres, thus hampering the growth of the training services supply (PAG Uniconsult, Pentor, 2007). Secondly, as a consequence of limiting recipients of state support to persons in a difficult labour market situation, the same individuals may have participated in a large number of trainings. Finally, an increase in public spending could have brought about a replacement of private expenditure in this area. For instance, companies that used to train workers at their own expense, reduced their expenditures thanks to trainings co-financed by the European Social Fund. Although the available data does not allow to estimate the scale of this crowding-out effect, its sheer existence is indicated by qualitative research (PSDB, 2008).

Allocating majority of the funds to training institutions is also challenged by arguments based on the theory of economics, especially since the criteria of allocation are often arbitrary. There is no efficient system of rewarding institutions that achieve best results and penalising the worst ones. As a result, organisations hardly ever compete in terms of quality, which neither brings improvement in their services nor adjusts their offer to the needs of the labour market. The situation is further aggravated by the asymmetry of information in the market of training services. Participants of training programmes are virtually unable to verify their quality before enrolment, with low costs of the co-financed trainings even further decreasing their motivation to carry out such a verification. In the end high quality training programmes are crowded out by poor quality ones. As shown by PSDB research (2008), this effect can be also observed in the Polish lifelong learning system.

Another negative outcome of allotment of public funds to the supply–side of lifelong learning is that the training institutions' offer does not meet labour market expectations. This holds both for the form of training (resulting e.g. in small supply of the on-the-job training) and their content. A meticulous control of the lifelong learning system in Poland conducted by the Supreme Chamber of Control (NIK) 2008 (see Box IV.7) proved this point to be true beyond any doubt.

Box IV.7. Polish lifelong learning system evaluated by the Supreme Chamber of Control (NIK).

In 2008, the Supreme Chamber of Control tested the adequacy of the lifelong learning system in Poland to the labour market needs. Having scrutinised the activity of 40 public training institutions from 2005 to 2008, the Supreme Chamber of Control concluded the following:

- in academic year 2007/2008, 53 percent of participants of lifelong learning programmes were preparing to take up 20 professions which were notorious for the highest number of unemployed graduates (e.g. economic assistants, junior cooks, economists, trade assistants, mechanics);
- 35.6 percent of trainings in the controlled institutions focused on the permanently surplus occupations, in which the number of the unemployed registered in the labour offices exceeded the number of all registered job offers by 10 percent;
- only 12.5 percent of trainings were related to deficit occupations (in which the number of the unemployed registered in the labour offices was 10 percent lower than the number of the registered job offers);

The control also revealed an extremely low attendance rate and high number of participants giving up training, which indirectly may provide evidence for its low quality. What is more, there were courses recorded where all participants resigned after the first semester. An average 56 percent of those sitting their professional qualifications exams were successful, but 18 percent of those who completed their training never registered for the exam. Moreover, only 9 percent of public lifelong learning institutions were accredited to conduct vocational courses outside school (27.8 percent in the case of private institutions). The Supreme Chamber of Control report provides strong evidence of the low quality of training services offered by public lifelong learning institutions in Poland and indicates that to a very large extent they do not meet the labour market needs.

Source: The Supreme Chamber of Control (NIK), 2009.

To sum up, direct state support for training institutions seems to be an inefficient tool for promoting lifelong learning. Its major drawback is the fact that the distribution of public funds between various training institutions is not based on the actual demand for their services among lifelong learning participants. Consequently, the system lacks any stimuli that would motivate training institutions to adjust their offer to the labour market demands. Moreover, competition mechanisms become distorted, which has a devastating effect on the quality of the education offered. These problems could be at least partially remedied by implementation of instruments targeted at individuals and companies i.e. the demand-side of lifelong learning. Such solutions will be suggested below.

3.3. Instruments available to firms

Since companies are central to initiating their employees' learning, many institutional solutions to promote lifelong learning are directed at entrepreneurs. There are two basic forms of this type of support:

- **Financial instruments**, most frequently in the form of a subsidy for organisation of a training programme or tax exemption enabling a full or partial reimbursement of expenses borne by companies in order to provide training to their workers.
- **Nonfinancial instruments**, aimed at mitigating negative effects of the information asymmetry on the market of training services. Such solutions may include providing free consulting on training-related topics for companies or developing qualification standards or actions ensuring a high quality of training services (accreditation, certificates for training institutions etc.).

The key advantage of supporting companies is that it stimulates the demand-side of lifelong learning, thus contributing to better productivity and competitiveness of training services market. Moreover, the scope of such support includes a wide range of training forms, including on-the-job training, which does not interfere with workers' professional duties. It is debatable, however, whether supporting companies is an efficient method of spreading the idea of lifelong learning.

In 1999 and 2005 *Continuous Vocational Training Survey* (CVTS) was conducted among entrepreneurs in Europe. Among many other things, it also investigated whether the fact that companies developed training plans was at all influenced by availability of particular instruments supporting lifelong learning. Results of the survey are presented in Table IV.8.

Poland is one of the countries, where support for companies is least efficient. Even more striking is the fact that in reality only professional qualification standards have any real influence on the firms' decisions. It has to be remembered, however, that CVTS was conducted in 2005 and the availability of instruments supporting companies in fostering lifelong learning has increased ever since. It is also

noteworthy that countries where the learning policy was most appealing to companies and successfully influenced their training plans have not ranked highest in terms of the lifelong learning participation rate. It hence appears that apparently the company support instruments have not been crucial in promoting adult learning, which suggests that their effectiveness is limited in this respect. This could be explained by the crowding-out effect causing companies to replace their own spending on training with public funds.

Table IV.8. Percentage of companies which pointed to a particular instrument supporting lifelong learning as influencing their training plans; by countries, in 2005.

	Any instrument	Training subsidy	Tax exemption	Counselling	Professional qualification standards	Quality certification of training services
Greece	59	47	26	18	38	20
France	56	41	16	26	16	20
United Kingdom	45	17	9	9	32	25
Austria	43	23	21	6	19	16
Spain	38	17	26	4	16	2
Sweden	37	10	10	5	26	6
EU-25	36	17	10	9	20	11
Denmark	33	21	6	6	22	6
Poland	25	2	–	2	22	5
Finland	25	14	–	5	14	–
Latvia	24	0	–	5	22	5
Hungary	24	9	16	1	10	3
Czech Republic	21	1	–	2	19	3
Slovakia	21	2	1	4	18	6
Estonia	20	5	3	1	13	7
Germany	18	2	1	1	14	6
Lithuania	15	5	–	11	–	3
Norway	5	3	–	2	–	–

Source: Eurostat.

3.4. Individual Learning Accounts: direct support to participants

The scope of the possible institutional solutions aimed at encouraging individuals to take up training is enormous. Regardless of their form (tax exemptions, financial subsidies, education vouchers), the support may differ with respect to the following criteria:

- **Eligibility:** this might be restricted to all citizens in a particular age group (e.g. 25-59), or to persons meeting other conditions e.g. unemployed, inactive, poorly qualified, etc.
- **Available forms of learning:** education at institutions providing training services to adults, postgraduate courses, general trainings, on the job training.
- **Amount of support:** either relatively low financing (forcing larger contribution on the part of participants) or strong financial incentives.
- **Types of costs eligible for financing:** this may be tuition fees, traveling costs or other costs of training related to the necessity of taking time off or refraining from commencing employment.

In reality, the direct support to beneficiaries of lifelong learning usually consists of several instruments targeted at different social groups or available for different forms of training. Box IV.8 shows a case study involving Swedish institutional solutions supporting lifelong learning available for individuals.

Individual Learning Accounts (ILA) introduced in the United Kingdom constitute a relatively new form of lifelong learning support. In fact, this solution has been applied in many countries (United Kingdom, Denmark, Belgium and Austria), yet not on a large scale. The largest programme so far involved 2 million people in the United Kingdom. The instrument has significantly evolved since it was first introduced.

Box IV.8. Instruments supporting lifelong learning in Sweden.

Sweden is a country with the highest lifelong learning participation rate. One of the many factors contributing to this success involves instruments encouraging individuals to take up learning. ASE (Adult Secondary Education) was one of the first solutions allowing adults to attain secondary education, and it remains in force until today. ASE provides its participants with scholarships and student loans on preferential terms. Moreover, participants are entitled to unpaid holiday for education purposes. In addition to ASE, another programme: "Expanding Knowledge" was launched in 1997-2002 allowing its beneficiaries to start on-the-job training with the help of a scholarship grant and educational loan. The unemployed were entitled to additional benefits. In 1999, the programme attracted a record number of 228 participants (compared with 300 thousand students learning in three-year secondary schools in Sweden at that time).

A range of evaluations and analyses were carried out to measure the efficiency of the Swedish support programmes offered to participants of lifelong learning. The results were mostly inconclusive, and even contradicting in some cases. The most extensive research by Ekström (2003) focusing on careers of the ASE participants found no correspondence between participation in learning and earned wages.

A review of research on efficiency of active labour market policies prepared by Calmfors, Forslund and Hemström (2002) does support a thesis that providing training to people in a difficult labour market situation improves their employment prospects and chances for higher wages. The authors suggest that the inefficiency of such policies is largely caused by too many participants. This is especially true for young people who, attracted by lifelong learning and the related incentives, refrain from entering the labour market.

Source: Ericson 2005, Calmfors, Forslund, Hemström 2002.

The first suggestions of individual learning accounts were inspired by Individual Development Accounts (IDA) initiated in the USA at the beginning of the 1990s. This solution was meant to counter poverty and social exclusion. Individuals offered an IDA could accumulate some savings, which were supplemented by public funds and private sources (e.g. by charities). One could use these resources to start a business activity, purchase a house, save up for future pension etc. Individual learning accounts were to be structured in a similar way, but the savings would be allotted only to education. Individual learning accounts would be financed from three sources:

- employee's (holder's) current savings;
- employers' voluntary contributions;
- state subsidies.

Saving with learning accounts would be encouraged by preferential rates, direct state subsidies, tax exemptions on contributions made both by employers and employers. This form of a learning account would encourage people saving for educational purposes and removing some barriers in accessibility of lifelong learning.

The scope of freedom that holders of these accounts enjoy is the major advantage of this instrument. Participants of the programme may formulate their education goals themselves, which fosters a greater motivation. They can also individually define the method of reaching those goals, in terms of form, topic and timeframe of training programmes. The requirement to save one's own money would stimulate the process of education planning referring to expenses and benefits, thus helping in making the right education choices. In other words, holders of individual learning accounts stand the chance of shaping their lifelong learning according to their individual needs and preferences.

Despite many advantages, the first **generation of learning accounts** did not meet their authors' high expectations. Pilot programmes implemented in the Netherlands, England and Austria revealed significant flaws of the solution. First and foremost, relatively few people see the benefits of lifelong learning and so not many are interested in saving for training purposes. Those who do are usually well educated already and have no need for such instruments, as they are aware of the necessity of continuous learning and also capable to finance it on their own. In other words, individual learning accounts are not particularly effective in raising participation in lifelong learning – they attract only those who would have learned anyway. These drawbacks led to development and popularisation of the second generation of individual learning accounts operating on slightly different terms.

Box IV.9. Individual learning accounts in Upper Austria.

Upper Austria is the first region in Europe, which decided to launch a pilot system of individual learning accounts in 1994. Approximately 20 thousand employed individuals with low qualifications and low income were the beneficiaries of the programme. They were allowed to use individual learning accounts managed by the local government for the period of five years. The offered interest rates were preferential and 3 to 8 percent higher than interest rates available on the market. In the course of the first five years money from learning accounts could be withdrawn only to cover the cost of a training programme or any other training service provided to the account holder. After that period (i.e. in 1999), the savings could be used for any purpose. There was yet another incentive for the participants. They could apply for the reimbursement of 50 percent of training expenses and other costs related to training services. After the first edition of the programme was fully completed, its effects were evaluated and served for a new, improved edition in 2000. Participation criteria were made more lenient and reimbursement allowance was extended to 80 percent. This is how the instrument evolved from a traditional education savings account to a form of dedicated subsidies. The number of participants remains scarce and in 2006 it reached 20 thousand. Therefore it is difficult to estimate to what extent individual learning accounts fostered participation in lifelong learning in Upper Austria.

Source: CEDEFOP 2009.

The second generation of individual learning accounts is not meant to support individual savings, but constitutes a system of incentives encouraging people to take up learning. Thus, they function similarly to direct training subsidies. Their functionality is limited to information and administration tasks. A holder of such an account can benefit from co-financing of a training programme and additionally may:

- use career and learning counseling;
- browse offers of training institutions;
- register for a specific training programme.

This structure of learning accounts makes them better suited for fulfilling priority needs, from the perspective of the state policy and social groups: older people, individuals with poor education and/or low income. This is why career counseling and providing information on the training offer constitute integral elements of the second generation of individual learning accounts.

Apart from the above advantages, the individual learning account system has also certain flaws. One of the major drawbacks is its relatively high cost. Although the beneficiaries are usually required to co-finance their training, the present day learning accounts require more public funding than before. This problem could be approached by narrowing down the target group, e.g. to people in a difficult labour market position, who use other forms of social care anyway. Moreover, individual learning accounts also entail a potential risk of fraud in that they tempt training institutions to pursue rent-seeking. The problem can be illustrated on the example of Scotland, where its scale necessitated the modification of the local learning accounts system (Audit Scotland 2003). In order to avoid situations of the kind, managing administration should constantly register and monitor training institutions participating in the programme.

In sum, individual learning accounts appear to be an attractive tool of popularisation of lifelong learning. One of the programme's major advantages is that it focuses directly on future participants of learning, supporting them both financially and non-financially (e.g. via special software participants gain an easier access to the offers of training institutions). It is also important that learning accounts are economically more effective than other instruments.

An additional source of motivation is the fact that account holders formulate their educational goals in cooperation with a counsellor. They are also free to choose a training institution, which fosters competition within the sector. Learning accounts may be worth implementing also in Poland, where relatively large funds are available for lifelong learning, but the participation is low (caused not only by financial reasons, but also by the lack of motivation). In this situation, a partial redirection of public funds from training institutions to potential recipients of training could improve the lifelong learning participation rate by increasing the number of persons involved in learning. This could also help avoid instances when training is repeatedly provided to some participants, at the expense of others. The introduction of a learning accounts system would also integrate all currently dispersed forms of lifelong learning support: career counselling, provision of information on training institutions and their offer, training subsidies.

Conclusions

The period of political transformation brought about a boost in the education activity of Poles who, having graduated from upper secondary schools, more and more frequently opted for tertiary education. Institutions of higher education developed rapidly, mostly in the private sector. Although Poland is quickly catching up with developed countries in terms of the number of graduates with a higher education degree, sadly this is limited mostly to formal education of individuals below 25. This age is a threshold for a rapid loss of interest in learning, which has its direct effects in an exceptionally low lifelong learning participation rate in Poland, as compared to other OECD countries. The scale of the problem is caused not only by a scarce education activity among adults, but also by the fact that employers are not too eager to organise training programmes for their workers. Only one third invests in the employee training, comparing to almost 60 percent of companies in the EU. The group of lifelong learning participants in Poland consists mostly of young, well-educated people (more frequently women) residing in large cities and employed in large firms.

One of the major obstacles for Poles in taking up lifelong learning is the lack of awareness of the benefits that can be reaped from education. Although no direct correlation has been found between lifelong learning and pay rise or promotion (the identified influence was statistically insignificant), it can be surmised that upgrading skills increases one's employment prospects and visibly reduces the risk of long-term unemployment. The effect is especially evident among persons aged 50-65, as training programmes for older workers postpones their exit from the labour market. Considering the issues discussed in Part I, this conclusion could be of paramount importance for socio-economic policy.

Disproportions in the lifelong learning participation rate between Poland and other EU member states can be traced back to differences in the public policy on adult learning. It is not financial barriers that are the problem. Poland's expenditure on lifelong learning has significantly increased in the last few years and its current level is very likely to be close to that of other European countries. Despite this fact, educational activity among adults has not increased dramatically. Therefore, it is not the scope but rather the shape of the current policy that is to be blamed. Support is directed primarily to public and private education institutions i.e. the supply-side of lifelong learning, leaving the direct participants of training programmes with a limited influence on the form and content of the offered training. This is, of course, detrimental to the education market competitiveness and capacity for adjustment to labour market demands. As a result, the training costs rocket and the number of participants remains at a relatively low level. The problem could be solved by redirecting the state policy to supporting potential training participants rather than training institutions (e.g. by individual learning accounts). Functioning as vouchers for a chosen training programme, the ILA accounts boost the motivation of their holders to formulate and achieve individual educational goals, by at the same time stimulating competitiveness on the education market.

Recommendations

In 2009, the number of employed people in Poland soared to 16 million, thus reaching a historical record. This figure, however, is bound to dwindle away by a million over the coming decade. Such a massive decline will be attributed to the dynamics of demographic processes and the rapid exit of the post-war baby boom generations from the labour market. The ageing process affecting both the entire population and the labour force will result in a shrinking number of prime-aged people. The population will gradually undergo changes in age structure and size and it is expected to decline even by 6 million by 2060. Offsetting population and the economic consequences of these processes has become one of the major challenges of social policy in the present decade.

As shown in Part I, the impact of demographic processes on the economy in the coming decades is undisputable. And yet, their consequences are not imminent. Even though counteracting the effects of population ageing in such a short time span is extremely difficult, today Poland still has the potential to limit its scope, and even to overcome it in the course of 30 years. The most important challenge the Polish economy has to face is to fill the labour market gap made by populous cohorts born in the 1950s and early 1960s, which are gradually exiting the labour market even before reaching retirement age. We argue that evening out male and female retirement age at 67 years would, thanks to the strengthening of the synergy effect of the pension reform (1999) and abolishment of early retirement (2009), considerably bridge this gap. From a strictly economic point of view, the best alternative involves extending the official retirement age before 2020. This could be achieved e.g. by raising the official retirement age of females by 6 months annually starting in 2011, or alternatively by increasing it on a monthly basis by an additional month starting in 2013. The latter scenario assumes that the official retirement age of both men and women will reach 67 years in 2020. Thus, the number of labour market participants will then jump by 800 000 and the economic growth rate in the 2010-2020 period will rise up 0.2 percentage points annually. This is comparable with the direct impact exerted on the Polish economy by expenditures on basic infrastructure projects carried out under the EU's Cohesion policy.

The above effect can be positively strengthened by policies aimed at fostering the early entrance of youth (below 25) to the labour market. Such a solution will make young people in Poland begin their employment at an age similar to that of their peers in other OECD countries, i.e. 3 years earlier than at present. It is therefore necessary to lower the age of secondary education graduates, which will be achieved already in 2022 thanks to reforms that already have been implemented in the education system. What is needed first of all, however, is the change in the common perception of a B.A. degree. It should be commonly acknowledged (both by employers and employees) as the basic diploma of tertiary education and take the position of M.A. degree with this respect. The first step has already been made by the introduction of the Bologna process to the Polish education system. The next one would involve the organisation of university curricula that would enable students to work part-time. The process could be further complemented by awarding working students with additional ECTS points each semester both at full, part-time and extramural programmes.

Moreover, increasing the labour market participation of youth requires an expanded range and common application of available untypical employment options such as part-time or temporary employment, or temporary employment offered at job centers. Such solutions stand a chance of raising the labour market participation of young people who now remain inactive due to education or for other reasons. In the majority of OECD countries with the highest activity and employment rate of young persons, untypical forms of employment are favoured by young workers and their employers. For this reason, Polish legislators should consider introducing work contracts for specific projects concluded for a definite duration and related to the completion of a particular project. Unlike the classical fixed-term contracts, such legal solutions would not be limited by date, but would simply become void once the project is completed. A higher employability of young people could also be achieved by introducing amendments to the labour code which would render working time more flexible. This could bring benefits not only to individuals reconciling work with education (or family duties), but also to these entrepreneurs whose business activity is characterised by differing intensity at different hours or days (e.g. restaurant owners), who would eagerly hire a young worker with no experience.

Finally, young people may feel more inclined to enter the labour market earlier if Poland introduced compulsory tuition fees for all M.A. programmes (which is common in the OECD countries). By opting for an M.A. programme, one would then face a conscious economic decision involving loss of the source of income, additional education costs, but potentially higher earnings in the future. The greater prominence of a B.A. degree could be achieved by altering employment policies at public institutions, which at present consider it not enough for specialised positions and do not offer promotion to workers without an M.A. degree.

Another key element of the Polish labour market, whose potential is yet to be unleashed, are prime-aged women. In Part III of this report we argue that increasing the activity of this group will be an advantage not only for the entire economy (offsetting the effects of population ageing) but also for the women themselves. Females will gain longer work seniority and greater professional experience, which in turn will make them more immune to unemployment since their attachment to the labour market will be comparable to that of male workers'. In this context, it must be stressed that the Polish policy geared at providing equal labour market opportunities for men and women should focus on the reconciliation of work and child care. It is childcare and, in some cases, care provided to the ill and the elderly that most frequently cause the inactivity of women aged 25-35 and consequent career breaks. We believe three issues need particular attention. Firstly, it is necessary to prepare and successfully implement a strategy for a comprehensive system of institutional childcare. Care services for children at all ages have to be more accessible. This regards especially services for the youngest children aged 0-3 (nurseries) and children in early school age (day care facilities). The accessibility of care services for pre-school children is also

insufficient. These issues need immediate attention since women of the very populous generation born in the years 1980-1989 have today reached the peak of their fertility. The strategy should limit regional disparities and disproportions between the accessibility of child care services in cities, towns and villages. Another vital problem it should address involves minimising the costs borne by parents, especially those with lower income. Additionally, such a strategy must ensure the high quality of child care services.

It is extremely important that the range of offered services be attuned to the needs of children at different ages as well as parents' working hours. The development of traditional childcare centers such as nurseries, kindergartens and day care facilities at school should be accompanied by legal and financial solutions supporting the establishment of childcare facilities at workplaces and fostering care services provided at home by trained carers looking after several children. A conscious public policy regulating childcare services guarantees their high quality. It has to be stressed that access to high quality childcare should not only raise female employment (see Part I), but also positively affect the emotional and cognitive development of children by offering them contact with peers and participation in classes improving their education and development in a manner suitable for their age.

Secondly, increasing the employability of prime-aged women requires a far-reaching reform of childcare leaves since the current system of leaves does not meet the demands of the contemporary labour market. Childcare leave should be shorter, while the amount of benefits should depend on income before a leave is taken. This would make childcare benefits less social. Their new function would be rather focused on security, rendering them more universal, with a strictly temporal focus. Thus, women will feel more inclined to commence employment before childbirth with no fear of losing income while taking care of their infants by the time they will be able to use a well-developed system of childcare institutions (nurseries). It is worth considering the introduction of the degressive childcare benefit, which will gradually decrease in the course of the leave. The current system of childcare leaves leads parents into inactivity and is attractive only to people with lower educational attainment and lower income.

Thirdly, integrating men into childcare should become an important element of the political and public debate devoted to increasing female participation in the labour market and combating low fertility. A cultural change in this respect may be supported by specific institutional solutions, involving e.g. paternity leaves. Benefits received by fathers for such a leave would, just as in the case of mothers, depend on income before taking a leave. The introduction of paternity leaves should be accompanied by a campaign providing information and promoting the new image of a father: instead of a bread winner - a partner participating not only in guaranteeing financial support but also providing care. The first steps have already been taken, yet they contradict longer 'maternity' leaves. Although 'maternity' leaves are available for both men and women, the name suggests the opposite.

Part II presents an empirical analysis of the factors influencing older people's decision to carry on working (in Poland). It seems that health and workplace environment (conditions, organisation of work, workload) have a huge bearing on the economic activity of older workers. Comprehensive retirement solutions such as higher retirement age or the integration of selected systems with an actuarially balanced public pension system are conducive to a longer participation in the labour market. To prevent people aged 55 and above from an early exit from the labour market, we need a greater focus on health care, health and safety at work and adjustment of the workplace environment to the needs of older workers. Therefore, keeping older people in the labour market is a challenge employers will be confronted with as well. Whereas work itself should be less onerous, its organisation and load ought to be attuned to the needs of older workers. Moreover, the process of population ageing makes us believe that yet another factor will shape the future decisions of older workers: the development of old-age care services.

The title of the present issue of *Employment in Poland* is inextricably linked with a major challenge public policy in Poland has to face: improvement of the malfunctioning lifelong learning system. As shown in Part IV, Poland still needs to catch up with other EU member states with respect to participation in lifelong learning. The disparity is mostly caused by the different instruments used by the policy of adult education. Since Poland's accession to the European Union, financing lifelong learning has no longer been a problem. In the last six years, funds allocated to lifelong learning have been multiplied and are now comparable to those in other European countries. Nevertheless, adults have not displayed a significantly higher educational activity than before. This lends support to the hypothesis that the present situation has been caused not by the scope, but the shape of the implemented policy. It seems that the tendency to have an excessive supply of educational services and insufficient demand may be reversed by the re-orientation of state policy from subsidising training institutions to offering financial support to the potential participants of such training. One of the possible solutions involves individual learning accounts, i.e. vouchers enabling adults to take part in the training of their choice. Such vouchers motivate their owners to formulate and achieve their own educational goals, at the same time stimulating competition on the market of education services.

Yet another challenging problem that the Polish public policy has to confront in the next decade is external migration. Simulations presented in Part I indicate that if Poland, currently a net emigration country, does not achieve a positive net balance of external migration in the coming decades, it will be faced with a significant decline in population. We argue that a conscious immigration policy would make it possible to successfully prevent population shrinkage, which would otherwise be impossible in the course of the next 50 years, even at a fertility rate that guarantees full generation replacement (that in itself would be extremely difficult to achieve). It is therefore extremely urgent to design a comprehensive migration policy focused on (1) unleashing the full potential of return migrations of Polish

citizens in the coming 10-20 years, (2) making an asset of the EU membership; presenting the entire Union, and not only individual members, as an economic area attractive to educated migrants and transforming it into a tool of Community immigration policy (EU Blue Card), (3) making the Polish Card an efficient instrument encouraging foreign citizens of Polish origin to reside and commence employment in Poland.

Finally, having presented all of the suggested solutions, we would like to stress the importance of choosing the right *policy-mix*, which would constitute a comprehensive response to the demographic challenges that Poland has to face. As pointed out in Part I, only the synchronisation of different instruments can make the desired effect achievable: maximally high and productive employment, greater activity of selected problematic social groups and elimination of current labour market discrimination. The challenges posed by demographic processes are so serious that they may only be stopped by well-prepared, consistently implemented and synchronised reforms involving a range of public policies. Partial and fragmentary solutions will not be sufficient.

Methodological Appendix

Methodological Appendix

Appendix 1. Projection and decomposition of labour supply

The labor supply forecasts for the European countries over the period 2010-2050 were generated in line withthe methodology developed by Burniaux, Duval, Jaumotte (2004). They are based on the most recent Eurostat population forecasts (with a breakdown by five-year age groups and by sex) and our own projections of labour force participation rates in these age groups. Our projections are based on the simple dynamic modelling framework (see Burniaux et al. 2004). For each of the countries, using data from the period 2000-2008, we calculated the following probabilities for every each five-year age group: (i) that an economically active individual in the five-year cohort by sex will exit the labour market in the next 5 years ($P(EX_{t-5,ij})=(PR_{t-5,ij}-PR_{t,ij+5})$); (ii) that an inactive individual in the five-year cohort will enter the labour force in the next five years ($P(EN_{t-5,i,j})=(PR_{t-5,i,j}-PR_{t,ij+5})$), where $PR_{t,i,j}$ indicates the labour force participation rate in year t in country i, in the age group *(j,j+4)*.

Next, assuming that these probabilities will remain constant in the future (especially for the subsequent cohorts entering the labour market), we estimated the lifetime profile of participation rates for males and females in individual cohorts. Those profiles may differ from the static cross-sectional profiles recorded in a specific year, because the subsequent age cohorts entering the labour market may be characterised by a different overall labour supplied over the life course. On the other hand, the lifetime profile of participation is rather similar for different cohorts, irrespective of the shifts in the average participation level. Burniaux et al. (2004) confirm that such a rule for European countries.

In the final step, assuming that the probabilities of labour market exit and entry will remain constant and calculating the average participation rates in five-year age groups by sex over the 2003-2008 period, we estimated the evolution of the labour force participation for the EU countries. The forecasted number of the economically active is a product of these projected indicators and the Eurostat population forecast with breakdown by five-year age groups and by gender. The total change (compared to 2010) in the number of the economically active was then decomposed into the following factors:

- Population 15+ $a^{P}_{t,i}$, indicating the magnitude of the change in the labour supply resulting from the change in the size of the total population aged 15+, assuming that the share of five-year age groups by sex and their participation rates will remain constant for the entire projection period.
- Demographic $a^{D}_{t,i}$, indicating the magnitude of the change in the labour supply resulting from the change in the demographic structure of population aged 15+, assuming that the size of the total population aged 15+ and the participation rates in five-year-age groups will remain constant for the entire projectionperiod.
- Participation (cohort effect), indicating the magnitude of the change in the labour supply resulting from the expected change in the labour force participation rates by sex, assuming that the size of the total population 15+ and its structure will remain constant for the entire projection period.
- Residual component $a^{R}_{t,i}$

The contribution of these factors is calculated as follows:

$$a^{P}_{t,i} = (POP_{t,i} - POP_{2010,i}) \times PR_{2010,i}$$

$$a^{D}_{t,i} = POP_{2010,i} \times \sum_{j=15,20,\ldots,75} PR_{2010,i,j}\left(\frac{POP_{t,i,j}}{POP_{t,i}} - \frac{POP_{2010,i,j}}{POP_{2010,i}}\right)$$

$$a^{A}_{t,i} = POP_{2010,i} \times \sum_{j=15,20,\ldots,75} \frac{POP_{2010,i,j}}{POP_{2010,i}} \; (PR_{t,i,j} - PR_{2010,i,j})$$

$$a^{R}_{t,i} = (POP_{t,i} - POP_{2010,i}) \times \sum_{j=15,20,\ldots,75}\left(\frac{POP_{t,i,j}}{POP_{t,i}} - \frac{POP_{2010,i,j}}{POP_{2010,i}}\right) \times (PR_{t,i,j} - PR_{2010,i,j})$$

$POP_{t,i,j}$ denotes the population size in year *t*, in country *i*, in the age group *(j,j+4)*; $PR_{t,i,j}$ denotes the participation rate respectively; variables without *j* subscript refer to the entire population aged 15+. We used the previously produced probabilities that (i) an economically active person in the five-year age group will exit the labour market in the next 5 years and that (ii) an economically inactive person in each five-year group will enter the labour market to estimate the average effective age of labour market entry and labour market exit $EfEX_{t,i}$, according to the following equations:

$$EfEN_{t,i} = \sum_{j=10,15,\ldots,40} (PR_{t,i,j+5} - PR_{t-5,ij}) \times POP_{t-5,ij} \times (j+5) \Big/ \sum_{j=10,15,\ldots,40} (PR_{t,i,j+5} - PR_{t-5,ij}) \times POP_{t-5,ij}$$

$$EfEX_{t,i} = \sum_{j=35,40,\ldots,75} (PR_{t-5,ij} - PR_{t,i,j+5}) \times POP_{t-5,ij} \times (j+5) \Big/ \sum_{j=35,40,\ldots,75} (PR_{t-5,ij} - PR_{t,i,j+5}) \times POP_{t-5,ij}$$

Table A.1 Contribution of changes in population size, demographic structure and group-specific shifts in participation to changes of aggregate labour supply over the period 2015-2050 compared to 2010 (in percentage)

Austria												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	1.3	-0.5	-3.7	-8.0	-14.8	-22.3	2.2	0.6	-2.5	-6.2	-13.4	-21.8
Population size	1.1	1.3	0.8	-0.2	-3.8	-9.8	0.3	-0.1	-0.7	-1.7	-5.3	-11.1
Demographic structure	-1.8	-4.6	-8.9	-13.8	-17.3	-20.0	-2.1	-5.7	-11.0	-16.4	-22.4	-27.1
Participation	2.6	3.8	4.8	5.2	5.8	6.1	4.9	7.9	10.8	12.5	15.0	16.5
Residual	-0.6	-1.0	-0.4	0.8	0.6	1.6	-0.8	-1.5	-1.6	-0.6	-0.7	-0.2
Belgium												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-0.4	-2.2	-5.0	-7.6	-11.5	-15.1	3.2	4.0	3.3	2.1	-1.2	-5.6
Population size	0.8	1.3	1.9	2.0	0.7	-2.4	0.5	0.7	0.9	0.9	-0.2	-3.5
Demographic structure	-2.7	-6.0	-10.4	-13.7	-16.7	-17.6	-2.9	-6.6	-11.4	-15.1	-19.7	-21.8
Participation	1.7	3.0	3.6	3.9	4.5	4.6	6.7	11.8	15.8	18.8	22.1	22.9
Residual	-0.2	-0.4	-0.1	0.1	-0.1	0.2	-1.1	-1.9	-2.1	-2.5	-3.3	-3.3
Czech Republic												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.5	-4.7	-8.2	-11.5	-21.8	-32.9	-1.5	-5.1	-8.0	-11.9	-25.1	-36.2
Population size	-0.9	-1.9	-2.2	-3.3	-8.1	-14.6	-1.0	-2.1	-2.6	-3.7	-8.6	-15.3
Demographic structure	-2.3	-4.9	-8.1	-9.5	-17.9	-23.9	-1.6	-3.1	-5.4	-7.7	-18.2	-24.4
Participation	0.9	1.3	1.6	1.7	1.5	1.2	1.1	-0.1	0.1	0.0	-0.4	-0.8
Residual	0.9	0.8	0.4	-0.5	2.7	4.4	0.1	0.1	-0.1	-0.5	2.1	4.3
Denmark												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	0.0	-0.5	-2.0	-4.3	-8.1	-9.1	1.6	1.3	0.4	-1.8	-5.8	-7.0
Population size	1.8	2.9	3.6	3.5	2.0	0.7	1.4	2.5	3.3	3.4	2.1	0.5
Demographic structure	-2.7	-4.7	-7.4	-10.6	-14.4	-13.2	-2.6	-5.2	-8.5	-12.2	-16.9	-16.2
Participation	1.2	2.2	2.9	3.4	4.3	4.8	3.5	5.1	6.9	8.5	10.3	10.9
Residual	-0.2	-1.0	-1.1	-0.5	-0.1	-1.4	-0.6	-1.1	-1.3	-1.3	-1.2	-2.2
Estonia												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	1.5	0.1	-1.6	-3.1	-6.2	-13.5	1.4	-0.8	-3.0	-5.2	-11.3	-20.5
Population size	-2.0	-3.2	-3.3	-3.1	-4.2	-7.7	-2.2	-4.1	-5.3	-6.3	-9.4	-14.4
Demographic structure	1.3	-0.8	-4.5	-6.0	-8.7	-16.3	-0.2	-2.6	-6.1	-7.7	-11.1	-18.8
Participation	2.5	4.3	5.9	6.3	7.8	8.4	4.0	5.8	7.8	8.9	9.7	9.9
Residual	-0.3	-0.2	0.2	-0.3	-1.0	2.1	-0.3	0.1	0.6	-0.1	-0.4	2.8

Table A.1 continued

Finland												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.3	-3.8	-7.0	-9.4	-12.1	-15.2	-1.4	-4.8	-7.7	-10.0	-12.3	-16.0
Population size	1.0	1.3	1.5	1.4	-0.2	-2.7	0.9	1.2	1.4	1.4	-0.2	-3.7
Demographic structure	-4.4	-7.2	-10.5	-13.2	-13.6	-14.5	-4.6	-7.8	-11.4	-14.3	-14.7	-15.2
Participation	1.3	1.6	1.4	1.2	1.5	1.0	2.0	1.7	2.3	2.6	3.1	2.8
Residual	0.8	0.5	0.6	1.3	0.3	1.0	0.3	0.1	-0.1	0.3	-0.6	0.1
France												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-0.6	-1.7	-2.8	-3.5	-4.0	-4.9	1.2	0.5	-0.1	-0.9	-1.9	-3.6
Population size	1.9	3.8	5.7	7.3	8.7	8.8	1.6	3.2	4.7	6.0	7.2	6.2
Demographic structure	-3.4	-6.6	-9.6	-11.9	-14.1	-15.1	-3.7	-7.6	-11.3	-14.4	-17.8	-19.1
Participation	0.6	1.1	1.4	1.7	2.3	2.4	3.6	5.4	7.4	8.8	10.8	11.3
Residual	0.3	0.0	-0.3	-0.5	-1.0	-1.0	-0.3	-0.6	-1.0	-1.3	-2.0	-1.9
Greece												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.7	-4.9	-8.8	-13.2	-23.6	-33.5	-0.2	-1.7	-4.3	-7.9	-18.2	-28.6
Population size	-0.5	-1.3	-2.0	-3.1	-7.3	-13.5	-0.3	-1.2	-2.2	-3.5	-8.0	-14.4
Demographic structure	-1.4	-4.1	-7.4	-11.5	-19.7	-25.7	-3.3	-7.0	-11.3	-16.1	-25.1	-30.7
Participation	0.2	0.5	0.8	1.0	1.2	1.1	4.2	8.2	11.7	14.1	16.3	16.0
Residual	0.0	0.1	-0.2	0.4	2.3	4.6	-0.9	-1.7	-2.5	-2.3	-1.4	0.5
Spain												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.3	-4.2	-7.8	-12.0	-23.2	-34.0	5.3	8.1	8.4	6.7	-2.9	-15.9
Population size	-0.1	0.2	0.7	0.8	-2.5	-8.8	0.0	0.2	0.6	0.6	-2.2	-8.1
Demographic structure	-1.4	-4.6	-9.0	-13.6	-24.6	-30.8	-2.9	-6.8	-11.9	-17.1	-30.4	-39.6
Participation	0.6	0.8	1.0	1.1	1.7	1.9	10.0	17.7	23.2	27.1	32.1	33.9
Residual	-0.5	-0.6	-0.4	-0.3	2.2	3.7	-1.8	-3.0	-3.5	-3.9	-2.4	-2.1
Netherlands												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	0.9	0.6	-1.3	-4.1	-8.7	-11.7	4.0	5.6	5.1	3.0	-1.5	-5.0
Population size	2.2	4.2	5.0	4.9	3.0	-0.1	1.7	3.4	4.2	4.4	2.9	-0.2
Demographic structure	-3.4	-6.2	-9.7	-13.5	-16.9	-16.7	-3.5	-7.1	-11.6	-16.4	-21.9	-22.6
Participation	2.0	3.0	3.6	4.1	4.8	5.0	6.5	10.8	14.0	16.2	19.0	19.9
Residual	0.1	-0.4	-0.2	0.5	0.4	0.1	-0.7	-1.5	-1.6	-1.2	-1.5	-2.0

Table A.1 continued

Ireland												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	2.5	4.4	6.4	8.2	8.4	4.6	6.3	11.1	15.9	19.3	20.9	15.8
Population size	4.0	8.1	12.5	16.7	21.6	23.0	3.8	7.9	12.2	16.4	21.7	23.3
Demographic structure	-2.2	-4.4	-6.9	-9.0	-13.1	-18.9	-3.1	-6.2	-9.5	-12.1	-17.7	-26.9
Participation	0.5	0.8	1.3	1.5	1.6	1.9	6.2	10.0	13.7	16.2	18.9	20.6
Residual	0.2	-0.1	-0.5	-1.1	-1.7	-1.3	-0.7	-0.7	-0.6	-1.2	-1.9	-1.2
Lithuania												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.6	-6.6	-13.0	-18.8	-26.8	-35.4	-1.6	-7.3	-14.1	-20.3	-29.5	-38.6
Population size	-1.3	-3.4	-5.0	-5.9	-8.0	-12.6	-1.0	-3.1	-5.0	-6.5	-9.7	-15.6
Demographic structure	2.6	2.6	-1.3	-5.0	-9.0	-14.6	1.8	0.8	-3.6	-7.7	-13.2	-19.1
Participation	-2.5	-5.8	-8.7	-10.7	-13.6	-14.6	-2.3	-6.0	-8.0	-9.4	-11.2	-11.0
Residual	-0.5	0.0	1.9	2.9	3.8	6.3	0.0	1.0	2.5	3.3	4.7	7.0
Latvia												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	1.6	-0.6	-3.7	-6.0	-11.4	-20.5	3.7	2.0	-1.3	-4.5	-11.8	-22.7
Population size	-3.2	-5.7	-7.1	-8.1	-11.2	-16.2	-3.3	-6.1	-8.3	-10.2	-14.7	-20.9
Demographic structure	2.6	0.8	-2.8	-4.6	-7.5	-15.2	2.2	0.4	-3.7	-5.9	-9.7	-18.4
Participation	3.1	5.3	6.3	6.9	8.2	8.8	6.6	9.7	11.7	13.2	15.3	16.1
Residual	-0.9	-1.0	0.0	-0.2	-1.0	2.1	-1.9	-2.0	-1.0	-1.6	-2.7	0.4
Germany												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.2	-4.7	-9.9	-16.2	-25.7	-33.9	1.2	-1.4	-5.7	-11.4	-20.6	-29.7
Population size	-0.3	-1.5	-3.5	-5.9	-11.5	-18.9	-0.9	-2.3	-4.4	-6.8	-12.1	-19.2
Demographic structure	-2.2	-4.9	-10.0	-16.7	-20.3	-23.7	-2.4	-5.8	-11.3	-18.2	-23.1	-28.1
Participation	1.4	2.2	2.9	3.3	3.7	3.9	4.9	7.7	10.6	12.5	14.6	15.6
Residual	-0.1	-0.5	0.7	3.1	2.3	4.7	-0.4	-1.0	-0.5	1.1	0.0	2.0
Norway												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	2.3	2.7	2.0	0.7	-2.6	-4.2	3.5	4.2	4.3	3.5	1.2	-0.2
Population size	3.1	5.4	7.4	8.7	9.6	9.1	2.3	4.3	6.3	7.7	9.1	8.8
Demographic structure	-2.7	-5.1	-7.7	-11.1	-16.5	-16.3	-2.2	-4.7	-7.5	-11.2	-17.5	-18.0
Participation	1.9	2.6	3.2	3.5	4.2	4.4	3.5	5.0	6.5	7.8	10.3	11.1
Residual	0.1	-0.2	-0.9	-0.4	0.1	-1.4	-0.1	-0.4	-1.0	-0.8	-0.8	-2.1

Table A.1 continued

Poland												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	0.4	-1.9	-5.7	-9.2	-17.2	-28.3	-1.7	-5.7	-9.8	-14.1	-25.2	-36.8
Population size	0.3	-0.4	-0.8	-1.3	-4.2	-10.1	0.5	-0.1	-0.5	-0.9	-4.0	-10.6
Demographic structure	-1.4	-4.9	-8.3	-10.4	-15.3	-23.6	-2.3	-5.2	-8.4	-11.8	-20.4	-28.0
Participation	0.9	1.3	1.2	1.2	0.9	0.4	-0.2	-1.8	-2.7	-2.7	-2.8	-3.2
Residual	0.6	2.0	2.1	1.3	1.4	4.9	0.4	1.3	1.8	1.4	1.9	5.1
Portugal												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.2	-3.5	-6.0	-9.2	-17.5	-26.1	0.7	-0.1	-1.3	-3.9	-11.9	-21.0
Population size	0.0	0.1	-0.3	-1.2	-5.2	-10.9	0.1	-0.1	-0.8	-2.0	-6.3	-12.4
Demographic structure	-1.5	-3.6	-6.3	-8.7	-15.0	-19.7	-2.7	-5.5	-8.9	-12.0	-19.7	-25.0
Participation	0.1	0.1	0.3	0.5	0.8	0.9	3.6	6.4	9.3	11.4	14.3	15.4
Residual	0.1	-0.1	0.3	0.2	1.9	3.6	-0.4	-1.0	-1.0	-1.3	-0.2	1.1
Romania												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-0.3	-2.9	-5.7	-9.3	-17.5	-27.5	-1.5	-6.0	-10.3	-15.4	-25.1	-35.4
Population size	-1.0	-2.0	-2.9	-3.8	-7.3	-12.8	-0.8	-1.8	-2.8	-3.9	-7.6	-13.4
Demographic structure	0.6	-1.6	-1.2	-2.8	-8.2	-13.8	0.3	-2.3	-3.5	-6.1	-12.8	-18.8
Participation	-0.3	-1.3	-2.2	-3.2	-5.3	-7.1	-1.3	-3.8	-5.0	-6.4	-7.9	-10.0
Residual	0.3	2.1	0.6	0.5	3.3	6.3	0.3	1.9	1.0	1.0	3.2	6.7
Slovakia												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-0.4	-3.6	-7.7	-11.6	-21.7	-34.2	-1.8	-6.8	-10.8	-15.4	-28.3	-41.4
Population size	0.5	0.2	0.0	-0.4	-3.7	-9.8	0.6	0.4	0.3	-0.2	-3.4	-9.7
Demographic structure	-1.2	-4.0	-7.8	-10.5	-17.9	-26.5	-1.4	-3.2	-5.9	-9.0	-19.1	-27.7
Participation	-0.3	-1.2	-1.4	-1.5	-2.0	-2.6	-1.6	-4.9	-6.2	-7.0	-8.0	-9.4
Residual	0.6	1.3	1.4	0.8	1.8	4.7	0.6	1.0	1.1	0.8	2.1	5.4
Slovenia												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-2.9	-7.4	-12.1	-16.8	-26.8	-36.7	-0.9	-4.9	-9.0	-13.1	-22.7	-32.3
Population size	-0.2	-1.1	-2.1	-3.5	-8.7	-16.4	-0.4	-1.4	-2.4	-3.7	-8.1	-15.4
Demographic structure	-3.9	-8.7	-13.1	-17.0	-23.5	-29.0	-3.5	-8.2	-13.1	-17.6	-25.0	-30.2
Participation	1.0	1.6	2.0	2.3	2.9	3.2	3.5	4.9	6.4	7.5	9.6	9.9
Residual	0.3	0.8	1.0	1.4	2.4	5.6	-0.4	-0.1	0.1	0.6	0.8	3.4

Table A.1 continued

Sweden												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	1.1	0.8	-0.1	-1.2	-4.3	-6.8	0.8	-0.3	-1.1	-2.3	-4.9	-7.6
Population size	0.7	1.3	2.2	2.5	2.1	0.3	0.2	0.5	1.3	1.7	1.3	-0.8
Demographic structure	-1.3	-2.9	-5.4	-8.5	-12.1	-11.9	-1.4	-3.2	-5.7	-9.1	-13.1	-13.3
Participation	2.2	3.8	5.0	5.9	6.7	7.0	2.4	3.3	5.0	6.3	8.2	8.8
Residual	-0.5	-1.5	-2.0	-1.2	-1.0	-2.2	-0.4	-1.0	-1.6	-1.2	-1.4	-2.3
Hungary												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-1.3	-3.6	-6.2	-9.9	-20.4	-30.2	-0.3	-2.4	-4.7	-8.5	-20.4	-30.8
Population size	-1.5	-3.1	-4.3	-5.7	-9.7	-14.8	-1.6	-3.4	-5.1	-6.9	-11.9	-18.1
Demographic structure	-1.6	-3.8	-5.5	-8.2	-16.7	-22.7	-2.2	-4.0	-5.5	-8.1	-17.6	-23.5
Participation	1.7	3.1	4.1	4.6	5.0	4.9	3.6	5.0	6.5	7.9	9.0	8.9
Residual	0.1	0.2	-0.5	-0.7	1.0	2.5	-0.2	0.0	-0.7	-1.3	0.1	1.8
Italy												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	-3.2	-7.9	-13.4	-19.2	-29.9	-37.8	-1.4	-4.4	-9.2	-14.8	-26.4	-35.4
Population size	-0.4	-1.0	-1.8	-3.3	-8.6	-15.4	-0.7	-1.7	-2.9	-4.7	-10.1	-16.8
Demographic structure	-2.3	-5.2	-9.7	-14.6	-22.3	-24.3	-3.2	-6.8	-11.8	-17.4	-26.6	-29.1
Participation	-0.5	-1.4	-2.1	-2.5	-2.9	-3.4	3.4	5.9	7.4	8.8	9.7	8.1
Residual	-0.1	-0.3	0.2	1.3	3.9	5.3	-0.8	-1.8	-1.9	-1.5	0.6	2.4
United Kingdom												
	Men						Women					
	2015	2020	2025	2030	2040	2050	2015	2020	2025	2030	2040	2050
Total change in labour supply	1.0	0.6	-0.2	-1.4	-4.1	-7.0	1.5	0.7	-0.2	-1.7	-4.8	-8.9
Population size	1.5	2.5	4.0	5.0	5.7	4.5	0.9	1.5	2.6	3.5	3.7	2.0
Demographic structure	-1.3	-2.4	-5.4	-9.0	-11.6	-14.4	-1.4	-3.1	-6.9	-11.0	-15.2	-18.5
Participation	1.1	1.6	2.0	2.3	2.8	3.1	2.4	3.5	4.9	6.2	7.7	8.3
Residual	-0.3	-1.1	-0.8	0.2	-1.0	-0.2	-0.4	-1.1	-0.8	-0.3	-1.2	-0.7

Notes: The change in labour supply since 2010 is decomposed into contribution from the change in the size of the population aged 15+, the change in demographic structure and the change of group-specific participation rates and the residual component, according to definitions presented above.

Source: Own calculations based on Eurostat data and demographic projections.

Appendix 2.

Sequence analysis

Sequence analysis is a technique used for the graphic visualisation and analysis of longitudinal data collected in a panel or retrospective studies. It allows to analyse simultaneously the sequence of events for several career types. In this report we analysed men's and women's involvement in childcare (young children) and the successful or unsuccessful reconciliation of childcare and work. Two states were distinguished in professional career: working and not working, while three were distinguished in family involvement: taking care of young child personally, taking care of young child by a spouse, and taking care of young children together a with spouse. It must be stressed, however, that for clarity reasons, some categories were combined.

Intensity model (hazard model)

It allows to model the intensity of occurrence of event *j* over a short period *t*, $t,t+\Delta t$, provided that it has not happened until *t:*

$$\lambda_j(t) = \lim_{\Delta t \to t} \frac{1}{\Delta t} P(t \le T < t + \Delta t, Y = j \mid T \ge t)$$

where $\lambda_j(t)$ is the intensity of transition (the hazard rate). These models are estimated on longitudinal data. Each individual is studied from the point at which he/she begins to be subject to the risk of occurrence of event *j* until the event occurs or until the end of observation (e.g. the end of the survey). The problem in applying intensity models is to determine hazard function, which we managed to do by using piecewise linear hazard models.

Decomposition of occupational segregation index – method devised by Borghans and Groot (1999)

The Duncan and Duncan occupational segregation index adjusted by Karmel and MacLachlan (1988) has the following formula:

$$S = \frac{FM}{T^2} \sum_{j=1}^{m} \left| \frac{F_j}{F} - \frac{M_j}{M} \right|$$

where *m* is the number of occupations, F_j (M_j) represents the number of women (men) working in job *j*, and *F (M)* stands for the total number of working women (men), $T = F + M$.

Borghans and Groot (1999) decomposed this index into three components denoted in this report as (a), (b), (c). The interpretation of each components is presented in the main text of the report[1]. Individual components may be described by the following equations:

$$(a) = \frac{FM}{T^2} \sum_{i=1}^{n} \left| \frac{F_i}{F} - \frac{M_i}{M} \right| \qquad (b) = \tfrac{1}{2}\,[AS + TS - (a)] \qquad (c) = \tfrac{1}{2}\,[AS + TS + (a)]$$

where $TS = \sum_{i=1}^{n} \sum_{j=1}^{m} \left| \frac{F_{ij}}{F} - \frac{\frac{F}{T} T_{ij}}{M} \right|$ and $AS = \sum_{i=1}^{n} \sum_{j=1}^{m} \left| \frac{F_{ij}}{F} - \frac{\frac{F}{T} T_{ij}}{M} \right|$

Decomposition of the gender wage gap – Blinder-Oaxaca technique

The Blinder-Oaxaca technique requires the estimation of linear models using the logarithm of wages as an explanatory variable for men and women independently . Each of these models have the following formulas: $lnW_i = X'_i\boldsymbol{\beta}_i + \boldsymbol{\varepsilon}_i, E(\boldsymbol{\varepsilon}_i) = 0, i \in \{M,F\}$, where W_i is the vector of wages earned by all individuals in group ***i***, X'_i is the transposition of the matrix containing individual characteristics determining wages earned by all individuals in group ***i***, $\boldsymbol{\beta}_i$ is the vector of coefficients, $\boldsymbol{\varepsilon}_i$ stands for the disturbance term (with zero expected value), *M* denotes males and *F* denotes females.

If we denote the gender wage gap as *R,* then it can be expressed as follows: $R = E(lnW_M) - E(lnW_F) = E(X_M)'\beta_M - E(X_F)'\beta_F$. If added and subtracted $[E(X_M)' + E(X_F)']\beta^-$ from the right-hand side of the equation, the general form of the Blinder-Oaxaca decomposition will be obtained.

[1] It should be noted that in their original work, Borghans and Groot (1999) decomposed the index of occupational segregation into four elements. To make it more transparent we decided to limit the number of components to three.

The original form of the Oaxaca-Blinder decomposition cannot be properly applied when the estimated models (separately for men and women) are non-linear. For this reason in this report we used an adjustment to the Blinder-Oaxaca technique developed by Fairlie (2005).

Decomposition of the gender wage gap – Juhn-Murphy-Pierce technique

The Juhn-Murphy-Pierce decomposition technique requires the estimation of four separate linear models using the logarithm of wages as an explanatory variable, for women and men in two comparable time periods (or two comparable countries or other spatial units). Each of these models has the following formula: $lnW_i = X'_i\beta_i + \delta_i E_i, E(E_i)=0, S^2(E_i)=1, i \in \{Mt, Ms, Ft, Fs\}$. The only significant difference from the Blinder Oaxaca decomposition is that the Juhn-Murphy-Pierce technique standardises the disturbance term. Subscript *t* refers to observation in time period (country) *t*, while subscript *s* - in the period (country) *s*. Therefore the wage gap equation takes the following form:

$$R = E(lnW_M) - E(lnW_F) = [E(X_M)' - E(X_F)']\beta_M + \delta_M(\Theta_M - \Theta_F)$$

where $\Theta_M = \frac{(lnW_M - X'_M\beta_M)}{\delta_M} = E_M$ and $\Theta_F = \frac{(lnW_F - X'_F\beta_M)}{\delta_M}$.

As a result, the gender wage gap in time *t* can be expressed as: $R_t = [\Delta_t E(X)]'\beta_{Ft} + \delta_{Ft}\Delta_t\Theta$, allowing to decompose the differences between wage gaps into two periods (countries), which is the general purpose of the Juhn-Murphy-Pierce decomposition. The difference in the gender wage gap can be expressed as: $R_t - R_s = [\Delta_t E(X)]'\beta_{Ft} - [\Delta_s E(X)]'\beta_{Fs} + \delta_{Ft}\Delta_t\Theta - \delta_{Fs}\Delta_s\Theta$. If added and subtracted $[\Delta_t E(X)]'\beta_{Fs} + \delta_{Fs}\Delta_t\Theta$ from the right-hand side of the equation, the general form of the Juhn-Murphy-Pierce decomposition will be obtained:

$$R_t - R_s = [\Delta_t E(X) - \Delta_s E(X)]'\beta_{Fs} + [\Delta_s E(X)]'(\beta_{Ft} - \beta_{Fs}) + \delta_{Fs}(\Delta_t\Theta - \Delta_s\Theta) - (\delta_{Ft} - \delta_{Fs})\Delta_t\Theta$$

Appendix 3. Retrospective study of professional, educational and family biographies of men and women

The main objective of this study was to investigate the relationships between economic activity and family responsibilities among men and women in Poland. The data obtained during the study served to identify the barriers to combining activity in those areas and to propose social policy reforms to remove them. The study was conducted by the ASM company, which used personal in-depth interviews based on questionnaires and event history calendars. The sample consisted of 1 528 women and 1 520 men who in 2009 were 25-40 years old. To ensure that the sample adequately represents various subgroups the stratified sampling procedure was applied. Two strata were established on the basis of voivodeships and sex, with the TERYT database used as a sampling frame. The random-route procedure was then used for the choice of the addresses.

The questionnaire covered the following components:

- respondent's general socio-economic and demographic characteristics
- retrospective component concerning the evolution of professional career, educational attainment, migrations and family relationships over the life course with an accuracy of month and year of each event.

Despite the use of proved techniques and best research practices, not all research stages of the study fulfilled the initial assumptions. The most serious problems occurred in the recruitment process for an interview in the random-route algorithm. As a result, the sample showed overrepresentation of the youngest and the oldest respondents. Those errors were detected at an early stage of data examination and processing and then corrected by the exclusion of the observations of the overrepresented categories as well as additional sampling. In effect both the absolute sample size and its age structure satisfied the initially formulated assumptions.

It is worth mentioning that the generated database contains only raw information. Conducting any studies based on this data will therefore require their prior examination, removal of some observations and/or data input in the case of inconsistent information provided by respondents in response to retrospective questions.

Table A.2 Respondent distribution by age and sex

Age	Proffesional, educational and family biographies of men and women 2009		Central Statistical Office data (June 2009)	
	Men	Women	Men	Women
25–29	36.6	37.6	34.7	34.8
30–34	32.6	32.3	32.2	32.2
35–40	30.9	30.0	33.1	33.0
Total	100	100	100	100

Source: Own calculations.

Table A.3 Respondent distribution by highest education attained and sex

Education	Proffesional, educational and family biographies of men and women 2009		LFS data (second quarter 2009)	
	Men	Women	Men	Women
Without education	0.2	0.1	1.2	0.2
Primary	4.0	2.8	8.1	6.3
Vocational (lower secondary)	26.3	16.2	33.5	21.8
Vocational (upper secondary)	25.7	15.6	22.6	19.9
Upper secondary	10.5	16.7	7.4	8.8
Post secondiary (not tertiary)	3.9	10.6	2.4	5.0
Tertiary	29.3	38.1	25.5	38.0
Total	100	100	100	100

Source: Own calculations.

Table A.4 Respondent distribution by place of residence and sex

Place of residence	Proffesional, educational and family biographies of men and women 2009		LFS data (second quarter 2009)	
	Men	Women	Men	Women
City	74.8	73.8	61.1	62.9
Country	15.5	15.7	38.9	37.1
Lack of information	9.7	10.5	-	-
Total	100	100	100	100

Source: Own calculations.

List of abbreviations

ALMP - *Active Labour Market Policies*

CEDEFOP - *Centre Européen pour le Développement de la Formation Professionnelle* - is the European Agency to promote the development of vocational education and training (VET) in the European Union.

CVTS - *Continuous Vocational Training Survey* - an enterprise survey conducted by Eurostat to collect data on vocational training provided by enterprises for their persons employed.

DSGE - *Dynamic Stochastic General Equilibrium*

EUImpactModIII - developed by IBS, is a DSGE class model of the Polish economy, see Box I.5.

EC - *European Commission*

IBS - *Institute for Structural Research*

IROP - *Integrated Regional Operational Programme*

ISSP - *International Social Survey Programme* – is an independent research programme aimed at running annual surveys on topics important for the social sciences in 45 countries.

LFS - *Labour Force Survey* - is a quarterly sample survey of households focused on labour market issues, in Poland carried out by the Central Statistical Office (GUS), see Box IV.5.

OECD - *Organization of Economic Cooperation and Development* - is an international economic organization of 31 developed countries committed to promoting democracy and the market economy.

PHARE - *Polish and Hungary: Assistance for Restructuring their Economies* is one of the pre-accession programmes financed by the European Union to assist the applicant countries of Central and Eastern Europe in their preparations for joining the European Union.

PISA - *Programme for International Student Assessment* – is a cyclical worldwide evaluation of 15-year-old school children's scholastic performance, coordinated by the OECD.

PKD - *Polish Classifcation of Economic Activities*

PSM - *Propensity Score Matching* - is the econometric method that allows to minimize sample selection bias by collating and comparing two groups (treatment and control groups) which have very similar characteristics.

SES - *Structure of Earnings Survey* - is a cyclical sample survey of enterprises to collect data on earnings in the Polish economy.

SIMPL - is a micro-simulation model of the Polish labour market developed by the independent research group SIMPL.

SOP HRD - *Sectoral Operational Programme Human Resources Development*

SYMDEM 2.0 - developed by IBS, is a modelling tool that combines demographic projections with modelling of scenarios of labour market and economy in macroeconomic scale, see Box I.2 and Box I.3.

TFR -*Total Fertility Rate* - is the average number of births per woman in child-bearing age.

UNESCO - *United Nations Educational, Scientific and Cultural Organization* - is a specialized agency of the United Nations committed to promoting peace and international collaboration of the countries.

Country codes

AT – Austria

AU – Australia

BE – Belgium

BG – Bulgaria

CH – Switzerland

CL – Chile

CY – Cyprus

CZ – Czech Republic

DE – Germany

DK – Denmark

EE – Estonia

ES – Spain

FI – Finland

FR – France

GB – Great Britain

GR – Greece

HR – Croatia

HU – Hungary

IE – Ireland

IS – Iceland

IT – Italy

LT – Lithuania

LU – Luxembourg

LV – Latvia

MX – Mexico

NL – Netherlands

NO – Norway

NZ – New Zealand

PL – Poland

PT – Portugal

RO – Romania

RU – Russia

SE – Sweden

SI – Slovenia

SK – Slovakia

TR – Turkey

UA – Ukraine

UK – United Kingdom

USA - United States

NMS – New Member States

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