Country case study for Poland for the Regional ECA Jobs report

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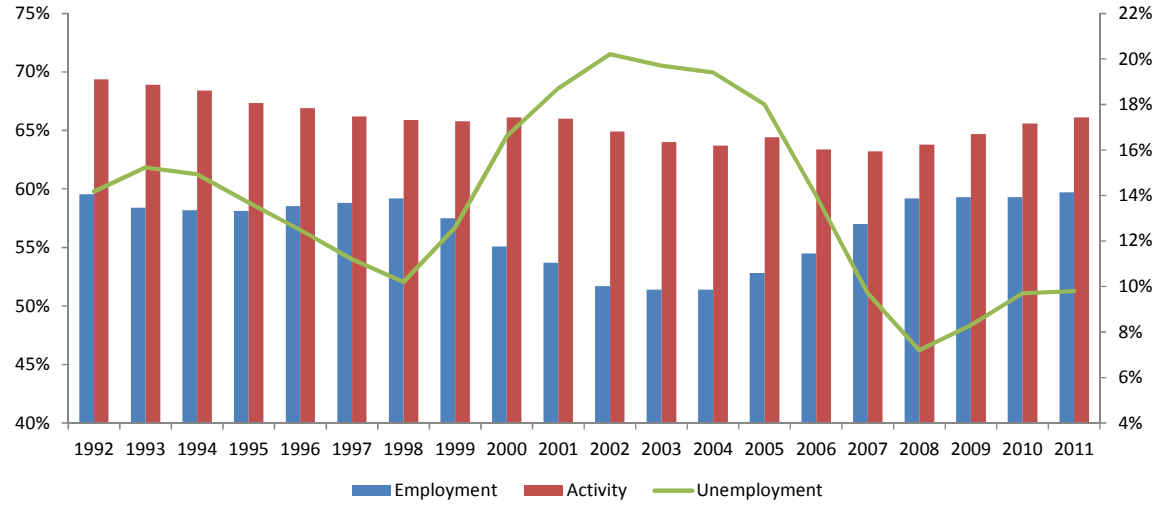
1.1 Labor market in Poland after transition

1.1.1 General developments on Polish labor market

The transition from a centrally planned to a market economy in Poland was followed by a sharp decline in GDP. After the initial transition shock, affecting the economy negatively between 1990 and 1994, the economy started to modernize and grow at the pace of few per cents per year. The process of catching up with more developed countries was initiated and Poland reduced its GDP gap with respect to the USA and the EU15 by about 70 per cent. The first few years after the transition from socialism to a market system could be characterized as a time of adaption to new mechanisms governing the economy. This was especially true for labor market, where reallocation of labor from state-owned to private companies had to take place. Despite the on-going restructuring, the employment rate during 1992-1997 was at the stable level of 58 per cent,[1] however at the same time labor activity was steadily decreasing from 69 per cent in 1992 to 66 per cent in 1997. After the unemployment increase due to the shock of transition the unemployment rate began to fall as the economy started to grow.

Figure 1. Participation (left axis), employment (left axis) and unemployment (right axis).



Source: Eurostat.

The first years of the transition (from 1990 to about 1997) can be described as a first phase of labor market evolution, with employment improving along with the general economic conditions. The second phase took place between 1998 and 2004 and it was a period of an economic slowdown caused by an external demand shock associated with the Russian crisis. The exports slump directly hit the labor market, and as a result employment rate fell by 8 percentage points in 1998-2002. At the same time unemployment rate went up by 10 percentage points, reaching its height of 20 per cent in 2002. From this point of view, Poland distinguished itself from other European countries. The impact of that economic slowdown on the labor market, in comparison to the NMS9 and the EU15, was substantial. In the EU15 the situation on labor market was at the time even improving. Other NMS

[1] 1992 was the year when Labor Force Survey was started, so the comparable data stretch back to that year.

also experienced the lower growth rates, however their labor markets were less affected than in Poland. The trough of the business cycle occurred in 2002-2003, the lowest employment rate figure was 51 per cent in 2003.

Figure 2. Employment rates in Poland, the UE15 and the NMS9 (population aged 15-64).

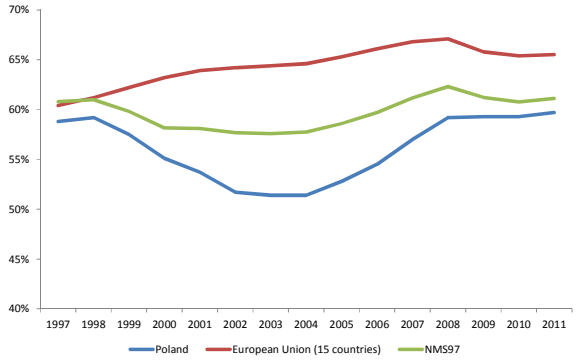
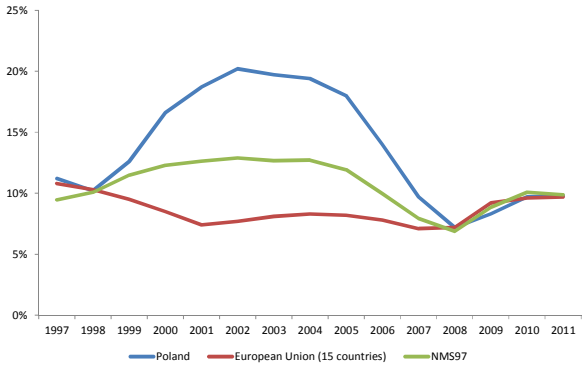


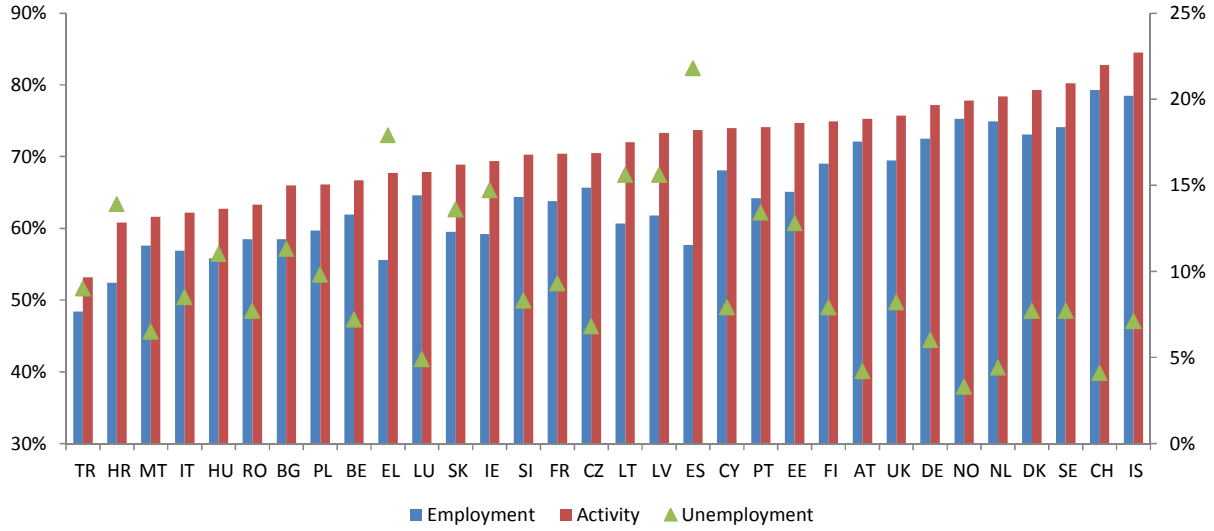
Figure 3. Unemployment rates in Poland, the UE15 and the NMS9 (population aged 15-64).



Source: Eurostat.

The third phase, that followed the 1999-2004 slowdown, consisted of an economic boom during 2004-2008, which was ended by the global financial crisis. After the 2004 the Polish labor market began to recover from harsh economic conditions. The demand for labor during 2004-2008 increased so much that the employment rate went up by 8 percentage points. As a result, unemployment rate in the working-age population, one of the main socio-economic problem in Poland in the past, was slightly above 7 per cent at the peak in 2008. In comparison to 2004, it was a reduction by 12 percentage points. Because of the prosperity employment rate was rising, but at the same time the average real wage was increasing by a few per cent per year, improving the incomes and living standards (see Chapter on poverty).

Figure 4. Participation (left axis), employment (left axis) and unemployment (right axis) rates (population aged 15-64) in European countries in 2011.



Source: Eurostat.

In 2008 the financial crisis triggered a global recession, and economies of developed countries shrank. Despite Poland was not directly affected by the turbulence on the financial markets, the economic crisis that hit the European countries was transmitted to the Polish economy through the

international trade. In 2009, the GDP in the Euro zone, which accounted for 60 per cent of Polish export, fell by 4.2 per cent. The main Polish trade partner, i.e. Germany, recorded a 5 per cent drop in GDP. However, the contraction in Polish exports was short-lived and relatively shallow, when compared with other countries in the region. Additionally, Polish banking system was not involved in financing construction sector expansion and there was no significant real estate bubble, so quite healthy banking system with no toxic assets distinguished Poland from many other European countries. As a result, Poland maintained a positive growth rate through the whole crisis period. The response of the labor market to the slowdown was also quite balanced. Employment rate even slightly rose by 1 percentage point between 2008 and 2011, at the same time unemployment rate was up by about 3 percentage points. Moreover, economic activity improved, contrary to previous slowdowns and medium term trend of decreasing labor market participation. Thus, recent adjustments on the Polish labor market may be considered moderate.

Additional information can be obtained by looking at the participation, employment and unemployment disaggregated by sex and age. The female participation and employment rates were for the whole period lower than those for males, by on the average 13 and 12 percentage points respectively. On the other hand, the female unemployment rate was on the average lower than the male one by about 2 percentage points. The difference in employment rates between genders was smaller during the time of weak economic performance. For example, in 2003 it was 10 percentage points, but in 2007 when economy was booming it was 13 percentage points. The recent crisis has also affected males to larger extent, due to its sectoral impact – mostly on manufacturing, construction and other male-dominated sectors.

Figure 5. Participation, employment, unemployment rates by sex (males – red, females - blue), population aged 15-64.

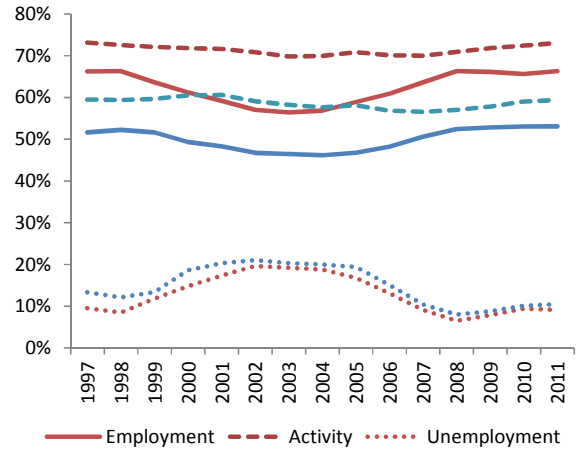
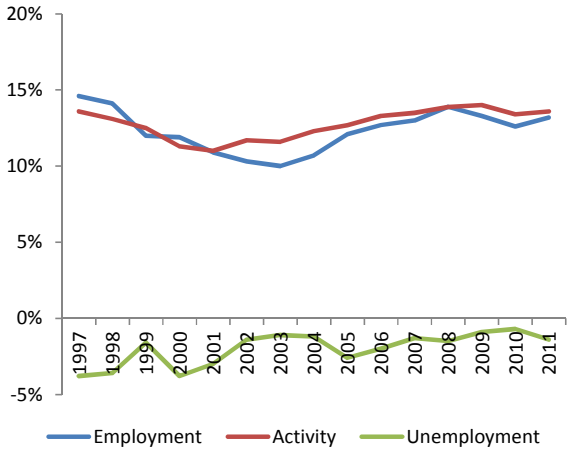


Figure 6. Difference between male and female activity, employment and unemployment rates in Poland in 1997-2011 (population aged 15-64).



Source: Eurostat.

The disaggregation by age shows that for 25-49 age group the employment rate was relatively high and stable. However, in case of youth and individuals aged 50+, the employment rate fluctuated more than for prime-aged workers. Between 1997 and 2004, the employment rate of 15-24 year-olds fell by 14 percentage points and then in 2004-2008 bounced back and rose by 12 percentage points. After 2008 the employment of the young declined. The figure for the 20-24 age group was 42 per cent in 2008, in comparison to 47 per cent in 2011. It was the only age group that has experienced a significant decline since the beginning of the financial crisis.

Figure 7. Employment rates by age groups below 40 years old.

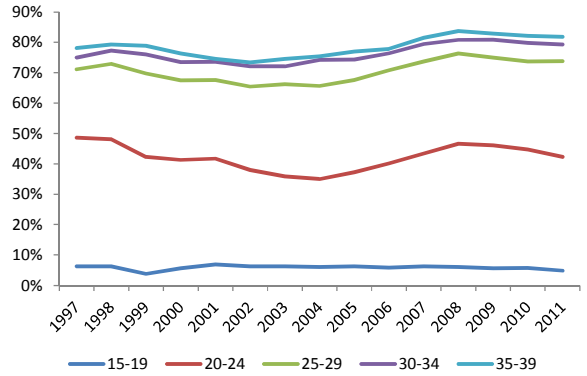


Figure 8. Employment rates by age groups above 40 years old.

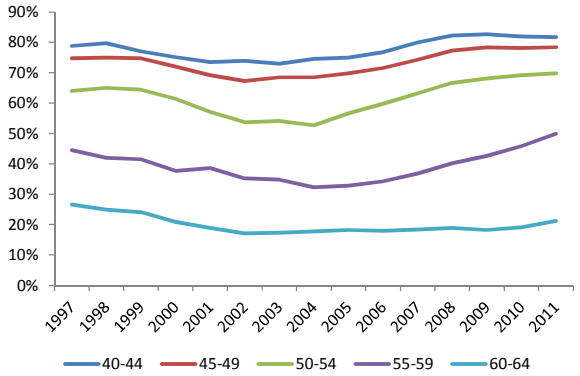


Figure 9. Participation rates by age groups below 40 years old.

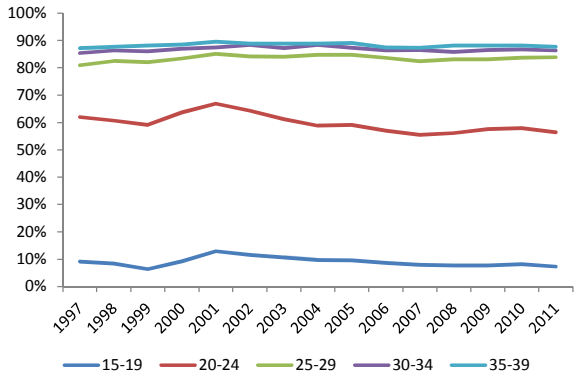
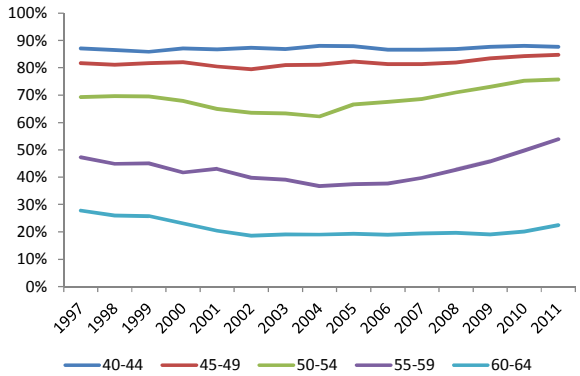


Figure 10. Participation rates by age groups above 40 years old.



Source: Eurostat.

The participation and employment of population aged over 50, and in particular 55, was much lower than among younger age groups. Between 1997 and 2004 the employment rate for persons above 55 years old was falling. In 2005 the employment in 55-59 started to grow and it expanded until 2011, but for 60-64 it stagnated. This can be attributed to regulatory changes concerning pension scheme discouraging early labor market exit, in particular abolishment of early retirement in 2008. Similar trends were recorded for participation rates by age groups. Participation rate of persons between 25 and 50 years old was relatively high and rather constant during the analyzed period. However, the participation rate of population aged 50+ first decreased in 1997-2004 then from 2005 began to rise. This shows that the employment of the old was highly correlated with economic activity. In case of the young the activity rate from 2000 to about 2008 followed a downward trend, however it is worth mentioning that when it comes to the employment and unemployment the cyclical competent dominated. Declining participation of youth can associated with educational boom that resulted in a rise in the number of tertiary students.

Figure 11. Average effective retirement age and employment rate of women (left panel) and men (right panel) aged 55-64 in the EU countries in 2000 (per cent).

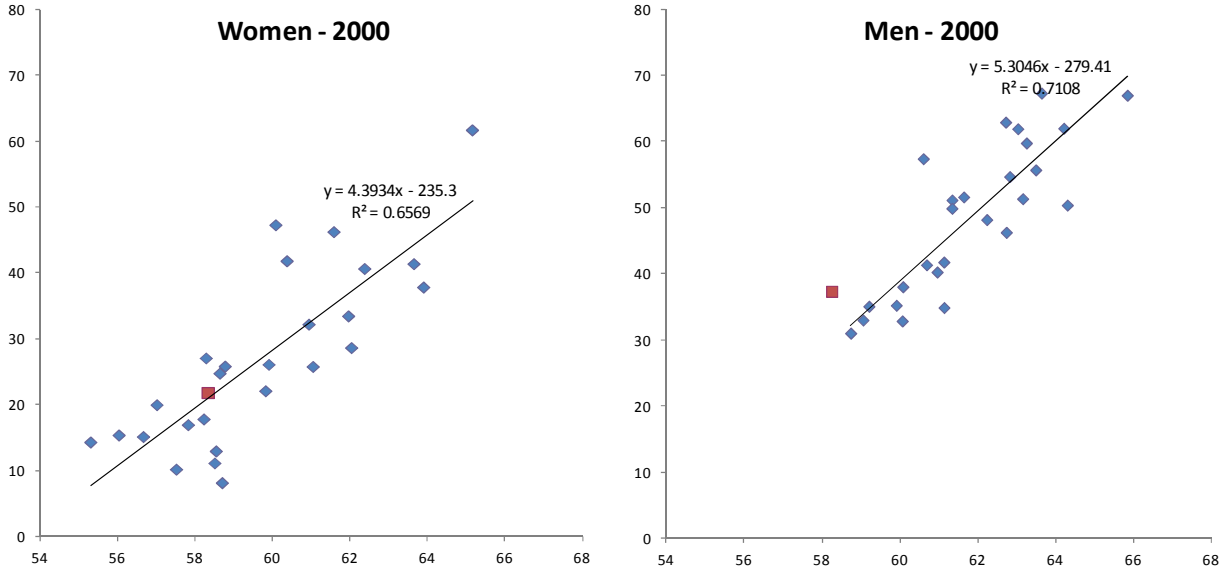
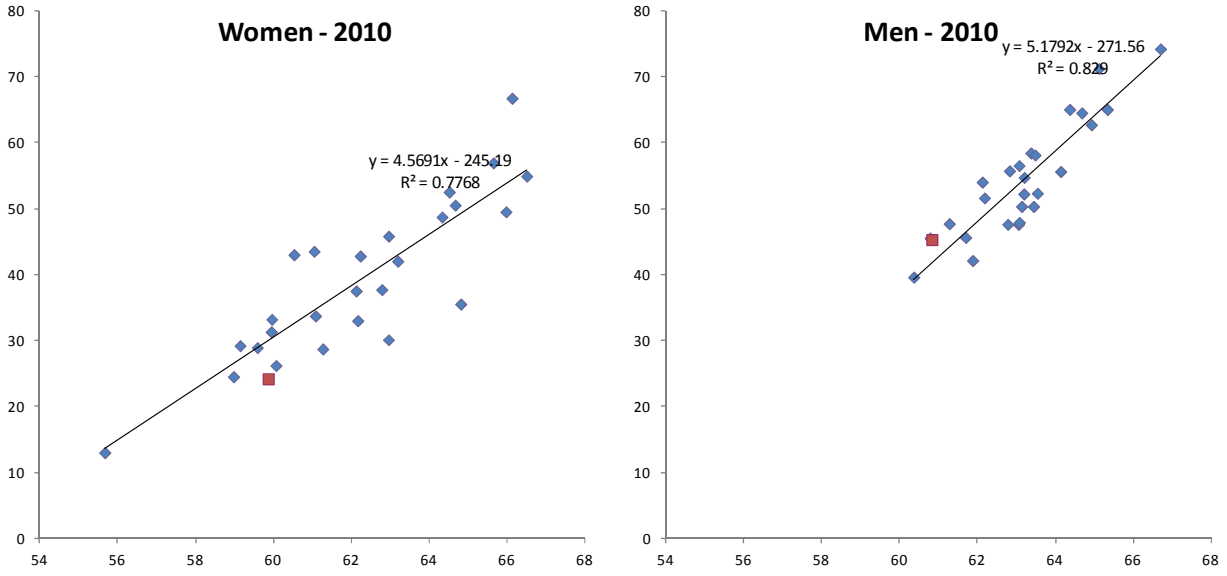


Figure 12. Average effective retirement age and employment rate of women (left panel) and men (right panel) aged 55-64 in EU countries, 2009 (per cent).



Notes: The red square denotes Poland.
Source: Own calculations based on Eurostat data.

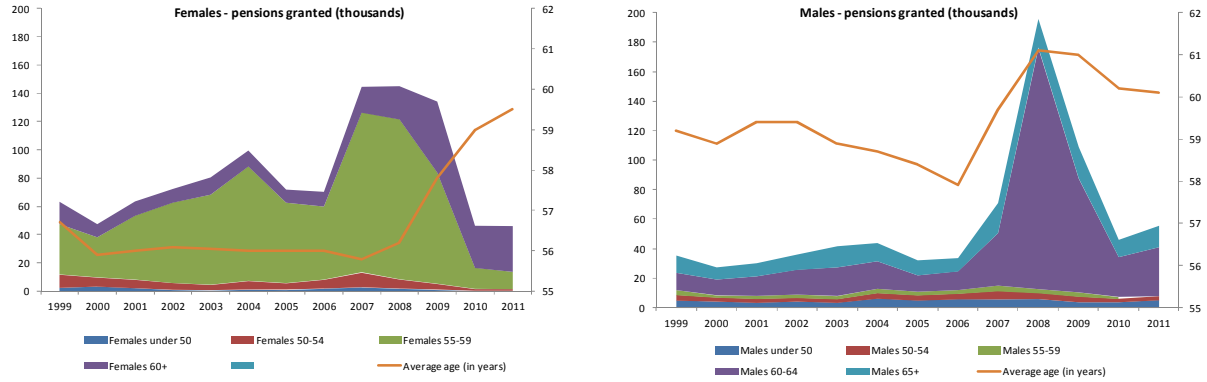
The lack of institutional reforms in Poland (except for the mentioned early retirement reform in 2008) has translated into a growing gap from EU countries in terms of the activity of women aged 55+. Figure 11 shows that in 2000 Poland was in the middle rank in Europe in terms of the average retirement age and employment of women aged 55-64. By 2010 the employment rate of older women was only higher than Malta, and the effective retirement age only exceeded Malta and Slovenia. In 2010, in 20 out of 27 EU countries, the effective retirement age among women went beyond 60 years – which was the statutory retirement age for women in Poland (and which is always higher than the effective age of retirement). It must be remembered that the Polish labor market has been the least affected by the global downturn in Europe, and less aggravated with problems of keeping or finding a job than other EU countries, meaning that the reasons of the weak progress in

the employment of women aged over 55 have been strictly institutional. The same applies to the employment of men and accordingly the gap between Poland and most of the EU Member States has not changed in this regard.

Figures 11-12 indicate that the correlation between the average age of leaving the labor market and the employment rate of older people in Europe has increased in 2000-2010.[2] In other words, the more effective the actions directed to lengthen the duration of economic employment, the higher the employment rate in the 55+ group. This correlation was already visible in 2000, and only became more pronounced in 2010. The low employment rate among older people in Poland has been connected with the low effective retirement age, which in turn is related to the low statutory retirement age (even after the elimination of early pension schemes).

Figure 13 shows that the anticipated and subsequently implemented in 2007-2008 abolition of the right to early retirement resulted in a massive outflow of workers in pre-retirement age into inactivity. In 2009, especially in its second half, the number of pensions granted declined significantly and remained much lower for the following years. Consequently, activity rates of people of pre-retirement age, especially women, increased, as well as the average age of exit from the labor market. However, it the average exit age hasn't converged to statutory retirement age among males, which is due to special sectoral rules for mining workers and some workers in the other sectors being eligible to early retirement in 2008, but taking the option some time later. Nevertheless, gradual increase in the statutory retirement age, introduced in 2012 and implemented from 2013 on, should lead to further increase in participation and employment among 55-64 year olds.

Figure 13. The number (in thousands) of women (left figure) and men (right figure) granted a pension by age and the average age of persons retiring between 1999 and 2011 (in years).



Source: Own calculations based on ZUS (Social Security Institution) data.

To summarize the discussed developments we evaluate to what extent the changes in employment rate of people aged 15-64 between 1997 and 2010 were due to the changes the employment rates of women and men, the young (aged 15-24), prime-aged (25-54) and older (55-64) people, and also to what extent they resulted from demographic factors, changes in the quality of the human capital and intensity of utilization of labor input in various demographic groups. We also assess the significance of these factors in the changes in employment rate of particular age groups. The methodology of the decomposition is presented in Box 1.

[2] Correlation coefficients between the employment rate of people aged 55-64 and the effective age of retirement increased for both sexes in 2000-2007, and then slightly decreased due to the drop in employment and increased unemployment during the downturn.

Box 1. Decomposition of employment rate changes.

A change (difference) in total employment rate (in particular of people aged 15-64) between the given moment (K) and the moment of reference (O) can be decomposed into the contribution of components determined by the characteristics of labor force (LZ), demographic factor (D), labor utilization intensity (I) and quality of workforce (J).

$$LZ_K = ER_O - ER_K = \sum_{wpk} \left(D_{pk} + I_{wpk} + J_{wpk} \right)$$

$$D_{pk} = ER_{Kpk} \left(\frac{P_{Opk}}{P_O} - \frac{P_{Kpk}}{P_K} \right)$$

$$I_{wpk} = \left(ER_{Owpk} - ER_{Kwpk} \right) \frac{P_{Opk}}{P_O} * \frac{P_{Kwpk}}{P_{Kpk}} * P_K$$

$$J_{wpk} = ER_{Owpk} \frac{P_{Opk}}{P_O} \left(\frac{P_{Owpk}}{P_{Opk}} - \frac{P_{Kwpk}}{P_{Kpk}} \right)$$

where:

ER – employment rate

P – population size

w – level of education (tertiary – 5-6 ISCED 1997, secondary –3-4 ISCED 1997, primary –1-2 ISCED 1997);

p – gender

k – age group (five-year age groups between 15 and 64 years of age).

In the calculations the annual EU-LFS data for 1997-2010 were used.

Figures 14–19 present detailed (disaggregation into 5-year age groups) decompositions of changes in employment rates of women & men in Poland in three subperiods 1997-2004 (deterioration on labor market), 2005-2008 (improvement) and 2008-2010 (global crisis), into the contribution of (i) demographics, (ii) human capital quality, and (iii) intensity of utilization of labor input among women and men. During the analyzed period the changes in total employment were mainly driven by changes in male employment. Between 1997 and 2004 employment fell by 8.3 per cent, and nearly 2/3 of this drop could be assigned to the change in men's employment rate. The similar situation was in 2004-2008 when the economy was growing and as a result the employment rate increased by 15.9 per cent. For this period the rise of male employment was responsible for about 58 per cent of the total increase. However, between 2008 and 2010, the contribution of both genders into total employment rate change (i.e. increase) was almost identical. Interestingly, the contribution of quality factor (i.e. improvement in human capital) was positive in all distinguished phases and it was higher for women over the entire period. Still, the changes in utilization (i.e. employment rates of particular age/gender/education groups) were much more pronounced and higher among males. Till 2008, changes in prime-age employment were most important for respectively decline of total employment rate between 1997 and 2004 and its increase in next few years. It is worth noting, that fast growth and booming labor market between 2005 and 2008 translated into substantial improvement in utilization of workers aged 20-29. On the other hand, they were also more negatively affected by the global crisis of 2008-2011. Interestingly, the 50-54 age group, which recorded the largest utilization improvements during the 2005-2008 boom, proved more resilient to the forthcoming slowdown.

Figure 14. The decomposition of change in female employment rate between 1997 and 2004 in Poland (population aged 15-64).

Figure 15. The decomposition of change in male employment rate between 1997 and 2004 in Poland (population aged 15-64).

Figure 16. The decomposition of change in female employment rate between 2004 and 2008 in Poland (population aged 15-64).

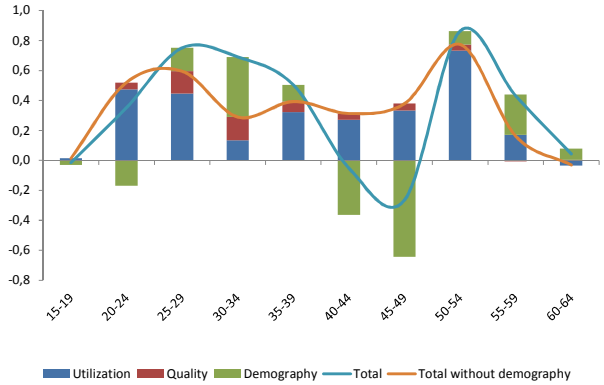


Figure 17. The decomposition of change in male employment rate between 2004 and 2008 in Poland (population aged 15-64).

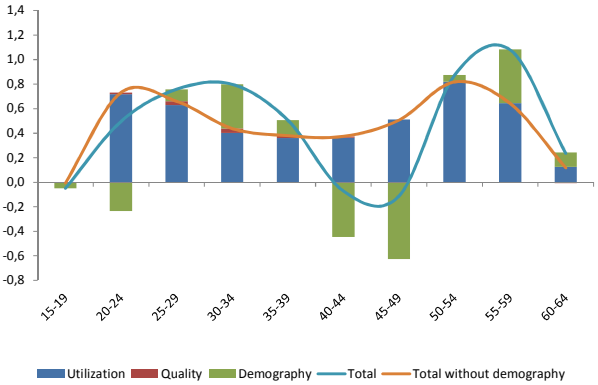
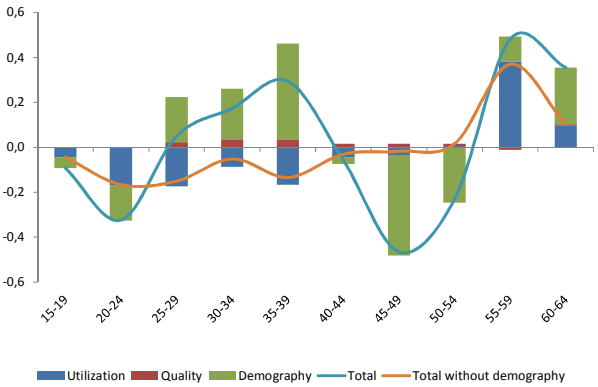


Figure 18. The decomposition of change in female employment rate between 2008 and 2011 in Poland (population aged 15-64).

Figure 19. The decomposition of change in male employment rate between 2008 and 2011 in Poland (population aged 15-64).



Source: Own calculations based on Eurostat data.

On the other hand, the impact of demographic processes on total employment rate was moderately negative. It is because the share of prime-age workers in the total labor force was slightly declining. In the first part of the studied period, very numerous cohorts born in the early 1980s were entering the labor market, and in the last few years very numerous cohorts born in the 1950s were approaching pre-retirement age. However, the contribution of demographic factor was much lower than the contribution of both utilization and quality factors.

It is also worth noting that these age and gender labor market patterns in the 2000s in Poland were very different from the ones characterizing the EU15 and EU27. Firstly, in the EU15 and EU27, the increase in employment rate by 2.2 and 2.0 percentage points, respectively, resulted almost completely from the increase in the employment rate of women.[3] In Poland it was the increase in the employment rate of men that contributed most to the total increase in employment rate (4.2 percentage points). Secondly, although both in Poland and the EU15 the positive contribution of intensity of utilization of labor input was concentrated among people aged over 40, in the EU15 it mostly concerned women after 50 and men after 55 years of age. In Poland the contribution of this factor among people 50+ was much lower, and among 60+ it was negative. Only after abolishment of early retirement in 2008 it became a driving force behind the overall employment growth.

1.1.2 Complementary aspects of Polish labor market– temporary employment and long-term unemployment

During the last decade the relative importance of the temporary jobs on the Polish labor market substantially increased. In late 1990's the share of temporary workers in total employment oscillated around 5 per cent, but from the beginning of the decade, within seven years incidence of temporary jobs jumped to 25 per cent of total employment and then from 2007 stayed on the same level. Most of these contracts are fixed-term, temporary agency work has also been developing, but it's substantially less widespread. There are two possible reasons for a surge in temporary jobs. One associated with change in employment protection legislation, the second with negative macroeconomic shock. The former explanation is more natural and it attributes the responsibility of a temporary employment increase to partial liberation of the labor code. Due to this kind of reform, where regular jobs are heavily protected and temporary employment law loosened, the dual labor market can be created, as it happened in Spain. A negative macroeconomic shock can be another reason behind the rise in fixed-term contracts. Facing an economic crisis and uncertainty associated with it, especially regarding future demand for labor, firms can react by using of more of a flexible type of employment. This path of labor market development was followed by Sweden, as the incidence of temporary employment increased during the crisis in the early 1990s and stayed at higher plateau for prolonged period of time. In case of Poland there is no evidence of an important changes in employment protection legislation in the vein of Spanish partial reforms of the 1980s. However, the timing of the beginning of shifts in the contractual structure indicates that the initial surge in temporary jobs was associated with the negative impact of the Russian crisis. The economy was hit by the external shock and in consequence companies started to prefer more flexible employment relations which don't require notice periods[4] and enable them to adapt to a disadvantageous economic situation more freely.

[3] The sectoral impact of the 2008-2009 downturn also played a role here, as the situation of men in the labor market was affected more badly than that of women, although usually in recessions greater decreases in employment occur among women.

[4] Usually the notice period in the case of open-ended contract is three months.

Figure 20. The share of temporary employed in total employment in Poland between 1997 and 2011.

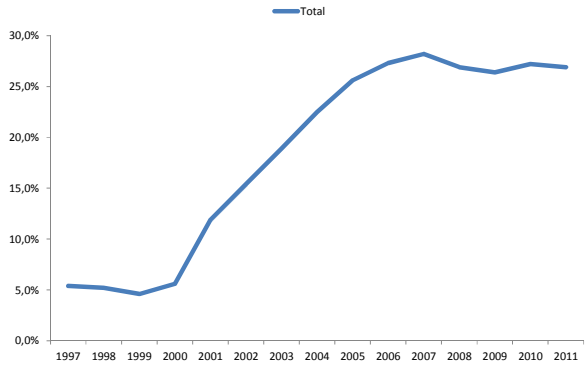


Figure 21. The share of temporary employed in total employment by gender in Poland between 1997 and 2011.

Source: Eurostat.

The shift in the structure of temporary employment by age has occurred between 1997 and 2011, in particular between 2000 and 2006. The percentage of prime-aged workers among temporary employees increased from 55 per cent to 64 per cent, at the expense of the share of old and the young. However, the high percentage of temporary workers in prime-age group results mainly from a high number of workers in that age group. The ratio of temporary workers to total employed is 0.2 for 25-49 age group which is relatively high in international comparisons, but relatively small in comparison to two-thirds of young workers being hired on the basis on a fixed-term contract.

Figure 22. The shares of age groups in temporary employment in Poland between 1997 and 2011.

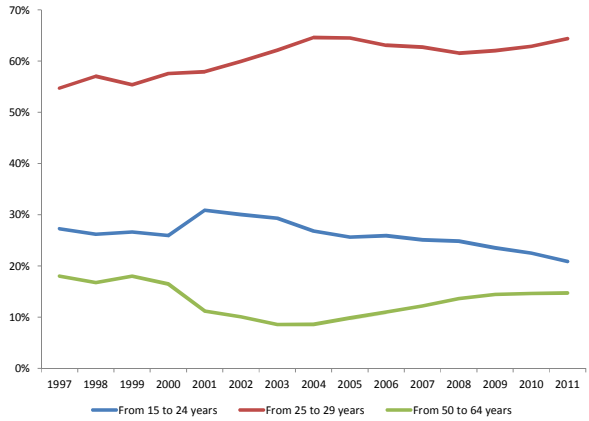
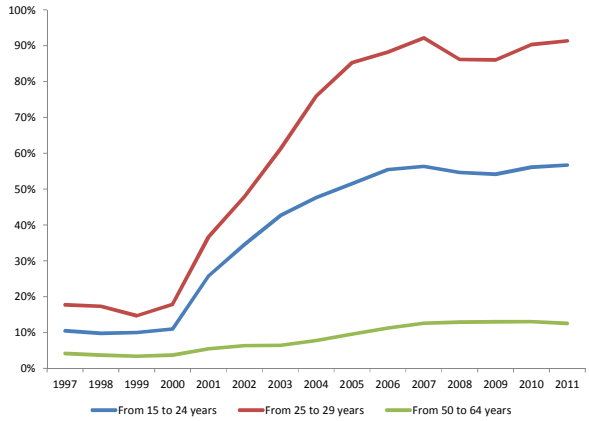


Figure 23. The share of temporary employed in employment by age in Poland between 1997 and 2011.



From 15 to 24 years From 25 to 49 years From 50 to 64 years

Source: Eurostat.

The incidence of temporary employment negatively correlates with the education level (see Figures 24-25). However, in the last ten years the percentage of people having higher degree and being employed on a fixed-term contracts (in relation to all temporary employed) has doubled, but at the same time their share in total employment has changed accordingly. Figure 25 shows that the share of employed on the basis of a temporary contract to all employed with a given education is increasing with the decreasing educational level attained.

Figure 24. The shares of education groups in temporary employment in Poland between 1997 and 2011.

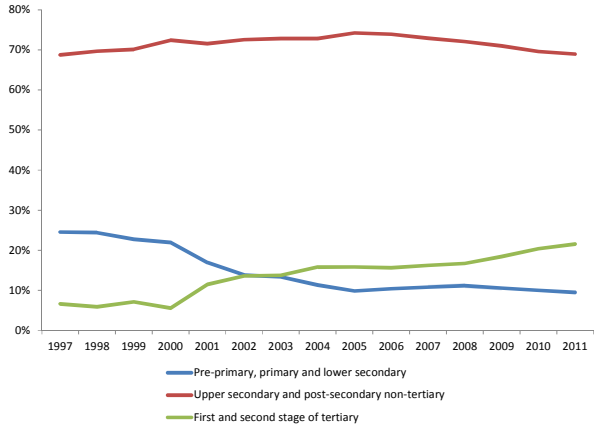
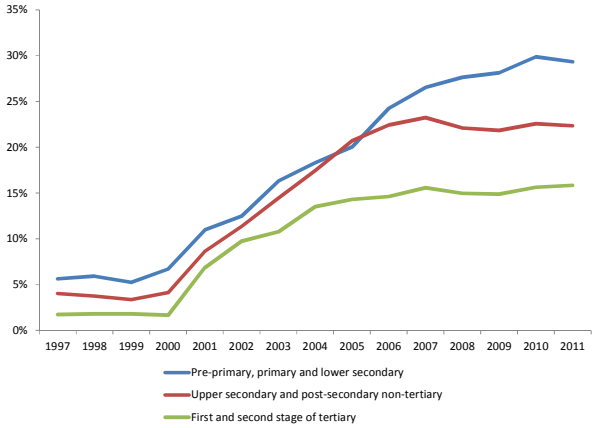


Figure 25. The share of temporary employed in employment by education in Poland between 1997 and 2011.



Source: Eurostat.

Figures 26-29 present decomposition of total employment changes into contributions of employment by gender and temporary/permanent contracts. In 2000-2004 employment in Poland fell by 5 per cent, due to a slowdown in economic activities. The magnitude of a drop in a number of employed on indefinite time contracts in this period was incomparable with other EU countries, amounting to 18 per cent reduction in employment of this type. It has overlapped with surge in temporary employment which almost tripled between 2000 and 2004. It can be advocated that in face of sluggish economic performance and negative prospects firms decided to reallocate some workers from non-temporary jobs to temporary ones – some of the fall in permanent employment was compensated by an increase in temporary employment. The economic boom in the EU in 2004-2008 led mainly to a rise in permanent jobs – only one-fourth of a total employment growth can be attributed to rise in number of temporary employed. Slightly different was the situation in Poland, where almost a half of positive change on the labor market (16 per cent increase in total employment) can be explained by an increase in the number of people working on a temporary basis. After years of weak economic growth in Poland, companies started to hire during the expansion. However, business entities were more willing to make use of temporary contracts, that give them more flexibility in case of worst time. As a result during 2004-2008 despite the blooming economy the share of temporary employed increased further.

Figure 26. The decomposition of the change in employment in the EU members during 2000-2004.

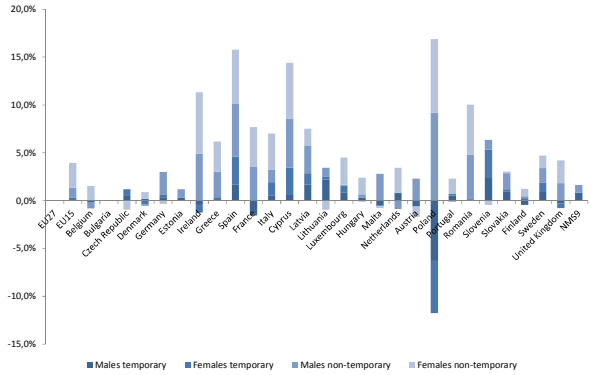
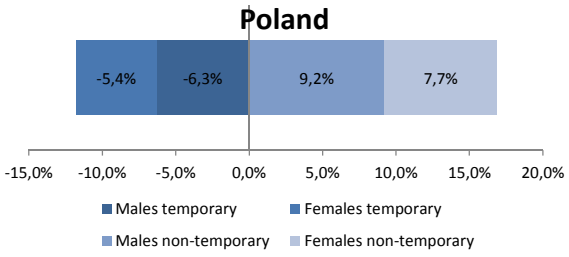


Figure 27. The decomposition of the change in employment in Poland during 2000-2004.



Source: Own calculations based on Eurostat data.

Figure 28. The decomposition of the change in employment in Poland during 2004-2008.

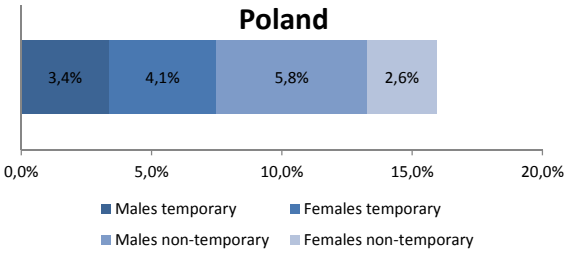
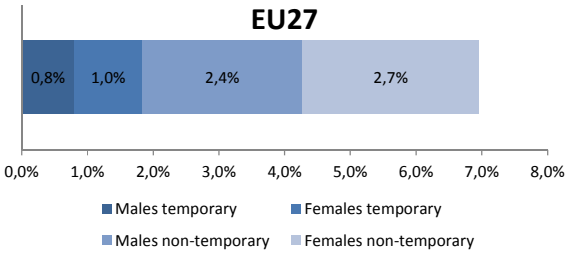


Figure 29. The decomposition of the change in employment in the EU during 2004-2008.



Source: Own calculations based on Eurostat data.

Between 2008 and 2011 employment in the EU fell by 2 per cent. The change was mainly caused by the reduction of permanent jobs occupied by males. Poland was in a small group of European countries that during 2008-2011 had positive GDP growth rate and was even able to increase employment by 2.1 per cent. The growth in temporary jobs for males and permanent jobs for females were the main contributors to total employment increase. In comparison to slowdown in 2000-2004, when there was a sharp reaction of the labor market, the current crises have so far small impact on overall employment and its structure with respect to contracts. Although the share of temporary employees in total employment in Poland has declined slightly since 2007 (see Fig. 20), it was rather due to increase in permanent employment.

Figure 30. The decomposition of the change in employment in Poland during 2008-2011.

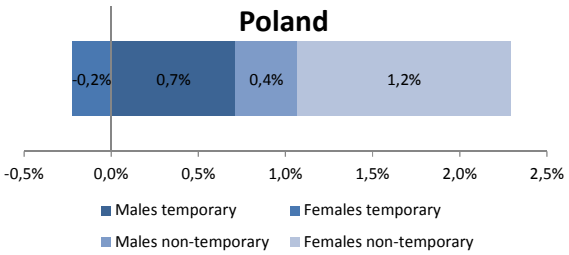
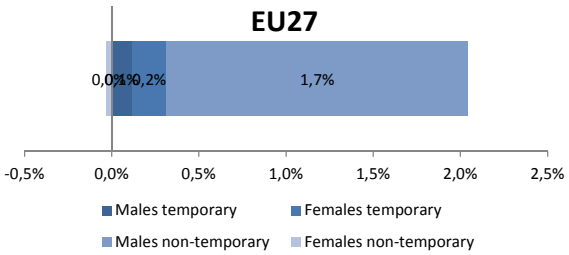


Figure 31. The decomposition of the change in employment in the EU during 2008-2011.



Source: Own calculations based on Eurostat.

The magnitude and severity of social problems related to unemployment in Poland resulted to large extend from the fact, that during 1998-2005 period the initial unemployment increase was followed the long-term unemployment going up substantially. This led to exclusion of a significant number of people from the labor market. From 2001 to 2007 the number of long-term unemployed was higher than the short-term. The demand shock induced by Russian crisis not only was responsible for the increase in unemployment, but also it resulted in a disadvantageous unemployment structure dominated by long-term unemployed. During 1998-2002 the unemployment increased, because companies were not hiring new workers, so the lack of employment opportunities for new entrants translated into a higher number of unemployed. However, after the labor market improved, the long-term unemployment rate declined to a fraction of its past levels (see Figure 32). Between 2007 to 2011 the situation on the labor market looked different than in previous slowdown. Bukowski, Kowal, Lewandowski (2012) show that firms reacted to crisis first by redundancies and this caused the short-term employment to increase in the first place. Hirings declined with some lag, and the long-term unemployment rate stayed stable around 2-3 per cent. The different response to economic slowdown by labor market indicates that during the decade occurred a change in institutional setting concerning labor relations.

Figure 32. Short-term employment versus long-term employment (per cents of economically active working age population).

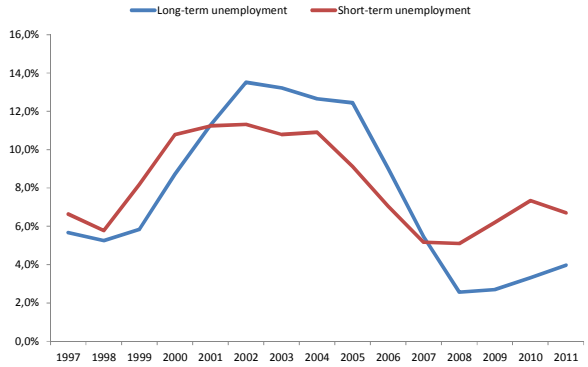
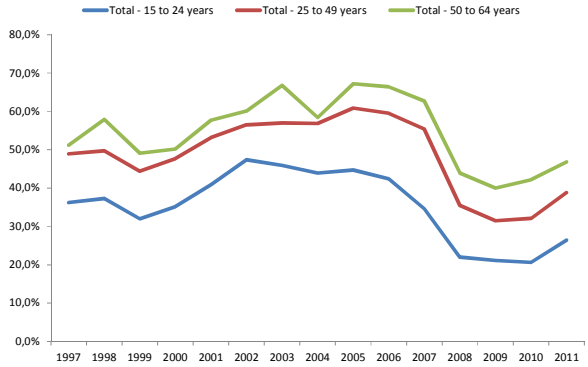


Figure 33. The share of long-term unemployed in total unemployment in a given age group.



Source: Eurostat.

Figure 34. The share of long-term unemployed in total unemployment for males and females in 15-64 age group.

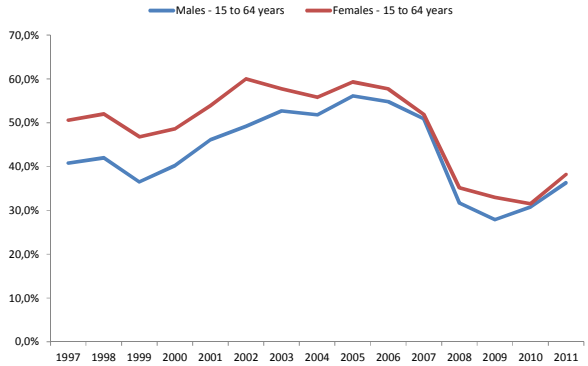
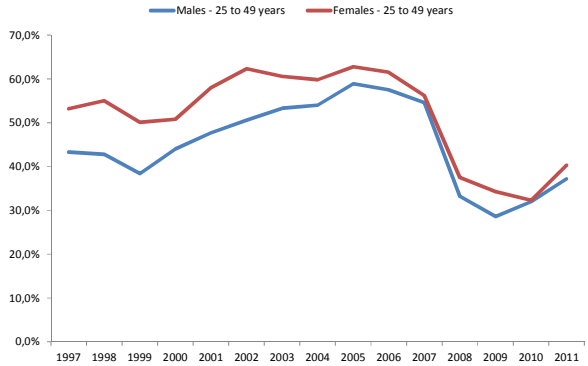


Figure 35. The share of long-term unemployed in total unemployment for males and females in 25-49 age group.



Source: Eurostat.

Looking at the unemployment structure by age, it is not surprising, that the older the age group, the higher the percentage of long-term unemployed. The share of males and females that are long-term unemployed in all age groups is similar. Until 2007, it was characteristic that females constituted the

majority of long-term unemployed. However, since 2007 then both males and females exhibit similar share of long-term unemployed among unemployed.

1.2 Productivity and sectoral developments in Poland

1.2.1 GDP and productivity convergence in Poland

Poland is still being described as an emerging economy. The economic structure and its efficiency are improving which leads to GDP growth and convergence. From 2000 to 2011 real GDP per capita increased by about 60 per cent. Comparing Poland with a benchmark country (the USA), the GDP per capita was 70 per cent lower in 2000, whereas in 2009 the difference was 60 per cent. Gap in GDP per capita in a given year can be decomposed into components arising from differences in (i) productivity, defined as value added per hour worked, (ii) labor input measured in average number of hours worked by the average worker during the year, (iii) the share of employed in the working-age population and (iv) the demographic structure, i.e. the share of working-age population in total population (see Box 2). Such decomposition can be also used to trace the sources of convergence. Figure 37 shows that the 10 percentage points reduction of the distance in 2000-2010 resulted mainly from the increasing employment rate, although it remained lower than in the USA. This increasing employment was accompanied by a slight increase in average annual hours worked (higher than in the USA as early as 2000), and a productivity growth slightly higher than in the USA (measured by the dynamics of value added per hour worked). However, the contribution of labor productivity convergence in reducing the development gap was relatively low, which suggests that despite being a distinctly poorer country, Poland struggles with achieving productivity dynamics that could result in a rapid convergence to the USA. In other words, the labor productivity growth in Poland, only a little bit higher than in the USA, puts into question the possibility of convergence between the two countries. Reserves in the extensive supply of labor in Poland do still exist, but after they are exhausted bridging the development gap will only be possible through higher dynamics of value added per hour worked. In addition, progress in convergence to the EU15 results rather from the weakness of these countries rather than from the high competitiveness of the Polish economy.

Figure 36. Decomposition of the GDP per capita gap between the EU15 and USA in 2000 and 2009 (per cent).

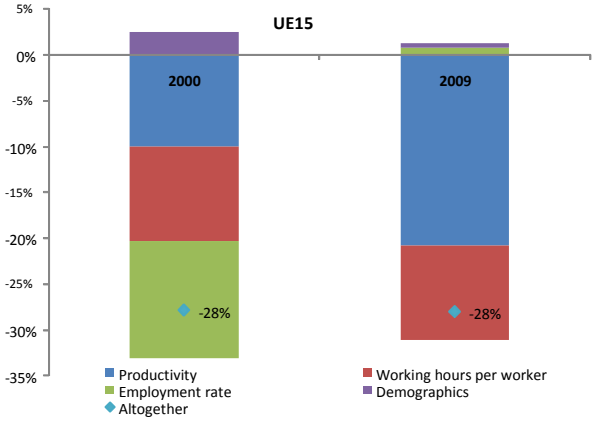
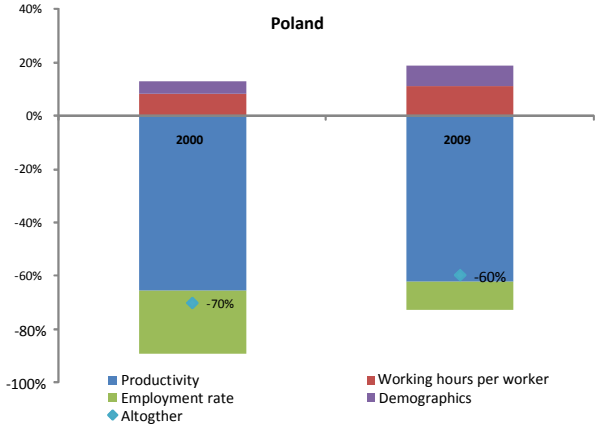


Figure 37. Decomposition of the GDP per capita gap between Poland and the USA in 2000 and 2009 (per cent).



Source: Own calculations based on Eurostat and OECD data.
Notes: Difference in GDP per capita in relation to the USA is decomposed into the contributions of: (i) productivity – differences in the output per hour worked, (ii) hours worked – average number of hours worked per worker, (iii) employment rate, (iv) demographics – share of 15-64 year olds in the total population. All the values expressed at per cent of GDP per capita in the USA in a given year.

Box 2. Decomposition of the GDP per capita gap to the USA.

Gap in GDP per capita of the i-th country (GDP_i) relative to GDP per capita in the United States (GDP_{USA}) in a given year can be decomposed into components arising from differences in (i) productivity, defined as value added per hour worked (*VA*), (ii) labor input measured in average number of hours worked by the average worker during the year (*AH*), (iii) the share of employed in the working-age population (*Emp*) and (iv) the demographic structure, i.e. the share of working-age population in total population (*Dem*). The equivalence

$$\frac{PKB_i}{PKB_{USA}} = \frac{VA_i * HA_i * Emp_i * Dem_i}{VA_{USA} * HA_{USA} * Emp_{USA} * Dem_{USA}}$$

can be expressed as

$$\ln\left(\frac{PKB_i}{PKB_{USA}}\right) = \ln\left(\frac{VA_i}{VA_{USA}}\right) + \ln\left(\frac{HA_i}{HA_{USA}}\right) + \ln\left(\frac{Emp_i}{Emp_{USA}}\right) + \ln\left(\frac{Dem_i}{Dem_{USA}}\right).$$

Using the approximation y-1=ln(y) for y≈1,[5] we obtain

$$\frac{PKB_i}{PKB_{USA}} - 1 = \left(\frac{VA_i}{VA_{USA}} - 1\right) + \left(\frac{HA_i}{HA_{USA}} - 1\right) + \left(\frac{Emp_i}{Emp_{USA}} - 1\right) + \left(\frac{Dem_i}{Dem_{USA}} - 1\right) + \theta_i$$

so

$$\frac{PKB_i - PKB_{USA}}{PKB_{USA}} = \frac{VA_i - VA_{USA}}{VA_{USA}} + \frac{HA_i - HA_{USA}}{HA_{USA}} + \frac{Emp_i - Emp_{USA}}{Emp_{USA}} + \frac{Dem_i - Dem_{USA}}{Dem_{USA}} + \theta_i,$$

where θ_i is a decomposition residual.

GDP per capita and value added per hour worked have been expressed in purchasing power parity (PPP in U.S. dollars, OECD).

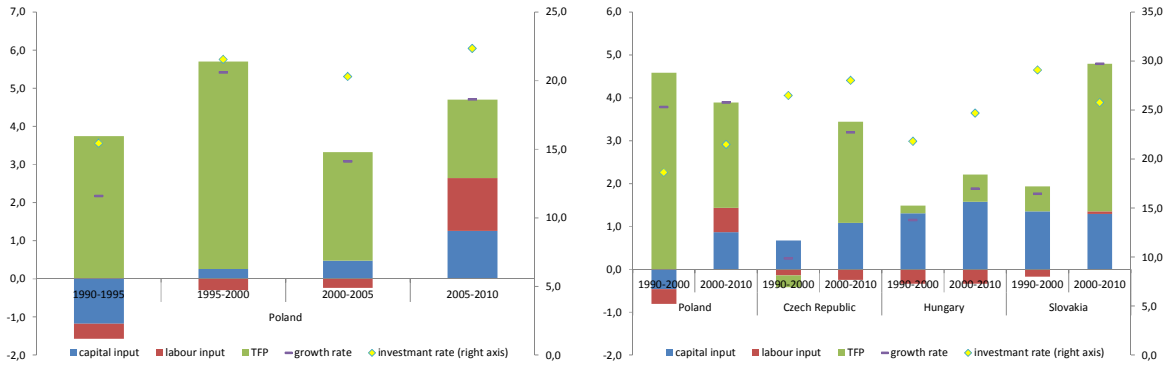
[5] As x=ln(1+x) for x≈0.

In 2000, the development gap in Poland was caused by three main factors: (i) much lower public and private capital engaged in production than in most developed countries, (ii) lower level of technology, resulting in lower efficiency of production processes; and (iii) lower human capital and slightly lower relative labor input (cf. Bukowski, Growiec, Marć 2009). Over the following ten years the labor input increased, mainly thanks to rising employment and decreasing unemployment. However, the improvement in employment and hence GDP per capita could both have been greater if Poland had managed to increase the employment of women and older workers to average EU levels.

A relatively low labor productivity dynamic in Poland after 2000 distinguishes it from other Central European countries, especially the Czech Republic and Slovakia. Although the aggregate increase in output per hour worked in Poland amounted to 30 per cent in 2000-2009, which shortened the distance to the EU15 and to a lesser extent the USA, other NMS countries that joined the EU in 2004 reached better outcomes. In the Czech Republic, already distinctly wealthier than Poland in 2000, labor productivity growth in 2000-2009 totaled 36.5 per cent and its contribution to the convergence to USA was twice as great as in Poland (6 percentage points against 3 percentage points in Poland). In Slovakia, the overall increase in labor productivity was 45 per cent, and its contribution to the output per capita convergence to the USA reached 8 percentage points.

Another way to look at economic growth is through Solow growth decomposition that enables to calculate how much labor, capital and total factor productivity contributed to GDP growth. In Poland the main source of growth was increasing TFP. It was particularly true during the 1990-2005 period, when the output growth was almost totally driven by productivity improvements. However, between 2005 and 2010 the rate of TFP growth slowed down and a substantial contribution, in comparison to the 1990-2005 period, was from labor and capital inputs.

Figure 38. Growth decomposition for Poland in 1990-2010 and for the chosen NMS.



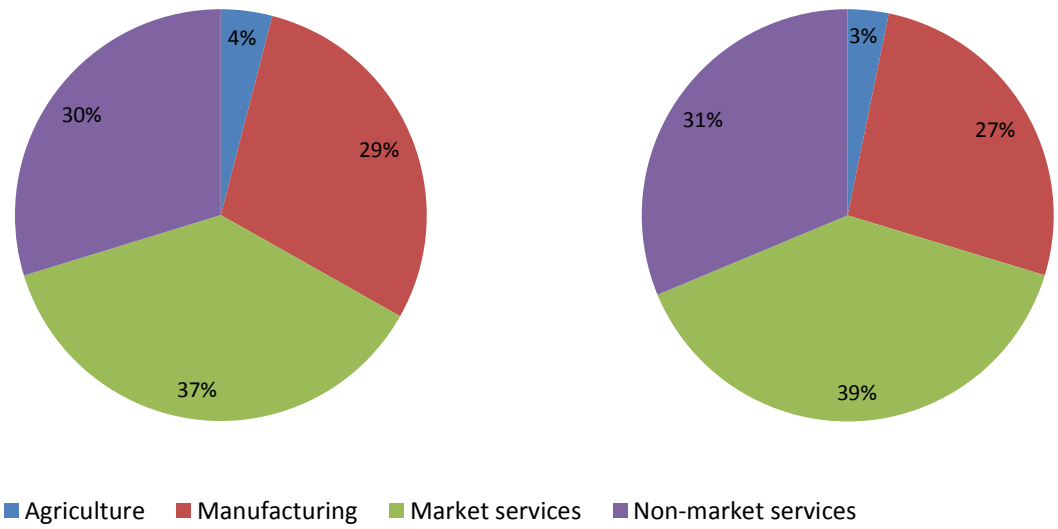
Source: Own calculations based on Eurostat data.
Note: Data for 1990-1995 were approximated due to incompleteness.

According to the growth theory, relatively poorer economies with comparable human resources and institutional and regulatory environments should develop faster than wealthier countries. In this light, the convergence of Poland to the EU15 and the USA in 2000-2009 was below expectations. Among the countries of the Visegrad Group, only Hungary exhibited lower productivity and employment dynamics than Poland. The causes of this distinct decrease in growth of GDP per hour worked in 2000s are related to low investment rates in Poland over the period, especially at the turn of centuries.

1.2.2 Sectoral developments in Poland

Assessing the long term trends occurring in the economy demands, besides GDP growth study, the analysis of the sectoral structure of the economy. The structure can be characterized with regard to employment or value added. Beginning with the employment, Polish has one of the most traditional structures among EU27 countries. The share of Polish agriculture in employment in 2007 was approximately four times larger than in the EU15, and nearly three times greater than in the NMS7 (14 per cent against respectively 3.2 per cent and 5.3 per cent). At the same time, a strong downward trend in the proportion of those employed in agriculture was common for all the NMS8. The accession countries had a higher employment in manufacturing than the "old EU"- in Poland this difference was 4.7 percentage points and in the remaining NMS7 the average difference was 9.7 percentage points. The logical consequence is a far higher share of services in total employment in the EU15 - in 2007 it amounted to more than 70 per cent (in the NMS7 - 58.5 per cent, Poland - 54.9 per cent). At the same time, however, differences in relative employment in market services were much lower, which means that the relatively greater role of services in employment in the EU15 was due to more complex public services. In Poland, both the direction and dynamics of changes in employment structure indicate a gradual convergence to the EU15 – the fastest is the employment growth in market services, while manufacturing employment remained essentially constant and in agriculture it was decreasing.

Figure 39. Sectoral employment structure in Poland in 2000 (left) and 2007 (right).

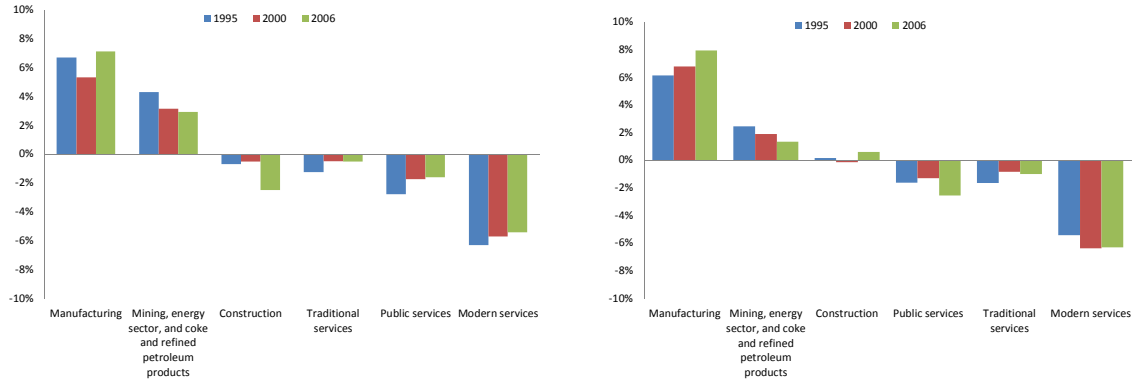


Source: Own calculations based on Eurostat data.
Note: Data for later years, due to the introduction of NACE Rev.2 classification, do not guarantee full comparability, and therefore the time series has been limited to years 2000-2007.

A natural benchmark for Poland is a typical labor market structure of the EU15 and it is indicative to assess the convergence through employment gaps across sectors and compare it with other NMS. One of the sources of the structural shift is a decline in the number of employed in agriculture. In addition to the limited reduction in the role of agriculture, the convergence of the Polish

employment structure to the EU15 has been implemented through a reduction of employment in the mining and energy sectors, and by reducing the gap in all services groups. Similarly to other NMS, the gap in manufacturing was increasing, accompanied by a marked trend towards reallocation of labor to relatively less productive sectors, such as the manufacture of wood and wood products. The positive relationship between the sectoral gap and labor productivity decreased in 1995-2006. In Poland, the reduction in the gap occurred mainly in modern services. Other NMS had a stronger reallocation of labor to industry, especially electrical power, high-tech and automotive industries, and was accompanied by a strong increase in their labor productivity.

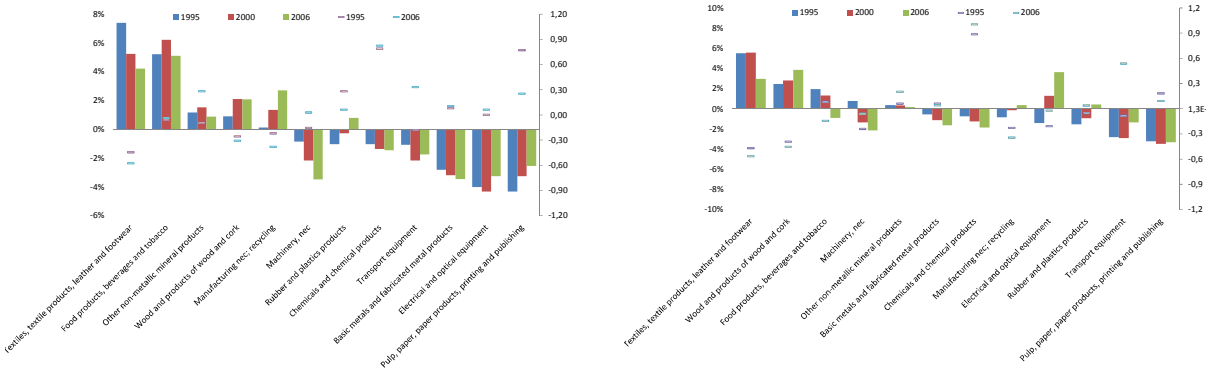
Figure 40. Gaps in the sectoral structure of the labor market between Poland and the EU15 (left), and between the NMS7 and the EU15 (right).



Source: Own calculations based on Eurostat data.

Note: The presented gaps signifies a difference in sectorial structure of hours worked in Poland (left) and NMS7 (right) in relation to EU15, excluding from the total working time agriculture, forestry, hunting and fishing, and activities of households.

Figure 41. Differences in industrial employment between Poland and EU15 (left), and between NMS7 and EU15 (right), versus labor productivity.



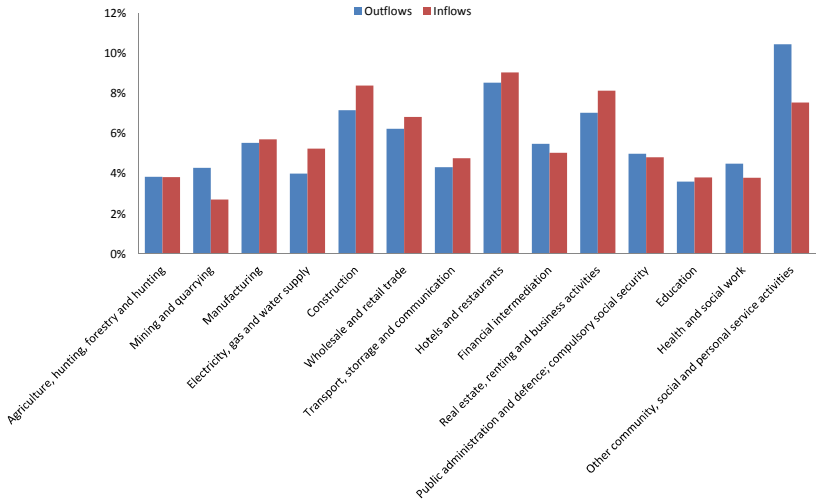
Source: Own calculations based on EU-Klems data.

Note: The left axis is used to describe the difference in employment structure, i.e. the difference in employment share of various divisions. Productivity of labor in individual divisions (described by horizontal lines and denoted on the right axis) is compared with labor productivity in the Polish economy (left) or in NMS7 (right). Zero per cent would mean that the level of productivity in a given section is equal to that in the entire economy).

The comparison between the employment structures in different years flattens some aspects of the structural transition. To describe dynamics and assess potential barriers that could hinder the change to a modern economy it is useful look at flows into and out of particular branches. The gross worker flows can be used to map the problematic sectors due to entry and exit barriers.

Industries with particularly intense outflows and inflows are construction, trade, hotels and restaurants, real estate, renting and business activities, while small flows are characteristic for mining, agriculture, education and health care. The differences between sectors with lowest and highest flows are more than double.

Figure 42. Average annual worker flows into and out of individual sections in Poland in 2001-2008.



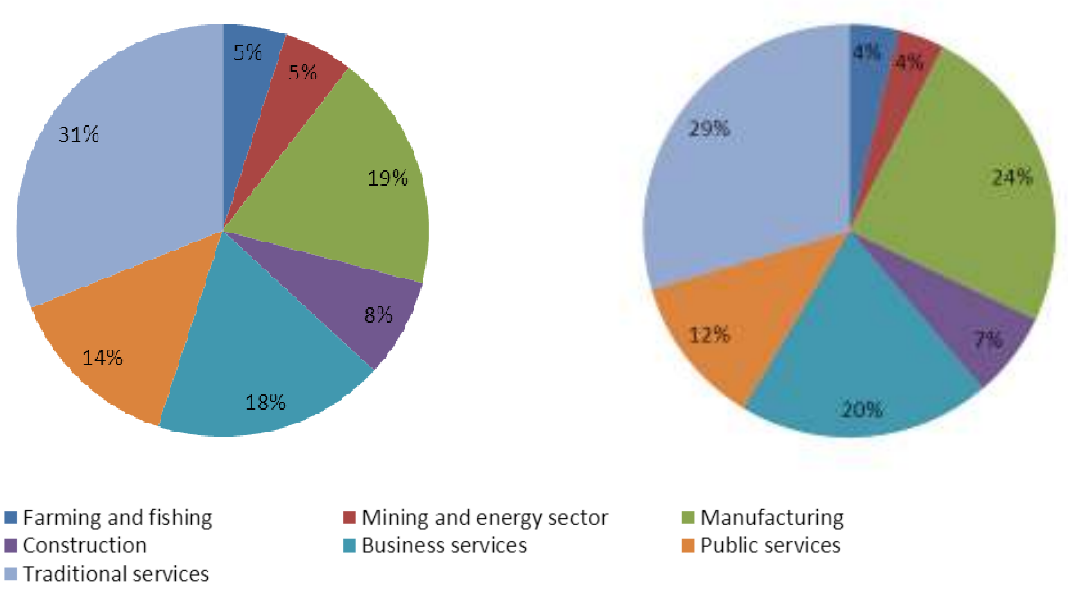
Source: Own calculations based on LFS survey.

Low flows in public services result from high informal employment protection, and codified rules of hiring officials, teachers and so on. Moreover, traditional services such as hotels and restaurants, trade, construction, although with stable or moderately increasing significance, could be the second best available option of "escape from agriculture and mining" after the outflow to business services. The high inflows to those sections indicate relatively low entry barriers. However, low outflows from agriculture and mining, suggest that exit barriers are much greater (reinforced by the institutional protection against dismissal in the secondary sector and a relatively low level of professional deactivation in the primary sector). In particular this applies to agriculture, with low salaries and low quality of work. One of the key barriers to the outflows from traditional branches to services may be a mismatch of qualifications. Flows out and into agriculture are studied in more detail in chapter 3.

Besides the labor structure, the importance of specific sectors can be analyzed in relation to the structure of the value added. From 2000 to 2008 a shift in the value added structure toward a more modern one occurred. The value created by farming and fishing decreased by 1 percentage point. The same trend could be seen in mining and energy sectors. An additional element that contributed to the structural shift was an increase in significance of business services, as opposed to traditional. However, the total share of services stayed in 2008 below that of 2000 due to a decline in value in

traditional and public services, which was not reverted by a greater value created by business services. The most significant change in the value added structure occurred in case of manufacturing, whose value added share went up by 5 percentage points from 19 per cent to 24 per cent. Despite the structural transition is clearly visible in the period between 2000 and 2008 the strength of the process is moderate.

Figure 43. The structure of value added in Poland in 2000 (left) and 2008 (right).

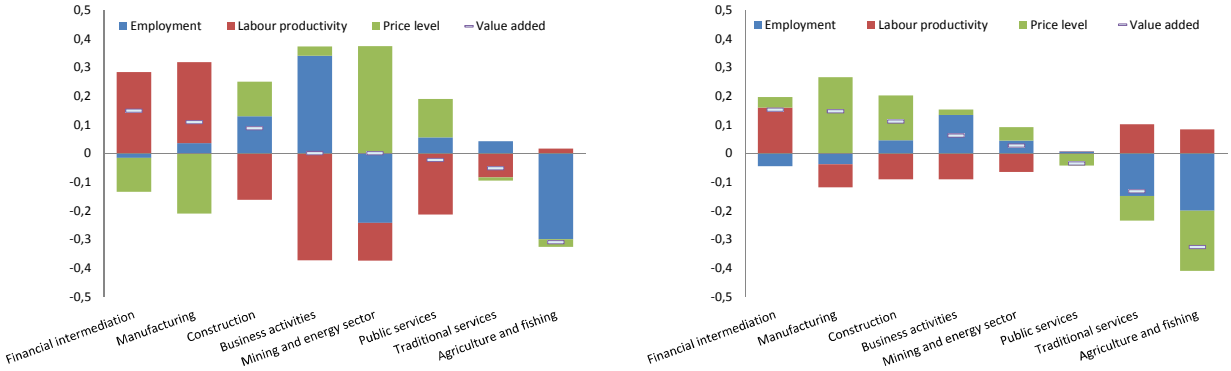


Source: Own calculations based on Eurostat data.
Note: 'Farming and fishing' includes agriculture, forestry, hunting and fishing, 'mining and energy sector' - mining and quarrying and the production and supply of electricity, gas and water, 'manufacturing' – industrial manufacturing, 'business services' - real estate, renting and business activities, 'public services' - education, health and social work, public administration and national defence, 'traditional services' - trade, restaurants and hotels, transport and communication, and other social and personal services.

1.2.3 Interactions between productivity and employment growth

At the sectoral level, in principle, changes in productivity and labor input should be mutually contradictory, because of decreasing marginal productivity of labor. However, in the long run from the development perspective the relation between productivity and employment should be reversed, the sectors with higher productivity should experience increases in the number of workers. This results from the improvements in technology, organization etc. In real world both effects overlap and it comes to specific sectors which forces dominate. We try to quantify them with decomposition of changes in the structure of the value added into contributions of changes in labor input, real labor productivity and price level. The decomposition makes it possible to analyze the labor productivity/employment relation and at the same time to assess the change of a significance of a particular sector in the economy.

Figure 44. Decomposition of changes in the share in the value added in Poland (left) and the EU15 (right) in 2001-2008.



Source: Own calculations based on Eurostat data.

Note: Labor input means a change in the share of total hours worked by all employees, labor productivity - change in real value added per hour worked in a given group of sectors in relation to the analogous values for the whole economy, price level - change in the group of sections against the general price index. The changes are presented in a logarithmic scale.

In the last decade productivity growth and labor input change were correlated positively in Polish manufacturing, mining and energy sectors. In the first mentioned sector, the increase in productivity was accompanied by the inflow of labor, opposite to the situation in the EU15 where the importance of manufacturing was decreasing (both in the value added composition and employment structure). The increase in labor productivity in Polish manufacturing, achieved with a better use of physical capital and technological progress, was so significant that it exceeded the change in the opposite direction induced by increased employment. Thus the perception of manufacturing as a traditional sector as opposed to services is inadequate, because with respect to productivity the Polish manufacturing industry has had a distinct ability to simultaneously increase efficiency and employment. It does not change the fact that in the EU15 and remaining NMS the share of manufacturing in the output structure and value added had been decreasing for many years.

From the perspective of productivity changes and share in the employment structure, especially the mining industry, and the electricity, gas and water supply can be perceived as traditional. In terms of productivity and employment, their economic importance has decreased over the last decade, the significant increase in prices generated by these sectors has increased their share in value added both in the EU15 and the NMS, or at best remained at an unchanged level (in Poland). A significant increase in the international demand for natural resources was accompanied by a real production growth that was much lower than the growth of the total economy and which contributed to the increase in relative prices. This inelasticity of supply can be explained mainly by the high capital intensity, stringent regulations and dependence on the availability of natural resources – making it difficult to adjust production to demand.

Public services and construction across Europe (including Poland) have experienced the effect of *cost disease*.[6] An increase of the productivity gap, for example in comparison with manufacturing, was accompanied by a relative increase in prices, which translated into increased share in output and, due to limited price elasticity of real demand, an increased share in the employment structure.

[6] Baumol (1967) formulated the hypothesis of cost disease, in which the structure of real demand remains the same, and where extensive development of the service sector is due to the relatively lower pace of technological progress.

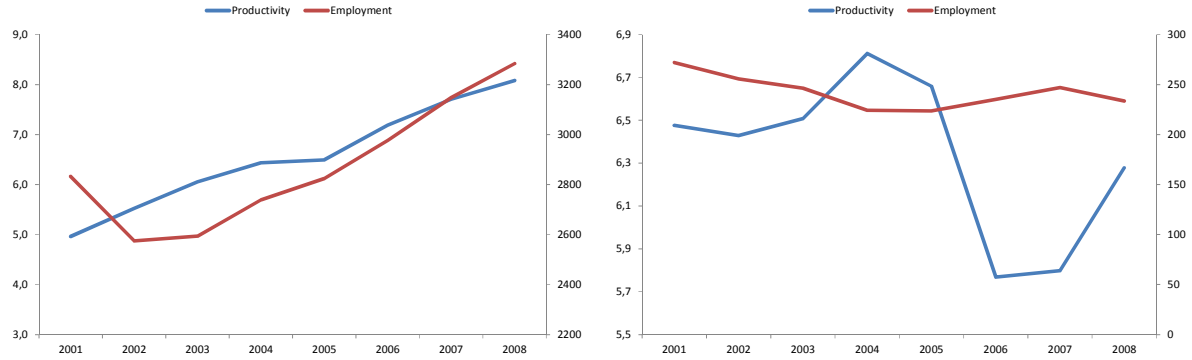
Especially with respect to public services, this inelasticity could be attributed to the non-market mechanism of their delivery. After 2004 the Polish construction industry changed significantly – until then, both relative prices and the share in the structure of both employment and value added had been steadily decreasing. Since 2005, all of them were increasing and the latter two categories with increasing pace. This fact can be associated with the intensification of construction projects related to EU accession, the availability of the EU funds, and the credit boom in the private housing market (however, significantly smaller in Poland than for example in the Baltic states, Spain or Ireland).

Financial intermediation, as opposed to public services and construction, recorded an above-average real growth of value added. A significant increase in the productivity of inputs in this sector was related to moderate changes in employment and a decline in relative prices (or, in the EU15, only a slight increase) that had resulted from an increase in efficiency. During the period, the sector also showed significant innovation. Similar trends could be observed for business activities in the EU. However, they were subject to an expansion of employment, which in Poland was associated with a decrease in productivity, not only in relative (Figure 44) but also in absolute terms. Thus, financial intermediation is not in decline and, opposite to the construction and public services, the share of this sector in GDP has grown (in the EU15) or remained more or less at the same level (in Poland).

Unlike financial services, the share of traditional services (trade, hotels and restaurants, transport and communication, and other) in the creation of value added has remained rather stable in the EU15. However, in Poland and other NMS, a real demand for these services has been growing more slowly than the overall economy, which can be attributed primarily to fast development in manufacturing and financial intermediation. At the same time, however, traditional services increased their share in employment, with at best limited (except communication) increases in labor productivity. This means that the increase in production in this sector in Poland and other NMS was possible through employment expansion, at the expense of efficiency.

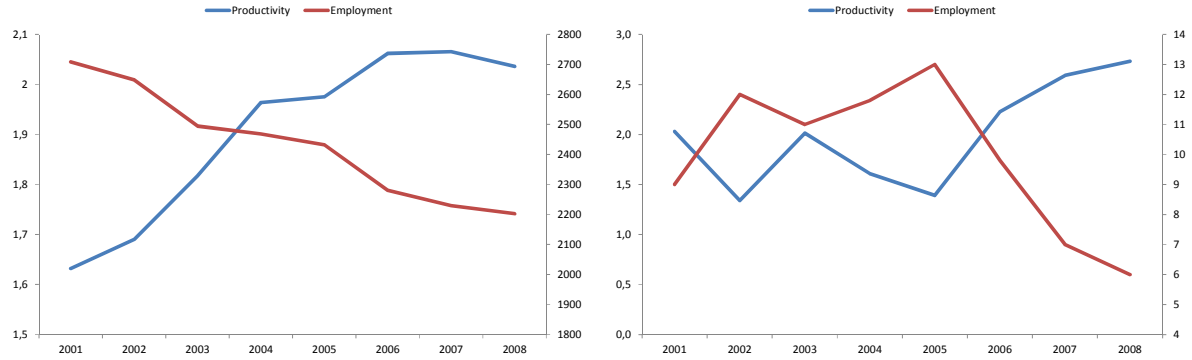
To sum up, from the perspective of productivity changes and the share in the value added structure, especially the mining industry, and the electricity, gas and water supply can be perceived as traditional sectors. In terms of productivity and employment, their economic importance has decreased over the last decade. However, the significant increase in prices generated by these sectors has worked in the opposite direction diminishing an overall effect on the share of value added. Besides manufacturing and financial intermediation, an above-average increase in labor productivity in Europe in 2001-2008 was also observed in "agriculture, forestry, hunting and fishing", which all experienced a significant decline in employment – both in relative and absolute terms. In Poland, this trend was accompanied by a real growth of value added produced in this sector (albeit slower than the growth of the entire economy). Although Polish agriculture was gradually reducing its excess employment, the process cannot yet be considered complete as the gap between Poland and Western Europe with regard to labor productivity and labor intensity in agricultural production is still high, due also to the small size of farms and low marketability of products.

Figure 45. Labor productivity (in thousands Euros per person – reference year 2000) and employment (in thousands) in 2001-2008 in manufacturing (left) and mining and quarrying (right) in Poland.



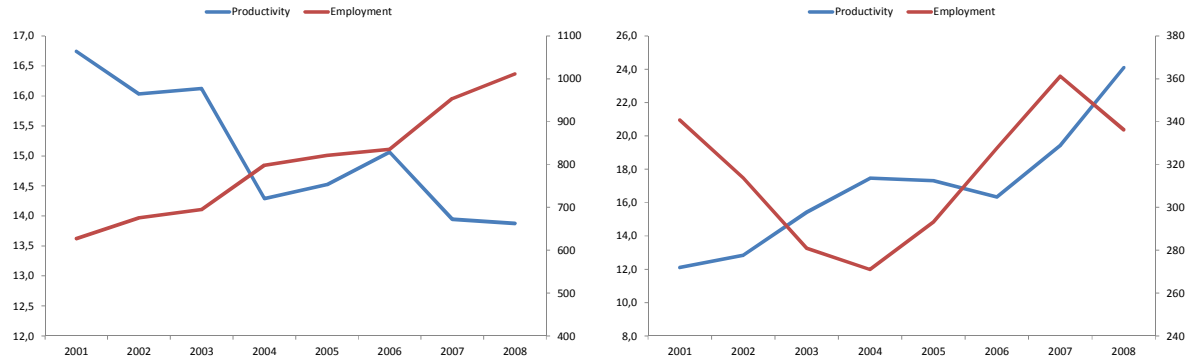
Source: Own calculations based on Eurostat data.

Figure 46. Labor productivity (in thousands euros per person – reference year 2000) and employment (in thousands) in 2001-2008 in agriculture, hunting and forestry (left) and fishing (right) in Poland.



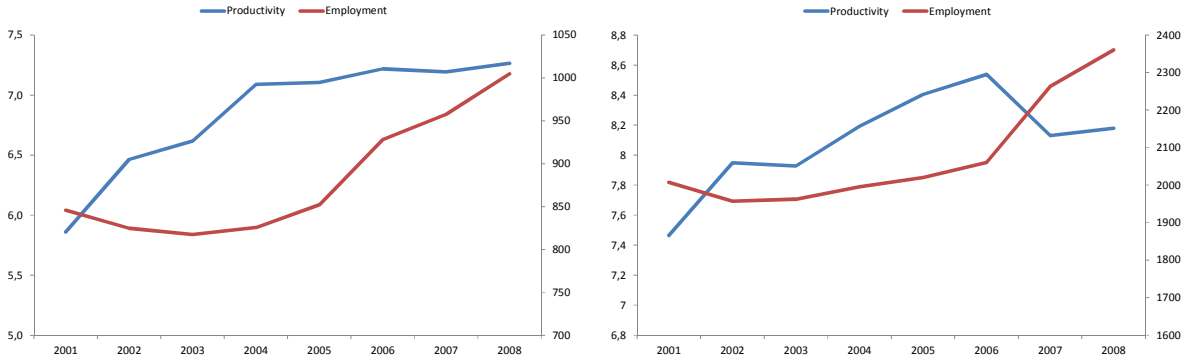
Source: Own calculations based on Eurostat data.

Figure 47. Labor productivity (in thousands euros per person – reference year 2000) and employment (in thousands) in real estate, renting and business activities 2001-2008 in (left) and financial intermediation (right) in Poland.



Source: Own calculations based on Eurostat data.

Figure 48. Labor productivity (in thousands euros per person – reference year 2000) and employment (in thousands) in 2001-2008 in transport, storage and communication (left) and wholesale and retail trade (right) in Poland.



Source: Own calculations based on Eurostat data.

Having described the productivity/employment trade-off and the sources of the structural transition, the next step is to look at the initial labor productivities of sectors (in 2000) and their impact on employment dynamics. In traditional development approach it is widely believed that the reallocation form less productive to more productive sectors improves efficiency and overall economic performance. From this point of view the expectations are that the initial high labor productivity corresponds to an increase in employment in a given sector.

In Poland during the 2001-2008 period the pattern of transition from less to more productive could be observed. On average employment in agriculture was decreasing by 2.9 per cent yearly and in fishing by 3.6 per cent. In 2001 the labor productivity of agriculture was about 29 per cent of average labor productivity for the whole economy, while the corresponding number for fishing was 36 per cent. This suggests that in case of agriculture and fishing the process of labor outflow was taking place due to low productivity.

Figure 49. Relation between sectors' labor productivity in 2001 and average labor productivity in 2001-2008.

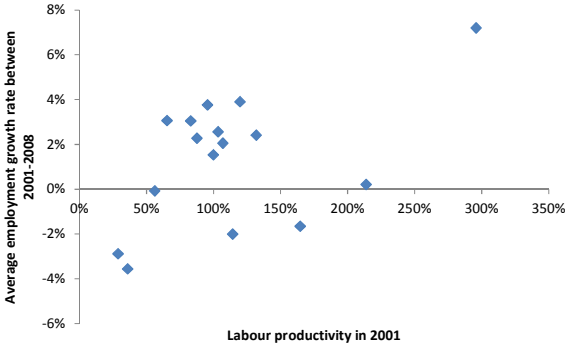
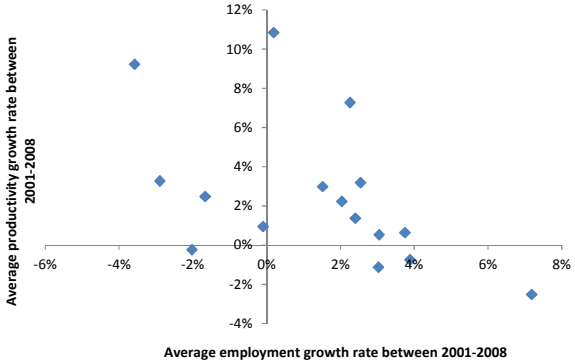


Figure 50. Relation between sectors' average labor productivity growth rate and average employment growth rate in 2001-2008.



Source: Own calculations based on Eurostat data.
Note: Labor productivity counted in relation to labor productivity for whole economy.

The highest labor productivity in 2001 was recorded by real estate, renting and business activities. With employment growth rate of 7.2 per cent it was the fastest growing sector in the economy. The chief contributor to this effect was the high initial productivity, almost three times higher than the average. When it comes to other branches of services the relation between productivity and

employment is not so clear cut. All other categories of market services (excluding business services) experienced an average yearly increase in employment of approximately 2.5 per cent, but the variation in the initial productivity was substantial and ranged from 65 per cent to 132 per cent of average labor productivity. Financial intermediation is different from the mentioned group, because high productivity did not translate into higher employment. The relation between initial productivity and employment growth in case of public services seems more complicated. Education with below average productivity (83 per cent of the average) had a yearly employment growth rate of 3.1 per cent, while public administration and defense 3.9 per cent and above average productivity. However, health and social work low productivity (0.6 per cent) induced low employment growth, minimally below zero. Mining and energy sector, perceived as a traditional segment of the economy, reduced employment between 2001 and 2008, despite higher than average productivity in 2001. Manufacturing and construction, when it comes to relation between initial labor productivity and employment growth, are somehow similar. Both at the beginning of the period had slightly lower than average labor productivity (construction 95 per cent, manufacturing 87 per cent) and then they experienced a moderate labor inflow, on average above 2 per cent yearly.

Figure 51. Labor productivity for chosen sectors productivity in 2001-2008.

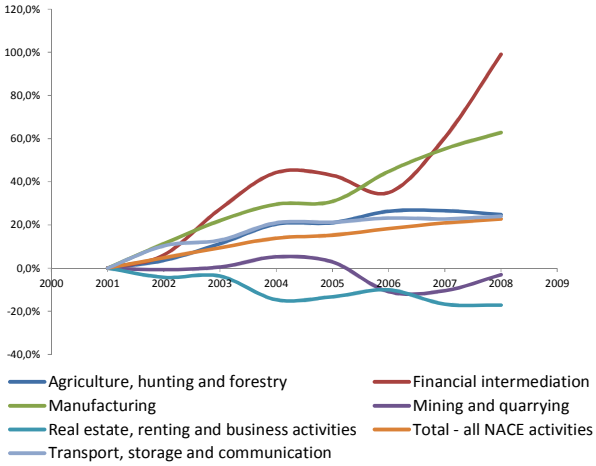
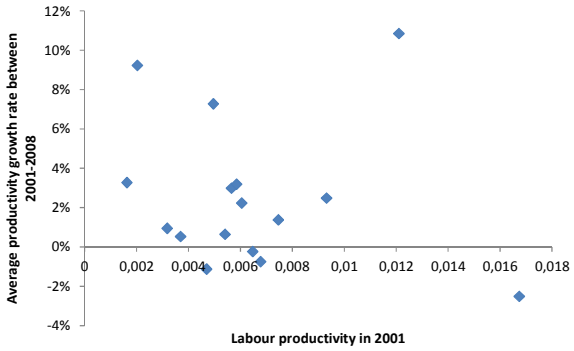


Figure 52. Relation between initial labor productivity and average labor productivity growth rates productivity in 2001-2008.



Source: Own calculations based on Eurostat data.

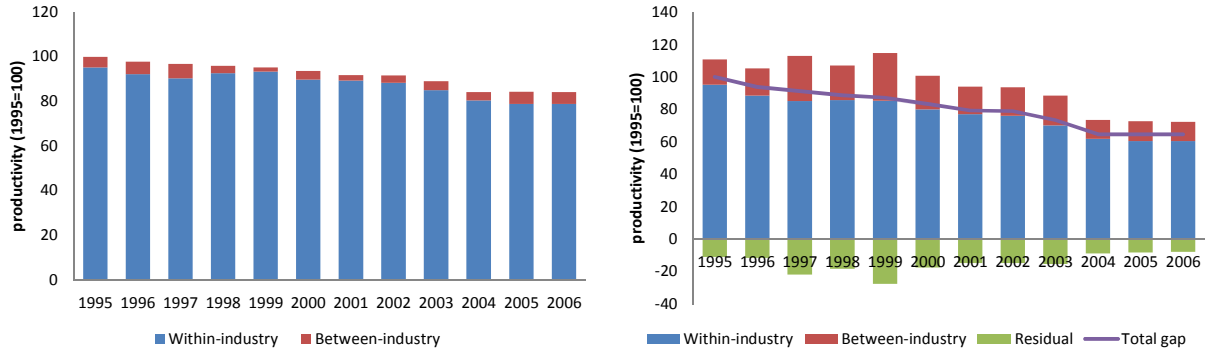
One issue is the level of initial labor and its impact on employment dynamics, but it also of interest the relation between productivity at the beginning and dynamics of productivity. Some different than average examples can be evoked, like in case of exceptionally high initial productivity in real estate, renting and business activities decreasing over time. Contrary to that, in financial intermediation, the productivity had started at high level and continued to increase further. Manufacturing with its below average productivity in 2001 was expanding rapidly, about 7.2 per cent yearly. For other sectors the impact of initial productivity on a productivity growth paths was similar to that of the whole economy.

To sum up, the relation between initial labor productivity and average employment growth indicate a broad pattern of a structural shift from a traditional to a more modern economy. However, when looking at average growth rates of labor productivity and employment the results seems to be mixed. In data there is no general relation between growth rates of labor productivity and employment in Poland. Despite this it is possible to distinguish some groups based on similarities of growth paths of

employment and labor productivity. The results from the comparison between average productivity and employment growth rates are similar to that of value added decomposition and indicates that labor flow from traditional to modern sectors. The increase in labor productivity in traditional sectors was associated with employment reduction. Services experienced an inflow of labor simultaneously with a negative productivity growth rate during the 2001-2008 period. On the other hand, manufacturing and construction both increased productivity and employment.

Knowing that reallocation of labor to more efficient sectors is taking place and at the same time specific sectors improve their productivity through (technological, organisational etc.) innovations, the important question is how much of overall productivity can attributed to particular of these causes. Using methodology of Caselli and Tenreyro (2005), it is possible to decompose differences in overall productivity into within-industry and between-industry productivity gaps. It is shown that the differences in the within-industry productivity are responsible for 90 per cent of the Polish gap and the difference in between-industry productivity accounts for less than 19 per cent.[7] Accordingly, one can argue that the convergence of labor productivity between the NMS and the EU15 should rely more on productivity growth within sectors rather than on the reallocation of inputs between them. Interestingly, whereas in 1996-2000 the differences in the overall pace of convergence in NMS8 were determined by both the reallocation of labor (Lithuania, Latvia, Estonia and Slovenia) and the reduction of gap in individual sectors, in 2001-2006 it was decided only by the latter. Moreover, the convergence of productivity in individual sectors accelerated and was accompanied by an increase in the structural gap. The acceleration in the convergence of sectors in Poland (and other NMS) depended mostly on the gap reduction in agriculture, chemical and petrochemical industry, electrical engineering, trade, financial services and educational services.

Figure 53. Two- and three-component decomposition of differences in labor productivity between Poland and France (total gap in 1995 = 100).

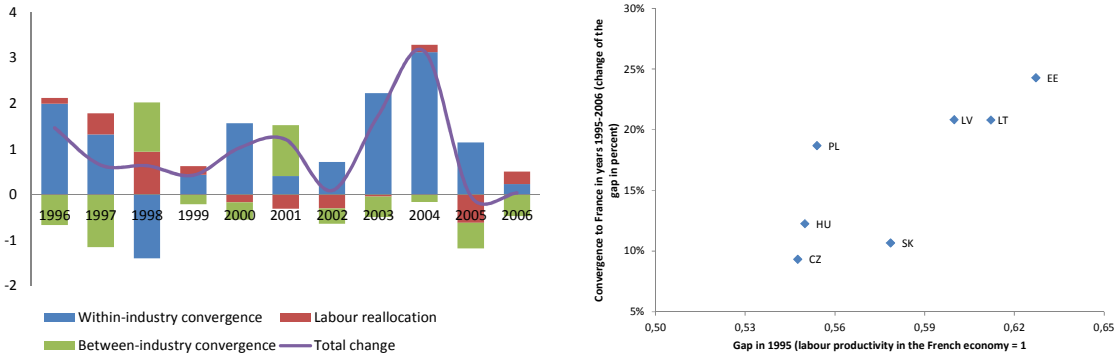


Source: Own calculations based on EU-Klems data.

[7] 100 percent of the gap is obtained by using a residual, 'covariance' in the paper of Caselli and Tenreyro (2005). In Poland, similarly to other "eastern" member states, it assumes a negative value, which may mean that an average productivity gap in sectors with a higher (than in France) share in employment structure is greater than the gap in sectors with a lower (than in France) share in employment.

Decomposition of labor productivity of Polish economy convergence to France[8] reinforces this conclusion. The gap in labor productivity of individual sections decreased almost every year, and the reallocation of labor, except initially, did not contribute significantly to convergence, and in some years even deepened the underdevelopment. In addition, a between-industry divergence could be noticed. In the entire period 1995-2006 (before the economic crisis of 2008-2009), the convergence of productivity in Poland was faster than in the NMS8 in general. After the exclusion of Slovenia, the least underdeveloped at the beginning, with an atypical economic structure and the fastest pace of convergence, one can observe a positive correlation between the initial distance to France and the relative rate of its reduction. Poland had a higher pace of convergence in comparison with the slightly more developed (in 1995) Czech Republic and Hungary, and a much smaller initial gap than the slightly faster converging economies of Lithuania and Latvia.

Figure 54. Convergence of the labor productivity in Poland in relation to France, measured in percentage points (left, French labor productivity in 1995 = 100) and the rate of NMS convergence in relation to the gap in 1995 (right).



Source: Own calculations based on EU-Klems data.
Note: The right panel does not include Slovenia, for the sake of clarity.

1.3 Summary

This section presented the general characteristics of Polish labor market in the transition and post-transition period and analyzed the changes in the sectoral structure of economy. The evolution of the labor market since the early nineties can be divided into four phases: (i) the transition to a market economy and adaption to new system (1990-1998), (ii) economic slowdown caused by exports breakdown due to the Russian crisis (1998-2004), (iii) a boom that coincided with the EU accession (2004-2008) and (iv) stagnation associated with the global financial crisis (2008-2011). In the first phase the reallocation of the labor from a public to private sector affected negatively conditions on the labor market, but after 1994 it rebounded. This period ended in 1999 when the labor market situation began to deteriorate. Between 1998 and 2004 the unemployment (with increasing share of long-term unemployed) reached the highest level in the history of contemporary Poland. At that time an expansion of temporary jobs can be observed as a response by employers to economic uncertainty. After 2004 the labor market conditions improved substantially, the employment went up and in 2008 unemployment rate fell to its lowest level. Still, the employment rate stayed relatively

[8] France is used as a point of reference because its labor productivity has remained close to EU average over long periods of time. With follow Caselli and Tenreyro (2005) in this regard.

low in comparison to other EU countries. During the financial crises (2008-2011) the quantitative adjustment on the labor market were minor, mainly in males' employment. The observation that employment changes were caused by the changes of the males' employment rate applies not only to the last few years, but it spans over the whole analyzed period.

Poland has one of the most traditional sectoral structure with a high number of employed in agriculture. Despite the modernization of the economy (in terms of the sectoral changes) was taking place the main source of convergence to developed countries were productivity improvements within sectors. The sectoral convergence is clear, but at the same time relatively slow. One of the reasons for this are structural problems in agriculture. The sector, dominated by small familial farms, is inefficient and blocks substantial human resources that could be utilized in more productive way. On the other hand, the sectors which expanded were those associated with modern services.

2 Poverty, living standards, and wage structures developments in Poland

2.1 Changes in poverty and living conditions

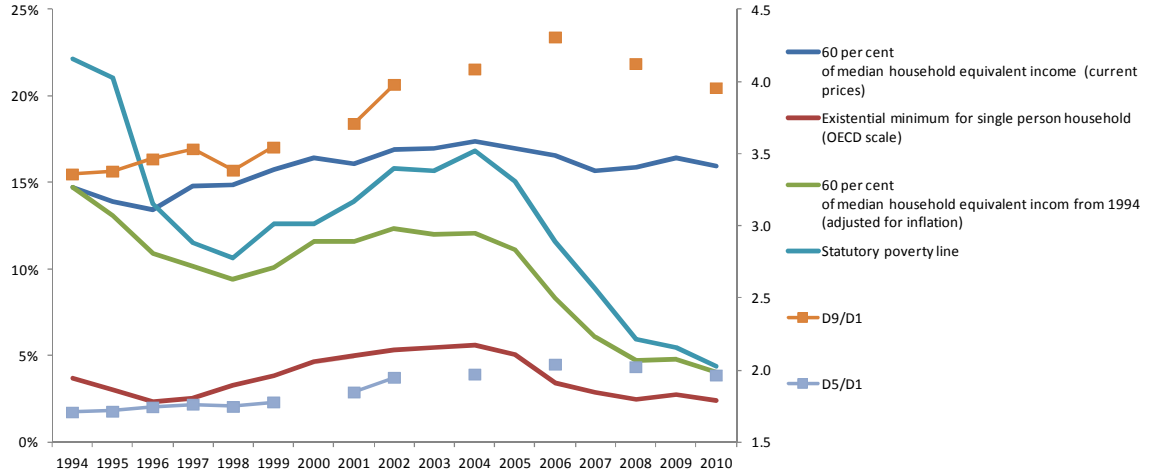
2.1.1 Poverty in Poland – a statistical picture

To study changes in poverty and living conditions, we are using four types of poverty lines:

- 60 per cent of median household equivalent income – which is a standard Eurostat measure of relative poverty;
- Subsistence minimum for single person household – the absolute poverty line calculated each year by Polish institute IPiSS, but only for selected types of households. We used IPiSS' poverty line for one-person household and calculated the lines for all other household types using OECD equivalence scale;
- 60 per cent of median household equivalent income in 1994 adjusted for inflation – the quasi-absolute poverty line, calculated by IBS team by taking a 60 per cent of median household equivalent income in 1994 and adjusting it for inflation till 2010;
- Statutory poverty line – the government announced poverty line which is used a point of reference for various social transfers, but is not based on any strict methodology.

In the 1994-2010 period, the risk of poverty in Poland has been roughly procyclical and peaked between 2002 and 2004, depending on the measure. The risk of relative stood between 14 and 17 per cent over the studied period and it was much less volatile than the poverty risk according to the absolute measures. Moreover, in absolute terms, the poverty risk declined substantially over this period, as shown of Figure 55. It is worth noting that not only according to the relative measure, but also according to all absolute measures, the risk of poverty was increasing between late 1990s and early 2000s (between 1997/1998 and 2002/2004, depending on the measure), declining thereafter (along with improving macroeconomic situation), also during the global crisis of 2008-2010.

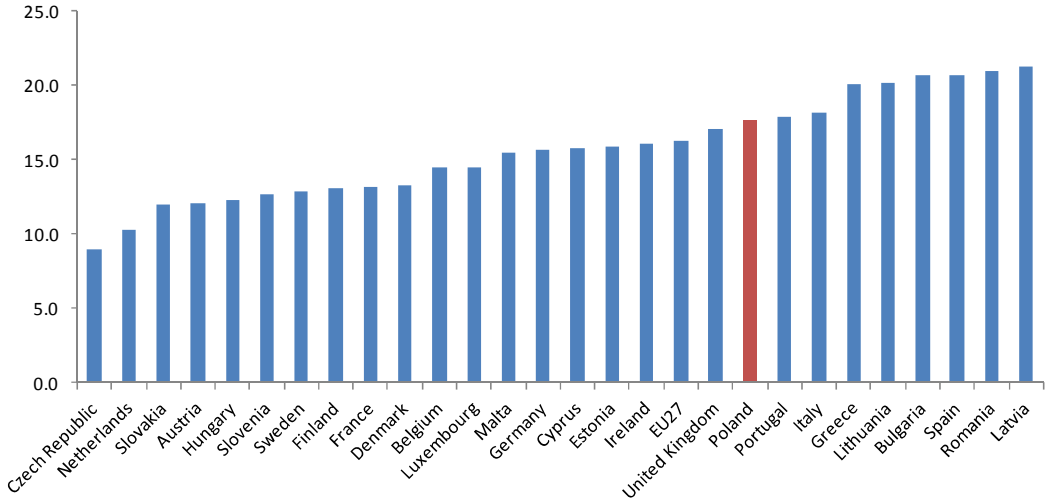
Figure 55. The percentage of population living in poverty according to various measures (left axis) and earnings dispersion in the same period (right axis) in Poland in 1993-2010.



Source: Own calculations on the basis of Households' Budget Survey and Structure of Earning Survey data.

The risk of poverty and dispersion of earnings in Poland have been positively correlated since the transition began. Dispersion of earnings (measured by D9/D1 relation and Gini coefficient) increased by half between 1994 and 2006 and has been declining since then. The increase in Gini coefficient is attributed mostly to increasing dispersions of earnings below median wage – the correlation coefficient of D9/D1 and D5/D1 ratios in the 1994-2010 period is 99 per cent, the D9/D5 ratio has been very stable and close to 2 over this period.[9] In the mentioned period, the growth of real wages was higher for better educated groups, which translated into increasing discrepancies between average wages earned by particular educational groups and wage premium for every next education level attained (especially higher education) being larger in Poland than in the EU on average. As it were women who participated mostly in the educational boom in Poland, their average wages have grown faster than those of men. Studies have also shown that there exists a positive wage premium for workers with higher education in the private sector, but less educated individuals receive relatively higher wages in the public sector. The evolution of earnings and wage inequalities is studied in more detail in the second section of this chapter.

Figure 56. The risk of relative poverty in the EU in 2010.



Source: Eurostat.

Regardless of the poverty measure, large differences within the EU can be observed. In 2010, Poland was 9th in the EU in terms of risk of (relative) poverty, as it affected 17.7 per cent of population. The risk of poverty in Poland in 2010 was similar among men and women, was slightly higher among people aged under 24 than in older age groups. It was also more steeply rising with a number of children in household than in it was in the EU overall. As the result of these, the poverty risk among children is exceptionally high in Poland (according to the Eurostat data, the risk of relative poverty among children in Poland is highest in the entire EU) and higher than among e.g. people aged over 65 regardless of the measure. Risk of poverty in Poland has been strongly negatively related to education level and intensive labor supply of the household (total hours worked by household members within a given period). Nearly half of unemployed and over 1/3 of other non-working individuals have been at the risk of poverty. The poverty rates are highest in rural areas and towns with up to 20 thousand inhabitants and more widespread in northern and eastern regions of Poland.

[9] The D9/D1 ratio coefficient of variation between 1994 and 2010 was 9 per cent, of which 7 pp. can be attributed to the variation of D5/D1 ratio, and 2 pp. to the variation of D9/D5 ratio.

Figure 57. The poverty rate in 2010 by age groups.[10]

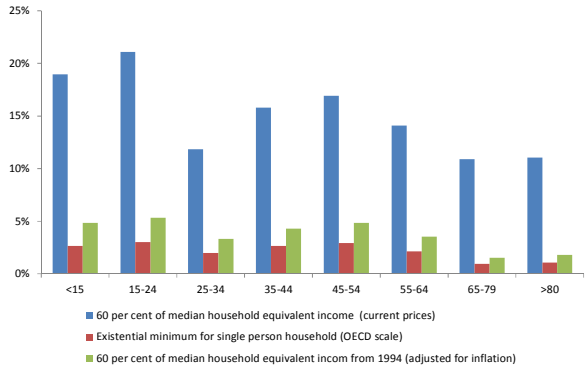
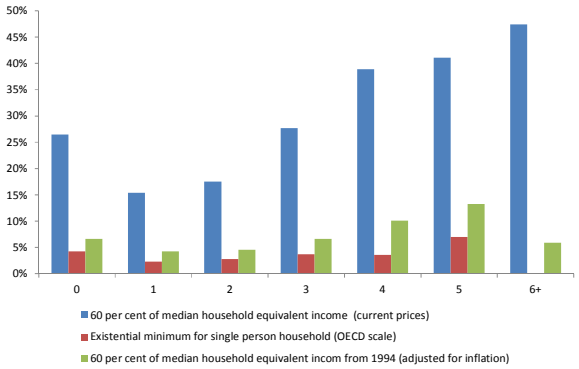


Figure 58. The poverty rate in 2010 by a number of children in a household.



Source: Own calculations on the basis of Households' Budget Survey data.

Figure 59. The poverty rate in 2010 by education.

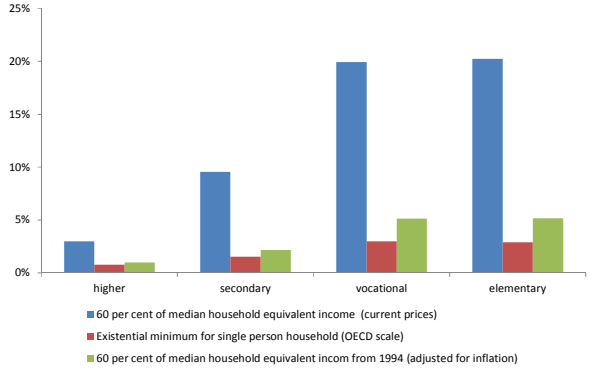
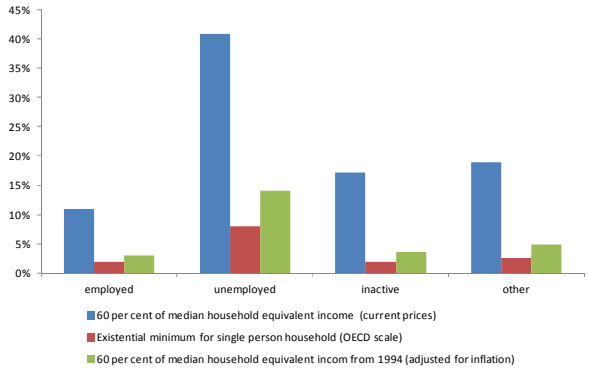


Figure 60. The poverty rate in 2010 by economic activity.

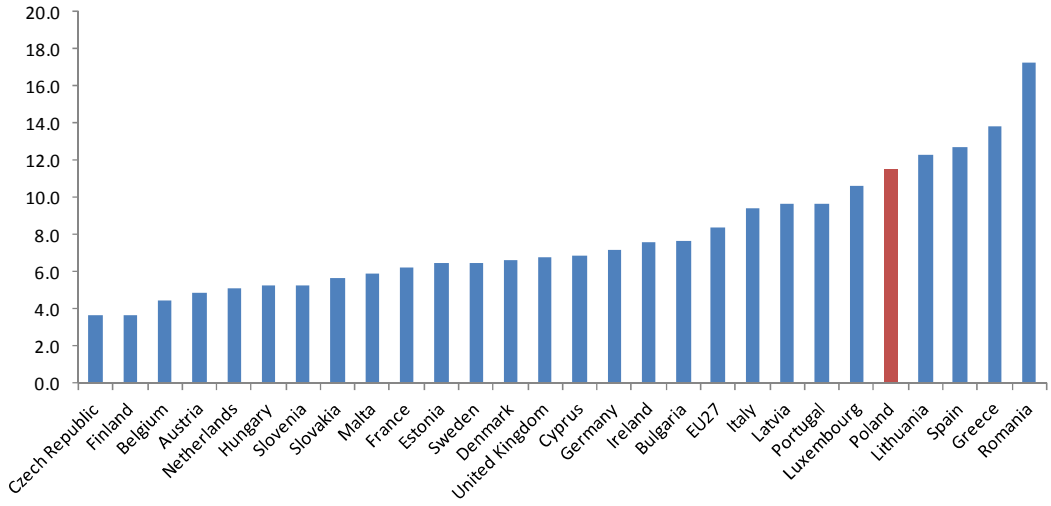


Source: Own calculations on the basis of Households' Budget Survey data.

Poverty, which has traditionally been perceived as a phenomenon related to lack of employment, has gradually started affecting workers to a larger extent. In terms of in-work poverty Poland has ranked fifth among the EU countries in 2010. As a result of a high figure of working poor, a proportion of employed in a total number of individuals at the risk of poverty was higher than in the EU on average. In comparison to the other European countries, the risk of poverty in Poland affects workers relatively more often than those unemployed or inactive. This is however to significant extent due to the specific nature of Polish agriculture – the majority of farms are small farms which market just a fraction of their production and their incomes are likely to be underestimated in the EU-SILC survey. Therefore, to study trends in poverty and in-work poverty in Poland, we use Polish Households' Budget Survey, which takes into account this factor and presents more adequate picture. This data show, that in-work poverty differs substantially between agriculture and the rest of economy.

[10] This and all other graphs in this chapter relate to Poland, unless it's stated otherwise.

Figure 61. The risk of in-work poverty in the EU27 in 2010.



Source: Eurostat.

Trends concerning in-work poverty are similar to these pertaining to general poverty. Until 2003 the percentage of working poor was slowly increasing, then in 2004 it began to fall, and this decline continued even during the recent crisis. The decrease has amounted to about 2 percentage points in case of relative poverty and was much higher for the absolute measures.

The risk of in-work poverty can be associated with specific household/worker characteristics[11]. For example, the risk of poverty has been more or less two times higher among households with main source of income other than employment, in comparison to households with employment being the main source of income. The Eurostat data shows the incidence of working-poor is much higher among self-employed than among other workers. This is however affected by most of farmers being classified as self-employed in the EU-SILC data and Eurostat statistics. As we show below, self-employed outside agriculture are at relatively low risk of poverty. It can be also seen that temporary employees face higher risk of poverty (regardless of the measure) than permanent employees, although that risk is much lower than among farmers.

Risk of in-work poverty is slightly higher for women than men, however the difference seems to be small and insignificant. Moreover, the most affected by this type of poverty are persons in 15-24 and "above 80" age groups. There is a natural explanation for this phenomenon. Youth, entering the labor market or having little experience, receive low wages, while in case of the old it can be presumed that only those who are living in the poverty are forced to work, especially that most of these "elderly working poor" are in agriculture. In their case work on a farm is subsistence activity. However, abstracting from these two groups, the incidence of working-poor in age group from 45 to 54 is quite high. Depending on the measure[12], the risk of in-work poverty for 45-54 group is even higher than for two previously mentioned groups.

[11] The methodological problem with working poor is that poverty relates to households, but work to individuals.

[12] For example, taking as a measure 60 per cent of median household equivalent income.

Figure 62. The in-work poverty between 1997 and 2001.

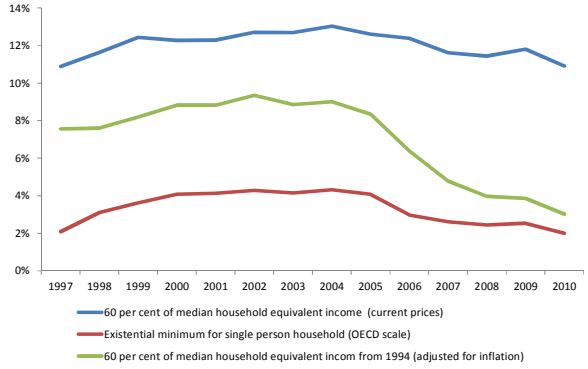
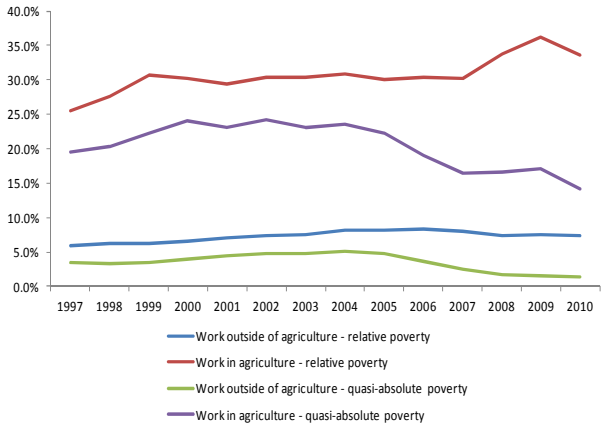


Figure 63. The in-work poverty rate in and outside agriculture between 1996 and 2010.



Source: Own calculations on the basis of Households' Budget Survey data.

Figure 64. The in-work poverty rate in 2010 by age.

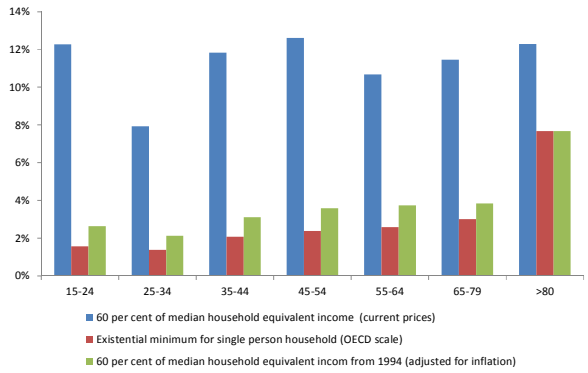


Figure 65. The in-work poverty rate in 2010 by education.

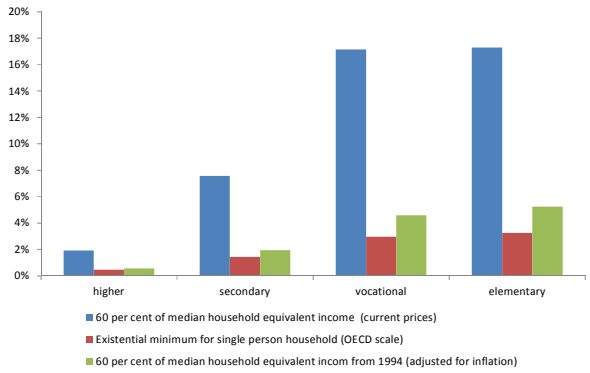


Figure 66. The in-work poverty rate in 2010 by type of contract.

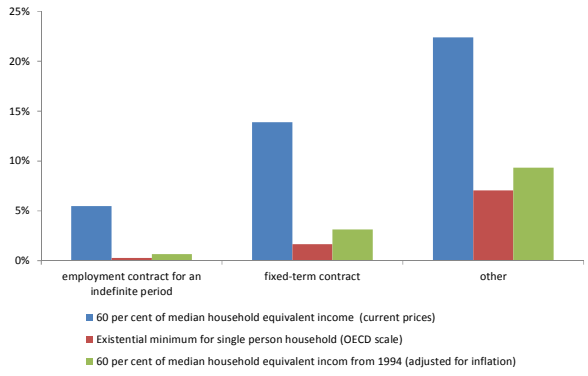
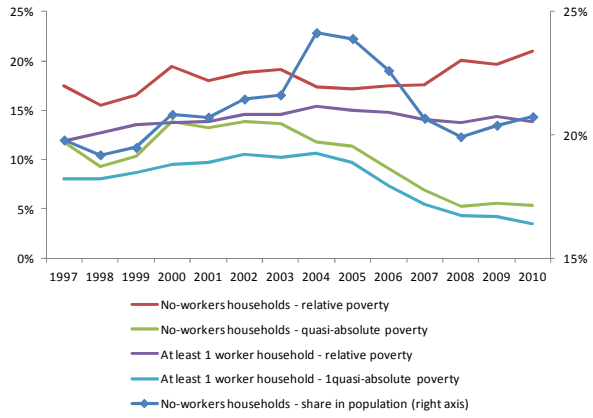


Figure 67. Poverty rate among individuals living in no-worker and at-least-one-worker households between 1996 and 2010.



Source: Own calculations on the basis of Households' Budget Survey data.

Another important characteristic that is associated with in-work poverty is education. The higher the level of attained education the lower the risk of being working poor. The difference between primary and higher education can be substantial. A person that graduated only from elementary school have a few times higher risk of in-work poverty than someone with a university degree. Poland stands out among the EU countries, because of above average in-work poverty among least educated and very

low among those with higher education. This can be explained by substantial wage differences between workers with different educational backgrounds.

The low level of education is correlated with a high number of dependent children in a household. In Poland along with increasing number of children the risk of in-work poverty is also going up. The family with only one child has three times lower in-work poverty than a household with three children. In comparison to the EU the risk of in-work poverty is relatively higher for families with children than for single-person households. Moreover, although in-work poverty has been a noticeable phenomenon in post-transformation Poland, Figure 67 shows that the risk of poverty in household with no workers was much higher than the poverty rate among individuals living in households with at least one worker, and this difference has been increasing since 2004, when the labor market rebounded after the early 2000s recession. On the other hand, the share of individuals living in households with no workers has been strongly pro-cyclical, amplifying the differences in poverty rates of both groups.

2.1.2 Decomposition of poverty risk changes in Poland

In this section we present decompositions of poverty risk changes in Poland, to show (regardless of the measure) contributions over time of changes of poverty risks of particular groups and changes in a share of the group in the studied population. The latter relates to the structural change. When people move from a group with high poverty rate to the one with lower poverty risk, the overall poverty falls, analogously the movement from a group with low risk of poverty to a high risk group induces a poverty increase. On the other hand, the changes in risk by groups may drive the changes in total poverty risks. The aim of these decompositions is to quantify these effects for overall poverty and in-work poverty. The populations of interest are total population in Poland, total population aged over 15 and working population. The decompositions are conducted for the 1997-2010 period (for which fully comparable data is available) and for 1997-2003 and 2003-2010 subperiod, to outline the importance of particular factors for the increase in poverty rates in the former subperiod and their decline in the latter.

Figure 68. Decomposition of changes in poverty rates for total population in 1997-2010 by labor market status.

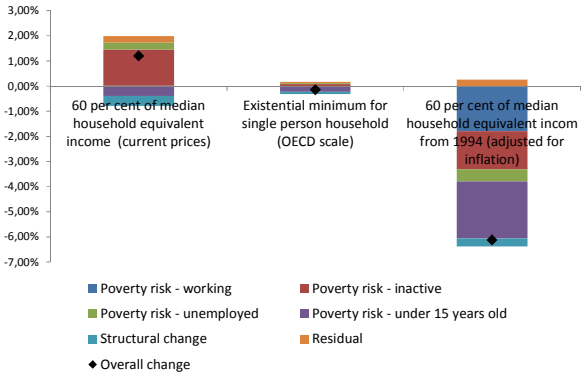
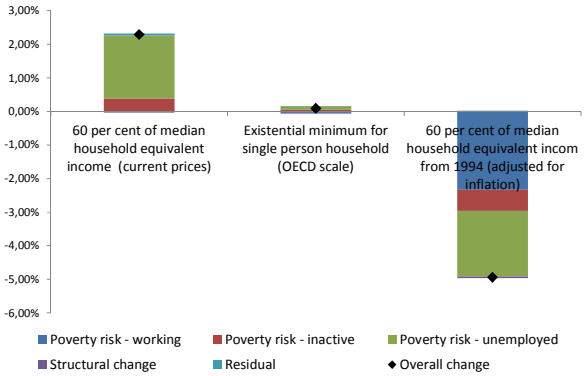


Figure 69. Decomposition of changes in poverty rates for population aged 15+ in 1997-2010 by labor market status.



Source: Own calculations on the basis of Households' Budget Survey data.

Box 3. Decomposition of poverty risk changes.

The change of poverty risk for the given population *p* (PR_p) between the given moment (*K)* and the reference moment (*O*) can be decomposed into structural change (*SC*) i.e. the change of particular groups' share in the population and poverty rate changes within the groups (PRC_i). The residual (*R*) have to be added to ensure equality.

$$PR_{Kp} - PR_{Op} = SC_p + \sum_i PRC_{pi} + R$$

$$SC_p = \sum_i PR_{Opi}(\alpha_{Kpi} - \alpha_{Opi})$$

$$PRC_{pi} = \alpha_{Opi}(PR_{Kpi} - PR_{Opi})$$

$$R = \sum_i (PR_{Kpo} - PR_{Opi})(\alpha_{Kpi} - \alpha_{Opi})$$

where:
i – group index - groups are mutually exclusive and sum to population
α_{pi} – share of *i*-th group in the population *p*
PR_{pi} – poverty risk of *i*-th group

Calculations were based on annual data for the period 1997-2010, from the Household Budget Surveys.

Between 1997 and 2010 the relative poverty (60 per cent of median equivalent household income) rose by 2.3 percentage points, at the same time, according to absolute measures, poverty declined (in case of quasi-absolute measure, by 5 percentage points). The crucial role in the overall change of poverty was played by a change in poverty risks of particular groups, structural shifts were less important. For the relative measure, the change was driven by the change in poverty risk of inactive aged 15+, and in case of absolute rates, decrease of in-work poverty as also quantitatively important. It is also worth noting, that the contribution of changes in absolute poverty rates of under 15-year-olds was even higher than these of workers. This underlines the importance of child poverty for the general poverty changes in Poland. The contribution of structural changes, understood as an impact of change in structure of population with respect to these groups, was rather insignificant when 1997 and 2010 are compared.

Figure 70. Decomposition of changes in poverty rates for total population in 1997-2003 by labor market status.

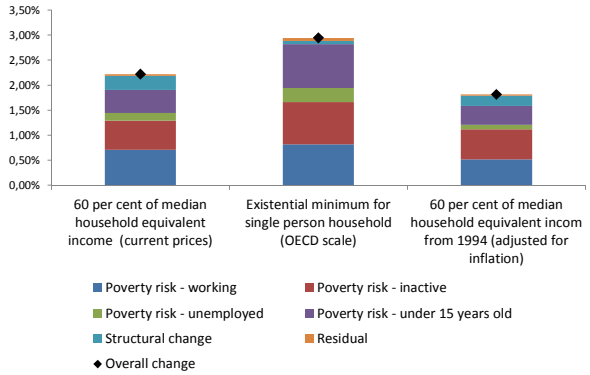
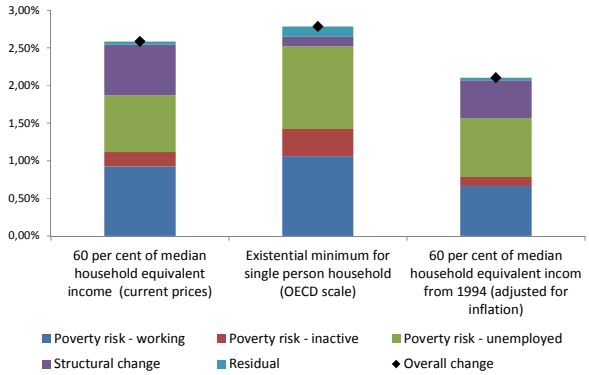


Figure 71. Decomposition of changes in poverty rates for population aged 15+ in 1997-2003 by labor market status.



Source: Own calculations on the basis of Households' Budget Survey data.

Figure 72. Decomposition of changes in poverty rates for total population in 2003-2010 by labor market status.

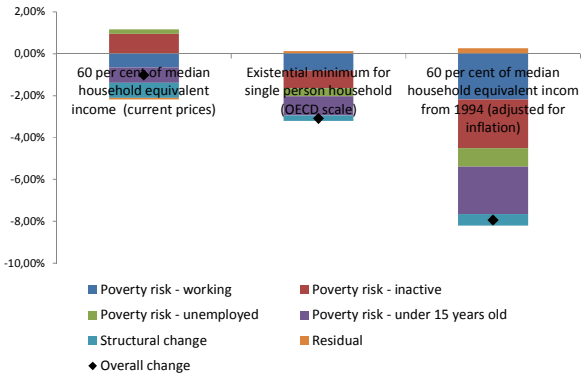
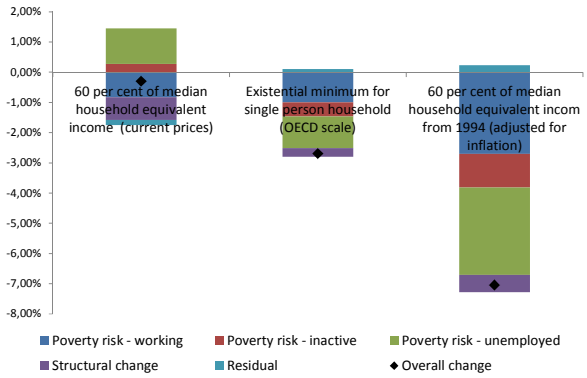


Figure 73. Decomposition of changes in poverty rates for population aged 15+ in 2003-2010 by labor market status.



Source: Own calculations on the basis of Households' Budget Survey data.

As mentioned, two subperiods can be distinguished, first form 1997 to 2003 and second from 2003 to 2010. Between 1997 and 2003, for all poverty measures, changes in poverty risks among inactive and workers were jointly responsible for about 70 per cent of the total change. Structural changes had in this period a minimal impact on poverty dynamics. In the 2003-2010 period, poverty generally declined. However, the composition and magnitude of those movements depended on the applied measure. A significant absolute poverty decline could be observed, by about 7 percentage points for quasi-absolute measure. At the same time, the relative poverty rate barely changed. Still, as it was in previous period, changes in poverty risks within groups, especially among inactive and employed (and children) were the most important factors behind the overall change. Interestingly, for the absolute and quasi-absolute measures this were declines of poverty risks for all groups, but in case of relative measure – declines of in-work and child poverty were accompanied by increases of unemployed and inactive (aged 15+) risks. Moreover, for the relative measure, considerable input came from the structural factor (in the form of decreasing share of inactive and unemployed and increasing share of working population), it amounted to about 30 per cent of the total change. For comparison this value for absolute measures oscillated around 10 per cent.

Structural changes were also more important for the dynamics of in-work poverty. The decomposition along the division of the working population on employed in and outside the agriculture shows that the reduction in a number of workers in agriculture and an increase in the employment in non-agricultural sectors contributed significantly to the overall in-work poverty reduction over 1997-2010 period. It happened because a person working in agriculture has much higher risk of poverty than individual with a non-agricultural job. Between 1997 and 2010 the impact of the structural factor was comparable across different measures. However, in case of the relative measure, the changes in poverty probabilities and in the structure were working in opposite directions: the structural factor contributed negatively, increases of poverty risks contributed positively. As a result the relative poverty stayed unchanged. For absolute measures, the situation was different, because both components (structural and poverty risks) were lowering the poverty incidence over the entire period. It is worth noting, that structural changes (shift out of agriculture) has quantitatively bigger impact than decreases in poverty risks for both groups of workers.

Figure 74. Decomposition of changes in in-work poverty rates for population aged 15+ in 1997-2010 by sector.

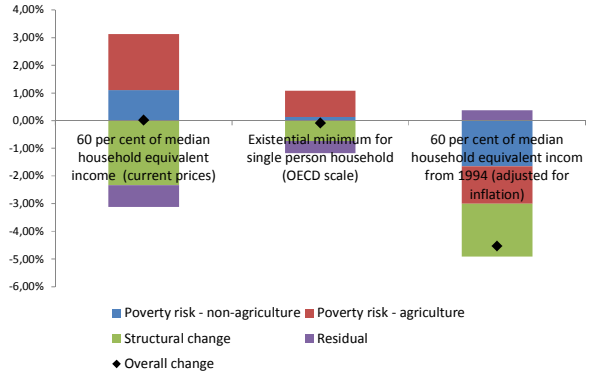
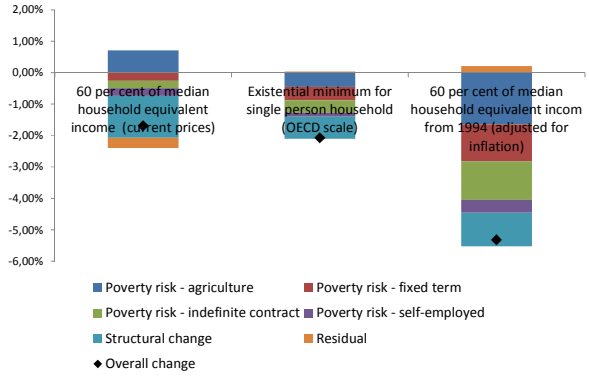


Figure 75. Decomposition of changes in in-work poverty rates for population aged 15+ in 2005-2010 by sector and type of job contract.



Source: Own calculations on the basis of Households' Budget Survey data.

From 1997 to 2003 the risk of poverty among workers increased by about 1-2 percentage points (independent of a measure). This change was almost totally caused by increases in poverty risks for employed in agriculture and in non-agricultural sectors (their contribution was comparable), only partly compensated by structural factor. Between 2003 and 2010, the relative poverty decreased by 2 percentage points, almost exclusively due to a structural shift. The percentage of employed living in absolute poverty by 2 percentage points. Moreover, the change of poverty risks within groups and the evolution of the share of a given group in population had an effect of comparable magnitude. The quasi-absolute in-work poverty measure declined during 2003-2010 by 5.8 percentage points, and the main factor behind it was a decrease in poverty risks for employed in and outside agriculture, although the structural factor was nearly as important (and dominant in case of relative poverty).

Figure 76. Decomposition of changes in in-work poverty rates for population aged 15+ in 1997-2003 by sector.

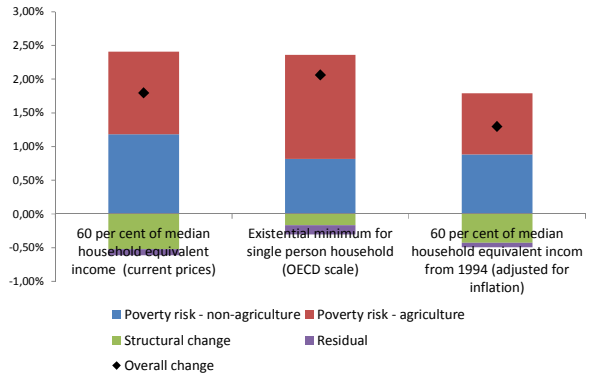
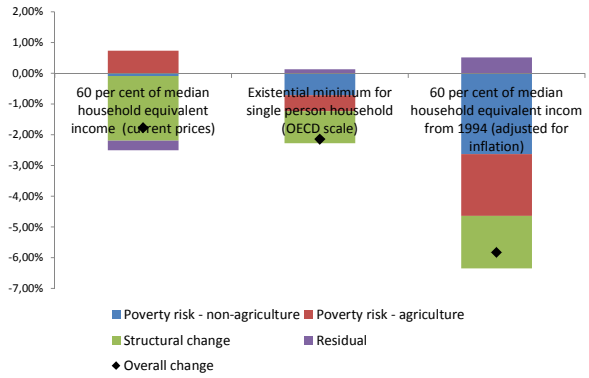


Figure 77. Decomposition of changes in in-work poverty rates for population aged 15+ in 2003-2010 by sector.



Source: Own calculations on the basis of Households' Budget Survey data.

The data enables also to distinguish non-agricultural workers by the type of a labor contract, but only in 2005-2010 period. The category concerning self-employed is also included. The additional information that comes from this more detailed decomposition shows that the poverty risk changes concerning employed in non-agricultural sectors are driven mostly by changes in poverty risks among fixed-term workers and those with contracts for indefinite time. Both elements had quantitatively similar input to the in-work poverty changes. The impact of the poverty risk changes among self-

employed on the in-work poverty was limited. Interestingly, the structural factor was again negative, because of dominant impact of shift out of agriculture.

2.2 Analysis of earnings on the basis of Structure of Earnings Survey data

2.2.1 Evolution of wages in Poland

In the long run, labor compensation should follow labor productivity. The latter is empirically often measured with GDP per worker and indeed, the labor share in total output seems quite stable in developed economies. However, in the short run, due to cyclical fluctuations and difficulties with disentangling "real" labor productivity changes (i.e. improving technology, efficiency etc.) from "spurious" ones (resulting from layoffs or conversely, from labor hoarding), both indicators can diverge substantially. In the 2000-2010 period labor compensation per employee in Poland was growing slower than the GDP per worker. This was mainly due to the fact that between 2001 and 2004, despite the growth of the GDP per worker, labor compensation per worker stayed at the same level. In the next years the dynamics of both indicators were similar. Moreover, during the 2001-2010 there was strong persistence of the gap between labor compensation per worker and the GDP per worker. In 2007 the move toward closing the gap could be noted, but with the beginning of the global financial crisis the compensation per employee growth rate fell and that process was halted. Among other countries in the region, Poland distinguished itself negatively in terms of a relation between average wage and the GDP per worker growth rates. Between 2000 and 2010 the average growth rate of the GDP per worker was about 1.4 percentage point higher than the average growth rate of labor compensation.

Figure 78. Average real GDP growth per worker in comparison to average real growth of labor compensation per worker between 2000 and 2010.

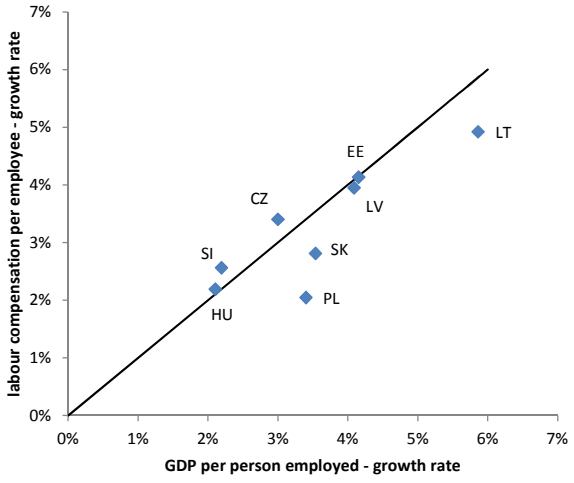
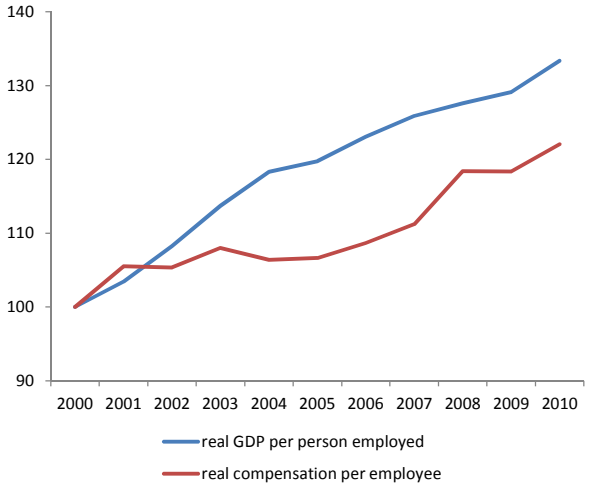


Figure 79. Real GDP growth per worker in comparison to the real growth of labor compensation per employee between 2000 and 2010.



Source: Own calculations based on Eurostat data.

The economic stagnation and an employment decline associated with it contributed to a decrease in the labor income share of the GDP between 2001 and 2006. Despite the fact that the economy rebounded in 2004, the labor income share was staying at the low level until 2006. On the other hand, in the NMS7[13] countries during the whole period of 2000-2006 the share of labor

[13] NMS7 – Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovakia, Slovenia.

compensation was rather flat. After 2006 the labor income share substantially rose and then shrank. In particular, it concerned the NMS7, where during the economic boom of 2005-2008 the labor income share significantly increased and then since 2009 it sharply dropped. Nevertheless, in Poland after 2006 the phases of the labor share increases and declines were milder than in the NMS7.

Figure 80. Labor income share in Poland and NMS7 between 2000 and 2011.

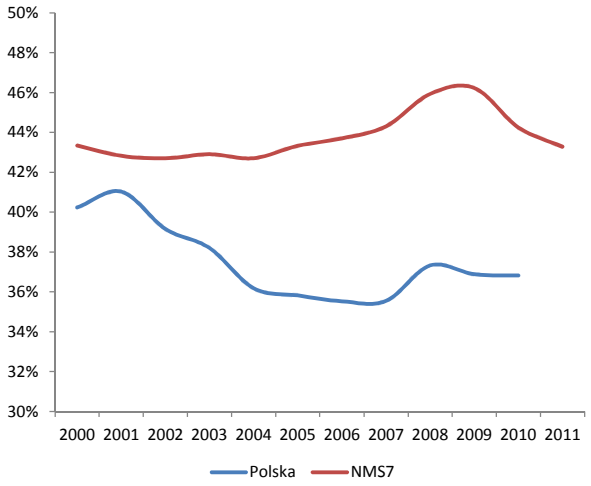
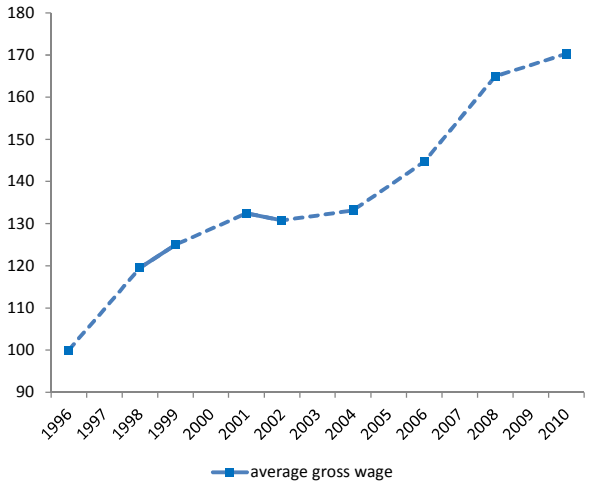


Figure 81. Changes in the average real gross wage (1996 = 100).



Source: Own calculations based on Eurostat and Structure of Earnings Survey data.

Earnings are of course related to the characteristics of employers and employees. Below we analyze how wages and their growth in Poland differed according to the division of workers by sex, age, education, occupation, sector, etc. We also study wage distributions.

Figure 82. Changes in the average real gross wage by gender (1996 = 100).

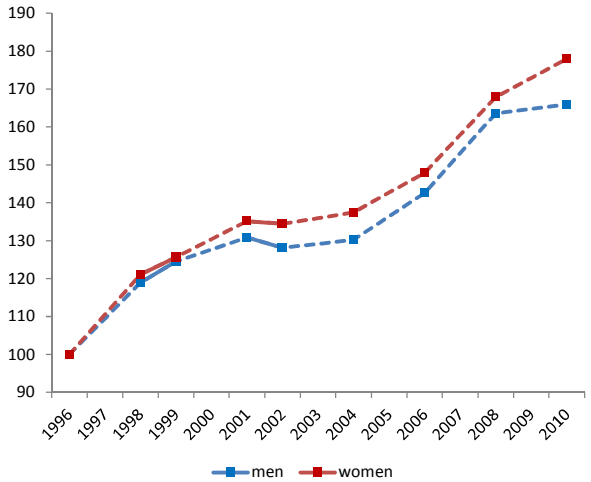
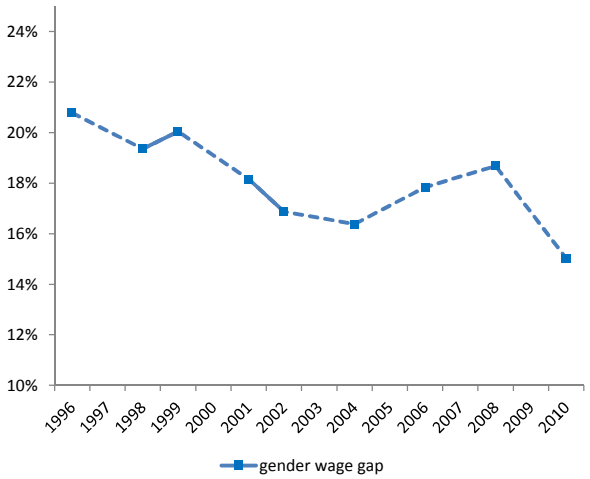


Figure 83. The gender wage gap between 1996 and 2010.



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

In 1996 females on the average earned about 20 per cent less than males in Poland. In 2010 it was already 15 per cent.[14] During the whole period between 1996 and 2004 women's wages rose yearly more (or dropped less) than men's. From 2004 to 2008, when the economy was booming, males'

[14] The values represent unconditional averages, without taking into account educational differences, different types of occupation, etc.

wages were increasing relatively faster, but the difference between growth rates for men and women was small until 2008. However, between 2008 and 2010 females' wages increased by 14 per cent, but males' wages only by 6 per cent. It can be explained by the specificity of the crises that hit mainly male-dominated sectors, in particular construction. It should be emphasized that the cumulative growth of wages in reference to 1996 was over the entire period higher for females than for males. One of the reasons behind this wage gap reduction was the improvement in a females' educational structure.

The second attribute that is important from the point of view of the analysis of earnings is age. In short, the relation between age and average earnings can be summarized by stating that the older a worker was, the more he or she on average earned. With regard to the reference group of 35-54 year-olds, the biggest difference wages was exhibited by workers aged below 25. In 2010 their wages were almost 40 per cent lower than in 35-54 age group. For the age groups between 25 and 64 years old (25-34, 35-54, 55-64) differences were substantially smaller, reaching maximum 15 per cent (between groups 25-34 and 55-64). Persons above 65 received substantially higher remuneration, in 2010 almost 50 per cent above the average for all workers. After reaching the retirement age, only those who have the highest wages decided to continue to work, hence such differences.

Figure 84. The average real gross wage by age (in 1996 prices).

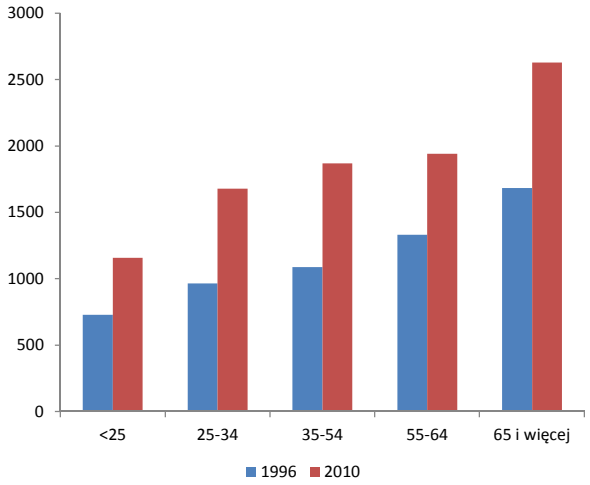
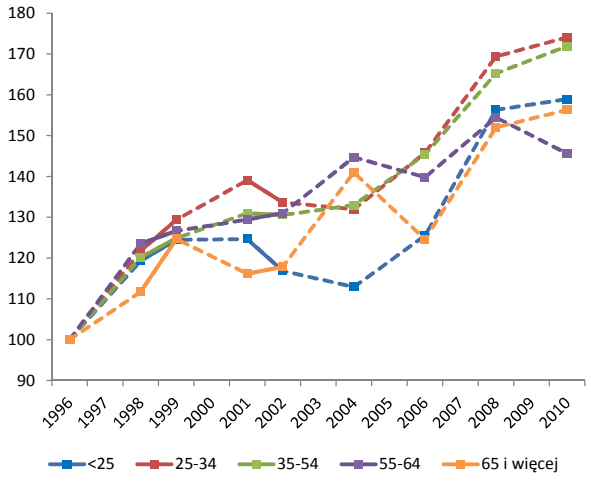


Figure 85. Changes in the average real gross wage by age (1996 = 100).



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

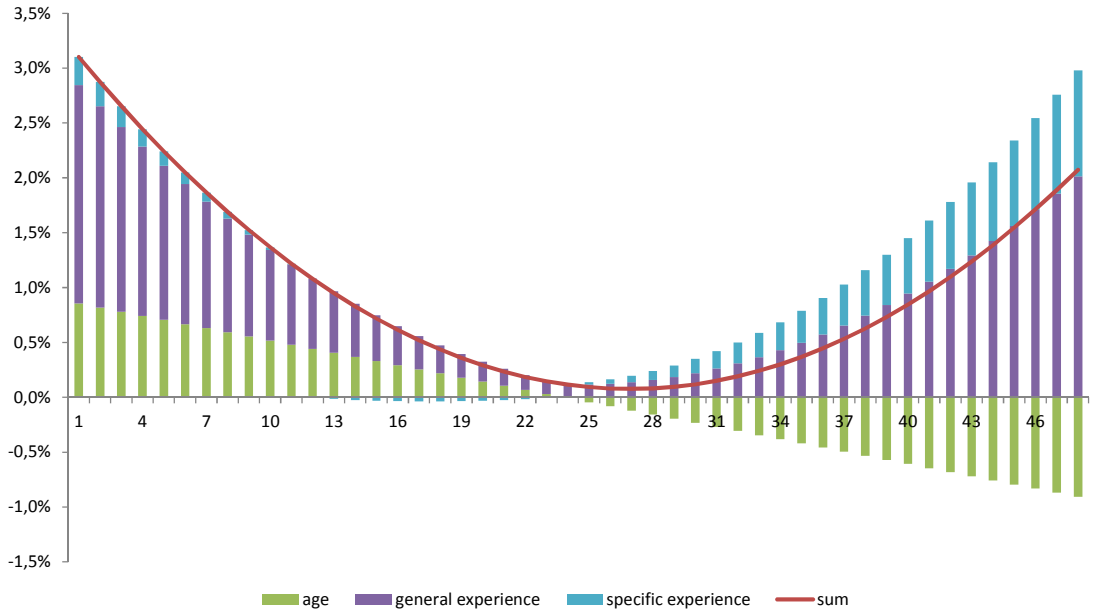
With respect to the wage dynamics there were substantial difference between the age groups. For persons aged between 35 and 54 years, wages were changing during 1996-2010 in line with the general trend for the entire economy. The similar case was with the 25-34 age group, but the fluctuations were more pronounced. The wages of workers aged below 25 and those aged above 65 fluctuated much more. The volatility was particularly visible for the youth, who between 2001 and 2004 noted a 3.4 per cent wage decrease, then in 2004-2010 their average earnings went up by almost 40 per cent.

The reasons why older workers earned more can be various. Firstly, it can be simply that with age people acquire some psychophysical features that influence their productivity. This is a "pure" effect of age on wages. Secondly, with time employees gain more experience which has a positive impact on productivity. Thirdly, their skills may become obsolete which has a negative impact on

productivity. The job experience can be divided into two categories: general (total) and associated with a time spent in a particular workplace (it can be defined as specific).

Using the wage equation it is possible to decompose the change in earnings resulting from working one additional year into age, general and specific experience. The relation between the marginal wage and the tenure years in 2010 was nonlinear. In the first years of a professional life with an additional year earnings rose substantially. Until about 25 years on the labor market the estimated impact of age was also positive, but after this threshold the isolated effect of age was becoming negative. However, the impact of age was counterbalanced by gains stemming from both general and specific experience, so that on balance each additional year on the labor market is estimated to be increasing wages over the whole career of workers.

Figure 86. Marginal rate of salary increase for an additional year of tenure in 2010.



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

A relation between education and earnings is unequivocally positive – the higher the level education attained, the higher the wage. A person with university degree in 2010 could expect on average to earn twice the average for all workers. Additionally, it is worth introducing the analysis of the wage dynamics by education since it can help to assess if the gap between well-educated and those with lower levels of education was diverging. Over 1996-2010 wages of university graduates went up relatively more than persons with secondary or vocational education. The reasons for that can be traced back to the 1996-2004 period, when until 2000 the earnings of persons with tertiary education degree were rising faster than the rest. Moreover, during the slowdown of 2000-2004 their wages were not falling, as it was the case with other educational groups, but they simply rose at the slower pace. After the 2004 the gap between wages of persons with higher and lower education started to narrow. The reasons for this kind of evolution in time of wages by education can be explained, on the one hand, by the increasing demand for well-qualified workers before 2004 that contributed to a wage rise, on the second hand, a surge in supply of university graduates after 2004 that lowered them. Moreover, the 2000-2004 stagnation affected mostly those with primary, secondary and vocational education, but the impact of the 2008-2010 slowdown was felt more equally by all educational groups.

Figure 87. The average real gross wage by education (in 1996 prices).

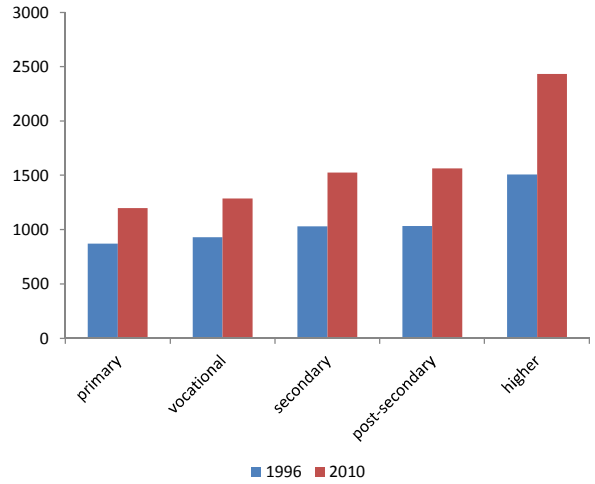
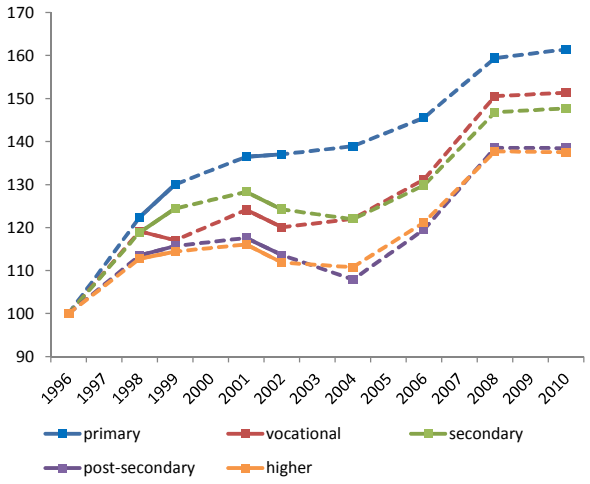


Figure 88. Changes in the average real gross wage by education (1996 = 100).



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

Earnings also vary due to a type of profession exercised. The most paid jobs belong in Poland to managers and higher civil servants. Moreover, the wages in these occupations rose the most in comparison to other professional groups. In 2010 persons from the "managers and higher civil servants" group earned 2.5 times more than, for example, office workers. Despite this, it was the only group that between 2008 and 2010 noted a drop in earnings. High wages and always positive growth rate could be observed among specialists. Furthermore, an interesting case are technicians. Before 2004 their wages were moving with accordance of the general tendencies, but after this date the earnings growth rate significantly went up. From 2004 to 2010 the average wage of a technician increased by 33 per cent, more than the average among all workers (28 per cent). The wage increases among technicians reflected unmet demand for workers with technical skills and problems concerning the quality of vocational education and skills of vocational school graduates. Crafters, farmers, sellers and others workers in simple jobs receive low wages and at the same time they were the most exposed to redundancies due to economic fluctuations.

Figure 89. The average real gross wage by occupation (in 1996 prices).

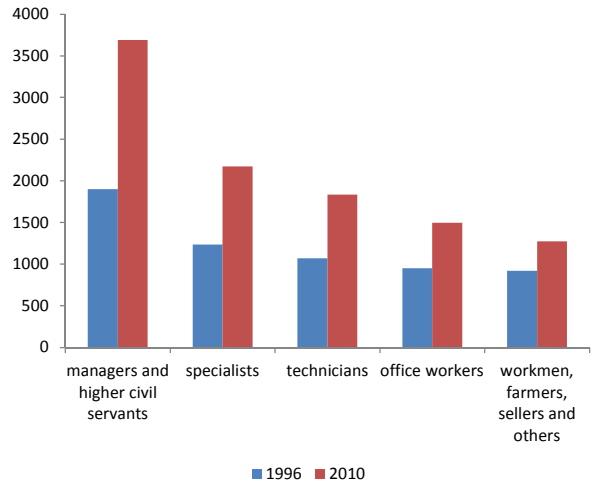
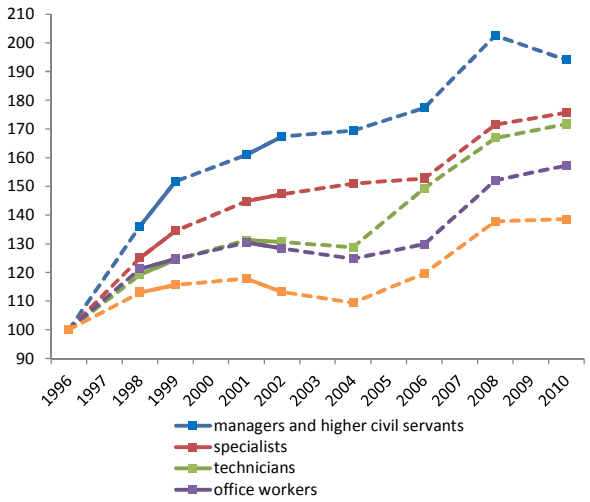


Figure 90. Changes in the average real gross wage by occupation (1996 = 100).



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

The population of workers can be also divided by the ownership of companies in which they are employed. The simplest classification distinguishes between public and private sector. For all the years when Structure of Earnings Survey was conducted, public sector wages were higher than those received by the private companies' employees, the difference ranged from few to several per cent. However, compared to 1996, the gap between private and public sector decreased slightly. It should also be noted that despite the higher average wage growth, earnings in the private sector were more volatile due to cyclical fluctuations. While in the public sector real wages rose in every consecutive survey, in the private sector there were periods of decline and stagnation.

Figure 91. Changes in the average real gross wage in public and private sector (1996 = 100).

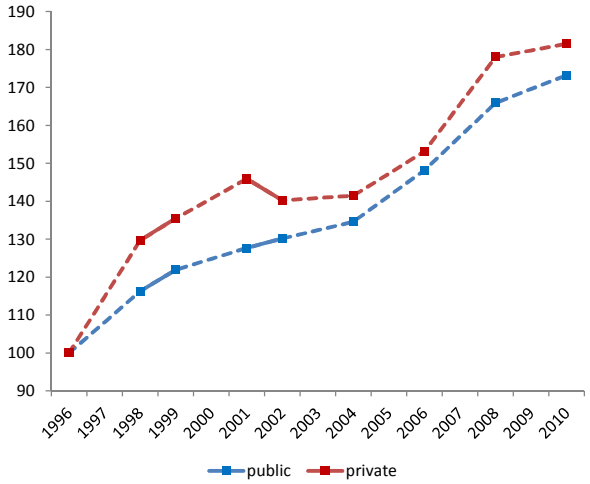
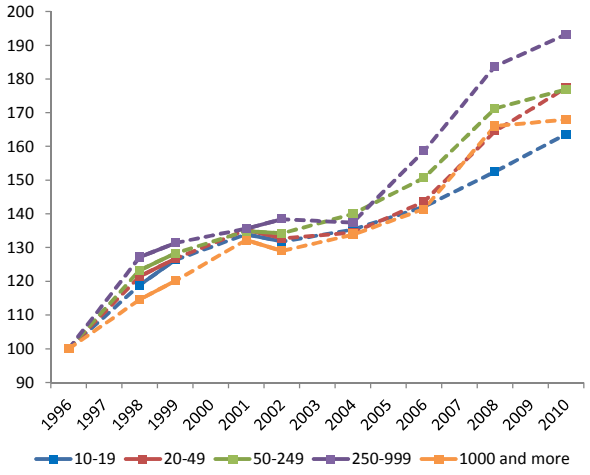


Figure 92. Changes in the average real gross wage by the size of the firm (1996 = 100).



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

It can be expected that persons working in larger companies (with more employees) may earn more. This regularity is supported by the data over the 1996-2010 period, for example, in 2010 a person employed in a workplace above one thousand employees had earnings higher on average by 60 per cent in comparison to small businesses, employing from 10 to 19 workers. In terms of wage growth rates the relation is similar, i.e. workers in bigger companies recorded higher earnings growth rates. However, in this case some important exceptions should be noted. Firstly, the wage in the biggest businesses (employing above 1000 people) grew at the rate comparable to the average. Moreover, it is characteristic that it was the only group, whose wages stagnated between 2008 and 2010. It can indicate that the slowdown hit the most not small and medium-sized employers, but the largest.[15] In the smallest workplaces wages were on average the lowest, at the same time the growth of earnings in this category was also the lowest. Among medium-sized employers, those with employing 20-49 people distinguished themselves, because they recorded the biggest increase (8 per cent) in the 2008-2010 period. Interestingly, in the same time interval the smallest firms (10-19 employees) also experienced a substantial rise in the average earnings, above 7 per cent.

[15] According to the Central Statistical Office study 'Activity of non-financial enterprises ", in 2008-2009 the larger the enterprise the more it reduced employment and had lower wage growth.

Box 4. Wage bargaining, the type of employment contract and their relevance to the earnings level.

In many cases not only the typical aspects like employers' and employees' characteristics (e.g. experience, profile of an employer, education) are taken into account when determining a wage, but also a bargaining power of the both sides. The bargaining power can be defined as ability to capture the surplus generated by job match.[16] Depending on the industry, profession and a labor market situation bargaining power is distributed differently between employers and employees. For example, specialists who possess unique and desirable skills can enjoy high bargaining power. On the other hand, workers doing simple and widespread tasks have usually little space to negotiate wages. Furthermore, apart from mentioned characteristics there is another way to change the balance of power in negotiations i.e. collective bargaining.

Table 1. Earnings in relation to the national average with respect to a type of employment contract and type of wage bargaining in 2010.

	Sectoral collective labor agreement	Firm level agreement	Other labor regulations
Indefinite term	1.17	1.13	1.09
Fixed term contract	0.76	0.72	0.70
Specified-purpose contracts	1.08	0.80	1.16
Contract for a trial	0.79	0.69	0.69

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

Various methods of wage negotiation and availability of different types of employment contracts can shape the wage setting process and as a result it can influence the earnings level. Firstly, it is important to emphasize that the way of bargaining, for example individual or collective, affects the wage. However, when it comes to a type of an employment contract, causality might be reversed - the amount of labor income determines the type of the contract, not the other way around. In 2010 employees with an indefinite term contract set in a sectoral collective labor agreement earned on average 17 per cent more than the average for all workers. In case of fixed and indefinite term contracts the higher the level of labor negations (sectoral, firm-level or other) the higher the wages. However, for specified-purpose contracts the highest average earnings were received, when wages were not set by collective agreements, but by different approach, for example, individual negotiations. This shows the specific character of this type of an employment contract.

2.2.2 Wage dispersion in Poland

In addition to the analysis of the changes of the average wage it is important to study the dispersion of earnings. This enables to outline the historical level and changes in wage inequalities. In Poland the transition from a centrally planned system to a market economy in a natural way induced an increase in inequality. However, the tendency of growing inequality was not reversed within initial few years after the establishment of the market system, the dispersion of earnings was rising until 2006. From this year the inequality indicators concerning the wages of workers started to diminish.

[16] The surplus can be defined as the difference between the revenue generated by the worker and the lowest salary for which he is willing to work.

Figure 93. Indicators of earnings dispersion.

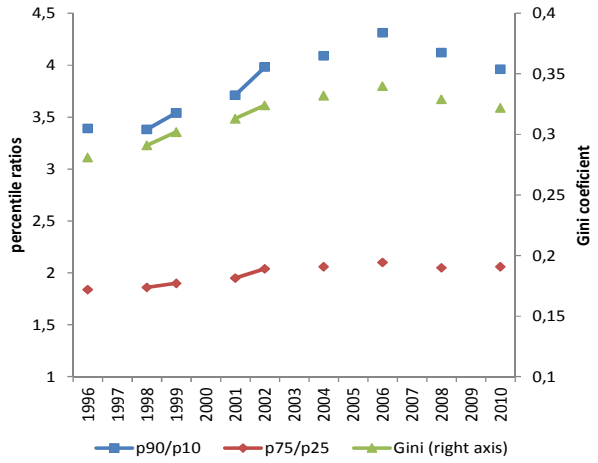
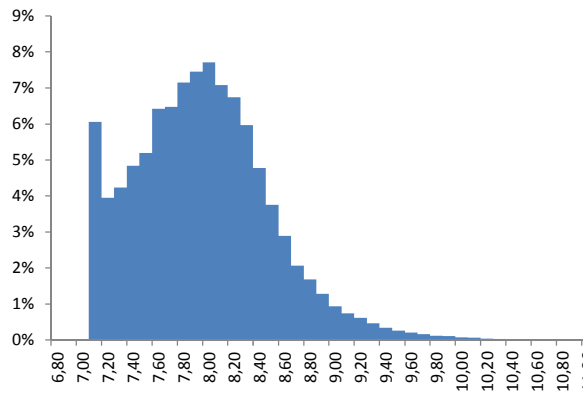


Figure 94. The distribution of logarithm of wages in 2010.



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

From the beginning of 1996 (first year of reliable data) to 2006 there was a visible trend of rising inequality. The ratio of 9th to 1st decile of the earnings distribution rose from 3.4 to 4.3, indicating a widening gap between two groups situated in opposite extremes of the wage distribution. Moreover, during the 1996-2006 period the upward trend in inequality was independent of business cycle phases. This state of affair can be partly explained by a significant wage increase among top 10 per cent earners. Between 1996 and 2006 wages in the tenth decile of distribution grew faster than the other 90 per cent of wages. In addition, during the slowdown of 2001-2004 the wages of those who earned less than 60 per cent of the average declined, but those above went up.[17] Nevertheless, over the whole period the change in D9/D1 was mainly driven by changes of the wage dispersion among those with earnings below the wage median.[18]

Figure 95. Earnings distribution in 1996 and 2010 (in 1996 prices)

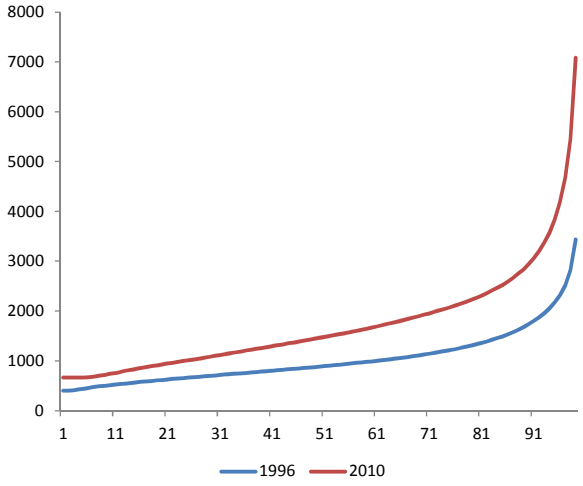
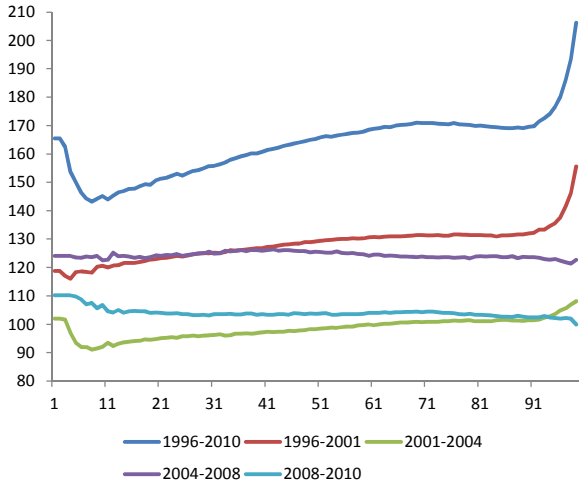


Figure 96. Relative changes in percentile of wage distribution in selected years



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

[17] These are comparisons of specifics section of wage distributions in various years, not of individual workers wage growth. The SES data are not panel and they do not allow the study of wage mobility.

[18] Of total 8.8 per cent variation in the D9/D1 ratio, 6.3 percentage points can be attributed to variability of D5/D1.

The situation concerning workers inequality was partially reversed after 2004. From this year earnings dispersion started to decline, for example, Gini coefficient decreased by 0.02. Between 2004 and 2008 an increase in wages was almost equally distributed. Furthermore, in the final phase of the boom the wages of the bottom decile started to rose relatively faster than the top earners. The downward trend in inequality was sustained even after 2008 when the global crisis began. It is worth emphasizing that between 2008 and 2010 the lower was the initial wage, the higher relative growth rate of wages, so the dispersion of earnings was reduced.

Table 2. The chosen indicators of earnings dispersion calculated for the 1996-2010 period.

	p90/p10	p90/p50	p50/p10	p75/p25	p75/p50	p50/p25	Gini	Var(ln(wage))
1996	3.39	1.96	1.72	1.84	1.38	1.33	0.28	0.23
1998	3.38	1.94	1.75	1.86	1.38	1.35	0.29	0.24
1999	3.54	2.00	1.79	1.90	1.40	1.35	0.30	0.26
2001	3.71	2.01	1.85	1.95	1.40	1.39	0.31	0.27
2002	3.98	2.04	1.96	2.04	1.43	1.43	0.32	0.30
2004	4.09	2.07	1.96	2.06	1.44	1.43	0.33	0.31
2006	4.31	2.11	2.04	2.10	1.44	1.45	0.34	0.32
2008	4.12	2.04	2.02	2.05	1.42	1.45	0.33	0.30
2010	3.96	2.01	1.97	2.06	1.42	1.45	0.32	0.29

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

When analyzing the distribution of wages it is worth noting the difference in the earnings patterns between men and women. As it was mentioned before, women earned on the average less than men, but considering the whole distributions gives additional insight. The comparison of the percentiles of the male and female earnings distribution shows that the biggest wage gap, above 30 per cent, could be observed among top earners (above 9th decile). For persons earning less than the 2nd decile the gender wage gap rose with wage level, but never exceeded 10 per cent. Between 2nd and 7th decile the difference was around 10 per cent. However, above 7th decile the gender wage gap widened substantially as earnings rose.

Figure 97. Wage distribution by sex in 2010.

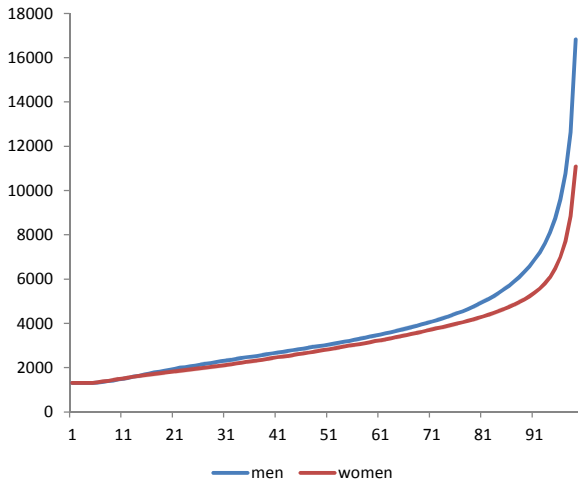
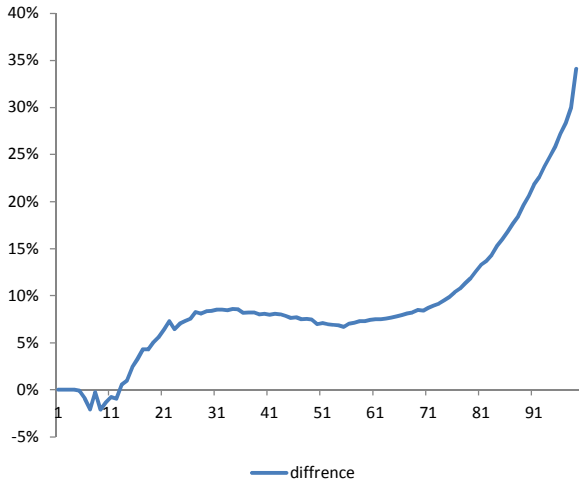


Figure 98. Gender wage gap by percentiles in 2010.



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

2.2.3 Determinants of wage levels in Poland

In addition to the analysis of the wage structures on the macro level it is essential to determine the microeconomic determinants of wages. Information derived from the estimation of wage equation allows to determine the effect of each variable, conditioned on other measured factors.

The results from the wage equation indicate that women performing the same job (all other variable kept constant) earned in 2010 about 16 per cent less than men.[19] What is more, the estimated coefficient describing gender effect was changing over time.[20] After the initial increase (what corresponds to a decline in a gender wage gap) that occurred between 1996 and 2002, the value of the parameter was declining systematically until 2008. Between 2008 and 2010 the difference between men and women earnings was reduced. The magnitude of the change (3 percentage points) should be associated rather with slower growth of male wages than directly with the change in females earnings dynamics.

Figure 99. Changes of the gender effect coefficient over time.

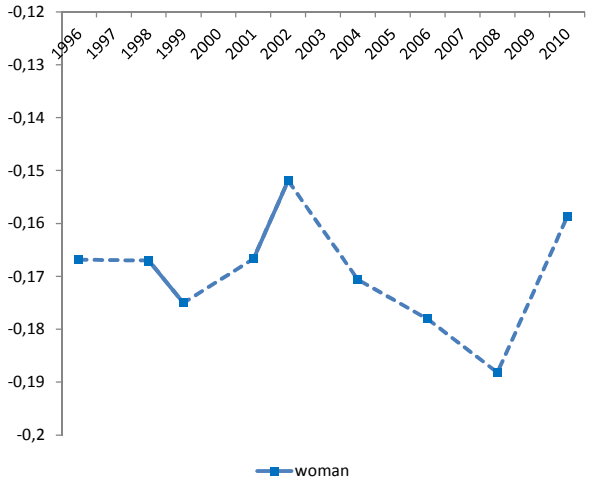
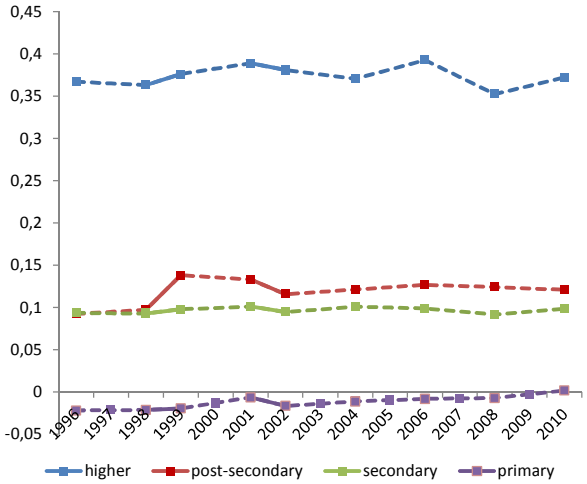


Figure 100. Changes of the coefficient describing education over time.



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

Premiums received by employees due to different educational levels (in comparison with vocational education which is reference group) were quite stable over time. The only substantial change occurred for the post-secondary education between 1998 and 1999, when the premium increased by 4 percentage points, and then stabilized around 12 per cent. During the 1996-2010 period a person with a tertiary degree could count *ceteris paribus* on about 37 per cent higher earnings than a person with vocational education. The premium of secondary education amounted to about 10 per cent. Over the whole period the difference between vocational and primary education gradually declined from 2 per cent to zero.

[19] Because of some unobservable characteristics of worker correlated with gender the value should not be interpreted as a "pure" impact of "being a man or woman".

[20] Wage equations were estimated on every available SES dataset between 1996 and 2010 and then the estimation coefficients were compared.

Box 5. Mincer equation.

Traditionally, as a method to measure return to education and assess the impact of education on wages the so-called Mincer equation is used. In the most basic form it is a linear (with regard to parameters) function of wage logarithm, job tenure, job tenure squared and education.

$$\ln(wage) = \alpha + \beta_1 * experience + \beta_2 * experiance^2 + \gamma * education$$

Estimation of parameters enables to determine return from an additional year of education. In addition, using the available data it possible to assess how the return to education evolved over time. In comparison to other parts of the analysis, where the educational levels are studied, taking the number of years in educational systems enable to determine the general tendencies of returns to education.

Between 1996 and 2004 the premium coming from one additional year of schooling systematically rose from less than 6 per cent to more than 10 per cent. After the slight decline in 2004 it stabilized around 9.5 per cent. The change of return to education reflected the working of two factors, first the increasing demand for well-qualified workers, second the rising supply of graduates with tertiary degree.

Figure 101. Return to education in 2010.

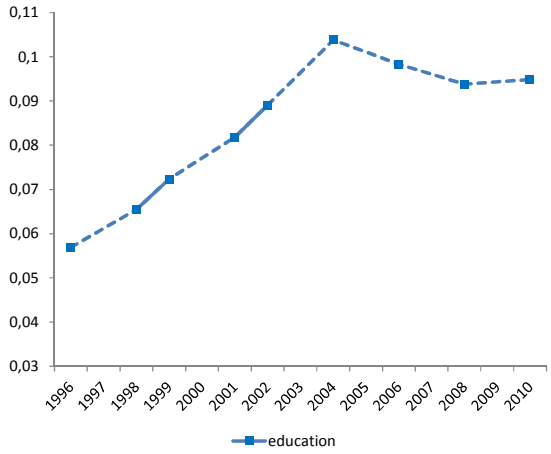
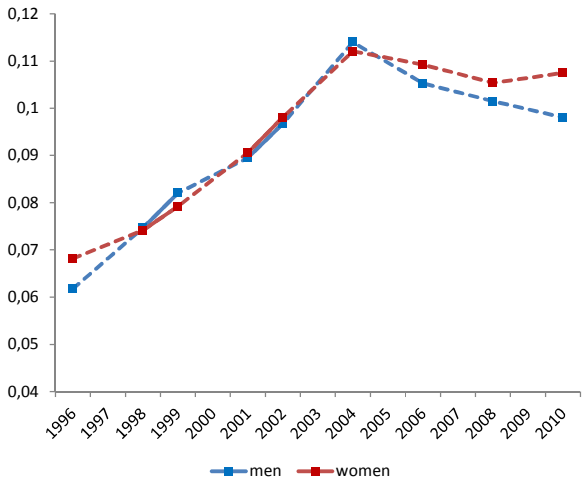


Figure 102. Return to education in 2010.



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

It is possible that by 2004 the demand exceeded the supply what resulted in higher returns to education. However, after 2004 with the increase in the number of better-educated the premium fell. Estimations of the Mincer equation for men and women separately show that until 2004 returns to education for both genders were similar. Nevertheless, the year of 2004 marked the beginning of divergence of male and female returns to education. Women during the 2004-2010 period gained from education relatively more in terms of earnings. In addition, during the slowdown between 2008 and 2010 the rate of return for men fell, but for women increased.

Apart from the period 1999-2001, the last several years were marked by the positive premium for workers in the public sector. With the second phase of the early 2000s downturn (2002-2004) and the first phase of recovery (in 2004-2006) the difference between the salaries in the private and public sector grew. The reduction of the gap between sectors began in 2006, but the global crisis put a stop to this process.

Figure 103. Wage difference between public and private sector by education in 2010.

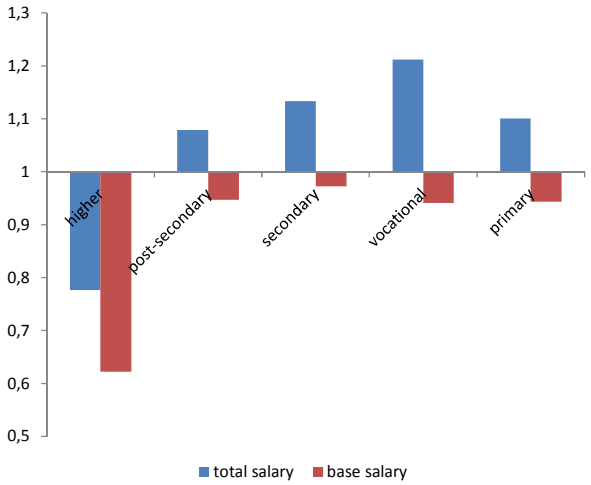
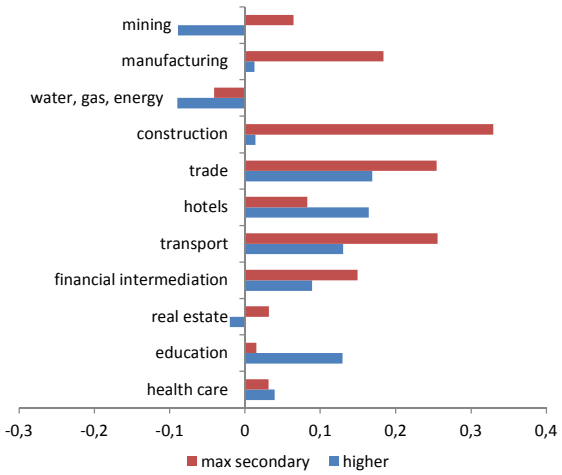


Figure 104. Wage difference between public and private sector by education and economic section in 2010.



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

Figure 105. Changes of the "private vs. public sector" effect coefficient over time.

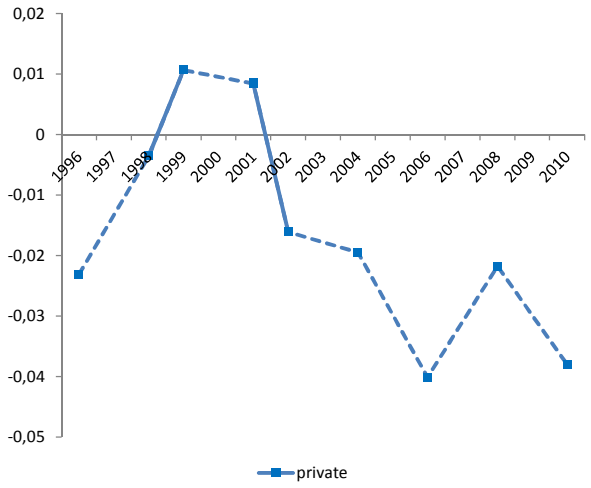
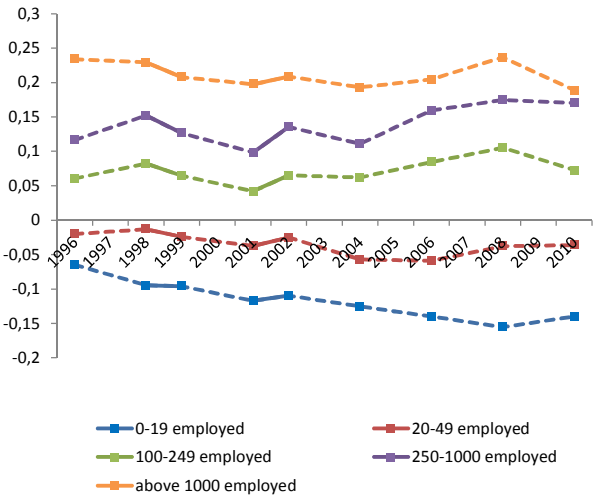


Figure 106. Changes of the coefficient describing size of the firm over time.



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

Wages in the public sector were not only on the average higher, but also the dispersion of earnings was lower. For the public sector in 2010 the variance of a logarithm of wages was 0.19, at the same time the corresponding statistic for private sector was 0.33. Taking into account the educational structure it is clear that workers with a higher degree are underpaid in the public sector, or that they are much less productive because of unobserved characteristics. However, those who attained secondary or lower education earned in public sector more than in the private sector. It is worth emphasizing that the advantageous situation of public sector workers was largely due to the high salary-related allowances (thirteenth salaries, bonuses, etc.). The comparison of the base salaries favored the private sector for all educational categories.

As was mentioned before, the highest wages in Poland are used to be earned by managers and higher civil servants. The premium attached to these professions (all other factors constant) rose substantially between 1996 and 2004. However, after this period there were some years of the premium declines, for example between 2008 and 2010. Analogously, in cases of specialists and

technicians the two phases can be distinguished, first before 2004 when premiums rose and second marked by stabilization and slight declines. Nevertheless, there was a group of occupations for which additional benefits in the form of higher wages were diminishing. To this groups belonged e.g. machine operators, personal service providers or agricultural workers.[21] The premiums in case of office workers and those doing simple works were stable over time.

The size of the company, defined as the number of employees, also had a significant impact on the earnings. The highest premium were observed in large workplaces, employing more than 1000 people, and the premium is found to be a negative function of the size for the firm (the number of employees). Moreover, over the time the smallest entities with less than 49 employees recorded a drop in the premium. Among the medium-sized companies (100-249 and 250-1000 employees) the premium in 2010, in comparison to 1996, was higher. But in the case of the largest establishments the premium associated with working in such places decreased.

Figure 107. Changes of the coefficient describing occupation over time – first group of occupations.

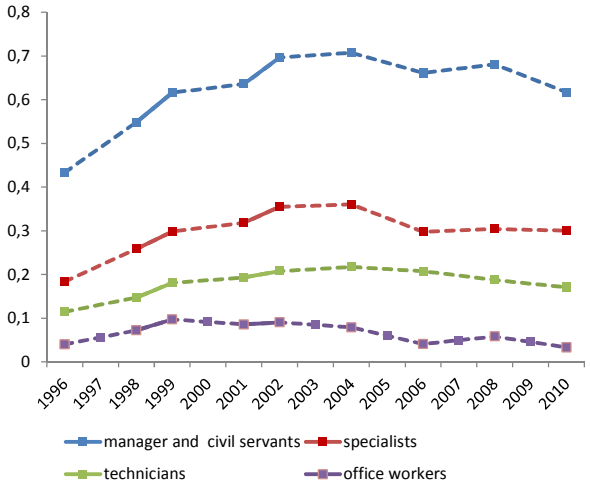
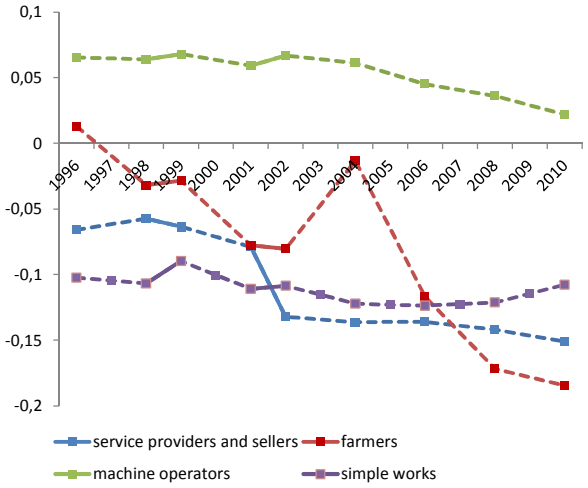


Figure 108. Changes of the coefficient describing occupation over time – second group of occupations.



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

Among the NACE sections mining particularly stood out as a section with the highest wage premium. Furthermore, significant growth dynamics of the premiums were characteristic for agriculture, fisheries, trade, transportation and processing, as well as education and health care. In the category "hotels and restaurants" a significant improvement could be seen between 2008 and 2010, which might reflect the general development of this kind of services and preparation for the Euro 2012 football tournament. The premiums “for being a farmer or fisherman” began to grow steadily after joining the EU in 2004. The section that was characterized by high volatility was construction, where a negative premium in 1996, suddenly rose to 10 per cent, and then again reached a negative value in 2004 to eventually began to grow again until 2008.

[21] As the SES data comprises of companies employing at least 9 workers, the agricultural entities in the sample are most likely relatively large farms, not the family farms which constitute the majority of the sector.

Figure 109. Changes of the sectoral effect coefficient over time – first group of sectors.

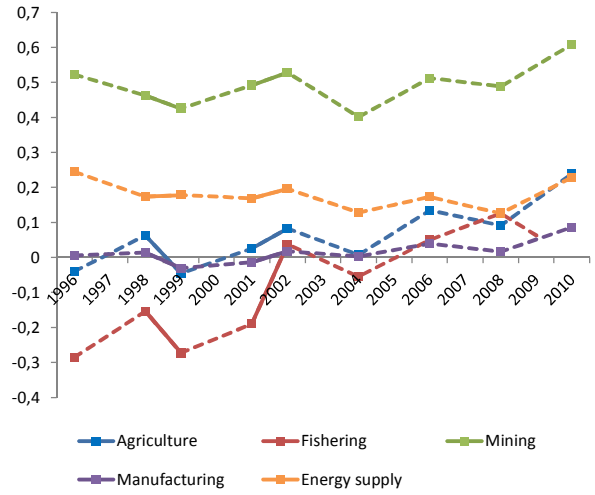
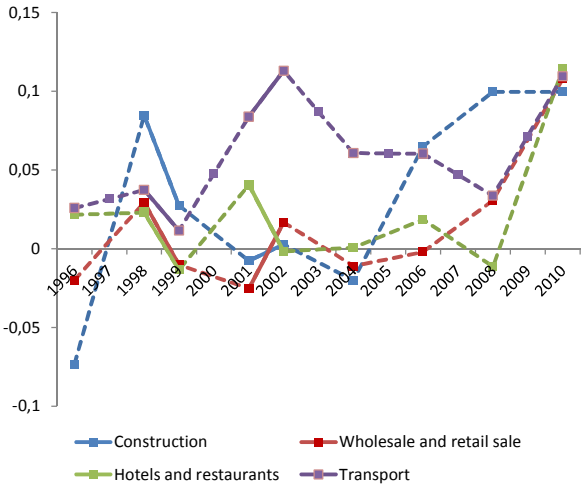


Figure 110. Changes of the sectoral effect coefficient over time – second group of sectors



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

Figure 111. Changes of the sectoral effect coefficient over time – third group of sectors

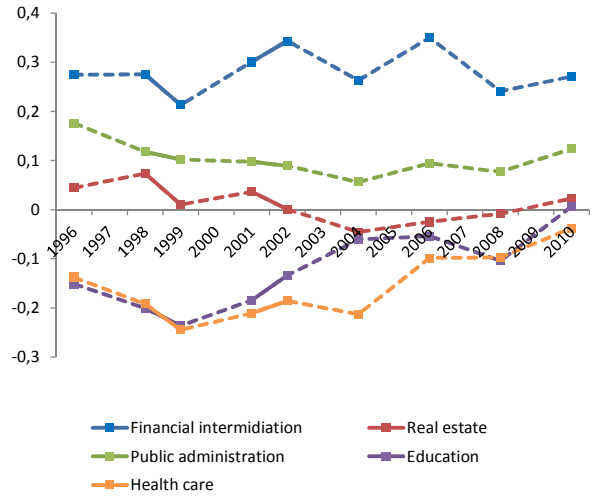
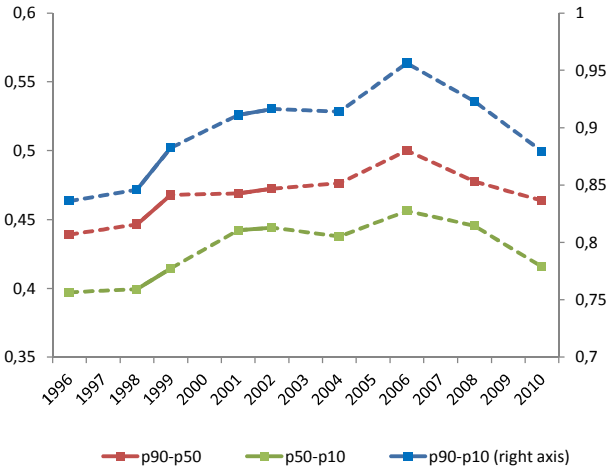


Figure 112. Differences of selected deciles of wage equation residuals over time.



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

Box 6. Regional differences of wage distributions.

The analysis of the distribution of wages can be carried out not only from the time-series perspective, but also in terms of regional differences. Depending on the region the average wage in 2010 varied from 85 per cent (Podkarpackie voivodeship) to 129 per cent (Mazowieckie voivodeship) of the national average. The regional variation of the median wage was lower. The highest earnings were in regions with large cities. An example of this is the Mazowieckie voivodship, where a huge role in shaping the wage distribution for the whole region was played by the Warsaw agglomeration. In five regions: Kujawsko-Pomorskie, Podkarpackie, Podlaskie and Swietokrzyskie workers earned on average less than 90 per cent of the average for the country. Only the Mazowickie and Sląskie voivoidoships could achieve the average earnings higher than the national mean. Taking median as a measure, to the group of two mentioned voivodoship (Mazowieckie and Slaskie) that were above the national average the Dolnoslaskie and Pomorskie should be added. This indicates a relatively high concentration of top earners in a few regions. The average wage calculated for all regions without Mazowieckie voivodship was 6.5 per cent lower compared to the average wage for the whole country. In case of the median the difference was 3.5 per cent.

Table 3. Selected statistics describing the spatial differentiation of wages in 2010.

voivodship	average	median	median/average	Gini	p90/p10	p90/p50	p50/p10
dolnoslaskie	99.6	101.0	0.83	0.316	4.02	2.04	1.97
kujawsko-pomorskie	88.1	90.7	0.85	0.292	3.54	1.91	1.85
lubelskie	86.3	91.4	0.87	0.271	3.31	1.82	1.82
lubuskie	91.0	94.0	0.85	0.287	3.54	1.90	1.87
lodzkie	90.4	90.6	0.82	0.311	3.96	2.04	1.94
malopolskie	94.3	96.6	0.84	0.304	3.78	1.95	1.94
mazowieckie	128.9	117.8	0.75	0.379	5.06	2.38	2.13
opolskie	92.7	94.7	0.84	0.295	3.52	1.92	1.84
podkarpackie	84.7	89.1	0.86	0.276	3.1	1.84	1.85
podlaskie	88.8	96.5	0.89	0.268	3.38	1.75	1.93
pomorskie	99.0	101.4	0.84	0.309	3.95	1.98	2.00
slaskie	101.1	105.0	0.85	0.303	3.93	1.96	2.00
swietokrzyskie	85.7	90.0	0.86	0.279	3.47	1.85	1.88
warminsko-mazurskie	90.0	94.2	0.86	0.289	3.65	1.0	1.92
wielkopolskie	92.9	95.3	0.84	0.302	3.65	1.92	1.90
zachodniopomorskie	92.0	96.8	0.86	0.286	3.57	1.87	1.91
Poland	**100.0**	**100.0**	**0.82**	**0.322**	**3.96**	**2.01**	**1.97**

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

Across voivodoships wage distributions differed not only in terms of average and median wage, but also in the earnings dispersion. Generally, the higher the average wages, the higher inequality. This is particularly true for Mazowieckie voivodship, where the ratio of the 9th of the wage distribution to the 1st decile reached a value of more than five. In the other region, with the exception of Dolnoslaskie (D9/D1 was over 4), the ratio did not exceeded four. If Mazowieckie voivodship is excluded from the sample, the Gini coefficient falls to 0.30, and the ratio of the 9th decile to the 1st is reduced by 0.22 pp.

2.3 Summary

The focus of this section was poverty and wage structures development. We described the evolution of poverty during 1997-2010 using three poverty measures: (i) 60 per cent of median household equivalent income (relative poverty) (ii) subsistence minimum for single person household (absolute poverty) and (iii) 60 per cent of median household equivalent income in 1994 adjusted for inflation

(quasi-absolute). In general, poverty risk in Poland is pro-cyclical, it is increasing during times of worse economic performance and decreasing while the economy is booming. As a result poverty risk rose in 1997-2003 and fell in 2003-2010 for all measures. Decomposition applied to those two periods showed that the changes of poverty rates within particular groups (not changes in the structure of the population) are the main factor behind the change of general poverty rates. This result is quite universal with exception of in-work poverty, when workers are divided into those employed in agriculture and in non-agricultural sectors. In this case flows between two groups, i.e. outflows from agriculture to other sectors, had significant impact on the overall in-work poverty.

The poverty risk and dispersion of earnings have been positively correlated since the transition began. In-work poverty is an important phenomenon, however poverty affects mostly those unemployed. Household with no member working has much higher risk of poverty. Worth noting is a fact that the share of individuals living in households with no workers has been strongly pro-cyclical. Moreover, the poverty risk among households with more children is higher and this relation is steeper than in the EU. As a consequence the poverty rate among children in Poland is exceptionally high. Looking at the age groups, the young and the old were more at risk of poverty than average. Furthermore, lower education levels also implied higher poverty rates.

The average growth rate of wages in 2000-2010 in Poland was lower than the GDP per person. Additionally, labor income share in GDP is lower than for the other NMS. Besides general tendencies, we also we analyzed how wages relate to different employee's/employer's characteristics. Women on average earn less than men, however the wage gap was reduced by about 6 percentage points between 1996 and 2010. The gap is more pronounced in higher deciles of distribution. Wages were positively correlated with age, whereas wage volatility over time was highest among young and old workers. Better educated and those with managerial and qualified jobs on the average earned more. The wages in public sector were on the average higher than in the private sector, although this was dependent on the education level of workers too – private sector pays workers with tertiary education more than the public sector, but less to workers with lower education levels. Public sector wages were also characterized by lower variance in time and across workers.

The wage dispersion in Poland increased in 1997-2006 and since 2006 has begun to fall. The change in D9/D1 (one of the measures used) was mainly caused by changes of the wage dispersion among those with earnings below the wage median. Before 2004 the wages of top earners rose much faster than those below 9th decile. After 2004 the changes of wages (in the relative terms) were similar across the distribution.

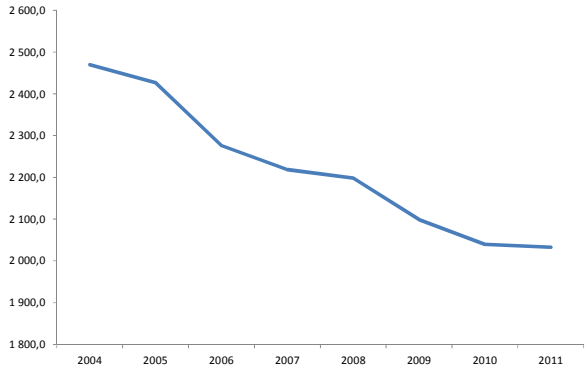
3 Agriculture and internal mobility in Poland

3.1 Agriculture in Poland after transition

3.1.1 Agriculture in Poland – statistical picture

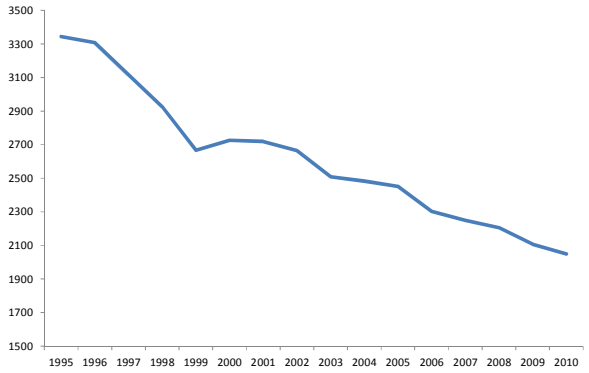
Employment in Polish agriculture has been decreasing since the transition began, and the trend has continued over the last decade. According to the Eurostat data (NACE rev. 2 classification), it declined from 2.47m in 2004 to 2.03m in 2011, 18 per cent reduction[22]. Using the Local Data Bank it is possible to portrait even a more persistent trend of decreasing employment in agriculture – the number of employed according to the LDB declined by 39 per cent between 1995 and 2010. Despite different methods of data collection concerning employment in agriculture a visible downward trend is visible.

Figure 113. Employment in agriculture, hunting and forestry (in thousands employed) between 2004 and 2011.



Source: Eurostat.

Figure 114. Employment in agriculture (in thousands employed) between 1995 and 2010.



Source: Local Data Bank.

However, the share of agriculture in total employment is still far higher than the average for the EU15, the EU27 and even the NMS10. Despite the diminishing role of agriculture in the labor structure (5.2 percentage points decline during 2004-2011), Poland falls behind benchmark countries, having 12.7 per cent of labor force employed in the sector, which is nearly double the share in the NMS9 and more than 2 times higher than in the UE25.[23] It can be said that reduction of the gap between Poland and rest European countries in that regard is taking place, but the pace of the change is disappointing. At the same time, the significance of the agriculture as an economic sector is decreasing. The share of agriculture in the value added went down by 1.5 percentage point in the 2000-2010 period. Despite substantially higher percentage of the labor force involved in agricultural production than in other New Member States, the share of this sector in total value was similar to that of the NMS10. It was higher than in the EU on average, but relatively substantially less than in case of employment share.

[22] Using NACE rev. 1, the figure dropped from 2.72m people in 2001 to 2.02m in 2010, a decrease by 26 per cent.

[23] The average share of employed in agriculture weighted by employment was 5,4 per cent in NMS9 (NMS10 without Poland), 5.3 per cent in the UE25 (UE27 without Poland and the UK) and 12.7 percent in case of Poland.

Figure 115. The labor share of agriculture in Poland relative to the EU27 and the NMS10.

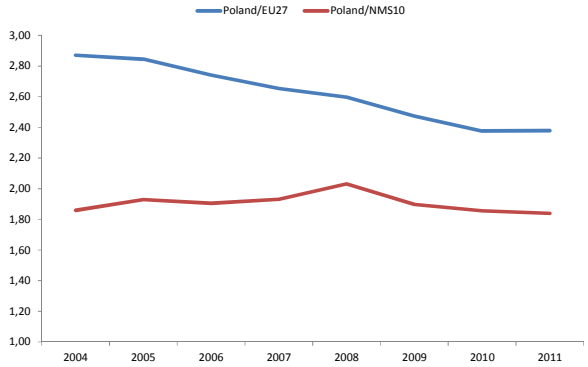
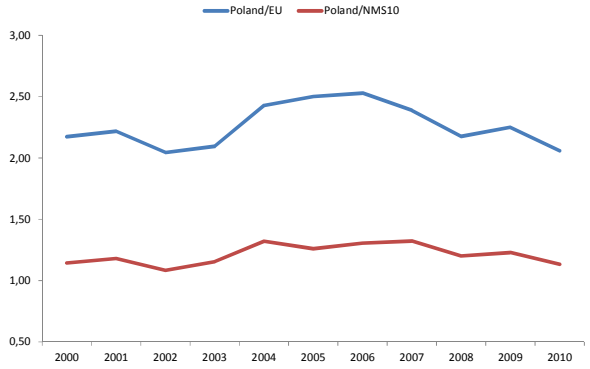


Figure 116. The value added share of agriculture in Poland relative to the EU27 and the NMS10.



Source: Eurostat.

Table 4. The labor share of agriculture (in per cent).

	2004	2011
Poland	17.9	12.7
EU15	3.5	3.0
EU27	6.3	5.3
NMS10	9.7	6.9

Source: Eurostat.

Table 5. The value added share of agriculture (in per cent).

	2000	2010
Poland	5.0	3.5
EU15	2.7	1.7
EU27	2.3	1.7
NMS10	4.4	3.1

Source: Eurostat.

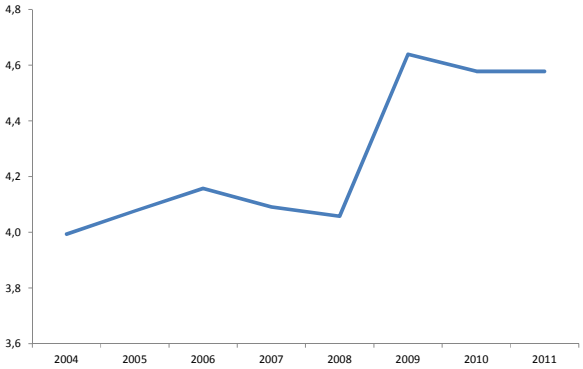
The crucial issue of Polish agriculture is very low labor productivity. In 2011, in the EU27 it was on the average three times higher and in the EU15 about seven times higher than in Poland. The gap with respect to the NMS10 is also substantial – the productivity in Poland is almost 60 per cent lower than the average for the whole group. In the EU only Bulgaria and Romania exhibited lower labor productivity in agriculture than Poland. What is more, the time series show only a weak productivity growth tendency (in 2004-2011 by only 2% a year, much less than the whole economy), too small to exert any reasonable impact leading to substantial modernization and restructuring of the agriculture.

Table 6. Labor productivity in thousands of Euro per person employed in agriculture (2005 prices).

	2004	2011
France	35.6	43,7
Netherlands	35.5	43.2
EU15	25.9	30.1
EU25	18.2	21.9
EU27	13.6	15.8
Czech Republic	11.7	11.8
NMS10	9.1	10.9
Slovenia	7.4	7.5
Poland	4.0	4.6
Bulgaria	2.4	2.0

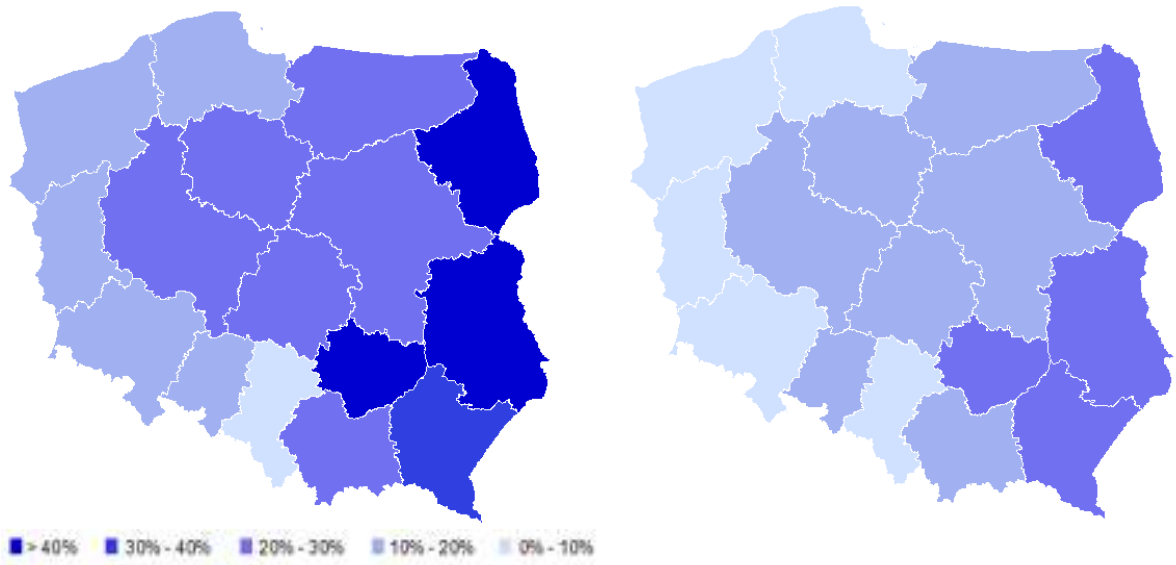
Source: Eurostat.

Figure 117. Labor productivity in Poland 2004-2011 (2005 prices).



Additionally to the analysis of employment in agriculture at the macro level, it is insightful to look at the particular regions. There were and are substantial differences across regions. It is possible to distinguish three regions in Poland based on the agricultural employment data: western, central and eastern. The lowest percentage of workers is employed in the western voivodeships (below 10 per cent in 2010), followed by the central region (10-20 per cent in 2010). Overemployment in agriculture is distinct for the eastern voivodeships, where more than 20 per cent of total employment in 2010 was in agriculture. Despite the general trend of employment reduction in agriculture the regional discrepancies have a tendency to persist.

Map 1. The employment share of agriculture in 1995 (left) and 2010 (right) by voivodeships.



Source: Local Data Bank.

Table 7. Number of farms, agricultural land and average farm size.

	Number of farms	Total acreage	Average farm size
	in thousands	in thousands hectares	in hectares
Farms (all types) [24]**:**			
2002	2933	16899	5,76
2010	2278	15534	6,82
change 2010-2002	-22.4%	-8.1%	18.4%
Farms engaged in agricultural production:			
2002	2172	15160	6,98
2010	1891	14971	7,92
change 2010-2002	12.9%	-1.2%	13.5%

Source: Report from results: The Agricultural Census 2010.

The issue of overemployment in agriculture is closely related to the farms' size structure. The average farm size in Poland is about 35 per cent of that of the EU15, and it is estimated to be 7.9 ha in 2010. However, it is slowly increasing. According to the Agricultural Census the average size of the farm went up from 6.98 ha to 7.92 ha (13.5 per cent increase) during the 2002-2010, mainly due to a

[24] The Agricultural Census distinguishes between farm and farm engaged in agricultural production. The latter concerns the entities that are a place of 'real' agricultural productions.

decline in the number of households engaged in agricultural production (12.9 per cent decrease). At the same time, the total agricultural land in this period decreased slightly (by 1.2 per cent).

The Polish agriculture is dominated by small farms, almost 70 per cent constitute these with an arable land below 5 ha. On the other hand, farms above 20 ha are in minority (only 5.4 per cent in 2010). The agricultural land fragmentation in Poland makes it difficult to obtain effects of scale, even with the more efficient use of agricultural machinery. Looking on the evolution of the farms' size structure over time it can be concluded that farms on average are getting bigger and more efficient. During the 2002-2010 period the number of farms below 20 ha was decreasing and at the same time the number of bigger farms above 20 ha was increasing. The biggest change marked very small farms, below 5 ha, as the number of agricultural households of this size declined by one-fourth. Still the pace of transformation (adding 1 ha per few years) is too slow to catch up with the average for the EU in reasonable time.

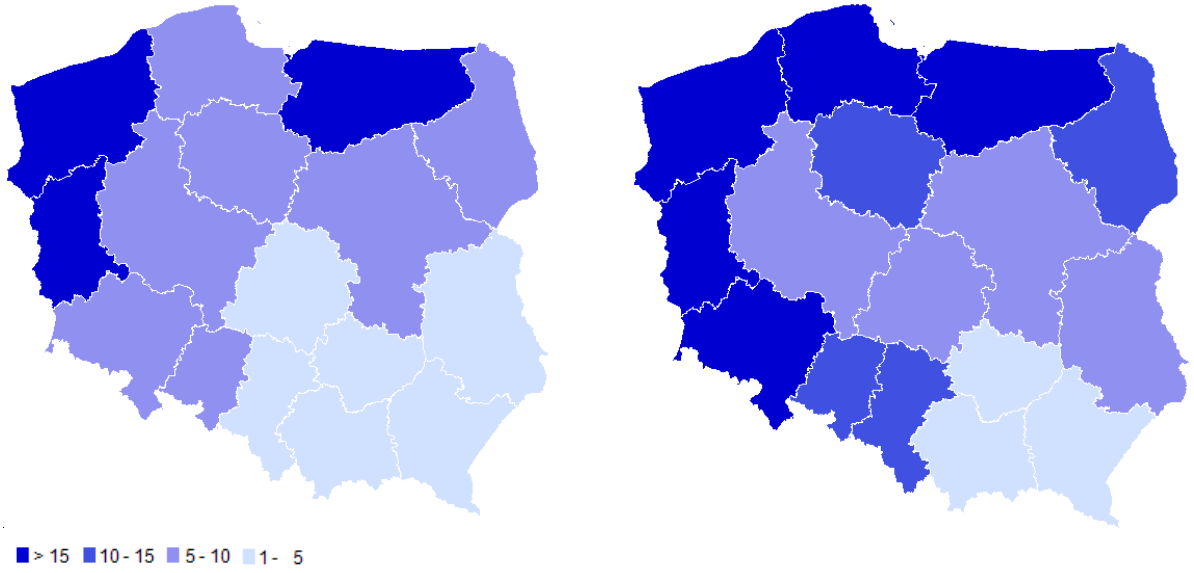
Table 8. Farms' size structure (in hectares).

	Farms	Total	<1	1-5	5-10	10-15	15-20	20-50	>50
2002	**In thousands**	2933	977	1147	427	183	84	96	20
2002	**In per cent**	100	33.3	39.1	14.6	6.2	2.9	3.3	0.7
2010	**In thousands**	2278	715	863	352	152	72	97	27
2010	**In per cent**	100	31.4	37.9	15.4	6.7	3.2	4.2	1.2
change 2002-2010		-22.4%	-26.6%	-24.5%	-17.5%	-16.7%	-14%	0.8%	34.4%

Source: Report from results: The Agricultural Census 2010.

From the regional perspective, the north-west region is characterized by the biggest farms (average above 15 ha), then smaller ones (10-15 ha) are typical for the central voivodeships, and smallest (below 5 ha) dominate the rural structure of the south-east regions. The differences of regional farms' sizes are rather persistent and changes in average acreage are mainly due to a general tendency for the whole country.

Map 2. Average farm size (in hectares) in 1995 (left) and 2010 (right) by voivodeships.



Source: Local Data Bank.

One of characteristic features of Polish agriculture is a small number of hired workers. The sector is dominated by familial, private households-farms and there seems to be no tendency to significantly change this situation. More than 95 per cent of employed in agriculture in 2010 worked on their own account, which is more than in 2002, when the number was 92 per cent. Other types of employment are rarely used, less than 5 per cent is hired on the basis of an employment contract.

Table 9. Type of employment in agriculture (in per cent).

	2002	2005	2010
Employees hired on the basis of an employment contract	6.3	5.9	4.2
Employers and own-account workers on private farms in agriculture	92.3	93.3	95.3
Members of agricultural production co-operatives	1.1	0.8	0.5

Source: The Statistical Yearbooks of Agriculture.

As most farmers work on their own account it is no surprise that the main source of income for people employed in agriculture comes from private farms. The share of this type of income increased from 2004 to 2011 by 5.3 percentage points. The share of hired labor income also went up by 2.6 percentage points, reaching 10.2 per cent in 2011. At the same time the role of social benefits has diminished, from 2004 to 2011 the share of this type of income decreased by 6 percentage points, but transfers still were more important source of income than hired labor. Social benefits and income from private farms constituted more than 85 per cent of total income in both 2004 and 2011.

Table 10. Income sources of agricultural workers (in per cent).[25]

Income from:	1995	2002
private farms	76.2	75.6
hired labor	1.4	0.1
work on own account	0.6	1.4
social benefits	19.6	19.9
other	2.2	3.0

Source: The Statistical Yearbooks of Agriculture.

Table 11. Income sources of agricultural workers (in per cent).

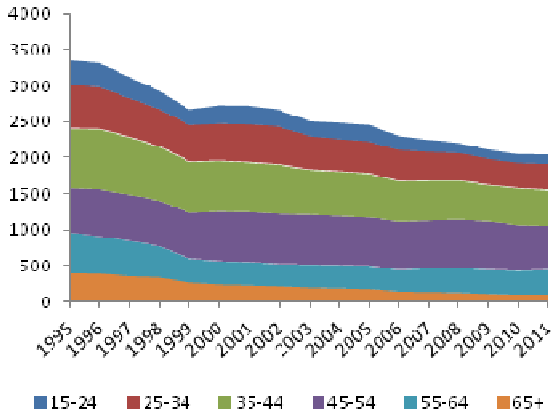
Income from:	2004	2011
private farms	66.1	71.4
hired labor	7.6	10.2
work on own account	1.8	1.0
social benefits	20.9	14.9
other	3.5	2.5

Source: The Agricultural Censuses 1995 and 2002.

Looking at the demographic structure of people employed in agriculture, there are a few points to be made. First, the share of females employed in agriculture is stable over time (even taking 15 year time horizon) and amounts to around 43 per cent. The Eurostat and Labor Force Survey data show that the percentage of the youngest and oldest people among agricultural workers has decreased, a significant decline in the share of in group aged 65+ can be observed, probably due to retirement. The majority of people employed in the agriculture are prime-aged (25-54 years old) - over 50% of workers in agriculture are now aged between 35 and 54, with 45-54 being the dominant age group.

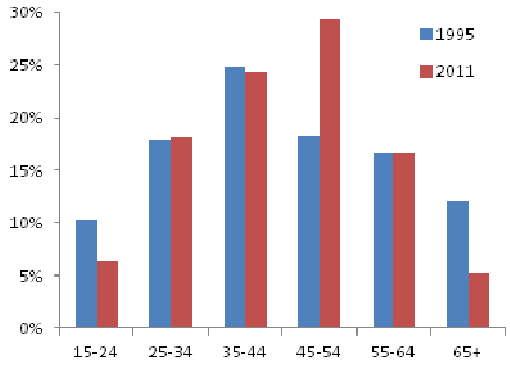
[25] Data about income sources from the statistical yearbook and the Census are non-comparable.

Figure 118. Agricultural employment by age groups in Poland between 1995 and 2011 (in thousands of persons).



Source: Labor Force Survey

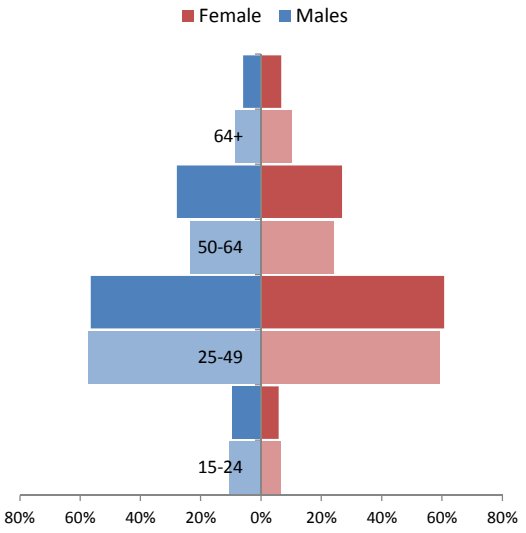
Figure 119. Age structure of the agricultural employment in Poland (percent).



Source: Labor Force Survey

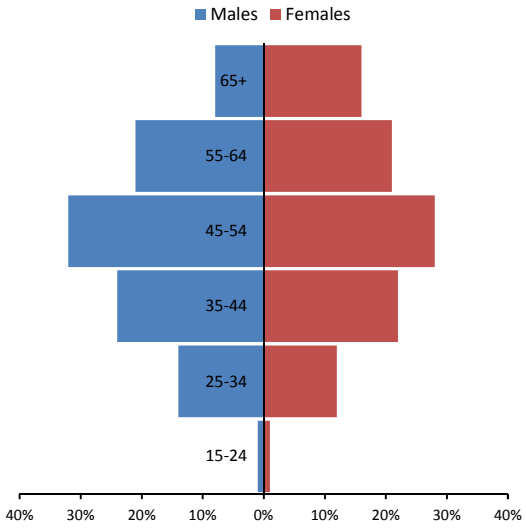
A slightly different picture comes from the Agricultural Census and the data concerning users of private farms (almost 90 per cent of all farms). These data are not fully comparable with the Eurostat, because the Census gathered information about holders of an agricultural holding (persons that use agricultural land) not workers. Moreover, the demographic data from the Census concerns private farms that are in general small and familial. As a result, the census data show that the age structure is older than the one inferred from LFS data. The young workers (aged 34 years old or less) account for 15 per cent of working population in case of males and 14 per cent in case of females. Most numerous group of working in agriculture is the 35-54 age group, which constitutes above 50 per cent among both males and females. What is also characteristic of the demographic structure of employed in agriculture is a high percentage of the 55+ group, and especially in case of women, even 65+, as 16 per cent of females who consider themselves working in agriculture are aged 65 years or more.

Figure 120. Demographic structure of employment in agriculture (in percent).



Source: Eurostat.
Note: 2000 – brighter color, 2007 – darker.

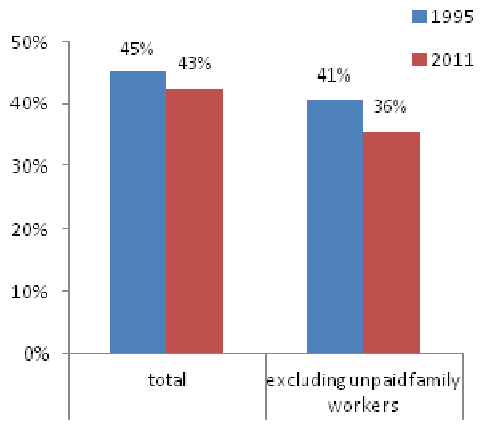
Figure 121. Age structure of farms' users of private farms in 2010.



Source: Report from results: The Agricultural Census 2010.

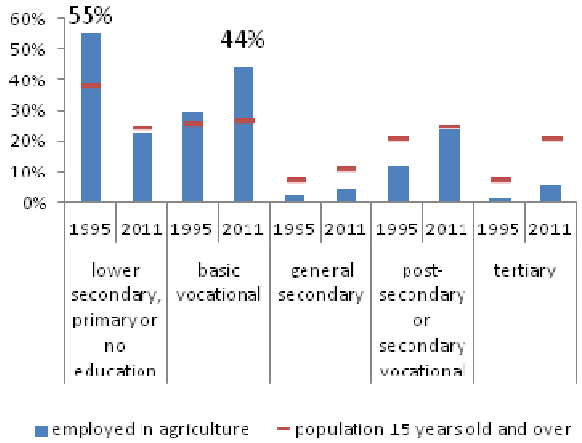
Agricultural labor force exhibits relatively lower human capital than the rest of the labor force. In 1995 over a half of persons employed in agriculture in 1995 had primary or no education. In 2011, 44% of agricultural workers had a basic vocational education and the share of people with lower secondary or lower education diminished significantly. Currently, the most common education level in agriculture is basic vocational, and the share of post-secondary or vocation secondary has also increased. However, although the educational structure of agricultural workers have improved since the 1990s, the gap with respect to non-agricultural labor force in terms of share of workers with at least general secondary education has barely changed.

Figure 122. Share of females in the agricultural employment in Poland.



Source: Labor Force Survey.

Figure 123. The population and the agricultural employment structure in Poland by education level.



Source: Labor Force Survey.

3.1.2 Worker flows out of and into agriculture in Poland

In this section we present the analysis of worker inflows and outflows from agriculture, on the basis of LFS data.[26] Agriculture has exhibited slightly different patterns of employment flows than other sectors. On the average in 1995-2010, 91.1 per cent of people working in the agriculture in a given year were still working in agriculture the year later. Only 2.7 per cent of them found a job outside agriculture, and 4 per cent flowed into inactivity. The rest, 0.9 per cent, became unemployed. Although the share of workers remaining in the sector was virtually the same as among those employed outside the agriculture, the direction of outflows was different – outflow to unemployment was very low and to inactivity slightly higher than among workers outside agriculture. The inflows to agriculture from other sectors were rather rare.

Table 12. The percentage of people with stable labor market status and the directions of flows out of the employment in agriculture and other sectors, (percentage of total employment in the years 1995-2011).

employed in the agriculture		employed outside of the agriculture	
remaining employed in the agriculture	91.9	remaining employed outside the agriculture	91.6
flowing into non-agricultural sectors	2.7	flowing into the agricultural sector	0.5
flowing into unemployment	0.9	flowing into unemployment	3.0
flowing into inactivity	3.9	flowing into inactivity	3.6

Source: Own calculations based on LFS.

[26] Because of small sample sizes, we have to pool data over at least 5 years to calculate the flows reliably.

Table 13. The percentage of people with stable labor market status and the directions of flows out of the employment in agriculture and other sectors of the economy (as a percentage of total employment, in the periods 1995-1999 and 2006-2010).

employed in the agriculture			employed outside of the agriculture		
	1995-1999	**2006-2010**		**1995-1999**	**2006-2010**
remaining employed in the agriculture	91.2	93.6	remaining employed outside the agriculture	91.8	94.1
flowing into non-agricultural sectors	3.1	3.0	flowing into the agricultural sector	0.6	0.3
flowing into unemployment	1.0	0.5	flowing into unemployment	3.4	2.3
flowing into inactivity	4.7	2.9	flowing into inactivity	4.2	3.3

Source: Own calculations based on LFS.

Interestingly, the LFS data show that during the studied period inflows into agriculture were higher than outflows which is not consistent with the absolute decline in farm employment occurring over the period (Figures 124-125). There are several potential explanations of these discrepancies. First, the panel dataset created on the basis of the LFS yearly data does not include persons who have stopped working in the agricultural sector because of the death. What is more, each person in the panel dataset is identified by a number of features, including the apartment number where they live and the number of household, to which they belong. Therefore, the panel dataset does not include people who have changed residence and began to belong to an another household.[27] Persons who are not included in the panel represent about 5% of the sample of analyzed period (1995-1999 and 2006-2010). It can be presumed that mentioned above imperfection of the panel results in underestimation of outflows from agricultural employment, considering how broad is the ILO employed definition. Figures 126-127 show that agricultural workers aged under 35, in particular under 25, are underrepresented in the panel data set. With respect to education level attained, the differences are not that pronounced, workers with lower secondary, primary or no education are slightly overrepresented in the panel data set, but this is related to the age patterns mentioned above. Nevertheless, we assume that this imperfection of the panel has no significant impact on the structure of flows, which are described in detail further below, and which we believe leads to important insights.

[27] Polish Statistical Office does not provide the panel data and it doesn't track people who have changed their residence between the surveys. This creates obstacles to study migration on the basis of LFS data, and also decreases the accuracy on panel datasets constructed on the basis of LFS.

Figure 124. Agricultural employment inflow and outflow in the 5-year periods in Poland (annual average, in thousands of persons).

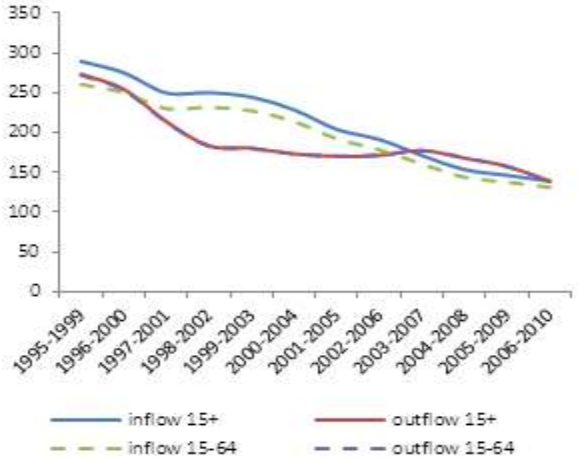
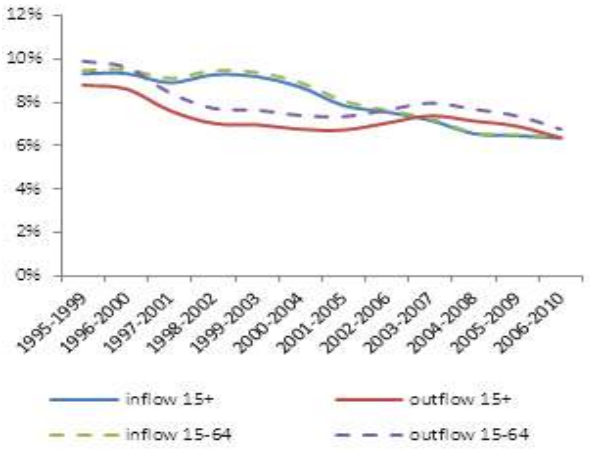


Figure 125. Agricultural employment inflow and outflow rates in the 5-year periods in Poland.



Source: Own calculations based on LFS.

Figure 126. Agricultural workers included in the panel and outside the panel, by age groups (the average of the years 1995-1999 and 2006-2010).

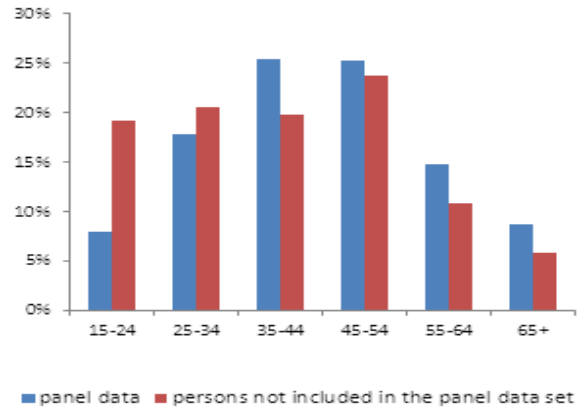
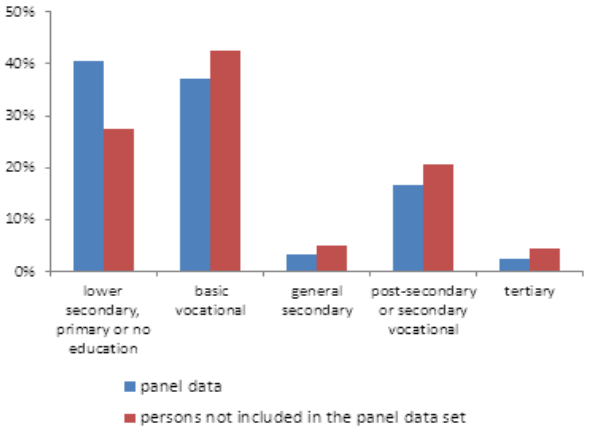


Figure 127. Agricultural workers included in the panel and outside the panel, by educational attainment (the average of the years 1995-1999 and 2006-2010).



Source: Own calculations based on LFS.

About a half of the labor force that has joined agriculture over the studied period used to be economically inactive the year before (Figure 128). Shares of persons who worked outside of agriculture a year before and those who were unemployed are similar and vary depending on the overall economic conditions of the economy. Transitions to inactivity have also been dominant type of outflows, except for the last few years, were outflows to non-agricultural employment prevailed. Since 2001 the share of this outflow in the total outflow has been significantly increasing. Most of former agricultural workers found employment in manufacturing, construction, or trade and repairs. These sectors are also a frequent source of the labor force flowing into agriculture (Figures 130). It is then likely that significant part of the observed flows between agriculture and the aforementioned sectors was temporary, reversed or repeatable.[28]

[28] Perhaps even occurs when the amount of work on the farm decreases and it is possible to take up another activity.

Figure 128. Agricultural employment inflow by the previous labor market status in the 5-year periods in Poland.

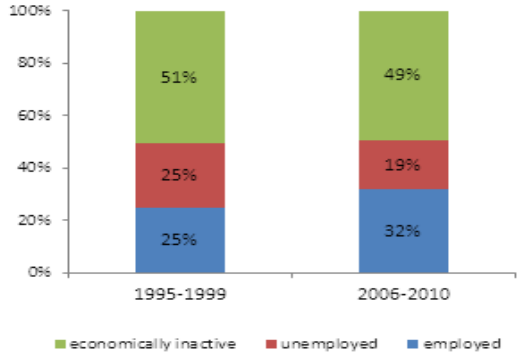
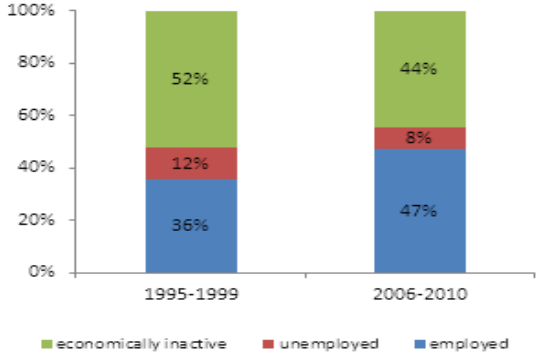
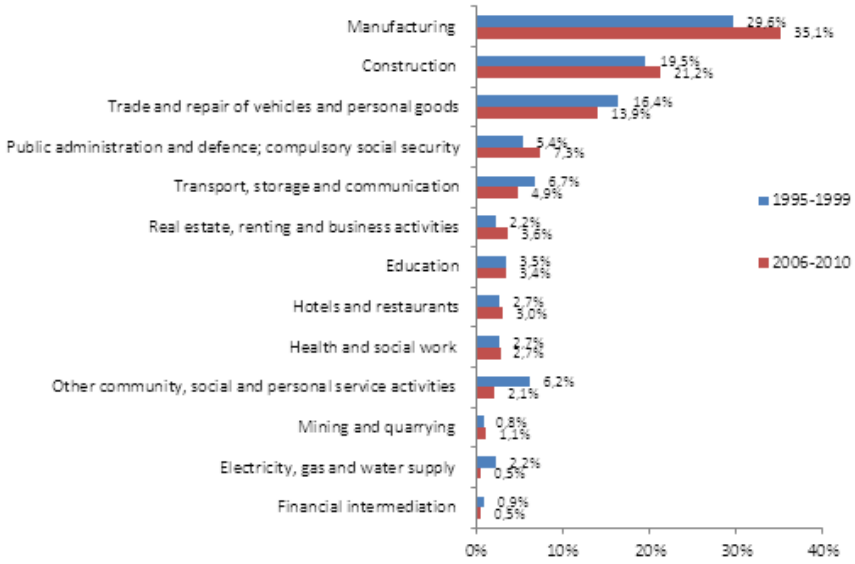


Figure 129. Agricultural employment outflow by the later labor market status in the 5-year periods in Poland.



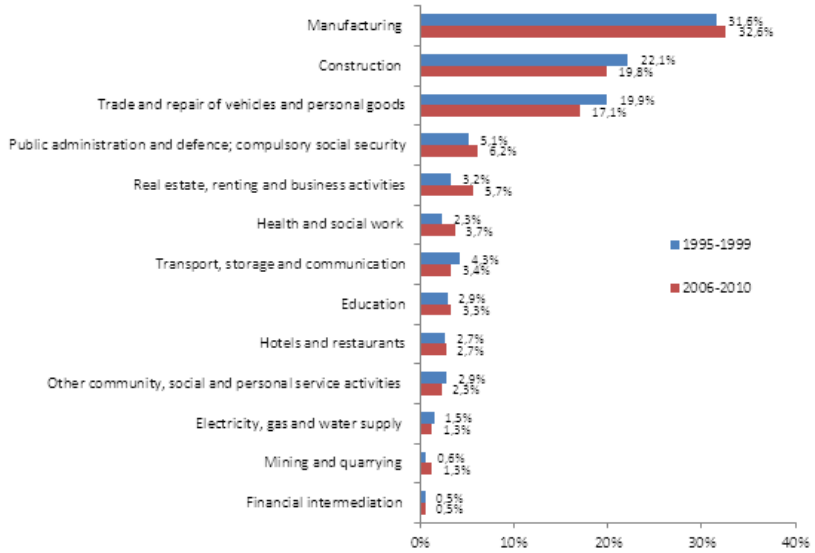
Source: Own calculations based on LFS.

Figure 130. Agricultural employment inflow by the economic sector of previous activity in the 5-year periods in Poland.



Source: Own calculations based on LFS.

Figure 131. Agricultural employment outflow by the economic sector of previous activity in the 5-year periods in Poland.



Source: Own calculations based on LFS.

Increasing disparity of representation of women and men in the agricultural employment is reflected in the structure of the flows into and out of agriculture. Between 1995 and 1999, 43% of people coming into agriculture were women, compared to the years 2006 to 2010 when women accounted for only 40% of inflows. The gender structure of outflow from agriculture was the same as the structure of employment in this sector, therefore, it didn't contributed to changes of gender structure of agricultural employment, which were driven by higher inflows of males.

Almost 1/4 of people entering agriculture in the years 1995-1999 was aged less than 25 years (Table 14).[29] In this period it was the most numerous group entering agriculture, however their share in inflows declined with time. In the years 2006-2010 the inflows to employment in agriculture was dominated by people aged 25-34. What is immediately apparent is that inflows seem much more dependent on age than the outflow, however the outflows of young workers are very likely to be underestimated by the mentioned imperfections of available panel dataset. Nevertheless, with few exceptions, changes in the structure of flows in large part reflect changes in population structure taking place during the period. Bearing in mind the underrepresentation of young workers in the panel data, it is worth noting that the number of people aged 25-34 flowing into and out of the agriculture was decreasing, while the share of this group in the total population has increased. A similar situation took place in the case of persons aged over 64 years.

Figure 132. Agricultural employment inflow by sex in the 5-year periods in Poland.

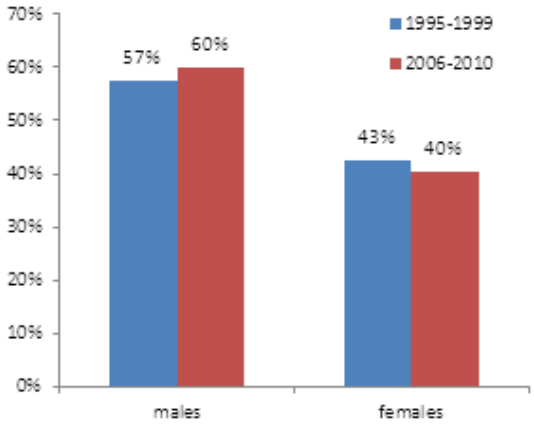
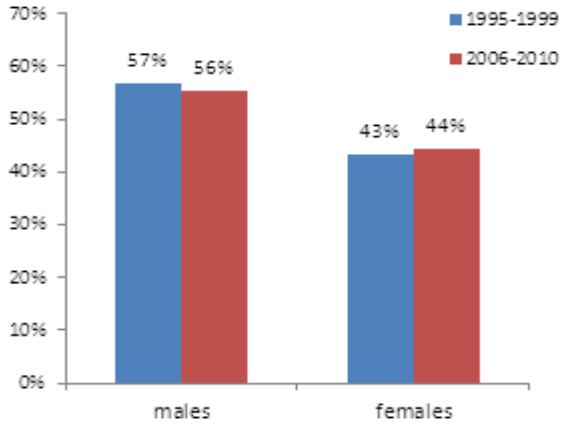


Figure 133. Agricultural employment outflow by sex in the 5-year periods in Poland.



Source: Own calculations based on LFS.

Table 14. Agricultural employment inflow and outflow by age groups, and the age structure of the population, in the years 1995-1999 and 2006-2010 in Poland (in per cent).

	inflow		outflow		age structure of the population	
	1995-1999	2006-2010	1995-1999	2006-2010	1995-1999	2006-2010
15-24	24	20	16	14	21	18
25-34	21	24	18	21	17	19
35-44	19	18	20	17	20	15
45-54	13	19	14	18	16	17
55-64	12	13	14	20	11	15
65+	10	6	18	10	15	16

Source: Own calculations based on LFS and the Central Statistical Office.

[29] This group was also the most numerous age group in the total population aged 15+, but still it was overrepresented in inflows.

The fact that inactivity was the main source of inflows to agriculture is related to the age structure of inflows. About 60 per cent of people aged 15-24 who found employment in agriculture during the analyzed period were previously economically inactive. Probably a large part of them started to work in agriculture after graduation. Small proportion of this age group in agricultural employment and its large share in the outflows from this sector can attest to the fact that working in agriculture can be considered by young people as a temporary job, often in a family farm. Destination of over 50 per cent of outflows in this age group was non-agricultural employment. 31 per cent of people aged under 25 who had stopped working in agriculture, became economically inactive, which most often was related to resuming education or parenthood/maternity. On the other hand, the majority of individuals over 54 years old who have found employment in agriculture was economically inactive year earlier. Economic inactivity also used to be the main destination of their outflows from agricultural employment. Therefore it can be assumed that some of the outflows were due to a temporary inability to work, and thus part of the inflows were returning to work after the break.

Figure 134. Agricultural employment inflow by age groups and the previous labor market status (the average of the years 1995-1999 and 2006-2010).

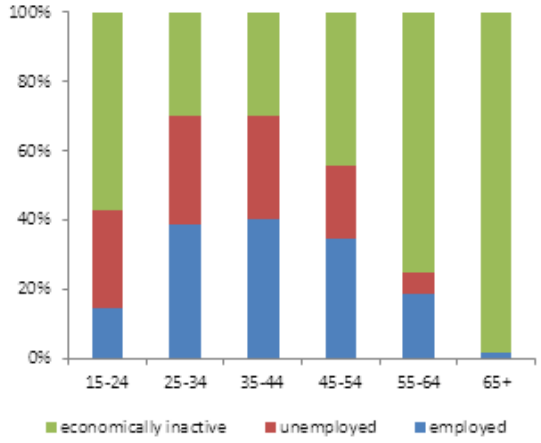
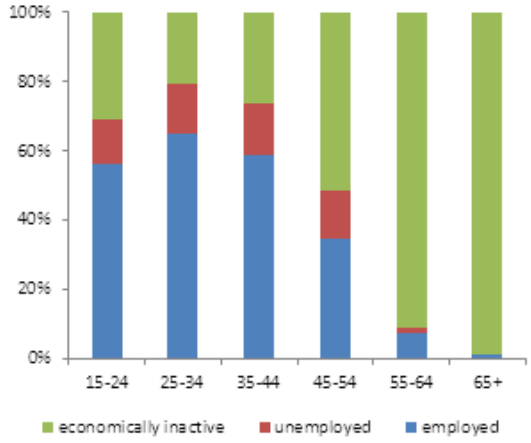


Figure 135. Agricultural employment outflow by age groups and the later labor market status (the average of the years 1995-1999 and 2006-2010).



Source: Own calculations based on LFS.

Figure 136. Agricultural employment inflows by education level attained in the 5-year periods in Poland.

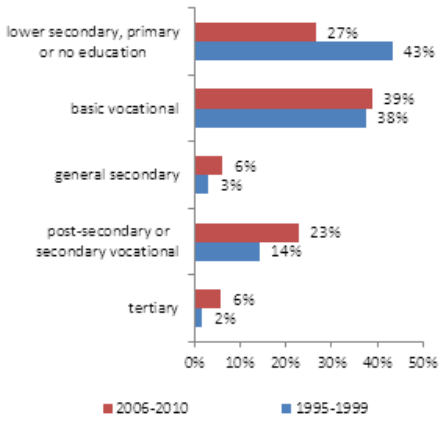
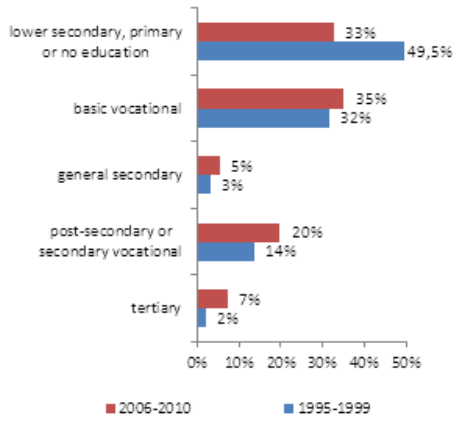


Figure 137. Agricultural employment outflows by education level attained in the 5-year periods in Poland.

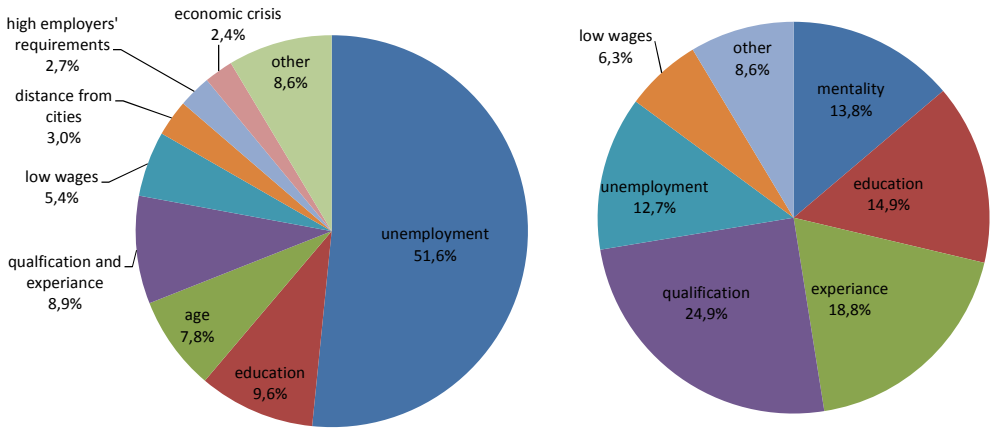


Source: Own calculations based on LFS.

Box 7. Employment barriers for farmers in Podkarpackie – case study.

The report „ Alternative for agriculture – analysis of outflow possibilities for employed in agriculture in *Podkarpackie* voivodeship" by BD Center presents quantitative and qualitative results of a field study. Based on questionnaires it presents opinions of farmers (potential employees) and employers concerning employment prospects for farmers.

Figure 138. Employment barriers according to farmers (left) and potential employers (right).



Source: Alternative for agriculture – analysis of outflow possibilities for employed in agriculture in Podkarpackie voivodeship.

According to farmers the main obstacle to enter the labor market and find a non-agricultural job is unemployment. More than 50 per cent of employees indicated the lack of vacancies as a main barrier to leave agriculture. Moreover, farmers indicate that they have not adequate education and required qualifications. The other barriers mentioned are: age (age structure dominated by old), low wages (not attractive enough in comparison with agriculture) and problems with commutation (substantial distance from cities). In contrast to farmers, who focus on exogenous aspects, employers emphasize the lack of education (most have vocational education), qualification and experience. With "mentality" (which can be thought as an attitude toward a job) it constitutes almost three-fourth of answers given by employers. In eyes of employers farmers have no expertise, experience and are resistant to change and learn new things required to work. Employed in agriculture admits that they prefer jobs in construction or manufacturing where requirements are low and it is easy for them to adapt.

3.2 Labor mobility

3.2.1 International migration

The National Census of Population and Housing 2011 indicates that around 1.94m Polish citizens were living abroad for 3 months or more. In comparison to the previous Census from 2002 it is much higher, as the figure then was 786 thousands. It is estimated that around two-thirds of emigrants have been staying in a foreign country for at least 12 months.[30] The main destination countries of emigrants (the comparison base on the stock of emigrants, not flow) were UK (30 per cent), Germany (21 per cent), the USA (11 per cent) and Ireland (7 per cent). Before the EU accession the country that had most Polish emigrants was Germany. However, in 2004 when Poland became a EU member and the UK, Ireland and Sweden opened their labor markets the inflow of emigrants to these

[30] The Central Statistical Office reports the data about the stock of temporary emigrants, that are registered in Poland, but are staying abroad for more than three months.

countries have increased. Especially the UK and Ireland were frequently chosen by Polish emigrants. At the same time, the significance of Germany and non-European countries (notably the USA) have diminished. Moreover, with the onset of the financial crisis in 2008, the relative attractiveness of Nordic states (Sweden, Norway) has increased.

Figure 139. Stock of Polish emigrants between 2002 and 2011.

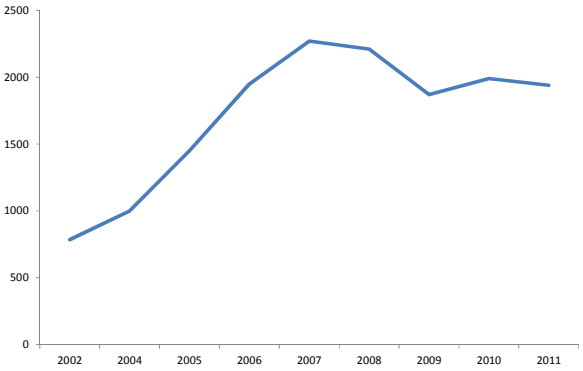
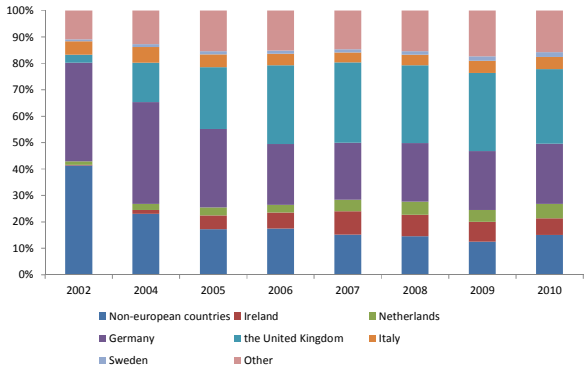


Figure 140. Structure of Polish emigrants' stock by destination country between 2000 and 2010.



Source: Central Statistical Office.

The figures concerning migrations for Poland shows a pattern (in the literature referred as a *migration hump*) of an increase in emigration during the first 3 years after the EU enlargement, then it begins to stabilize and even slowly decreases over time. Recently, the process of re-emigration has been taking place. According to the study by Centre of Migration research, the most re-emigrants during 2002-2008 came from Germany, UK and Italy.[31] However, the increased outflow of people after 2004 from Poland to the UK and Ireland will probably result in intensification of re-emigration from these countries. Other report by the same Centre suggest that the number of permanent emigrants became constant and temporary migration fell in 2009 and 2010.[32]

Emigrants are mostly young, about 83 per cent of them are at working age and 64 per cent between 15 and 45 years of age. This indicate that the typical emigrant is young or prime-aged, and mobile – in geographical and professional sense. In 2011 females constituted a slight majority of emigrants staying abroad (51 per cent), a drop in comparison to the previous national census in 2002, when the figure was 54 per cent. Almost two-third of those staying abroad for more than 3 months come from cities.

Polish emigration is driven mostly by economic factors. Finding a job abroad was the most frequently mentioned reason of emigration. Almost 73 per cent of those who answered the question about reasons of emigration in the national census indicated higher wages abroad and difficulties on the domestic labor market as a main incentives to leave Poland. For about 16 per cent of them, the main reason for emigration were family issues, like joining the family. The emigrants who were staying abroad due to participation in education totaled 6 per cent of all emigrants.

[31] „Poakcesyjne powroty Polaków" (eng. Poles' post-accession returns) edited by Izabela Grabowska-Lusińska.
[32] "Recent Trends in International Migration in Poland - The 2010 SOPEMI Report" edited by Paweł Kaczmarczyk.

3.2.2 Internal migration

In comparison to external migration, Poles relatively rarely decide to move to another region of Poland, and the popularity of internal mobility has been decreasing since the 1980s. Domestic migrants are usually more often workers and unemployed, as compared to non-movers (who have a higher fraction of economically inactive than the population of migrants). Therefore migration is frequently associated with a change of job (in the case of the employed) or leaving the labor force (the unemployed), which differs from patterns observed in the EU15, where only 3 per cent of domestic migrants leave the labor market.

Assessing internal mobility in Poland is a difficult task, because data mostly are based on the administrative registers. In the official statistics a person is counted as (internal) migrant when he or she changes formally a place of residence. But, because many people do not fulfill this obligation, the data probably underestimates the magnitude of the mobility. The mobility in 2011 between voivodeships (NUTS2) calculated on this data is about 0.2 per cent of working age population. The more reliable numbers come from Census. However, the most recent data have not been yet released. Nevertheless, it is possible to compute the internal mobility rate for 1989-2002. The census disregards regional divisions and counts people who came from different place and at the time of census are living in other place, but it can be used as an upper bound estimate (if NUTS2 are of interest). The number for 1989-2002 is about 0.9 per cent per year of total population or 1.3 per working age population.

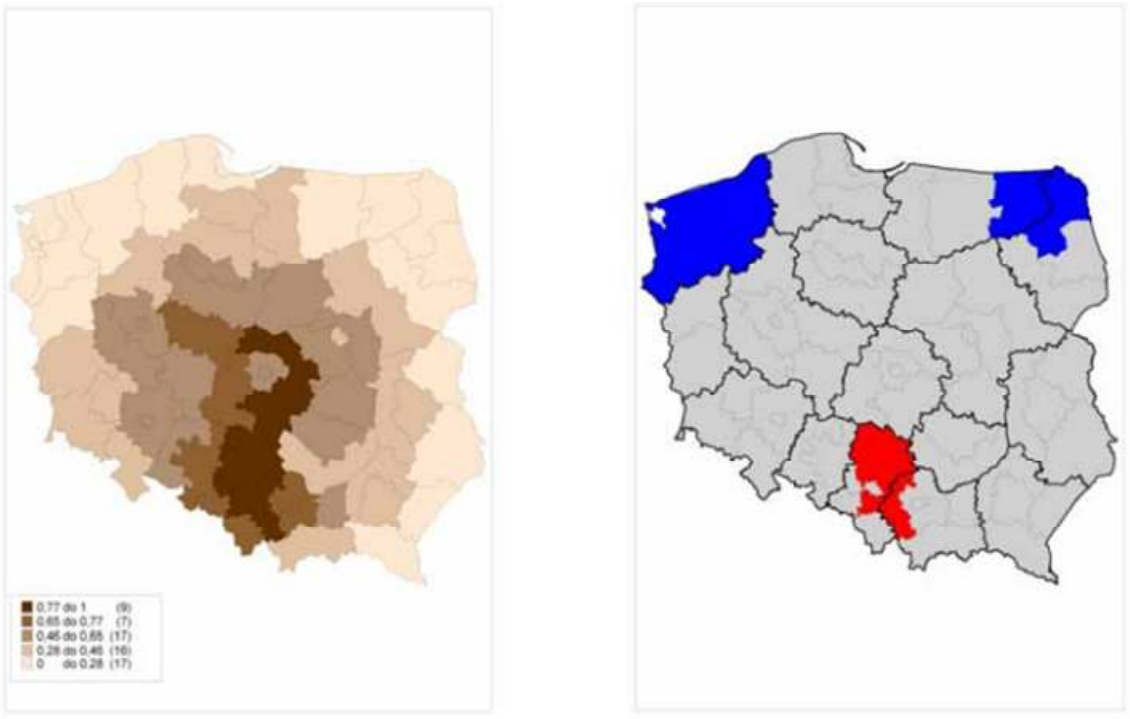
Some other sources also shows that internal mobility is low. For example, the report “Internal Labor Mobility in Central Europe and the Baltic Region“ indicates that the migration rate between the NUTS2 regions is slightly above zero. However, using the LFS it is possible to compare a place of work with place of residency from the previous year to get the number for more recent years. Despite different methodologies it is clear that the intensity of internal migrations in Poland is low.

Reports (Employment in Poland 2006) argue that Polish domestic migrations are less dependent on economic factors (e.g. unemployment rate in the local labor market) than events such as starting education or family matters. The most likely domestic migrants are young people (aged 20-29) that are getting married, men and university graduates. Despite the significant role of non-economic factors, Poles usually migrate from weakly developed regions (regions which under the communist rule were dominated by State Agricultural Farms, areas with low productive agriculture) to centres of development (cities and their neighbouring areas). They also search for apartments: low numbers of new rooms in their region increase the likelihood of their moving to a region with a high stock of apartments. Nevertheless, Poland exhibits nearly 4 times larger international than domestic migration flows (2007, Eurostat and MIMOSA data).

The low internal mobility of Poles can by partly explained by the attractiveness of international migration. It recent years it has increased substantially, mainly due to the opening of foreign labor markets, but also as a consequence of decreasing costs of taking up employment abroad, such as low-cost airlines or availability of employment information on the internet. Moreover, the recent surge in migration have led to the situation that more people knew someone who were or are currently staying in one of the EU countries and can give assistance and advice in case of a decision to emigrate. The existence of extensive social networks further lowers the cost of international economic migration.

However, several factors constraining internal mobility can be pinpointed. First of all it is the undeveloped and lacking transport infrastructure – both road and rail. It affects both the propensity to commute and to migrate. The differences in availability of transport infrastructure between regions (NUTS2) are large (Bartkiewicz, Bukowski, Regulski, 2009). The Silesia region with connections to Lodz and Warsaw stand out with the highest availability, and the regions neighboring this strand come close. To the contrary, the eastern and northern Poland are dramatically underdeveloped in this respect. Not only have they sparse road and rail network, but they lack ties with the rest of the country,[33] and have virtually no airports.

Map 3. The communication infrastructure availability index with barriers and potentials.



Source: Bartkiewicz P., Bukowski M., Regulski A., (2009).
Note: Red refers to the areas for which the infrastructure is a potential, blue – a barrier.

Moreover, the connections between the biggest and most developed cities are still relatively poor. It can be said that the only efficient connections are on the south of the country (Wroclaw-Katowice-Krakow), between Warsaw and Katowice, Warsaw and Poznan and Toruń and Gdansk. Additionally, the existing communication network between cities is disintegrated and does not cover the whole country in a balanced way. As a result this negatively influences the propensity to migrate between them and the internal mobility. However, the improvement of infrastructure is progressing.

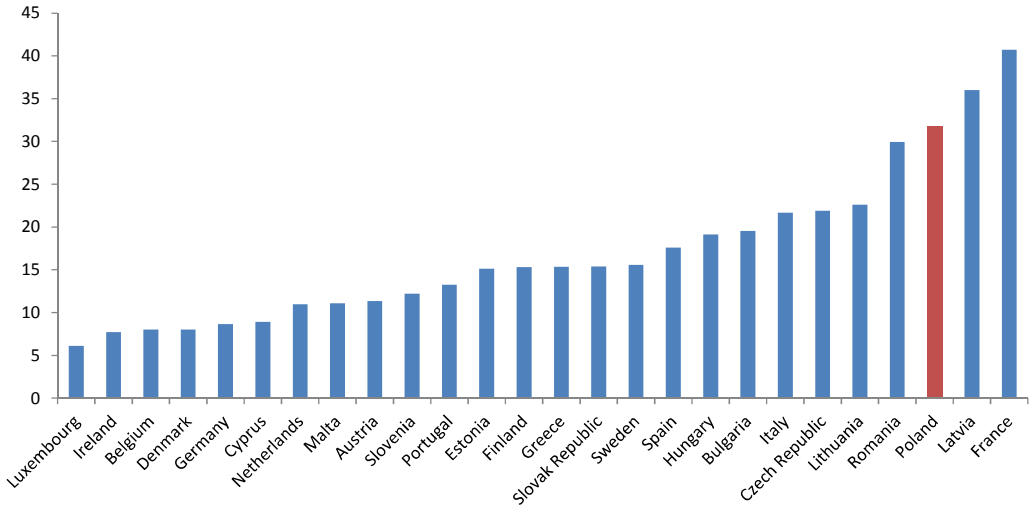
The poor availability of housing also might be limiting the internal mobility. The time needed for receiving construction permits is very high in Poland, both for business and housing constructions. Moreover, the supply of rental space is limited by the relatively high protection of renters, which creates disincentives to renting apartments, rises rental prices and increases marginal cost of moving to big cities.

[33] For example, there is no south-north communication run in the eastern Poland.

Taking into account income, Poland has one of the highest price for square meter among European countries. The ratio of price per square meter to GDP per capita multiplied by 100 in Poland reached the level above 30. Figure 141 shows that the housing costs can be a substantial barrier to mobility. An alternative to buying is renting. However, also the rent prices are discouraging mobility, as in the biggest cities (i.e. Warsaw, Cracow, Wroclaw) renting a flat for a single person amounts to about 50 per cent of the average earnings in that region.

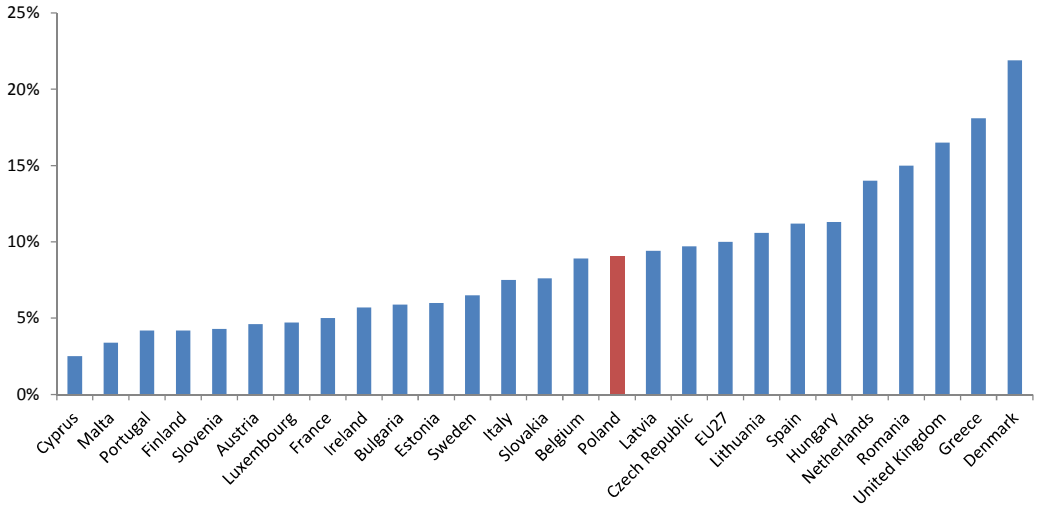
Another measure that enables comparison of housing costs among the EU is the housing cost overburden rate. It shows the percentage living in households where the (net) total housing costs represent more than 40 % of disposable income. In comparison to other EU countries, Poland exhibits a rate close to the average, however, it should be emphasized that the average was mainly driven up by 5 countries[34] with the highest rates.

Figure 141. The ratio of price per square meter to GDP per capita multiplied by 100.



Source: Global Property Guide .

Figure 142. Housing cost overburden rate in the EU in 2010 .



Source: Eurostat.

[34] Netherlands, Romania, United Kingdom, Greece and Denmark

As the examples above shows that in international comparisons Poland has rather high housing prices and costs. Nevertheless, in the context of internal mobility even more important might be regional discrepancies. Those can be substantial even between capitals of voivodeships. The highest prices are in Warsaw and they are almost three times higher than for the city (Zielona Gora) that ranked last. As in general prices are higher in more prosperous cities, moving from one city to another to improve the financial situation can involve substantial additional costs. However, as a market data collected by the real estate search engine morizon.pl show, the prices in a smaller town 50 km away from the metropolis can be lower by 60 per cent. Moreover, the difference between prosperous cities and rural areas is probably much bigger, posing a important barrier to the flows form less to better developed parts of the country.

Table 15. Housing prices in capitals of the voivodeships (in PLN).

Voivodeship	2012
dolnoslaskie	5880
kujawsko-pomorskie	4085
lubelskie	5045
lubuskie	3171
lodzkie	4203
malopolskie	7293
mazowieckie	8689
opolskie	3799
podkarpackie	4350
podlaskie	4518
pomorskie	6708
slaskie	3508
swietokrzyskie	4623
warminsko-mazurskie	4126
wielkopolskie	5303
zachodniopomorskie	5204

Source: Morizon.pl.

Another reason of low internal mobility may be commuting. For most people, commuting constitutes a more available alternative to internal migration, especially in case when the direct cost of migration is high. In this context, the lack of the affordable housing in the biggest cities in Poland is a barrier that discourage migration from rural to urban regions. On the one hand commuting can be a substitute for internal migrations, on the other it can play a complimentary role. The example of the latter is the case of suburbanization – the trend of moving households to suburban areas characterized by easier access to leisure services as well as less noise and pollution. In the Western Europe the process took place in the 70's and 80's. In Poland the beginning of these trends can also be observed in some regions of the country. It seems, however, that the process of suburbanization is currently still rather limited due to lower income level in the Polish society.

According to the data[35] provided by the Central Statistical Office more than 2.3m persons (25 per cent of all employed) were working in 2006 outside the municipality of their residence. The scale of commuting shows considerable spatial diversity and the levels varies with the chosen territorial subdivision of the country. Looking at the voivodeships, the share of the commuters living in the

[35] „Informacja o wynikach badania przepływów ludności związanych z zatrudnieniem w Polsce" - Central Statistical Office 2009.

region to all commuters in Poland ranged from 1.4 per cent (podlaskie) to 16.8 per cent (slaskie). Voivodeships with the rate above 10 per cent were also wielkopolskie (11.5 per cent), mazowieckie (11.3 per cent) and malopolskie (10.1 per cent). The share of commuters to all employed in voivodeships also varied substantially. The highest share could be observed in slaskie (25.9 per cent) and podkarpackie (24.9 per cent). On the other hand the lowest figures were for podlaskie (7.8 per cent) and lubelskie (12.4 per cent).

Table 16. Commuters by voivodeship in 2006.

Voivodeship	Working	Arrivals	Leaving	Net	Arrivals/Leaving	Arrivals/Working
dolnoslaskie	916500	178823	175946	2877	1.02	19.5%
kujawsko-pomorskie	667300	86657	92916	-6259	0.93	13.0%
lubelskie	741400	92254	103966	-11712	0.89	12.4%
lubuskie	302900	55507	57406	-1899	0.97	18.3%
lodzkie	921000	130242	145225	-14983	0.90	14.1%
malopolskie	1048600	223006	235294	-12288	0.95	21.3%
mazowieckie	2116100	335897	265373	70524	1.27	15.9%
opolskie	301900	55252	59862	-4610	0.92	18.3%
podkarpackie	654300	163040	170048	-7008	0.96	24.9%
podlaskie	394400	30571	33451	-2880	0.91	7.8%
pomorskie	690800	133145	134327	-1182	0.99	19.3%
slaskie	1543300	399755	394073	5682	1.01	25.9%
swietokrzyskie	443200	67745	74011	-6266	0.92	15.3%
warminskie	406100	53665	60823	-7158	0.88	13.2%
wielkopolskie	1257700	271822	269192	2630	1.01	21.6%
zachodniopomorskie	499900	62362	67830	-5468	0.92	12.5%

Source: Central Statistical Office.

The most popular commuting destinations are big cities. The highest flows in and out were characteristic for municipalities with developed economic infrastructure. This are mainly municipalities close to big cities, which are a part of an agglomeration.

3.3 Summary

In this section agriculture and labor mobility in Poland were characterized. Despite the number of employed in agriculture falling for several years, in comparison to the EU15 or the NMS the share of agricultural workers in total employment is still very high. Additionally, most farms have family character, use small land area and their productivity is low, about one third of the EU. The lack of bigger market-oriented farms that utilize hired workforce hinders development of the sector. The most people working in the agriculture are prime-aged, what makes the issue of overemployment even more problematic. As the analysis of flows shows even if farmers decide to leave agriculture their main outflow direction was inactivity. However, in recent years the percentage of outflows into employment in other sectors increased.

The internal mobility in Poland is low and it mostly undertaken due to not-economic reasons i.e. family issues, education etc. Partly this can be explained by attractiveness of international migration,

especially after the EU accession. The most popular among destination countries were those that opened their labor markets. Nevertheless, there are also internal barriers that hinder mobility within the country. The poor availability of housing is one of them. In international comparisons Poland has rather high prices and housing costs. Additionally, the regional discrepancies are substantial with the most prosperous cities having the highest housing prices. The underdeveloped transport and communication infrastructure is also a factor constraining internal mobility, especially in northern and eastern regions. Even the connections between the biggest and most developed cities are still relatively poor. Another reason for low internal migration might be the popularity of commuting. This concerns particularly agglomeration and nearby municipalities with developed infrastructure.

4 Institutional reforms on labor market in Poland

4.1 Abolishing the early retirement

From middle 1990s till 2004 the employment rate of 55-64 year-olds in Poland had been falling, but in 2005 the trend reversed and the expansion lasted even during the years of financial crises. At the same time the employment rate of people aged 60-64 remained roughly constant. The abolishment of early retirement scheme from 2009 on, increased effective age of retirement and as a result contributed to an increase of labor supply and employment of people aged above 55. Figure 1 shows how the anticipation and subsequent implementation between 2007 and 2008 impacted on the inflow of workers to the pensions system. In 2009 the figure declined and remained at the lower level in following years. At the same time activity rate and the average age of persons retiring, especially in case of women, increased. However, even despite the reform male average retiring age hasn't converged to statutory retirement age yet. This can be explained by special sectoral rules (eg. in mining sector, police, military forces, judiciary) and the fact that people who earned early-pension entitlements in 2008 are retiring few years later. Nevertheless, the reform had a profound impact on employment rate of older workers, with their unemployment rate remaining below the national average. Moreover, in line with the reform of the retirement age introduced in 2012, it is going to be gradually increased from 2013 on, to 67 years for both men (in 2020) and women (in 2040). This should translate into further rise in activity and employment of 55-64, and older age groups.

Figure 143. The number (in thousands) of women (left figure) and men (right figure) granted a pension by age and the average age of persons retiring between 1999 and 2011 (in years).

Source: Own calculations based on ZUS (Social Security Institution) data.

For a long time, welfare reforms in Poland were not tackling the ageing issue, to the contrary, since middle 1990s various paths into effective early retirement (disability pensions, pre-retirement assistance and benefits, early retirement benefits) were contributing to declining participation of people aged over 45. Social transfers targeted at people of working age on the basis of labor market reasons amounted on average to nearly 5 percent of GDP in Poland in 1996-2005. This was one of the highest spending levels in the OECD.[36]

[36] Since 2000, this share has been rather stable. Moreover, the structure of transfers to people of working age in Poland was different from most OECD countries - relatively more funds were spent on pre-retirement schemes and early pensions, thus creating incentives for leaving the labor market. The abolition of early

As the figures 2 and 3 show a gap in average effective retirement age and employment rates of 55-64 age groups between the EU countries and Poland was substantial. The reasons of the weak progress in employment of people aged over 55 have been mainly institutional, because Poland experienced rather mild slowdown during the financial crisis. As the correlation between the average effective retirement age and employment rate of older people in Europe is positive, especially for women, low employment rates in Poland have been associated with low effective age of leaving the labor force, which in turn was related to low statutory retirement age and various early retirement options.

Figure 144. Average effective retirement age and employment rate of women (left panel) and men (right panel) aged 55-64 in the EU countries in 2000 (per cent).

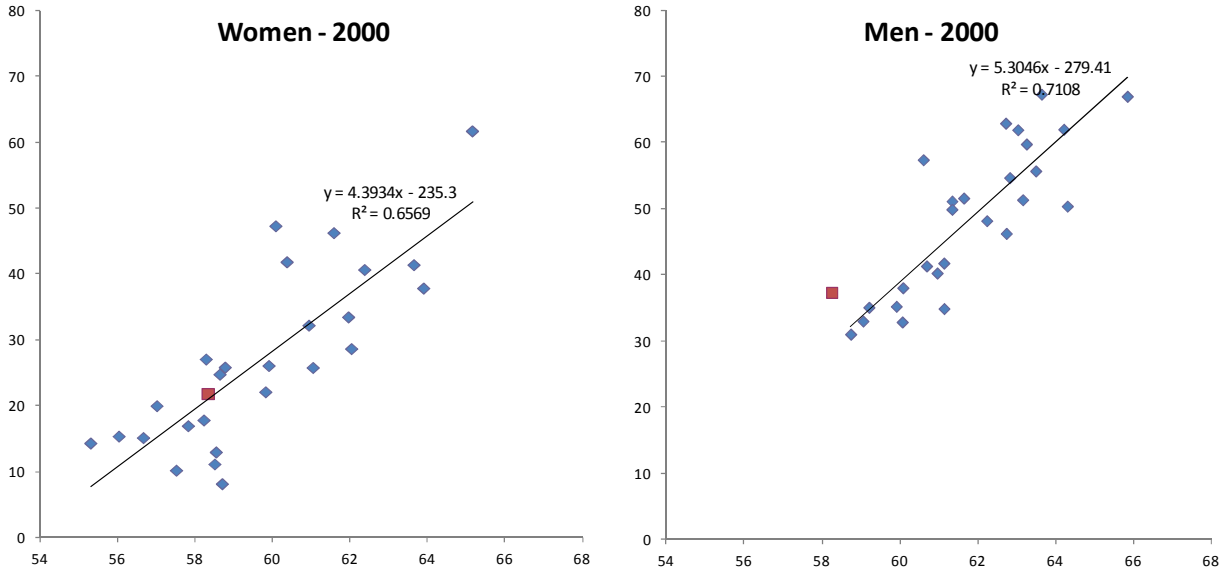
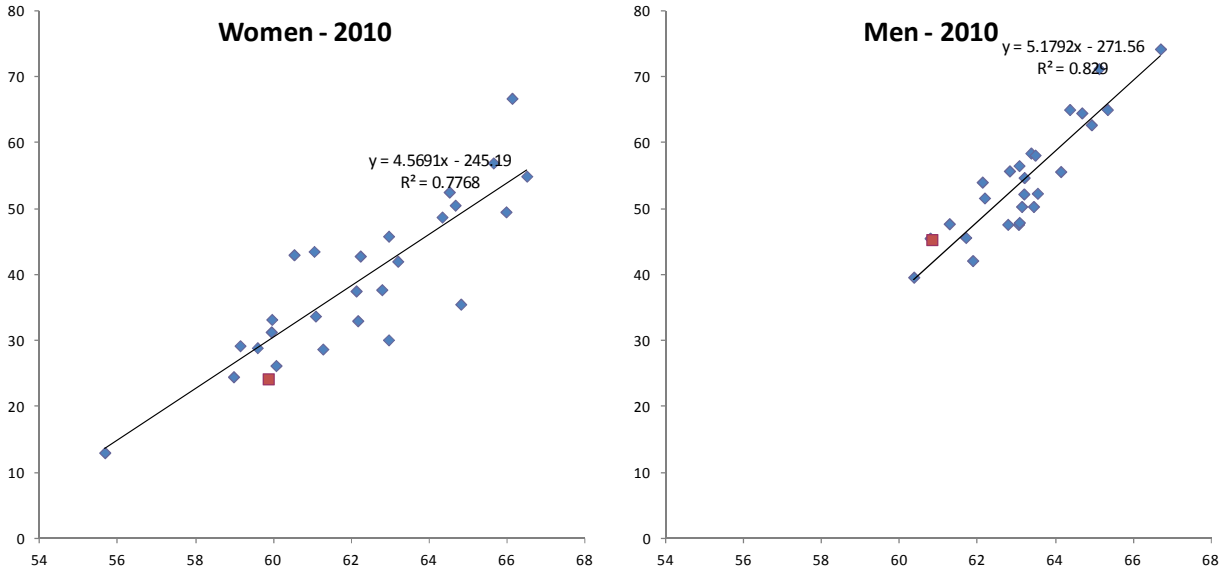


Figure 145. Average effective retirement age and employment rate of women (left panel) and men (right panel) aged 55-64 in EU countries, 2010 (per cent).



Notes: The red square denotes Poland.
Source: Own calculations based on Eurostat data.

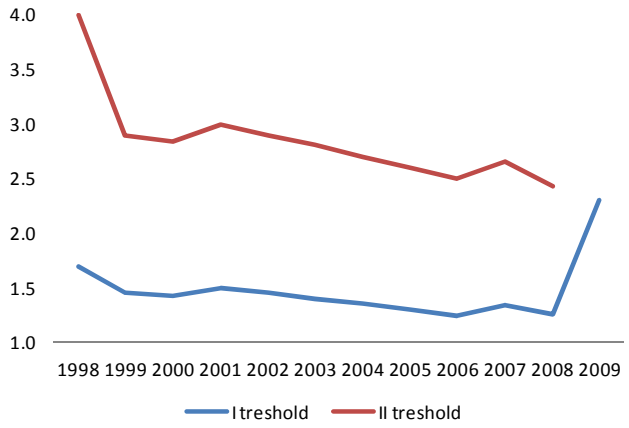
pension schemes in 2009 should result in convergence of the spending structure to the one dominant in the OECD.

4.2 Changes in labor taxation

The effective income tax burden on labor was increasing in Poland during the last decade. This happened mainly due to tax thresholds being held stable in nominal terms. Taking into account inflation and the average wage growth, the income tax wedge went up without changing the tax rates. Between 2001 and 2006 the first and second tax threshold were set at the same level, while at the same time average nominal wage increased by about 20%. In 2007 the first threshold was raised by about 17% and the second by about 15%, in 2008 respectively by 2.5% and 0%. According to OECD data, until 2006 tax wedge in Poland had been rising, as a result of freezing, in nominal terms, thresholds of the tax schedule. When the thresholds were changed, the average tax wedge dropped by more than 2.5 ppts.

In 2009 new tax law was implemented that reduced three tax brackets (19, 30 and 40%) to two (18 and 32%). The tax threshold for the second bracket was set at the level of previous second bracket. This change has mostly decreased the taxation of middle-earners (above 4300 PLN per month). As a result, not only the average wedge but also its progression decreased in 2009 in comparison with 2000, which was opposite to changes introduced in most OECD countries.

Figure 146. Relation of first and second threshold to average yearly nominal wage in the period 1998-2008.



Source: Institute for Structural Research calculations

Between 2007 and 2012 not only income taxes, but also disability insurance contributions were changed. In 2007 and 2008 the disability insurance contributions was reduced by 7% age points from 13% (by 3 ppts. in 2007 and 4 ppts. in 2008), mostly on employees side (5 ppts. reduction from total 7 ppts.). This reduction was partly withdrawn in 2012, when the disability insurance contributions were raised from 6% to 8%, in response to budgetary problems – in fact, the disability fund was roughly balanced before reduction of contributions in 2005, and went into red therafter.

The overall taxation of labor, i.e. the ratio of the sum of income tax and social security contributions paid by the employee and employer, to gross wage, was slightly lower in Poland in 2009-2011 than the average in the OECD.[37] The difference in the tax wedge between Poland and other European

[37] Both in the case of single earner household and a one-earner couple with two children.

countries however varies for different income groups - whereas for a single earner it was 7.5 ppts. lower than the EU15 average, the difference was less than 5.5 ppts. for working couples with two children. According to the OECD (2009b), the tax wedge progression in Poland in 2009 was the lowest in Europe – the difference between the wedge on highest incomes (a single person, earning 167% of the average wage) and the lowest incomes (a single parent with two children, earning an average 67% of the average) was only 6.5percentage points.[38] OECD (2009b) estimates that 99% of Polish taxpayers pay the basic income tax rate (18%), which makes the income tax almost flat. The progression declined mainly due to changes in the tax system introduced between 2007 and 2009

According to OECD data, the tax wedge in Poland since 2000 declined in all family-income groups, largely due to changes in the tax system introduced between 2007 and 2009. A parallel trend was also observed for the average tax wedge in all countries of the European Union and OECD, but it was not as pronounced as in Poland.

4.3 Active labor market policy

Labor market policy is financed by the contribution of 2.45% of gross wage of workers, which is paid to the Labor Fund which is responsible for passive policy and distributes the funds on active policy to PES which operate at the poviat (NUTS4) level. Research on the effectiveness of programs of active labor market policies in Poland is scarce, but the existing studies indicate that the effectiveness of the programs implemented by the labor offices is moderate, or even low. Regional labor offices have discretion in allocating the financial resources to the specific instruments and groups in the labor market. As a result considerable resources are spent on expensive instruments (such as a grant to start a business, grants and training of various kinds, such as time post-graduate studies), often ignoring the needs of the majority of the unemployed and employers. As a consequence, although the resources for active labor market policy in the period 2004-2010 increased mostly due to EU cohesion funds (in real terms more than doubled) and the number of unemployed in the same period fell by almost half (over 1.5 million people), in 2010, the activation programmes covered about 30% of persons registered in labor offices.

Table 1. The structure of the Labor Fund expenditures in 2005-2011, constant prices of 2010. [million pln]

Expenditures type:	2006	2007	2008	2009	2010	2011
Unemployment and pre-retirement benefits		3657	2709	2259	4844	5418	4760
Active labor market policies	2485	2652	3375	3669	5708	6284	2421
Specializations and internships for doctors, dentists, nurses and midwives	0	0	0	0	586	718	690
Other tasks	641	560	436	595	600	674	615
In total	7082	6871	6522	6525	11739	13096	8584

Source: Own calculations based on implementation reports of the state budget for the years 2005-2011

The abundance of funds available for ALMP and improvement on the labor market after 2005 allowed a large dispersion of expenditures on different forms, with the bulk of the actions often addressed to the relatively better educated and more entrepreneurial unemployed. In the case of co-financing dentists, nurses and midwives, even addressed to employees. There has been no significant

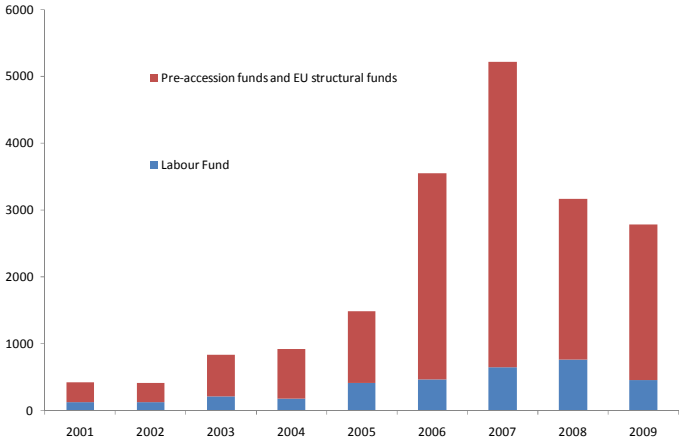
[38] Only Spain had a comparably low difference (10.2 ppts.); and the average for all the European countries in the samples was almost 25 ppts..

reform of organisation of the system, distribution of funds and no introduction of efficient guidelines, no regular net impact measurement. The spending was cut in 2011 by Ministry of Finance (which determines the spending limit of the Labor Fund, although it doesn't interfere with what the funds spends on) so the Fund had a surplus.

4.4 Lifelong learning and adult education

For many years supporting lifelong learning has been placed very low on the list of priorities of Polish socio-economic policies. However, as Poland has begun preparations for accession to the European Union, the situation began to change. Funds for the development of human capital have been steadily growing ever since. In 2004, after the Polish accession to the EU, the country gained access to a great amount of assistance from the Structural Funds. In addition, the domestic resources (part of the Labor Fund) aimed at funding education also increased.

Figure 147. Public financial support for lifelong learning in Poland [million PLN].[39]



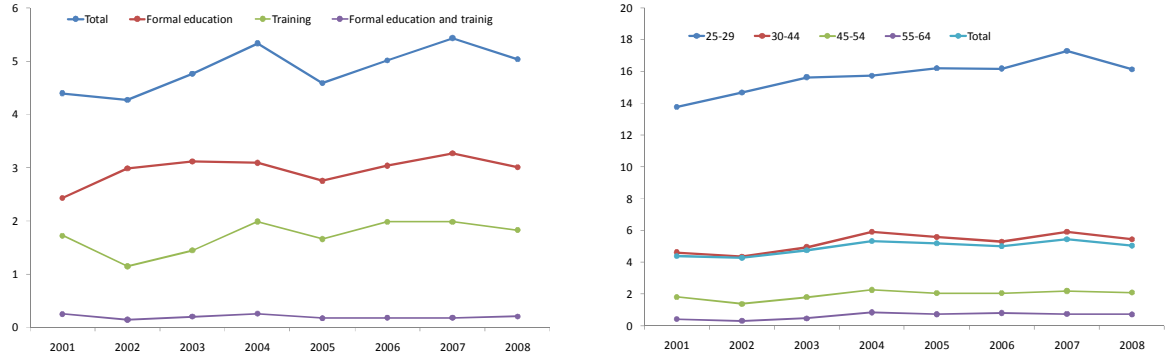
Source: Employment in Poland 2008.

Figure 5 shows the estimates of the on financial support for the life-long learning of the public in Poland. The amount of funds devoted to lifelong learning has increased substantially since 2002 (from approximately PLN 400 million in 2001 and 2002, to about PLN 5 billion in 2007). In the nearest future a further implementation of EU funds will portably stabilise the amount of public expenditures for development of human capital at the level of PLN 2.5-3 billion annually.

However, there still exist disproportions between Poland and many EU countries (especially the EU15) in the lifelong learning that are caused by differences in policies. In this case financial issues do not pose significant problems. Despite the fact that Polish expenditure on lifelong learning increased substantially during last decade and are close to that of the EU countries educational activity of adults did not reacted to those change. The lifelong learning participation rate of adults stayed almost at the same level. The reasons of this state of affairs is not the amount of funds involved, but the shape of policies. The human capital funds were mainly directed to educational institutions and participants had little impact on training and programs. This lead to rising training costs, but did not increased the number of trainees.

[39] 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

Figure 148. Lifelong learning participation rates in 2001-2008, 25-64 age group, by type of learning (left figure) and age groups (right figure).



Notes: Vertical axis indicates the percentage of people participating in lifelong learning in a selected category.
Source: Employment in Poland 2008.

4.5 Unemployment benefits

In 2010 the unemployment benefits , which used to be flat, were replaced by benefits decreasing with time. For the first three months unemployed receives higher benefits and for the next three months lower. The amount of cash for the second period is lower by about 20%.

In most cases, the unemployment benefit is granted for a period of 6 months. This occurs when the unemployment rate in the NUTS4 region does not exceed 150% of the average unemployment rate in the country. Benefits are granted for 12 months to unemployed registered in the NUTS4 regions where the unemployment rate exceeds 150% of the national level. In addition, entitlement to unemployment benefit for 12 months is granted to the unemployed:

• over 50 years of age who possessed at least 20 years of entitlement to benefits,

• who keep at least one child under the age of 15 years, and his/her spouse is also unemployed and has lost his right to benefits due to the termination.

Unemployed, which is proposed to take up employment, other paid work, training, apprenticeship, adult vocational training, intervention works or public works, loses benefits if he refuses to accept the offer without justification. The strictness of implementation of this rule has improved over the last decade. However, unemployment benefits are paid to relatively low share of all unemployed (usually between 12 and 18%, 16.8% in December 2012) so the impact of benefit reforms on total unemployment pool and job search is quite limited.

On the other hand, considering the fact that activity rate in Poland is one of lowest in Europe, there is a need to activate those economically inactive. However, there were no reforms of social assistance system that in general puts no requirements on labor market search. Social policy is run at commune (NUTS5) level so in practice cooperation of social policy offices with PES is very rare. This is likely to create unemployment (or rather non-working) traps.

4.6 Minimum wage

The amendment of 1 July 2005 introduced new rule of setting the annual guaranteed minimum wage growth – the increase should account for projected inflation, and 2/3 of projected real growth rate of GDP (unless is negative), as long as the minimum wage is less than half the average wage in the economy. From 2006 the minimum wage has been set in accordance with new rules. Since then the minimum wage went up substantially in relative and absolute terms. Before 2006 it was about 35% of the gross average wage, but since 2008 it has been above 40% of average wage. However, in poorer regions (Lubelskie, Podkarpackie, Lubuskie voivodeship, NUTS2) it is already over 50% of the average wage, whereas in the most affluent region (Mazowieckie) it is below 30%, and in others most developed (Dolnoslaskie, Pomorskie) it is around 35% of regional average.

Figure 149. Minimum wage to gross average wage.

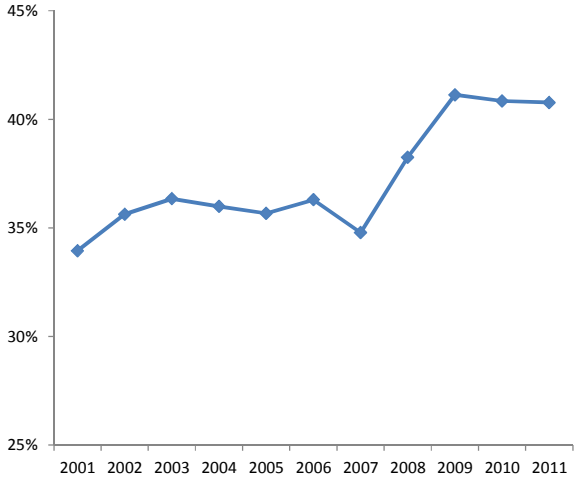
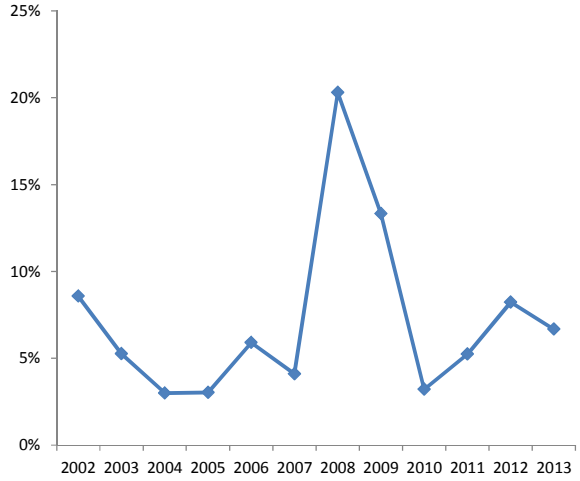


Figure 150. Nominal minimum wage growth rate.



Source: Central Statistical Office.

4.7 Labor code

There were no fundamental changes in the employment protection legislation in Poland in the 2000s. Interestingly, the increase in incidence of temporary work, in particular fixed term contracts, has occurred without any important flexibilization of rules applying to fixed-term contracts, nor increasing protection of employees working on open-ended basis. The coexistence of these developments suggests that despite the relatively moderate restrictiveness of regulation on open-ended contracts, creation of jobs contracted on permanent basis has been weak. It is therefore advisable to examine the adequacy of these regulations to labor market requirements and the expectations of agents.

The regulations on indefinite duration contracts are relatively liberal in Poland; the high value of the composite OECD EPL index is mainly due to strict regulations on fixed-term contracts, including temporary agency work. Employment protection in case of open-ended contracts in Poland might be described as moderately restrictive - the lengths of the notice period or severance payment in Poland are relatively low. As in all other post-communist states, the restrictions imposed on collective redundancies are relatively high, which can be perceived as a result of efforts to prevent massive employment reductions after the privatization of state enterprises in the 1990s.

According to the LABREF database, in 2002-2004 a number of reforms relating to each of the three aspects of the OECD EPL index were carried out in Poland, yet the overall impact of these changes was ambiguous. For example, in 2002 the rules relating to fixed-term contracts were softened, and the maximum duration of such contracts (the number of permissible renewals) was abolished. However, the requirement to convert the third such contract (spanning at least 12 months) into a permanent contract was restored in 2004,[40] and was soon accompanied by a bill limiting the maximum total duration of employment of a given temporary agency worker in a specific firm to 12 months over a 3 year period. Another important change in recent years was the liberalization of rules on collective redundancies. On balance, though, the changes resulted in an increase of overall restrictiveness of employment protection in 2000-2008, which contrasted with the general trend towards liberalization observed in the OECD countries. Although in 2000 the EPL index in the Poland was notably smaller than the average for OECD countries, a few years later the restrictiveness of employment protection reached the OECD average.

There is an important ban on lay-offs of older workers, those who are to reach the retirement age within 4 years. It is protecting older workers, but also discouraging hiring them. No attempts has been undertaken to remove this rule.

The amendment of the Labor Code in 2007 defined telework as a separate form of work: as a full-time work outside the office and in a particular place, not necessarily at home. This means that the legal status of people, who work outside the office for the part of their working time, seem to be unspecified. Moreover, the law obliges the employer to provide employees with equipment (and even equipment insurance). On the other hand the regulation give employers the right to control employees working at home. This formalization of teleworking may discourage both employees and employers from this form of employment.

4.8 "The anti-crisis pact"

The aim of the "anti-crisis" Act of the 1st of July 2009 was to mitigate the negative effect of economic slowdown on employees and employers. One of the areas that the Act should have an impact on economic conditions of companies was the possibility of subsidies covering the costs associated with a reduction of hours of work or a temporary stoppage of employment. However, only 162 firms met the criteria of the Act and as a result the regulation concerned only 0.07% of total employed. The scale of the intervention was probably too small to have any significant economic impact.

Moreover, the implementation of the Act introduced a possibility for companies to manage their work force more flexibly. The hours of work settlement period was extended to a maximum of 12 months. Additionally, employers could set varying number of hours for each employees from month to month by establishing individual work schedule. The regulation also set the maximum period of successive fixed-term contracts to 24 months.

With the Act it was possible to finance trainings and postgraduate level courses for employees of companies having temporary economic difficulties. This support was available for up to six months in case of training and up to twelve months in case of postgraduate courses. The total absolute

[40] It was restored when Poland joined the EU.

numbers are however small as only 491 individuals took part in training financed through the Act and no aid was granted in case of postgraduate studies.

To sum up, the Act had probably a limited impact on the whole economy as the scope of the programme was insufficient and the regulatory changes were minor. The Act was temporary binding (till 2012), nevertheless, there is a discussion to prolong it.

4.9 Reducing the complexity of setting up a business

In cross-country comparisons of business friendliness Poland fares moderately and rather poorly within the EU. In most cases the indices for Poland improved in last years, but the changes are modest, especially in comparison to some countries of the central-east Europe. As the countries with similar development level made improvements much faster, Poland was left behind and was often perceived as one of the least business friendly economies in the EU.

Doing Business report ranked Poland 55th in 2013 (74th in 2012). The overall performance is affected negatively especially by three areas: starting a business (124th), dealing with construction permits (161st) and paying taxes (114th). This shows the problem of overregulation, as it takes about 32 day to set a business, in comparison to 12 on the average in the OECD countries. Additionally, the cost of starting a business as percentage of income per capita is also about three time higher than in the OECD countries on the average (14.4 in Poland, 4.5 in the OECD).

However, there are some improvements like the reduction of number of procedures required to start a business (similar number as the OECD average), but it did not translate into shorter period required to set up a company. Nevertheless, there were substantial improvements in categories: resolving insolvency (form 91st to 37th) and enforcing contracts (from 84th to 56th). As a result of those positive changes Poland in the Doing Business 2013 report was announced a top improver. However, we are not able to assess the economic impact of these changes yet.

Similar patterns of small improvements can be observed using Index of Economic Freedom. According to Heritage foundation Poland is moderately free in terms of economic freedom, but in recent years the score has slightly improved. In the Global Competitiveness Index Poland was ranked 41st in 2012-2012 edition and the same in 2010-2011.

Poland has also relatively high number of regulated professions – according to European Comissio data, 380 professions are regulated in some way in Poland, the highest number in European Union. Currently there are projects being considered to reduce regulation on some professions, but they are still in progress.

4.10 Public investment and the crisis

The surge in public investment in the period of the financial crises cushioned the economy from the negative shock. High demand of public sector propped up the overall demand in the economy. Without funds spent on investment Poland would have been affected (with lower growth and employment) by the subprime crisis much more than it actually was.

IBS' assesses using EU Impact Mod DSGE model that EU funds have significantly contributed to Poland's convergence with the EU – GDP in the first half of 2012 was by 7.4% higher than in scenario without any funds. About half of this impact is attributed to infrastructure spending (mainly investment in transport and communication infrastructure), and the other half to investment in human capital and direct support to enterprises (with similar impact of both measures). This translates into significant impact on the labor market, with unemployment rate being lower by about 3 ppts., and employment rate being higher by about 4 ppts. than in the scenario without EU funds.

Annex

Regression of the logarithm of wages by sectors in 2010.[41]

Variables	Both sectors	Public	Private
Unemployment in the province	-0.0323***	-0.0273***	-0.0345***
Job tenure	0.0199***	0.0337***	0.0165***
Job tenure ^2	-0.0008***	-0.0013***	-0.0008***
Job tenure ^3 (/100)	0.0011***	0.0015***	0.0014***
Age	0.0149***	0.0109***	0.0226***
Age^2	-0.0002***	-0.0001***	-0.0003***
Woman	-0.1582***	-0.0974***	-0.1891***
Higher education	0.3603***	0.3371***	0.3665***
Post-secondary education	0.1140***	0.1085***	0.1022***
Secondary education	0.0925***	0.0862***	0.0850***
Primary education	-0.0040**	-0.0243***	-0.0002
Manager and higher civil servant	0.5909***	0.5458***	0.5819***
Specialist	0.2832***	0.2462***	0.2920***
Technician	0.1526***	0.0884***	0.1702***
Office worker	0.0227***	0.0096***	0.0107***
Personal service provider and seller	-0.1381***	-0.0861***	-0.1584***
Farmer and fisherman	-0.1882***	-0.1486***	-0.1521***
Machine operator	0.0250***	0.0532***	0.0072***
Workers doing simple works	-0.0990***	-0.1582***	-0.1052***
Private sector	-0.0065***	:	:
Agriculture, hunting, forestry	0.2061***	0.4042***	0.1090***
Mining	0.5721***	0.6217***	0.5928***
Manufacturing	0.0753***	0.1325***	0.0729***
Production and supply of electricity, gas, water	0.2092***	0.2475***	0.2441***
Construction	0.0934***	0.2825***	0.0950***
Wholesale and retail trade	0.0996***	0.1673***	0.1147***
Hotels and restaurants	0.1054***	0.0882***	0.1316***
Transport, storage and communication	0.0968***	0.1020***	0.1154***
Financial intermediation	0.2519***	0.3578***	0.2359***
Real estate and business support	0.0288***	0.1068***	0.0272***
Public administration and defense,	0.1139***	0.1552***	0.5592***
Education	0.0052	0.0019	-0.0867***
Health care and social assistance	-0.0398***	-0.0210***	0.0774***
0-19 employed	-0.1410***	-0.0246***	-0.1776***
20-49 employed	-0.0330***	-0.0107***	-0.0559***
100-249 employed	0.0754***	0.0256***	0.0964***
250-1000 employed	0.1697***	0.0840***	0.2058***
Above 1000 employed	0.1897***	0.1604***	0.2054***
Indefinite term	0.0884***	-0.0206***	0.1399***
Fixed term	-0.0425***	-0.0920***	-0.0019
For the probation period	-0.0731***	-0.1195***	-0.0527***
Job seniority in the workplace	0.0124***	0.0112***	0.0132***
Job seniority in the workplace ^2	-0.0004***	-0.0005***	-0.0004***
Job seniority in the workplace ^3 (/100)	0.0003***	0.0007***	0.0003***
0-0,25 time	-0.0780***	-0.0846***	-0.0991***
0,25-0,5 time	-0.0362***	-0.0548***	-0.0220***
0,50-0,75 time	-0.0415***	-0.0674***	-0.0167***
Sectoral collective agreement	0.0153***	-0.0026	0.0164***
Firm-level collective agreement	-0.0056***	-0.0231***	0.0088***
Constant	7.4429***	7.4072***	7.3285***
Adjusted R^2	0.5247	0.5911	0.4901
Number of observations	688 383	337 211	351 170

[41] As a reference for dummy variables: sex - male, education - vocational, occupation - industrial worker or craftsman, section - other service activities, number of employed – 50-100, working time system – full-time, labour arrangement – non-collective, contract – specific-purpose contract. *** means significance at 1% level.