The minimum pension as an instrument of poverty protection in the defined contribution pension system – an example of Poland

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The minimum pension as an instrument of poverty protection in the defined contribution pension system – an example of Poland

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Abstract

Pension systems' reforms are often related to a shift towards (fully or partially) defined contribution systems, in which the pension distribution reflects to a larger extent the wage distribution. Additionally, relatively shorter working lives of those that have lower earnings, increase the risk of receiving lower benefits.

The aim of the paper is to present the changing role of minimum pension as a tool of redistribution in Poland after the pension reform. The new mandatory pension system covers workers born after 1948 and is based on two components – notional and funded defined contribution (NDC and FDC). It replaced the old defined-benefit PAYG system, which had a significant redistribution through the pension formula. The formula itself served as a tool of low income protection, that was additionally strengthened by the minimum pension guarantee. The new system aims at actuarial fairness, which means that the only mechanism of redistribution is the minimum pension, financed from general taxes.

As a result of this change, grater income inequalities of pensioners following those of people in working age are expected. This means a change of the role of the minimum pension from one of the tools supporting redistributive policy to the main tool of social policy preventing poverty among elderly persons.

The minimum pension is expected to fall compared to average wage. The decision on its level and evolution becomes one of the most important policy questions. It will have crucial importance in preventing poverty in the old-age. Simulations are used to present the impact of changes in the pension distribution on the number of pensioners covered by minimum pension.

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[3] The authors would like to thank Social Insurance Institution, in particular Ms Hanna Zalewska, Head of Statistics Department and Ms Izabela Tomczyk for providing data and information for the preparation of this paper. We would like to thank the Chamber of Pension Funds in Poland for its support.

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Introduction

In the ageing world, pensions systems' design frequently evolves towards systems that are based on actuarially neutral principle. Notional-defined contribution (NDC) scheme is an example of such change, introduced in Italy, Sweden, Poland and Italy. Holzmann and Palmer (2006) describe the design features of the NDC that make them desirable, compared to the counterfactual design of the defined benefit scheme. First, NDC's are fair in the sense that two persons from the same birth cohort who make the same contributions into the scheme in the same period can expect to receive the same pension right for these. Second, a generic NDC is, in principle financially stable. The system is geared to maintain long-run equivalence between assets and liabilities at an unchanged contribution rate. The former means that NDC scheme is a mechanism for income allocation over the life-cycle, which has less distortive effect on the labour market. The latter feature is particularly important in the light of population ageing, when changing age structure of the population will create additional fiscal pressure on pension systems.

However, a shift towards NDC, or generally, defined-contribution scheme, regardless the financing mechanism, also means that the distribution of future pensions to a large extent mimics the distribution of wages, as there is no income redistribution in the pension formula. As a result, those with lower wages and shorter working careers, can expect pensions that represent lower fraction of their earnings compared to most of the defined-benefit systems.

In that light, the need for a design of the mechanism in the pension system that can offer protection against poverty in the old-age becomes an important component of the overall pension scheme design. Chłoń et al (2001) point out that there is an inherent conflict between the objective of reducing distortions caused by the pension system on the labour market and the goal of providing adequate income. This conflict forces each country to develop its own structural compromise, which reflects its own unique social history, economic situation and political preferences.

Countries deal with this problem through one of the five different approaches or some combination of them. These include: (i) citizens' pensions; (ii) contributory, flat pensions; (iii) progressive benefit formulae; (iv) minimum pensions and (v) income-tested supplements. The issue of providing adequate income protection for the old-age plays an important role in the international debate. Answers to that challenge depend highly on countries' characteristics. This ranges from the issue of assuring the adequate coverage of pension systems, in particularly in the developing countries, to the goal related to the adequacy of pension levels, which has been formulated in the pension strand of the social Open Method of Co-ordination in the European Union.

Poland, on its way to reform the pension system from defined-benefit to defined-contribution based, also changed the design and role of its minimum pension guarantee. Yet, the level of minimum pension guarantee and the rules for its uprating have not changed. This means that with time, the population at risk of falling below the minimum pension level will decrease, mainly due to the relative decrease of the level of the guarantee. In the paper, we aim to estimate the impact of individual characteristics (such as length of working career and wage history) as well as minimum pension level on the probability of receiving the minimum pension.

In the first section we present the current design of the minimum pension guarantee in Poland. In the second section, we present changes in the level of minimum pension and changes in the recipiency rate over the past decade. We also compare the evolution of the minimum pension level compared to average wage as well as poverty threshold in Poland. In the third section, we present projections of the future level of minimum pension, depending on the development of the wage level. In the third section we present results of microsimulations of future pension levels, with particular focus of the impact of wage level and work history as well as pension system's performance on the future pension level. We also analyse, based on mircosimulations, the potential risk of falling below minimum pension level over time. Finally, we provide some conclusions and recommendations regarding the development of the minimum pension guarantee in Poland in the future.

1. The minimum pension in Poland – design, level and recipiency rate

In this section, we present the design of the minimum pension guarantee in the old and new pension systems. We also present the historical development of the value of minimum pension and number of pensioners receiving minimum pension in the past years. These reflect mainly the result of guarantees in the old pension system, as all pensions granted until the end of 2008 were based on the old systems' rules.

1.1. Design of the minimum pension guarantee in the old and new pension schemes.

The new pension system in Poland, introduced in 1999, also changed the design and financing of the minimum pension. The new system firstly moved towards a defined contribution scheme, which means that future pension levels will be linked to lifetime history of contributions, with earned interest. Also the financing of the new pension system changed. The old-age contribution (19.52% of wage) was split between two accounts.

The first one, NDC account, is held in the social insurance institution. The contribution of 12.22% of wage is recorded on the individual account in the NDC scheme and earns an interest rate equal to the change in the overall contribution revenue, which represents the changes in the covered wage bill growth. The second one, FDC account, is held in an open pension fund, that invests assets on the financial market. Each month, a contribution of 7,3% of wage is transferred to the chosen pension fund. The FDC account earns a rate of return that is linked to the financial market performance.

The resulting old-age pension is calculated based on the value of accumulated assets in both accounts and unisex life expectancy at retirement age. Thus, there is no progressivity or redistribution in the pension formula, apart from the one resulting from differences in life expectancy of men and women. The minimum retirement age is different for men and women. Women can retire from age 60 and men from age 65[4]. This means that the individual replacement rate for persons retiring at the same age, whose individual pension relative to average pension was relatively stable is constant. That means, that those that earn 50% of average wage and those that earn 200% of average wage can expect to receive the same

[4] Detailed description of the new pension system in Poland is included in: Góra and Rutkowski (2000), Chłoń, Góra and Rutkowski (2000), Chłoń-Domińczak (2002).

proportion of their earnings at retirement. As a result, the distribution of pension level should follow the distribution of earnings, and differences will be due to different wage levels, length of work and differences in retirement age. It should be noted, that different retirement age of men and women can lead to a significant disproportion of men's and women's pensions. Women, retiring five years earlier will have not only lower retirement age, but also shorter working career. Combining that with lower wage level, due to gender wage gap, the risk of low pension benefits will be higher for women in the future.

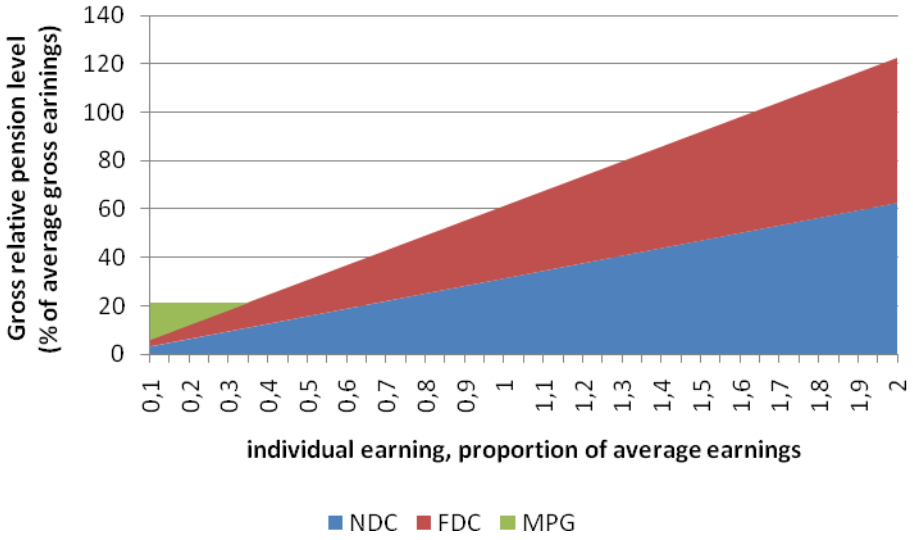
The new pension system covers workers and self-employed[5] that were born in 1949 or later. In this group, those born between 1968 and 1949 had an option whether to split their contribution between NDC and FDC account or have only NDC account. All pension rights accrued before the end of 1998 (prior to reform implementation) were recalculated into the initial capital, credited to the NDC account.

In the new pension system, the minimum pension guarantee is detached from contributory financing and moved to the state budget and general revenue financing. If the total pension (a sum of NDC and FDC pension) is below minimum level, then the pension is supplemented by the minimum pension guarantee, which is financed from the state budget. This is subject to the eligibility criteria, that is achieving minimum retirement age and work experience of 20 years for women and 25 years for men.

As a result, the two objectives of the pension system: income allocation over the lifecycle and providing protection against poverty at old age are separated and also based on separate financing. The latter has a broader base, similar to other benefits targeted at income support of low-income citizens.

Thus, there are potential three sources of financing of the old-age pension in the new system: minimum pension guarantee from the general revenue, NDC pension financed from the pay-as-you-go system revenues and FDC pension financed from assets accumulated in open pension funds, which is illustrated in Figure 1.

Figure 1. Gross relative pension level by sources of financing in the new pension system.



Source: authors' estimates based on the OECD (2009

[5]Only self-employed outside agriculture. Farmers have separate pension system in Poland.

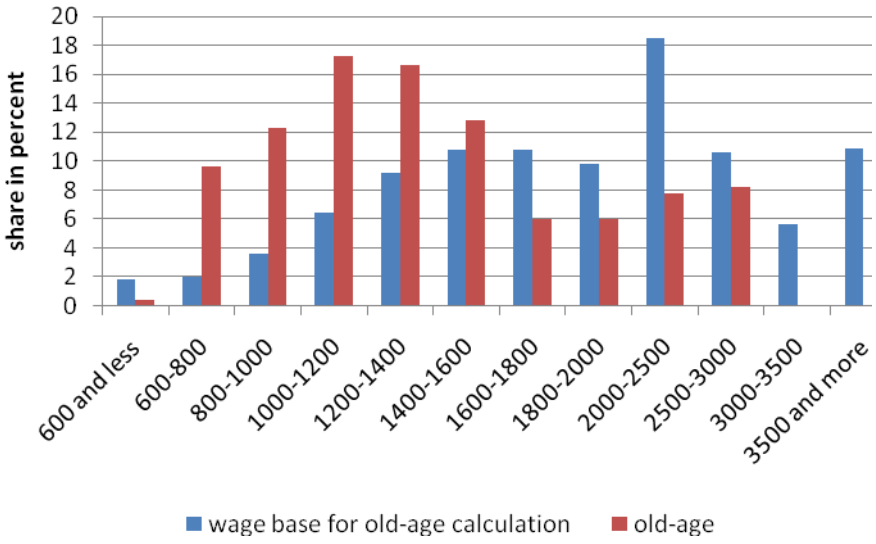
In the old defined-benefit system, the minimum pension guarantee was build into the general pension system formula. The benefit formula was progressive with a constant component equal to 24 per cent of the average wage. Each year of work increased the pension level by 1.3 percent of individual's wage component, that was calculated based on best wage in 10 years chosen from past 20 years of wage history, adjusted for changes in inflation and average wage levels. As a result, the distribution of pensions was more concentrated that wage distribution, which reduced the risk of falling below minimum pension level.

However, if an accrued pension was below the minimum level and the eligibility criteria were met, the pension was increased to the minimum level. Financing of the minimum pension was from the social security systems' revenue (from contributions and state budget subsidies). Eligibility criteria for receiving the minimum old-age pension were similar to the ones in the new system.

There are two general factors of individual's work history that have significant impact on the risk of minimum pension. These include the lifetime wages and covered by social security work tenure.

Distribution of wage base level for pension calculation and the distribution of old-age pensions level is shown in Figure 2.

Figure 2. Distribution of wage base for pension calculation and old-age pension levels in 2008 (in PLN)

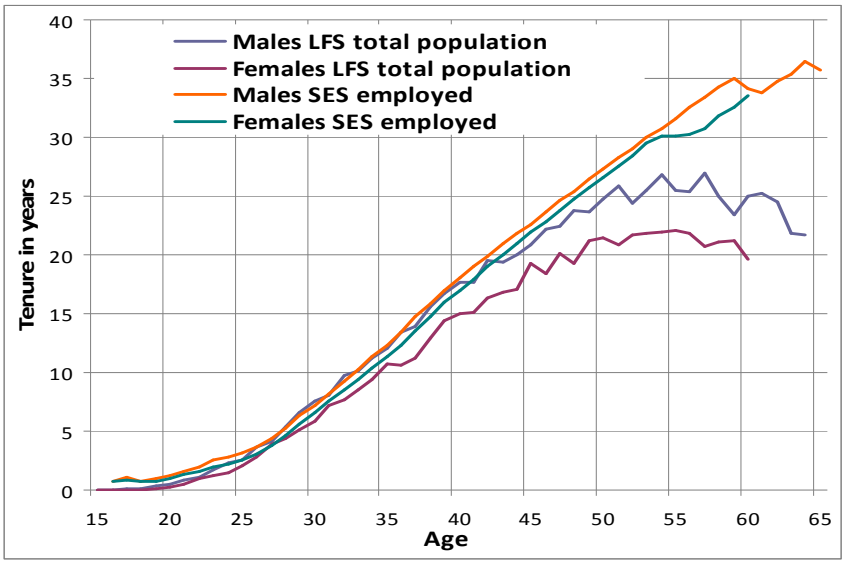


Source: own calculations based on Social Insurance Institution and Central Statistical Office data

The distribution of wage base for pension calculation in the old system (as shown in Figure 2) takes into account wage developments from past 20 years of work history. As one can see, the distribution of pension level is concentrated around the average value of PLN 1 471 per month., while the distribution of wage level for pension calculation is more dispersed compared to the average of PLN 2 128.

Labour market developments in the past decades will have a significant impact on the total length of work covered by social security.

Figure 3. Distribution of total numbers of years worked by age, sex and source of the data.



Source: Own calculations based on SES and LFS data

According to the Labour Force Survey (LFS) data, around 30 per cent of persons at retirement age can have total work experience below minimum period required for the minimum pension. If we take into account Structure of Earnings Survey (SES) data, this share reduces to some 10 per cent. As a result, the risk of poverty among persons in retirement age, not eligible for minimum pension guarantee increases.

1.2. Evolution of the minimum pension level

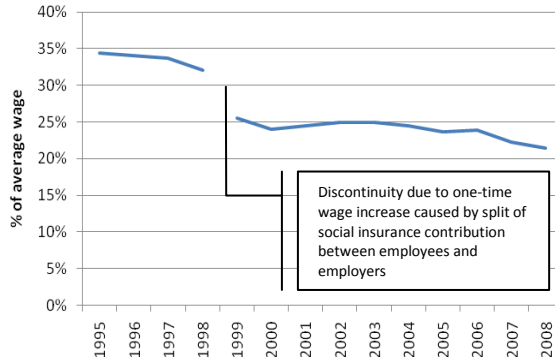
In the course of the past two decades, the minimum pension level evolved following ad-hoc changes at the beginning of 1990s and then, the regular indexation of pension benefits from mid 1990s. In our analysis we focus on the period from 1995, after the inflation level and indexation mechanisms stabilised after the transition movements. Minimum pensions are increased following the indexation of pensions. Currently, indexation is conducted annually, following inflation rate increased by a fifth of the wage growth. Indexation rate can be increased, if it is agreed in the Tripartite Committee. Such indexation was implemented in Poland from 1999, with a break between 2005 and 2008. In these years, pensions were indexed according to the inflation growth. The indexation mechanism leads to gradual reduction of the relation between minimum pension and average wage. Given that the pension system is perceived as a source of income replacement after retirement, reduced relation between minimum pension and average wage means that with time, this mechanism covers workers with lower wage levels.

In order to assess the role of minimum pension guarantee as a mechanism to protect against poverty, we compare it to the subsistence minimum calculated by the Institute for Labour and Social Affairs. The subsistence minimum (also called biological minimum) is perceived as lowest poverty threshold. This is understood as a threshold, below which there is a biological risk of life and psycho-physical development of an indiviudal (Kurowski, 2002; Deniszczuk, Sajkiewicz, 1997). The basket for calculating the subsistence minimum was developed by the experts of the Institute of Labour and Social Affairs in 1995. It covers only expenditure that

allows for maintaining the subsistence level, such as housing needs and food. The need for social activities is not included in this basket.

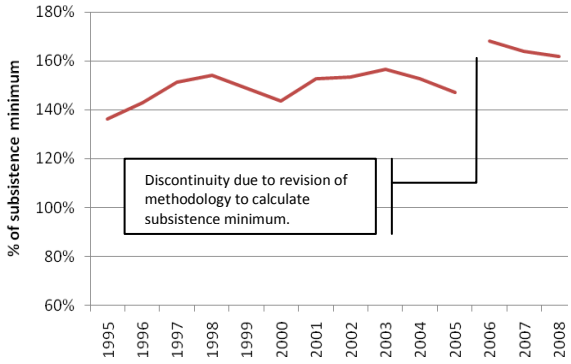
Evolution of minimum pension relative to average wage and subsistence minimum for pensioners is presented in Figure 4 and Figure 5 respectively. Due to differences in the tax wedge on wages and pensions – the former are subject to social security and health care contributions and personal income tax while the latter are subject to health care contribution and income tax – we can monitor the direction of changes and not the absolute level of this indicator. The same applies to the comparison with subsistence minimum, which is calculated on the net level.

Figure 4. Minimum pension relative to average wage



Source: own calculations based on Social Insurance Institution and Central Statistical Office data

Figure 5. Minimum pension relative to subsistence minimum*



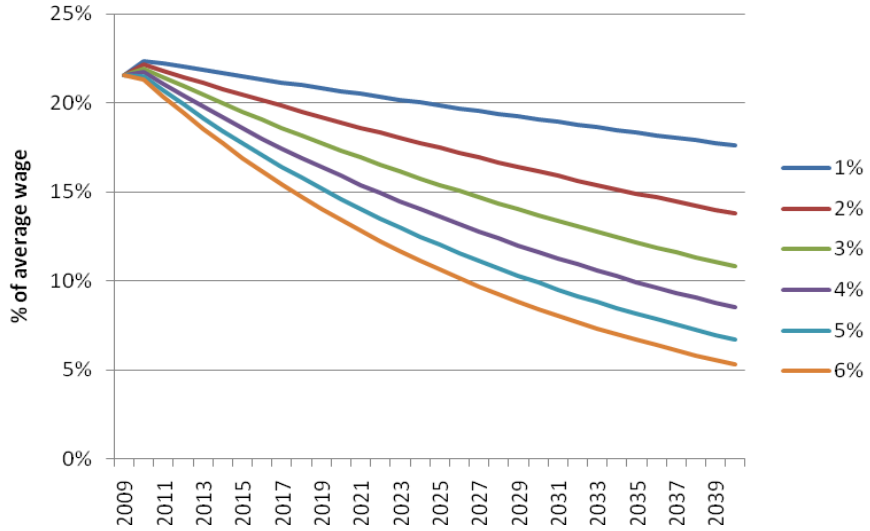
* subsistence minimum calculated for a single pensioner's household

Source: own calculations based on Social Insurance Institution and Institute for Labour and Social Affairs data

As one can see, there is a visible reduction in relation between minimum wage and average pension decreased by more than 4 percentage points. The relation between minimum pension and subsistence minimum changes with time. However in recent years – between 2003 and 2008 we can see also a reduction in this value. If the gross minimum pension falls below 120 per cent of subsistence minimum, this would mean that the guarantee can only cover the minimum needs of pensioners. Thus, the evolution of the minimum pension level should be observed from this perspective.

Further changes in the relation of minimum pension and average wage are determined by pension indexation mechanism. Given the 20 per cent share of average wage growth, with time the relation of minimum pension to average wage will fall. The faster the wage growth, the faster the reduction of this relation. This is illustrated in Figure 6. Assuming the moderate real increase of average wage of 3 per cent annually, the minimum pension will fall below 15 per cent of average wage in 2027. If real wages grow by 5 per cent annually, this threshold will be achieved by 2020.

Figure 6. Simulation of future minimum pension as per cent of average wage depending on the average wage increase



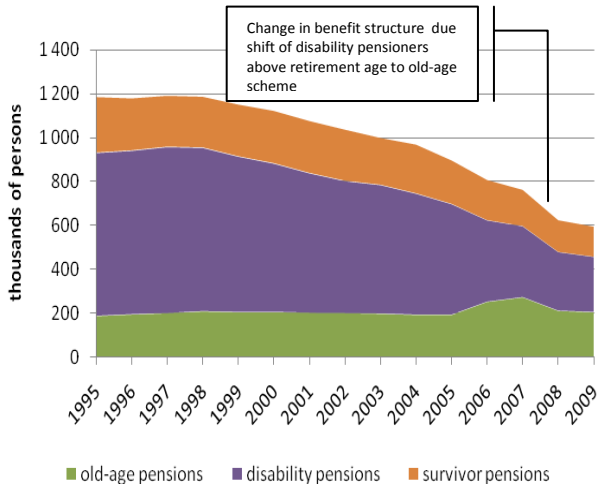
Source: Authors' calculations

These simulations show that with time, under no policy change scenario, the minimum pension level may not guarantee appropriate income protection for the elderly and can lead to increase of relative poverty rates among old-age pensioners.

1.3. Pensioners with minimum pension

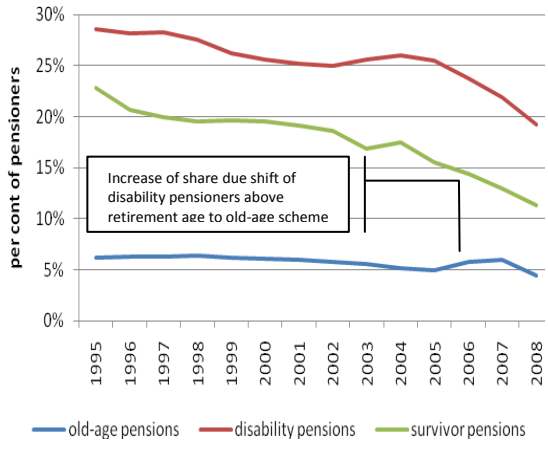
The level of minimum pension has also impact on the number of beneficiaries who receive minimum pension level. We can assume that with the relative decrease of minimum pension, the number of pensioners receiving this benefit should also decrease. Indeed, between 1995 and 2009 the total number of pensioners (including old-age, disability and survivor pensioners) receiving the minimum level of benefits halved.

Figure 7. Minimum benefits beneficiaries



Source: Social Insurance Institution

Figure 8. Minimum pension beneficiaries as per cent of total pensioners, by pension type.



Source: own calculations based on Social Insurance Institution data

This reduction was particularly strong in the case of disability and survivor pensions, as generally these groups of pensioners more frequently are covered by minimum pension guarantee. The reduction, however at smaller pace, can be also seen in the case of old-age pensioners[6], particularly in recent years.

Currently, less than 5 per cent of all old-age pensioners receive minimum pension. It is also important to analyse at the gender distribution of the minimum benefits, which is presented in Table 1.

Table 1. Minimum pension beneficiaries

Total	January 2005	January 2007	January 2009
Total			
old-age pensions	199 838	274 687	224 810
disability pensions	538 066	351 117	251 739
survivor pensions	195 928	167 438	134 048
Men			
old-age pensions	30 964	42 621	35 228
disability pensions	186 393	148 990	110 486
survivor pensions	50 143	45 171	37 469
Women			
old-age pensions	168 874	232 066	189 582
disability pensions	351 673	202 127	141 253
survivor pensions	105 207	122 265	96 573

**) without pensions of those who have a right to farmers' benefit and without pensions paid based on international agreements.*

Source: Social Insurance Institution

Data presented in the table indicates that women represent more than 84 per cent of all old-age pensioners receiving old-age pensions, which is the highest share among all pensioners' groups. This is caused by several factors, which include: lower retirement age, shorter working careers as well as wage gap between men and women. As discussed earlier, such different, already present in the case of the old pension system, can even deepen in the new pension system.

Analysing the stock of pensioners receiving minimum pensions shows the impact of changes between inflow of new pensioners and outflow, caused by increases of pensions (for example due to working period at retirement) or, more frequently, natural causes.

[6] Distortion in the time series between 2005 and 2006 is due to the legal shift of disability pensioners, who were older than 60 years (women) and 65 years (men) to the group of old-age pensioners. As some of those transferred between schemes were receiving minimum pension, this affected the structure of the minimum pension beneficiaries, as well as relative share of minimum pensions in total payments towards disability and old-age pensioners.

We can also analyse the inflow of new pensioners with minimum level, which is shown in Table 2.

Table 2. Newly granted minimum pension benefits in 2004, 2006 and 2008 (data for January of the next year)

	January 2005	January 2007	January 2009
Total			
old-age pensions	3 397	4 087	4 412
disability pensions	5 999	4 697	3 560
survivor pensions	6 357	5 316	2 626
Total (as % of all newly granted benefits)			
old-age pensions	2,4%	3,9%	1,3%
disability pensions	10,0%	9,4%	7,8%
survivor pensions	8,8%	7,8%	6,7%
Men			
old-age pensions	747	881	920
disability pensions	2 894	2 392	1 836
survivor pensions	2 352	1 978	1 002
Women			
old-age pensions	2 650	3 206	3 492
disability pensions	3 105	2 305	1 724
survivor pensions	3 205	3 338	1 624

**) without pensions of those who have a right to farmers' benefit and without pensions paid based on international agreements.*

Source: Social Insurance Institution

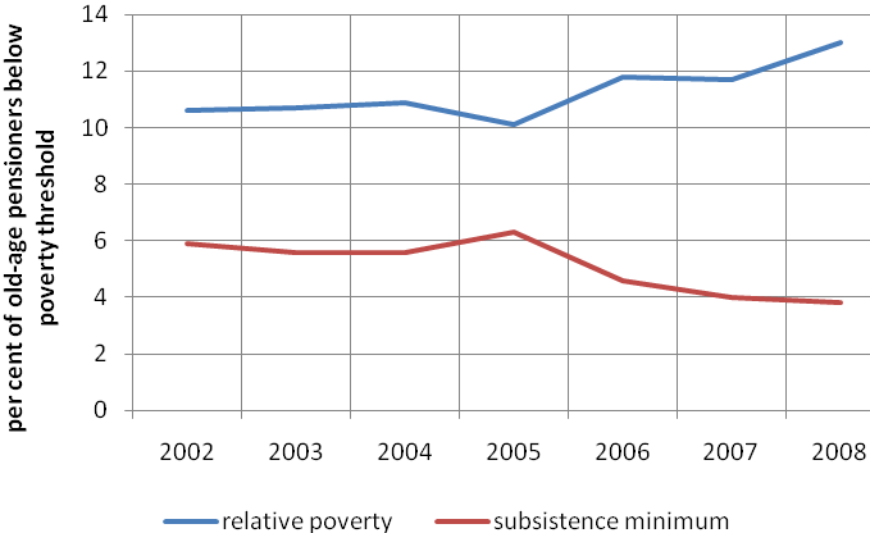
In recent years, the annual inflow of new old-age pensions was at around 4 thousand benefits per year, which represented from 1,3 per cent to 3,9 per cent of total inflow to old-age pensions. The inflow of new pensioners is below the average share of minimum old-age pensions in all pensions in payment. This indicates that in the future the share of pensioners receiving minimum pensions should further decrease.
Of all new minimum old-age pensions granted in the analysed years, around 80 per cent was granted for women. This shows that factors affecting higher risk of minimum pension benefits are still present.

1.3. Poverty among pensioners

Changes in the number and share of minimum pension recipients can be confronted with the evolution of poverty among pensioners. There are two thresholds that we use to monitor poverty: subsistence minimum as well as relative poverty threshold, which is taken at the level of 50% of average equivalised expenditure of households (which is the national relative poverty line in Poland).

As presented in previous sections, pension indexation mechanism, including changes in the minimum pension level lead to the reduction of relation between minimum pension and average wage, while the relation to subsistence minimum seems to be more stable.

Figure 9. Relative and absolute poverty of old-age pensioners in Poland



Source: Central Statistical Office, Households' Budget Survey

Widening the gap between absolute and relative poverty is a result of the methodology used to calculate poverty thresholds. While the relative poverty takes into account changes in average income of households, which rises with wage growth, the absolute poverty is based on the value of basket of the most necessary goods and services. As a result, the risk of absolute poverty is decreasing (though part of the decrease is due to change in the methodology of threshold calculation), while the risk of relative poverty is increasing, as wage increases and other changes in income of Polish households leads to real increases of the relative poverty threshold.

In the future, if minimum pensions are increased following the current mechanism, we can expect further widening of this gap.

2. Risk of minimum pension in the future.

In the new pension system future pension benefits depend on the capital collected during the whole working life from contributions, level of indexation in the NDC public pillar, and returns from capital in the privately managed FDC pillar. The aim of the simulation exercise in this part of the paper is to show which combinations of tenure and wages can generate pension capital that would be too small to assure pension level higher than minimum pension.

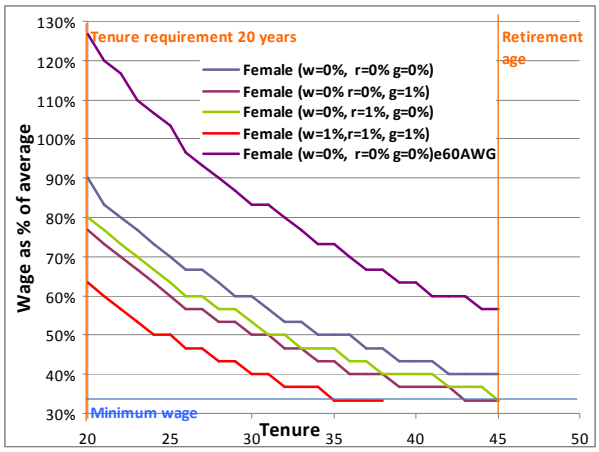
The simulation aims to determine which combinations of tenure and wage levels result in insufficient retirement savings under different assumptions concerning other parameters that have an impact on overall pension level or minimum wage level. The simulation is made for stylised work histories. It is assumed that persons can only work in the age between 15 and retirement age (60 for women and 65 for men). We assume constant wage during the whole life to keep the simplicity of the interpretation. All calculations were made in real terms as this assured that the purchasing power of wages is comparable in the whole period of simulation. Regarding tenure, the total assumed tenure was divided in equal parts between all years until retirement age.

2.1. Results of microsimulation projections.

The simplest form of simulation is the calculation of the sum of contributions collected during the employment period and calculation of pension on the basis of the information about the expected number of months on retirement. In this kind of simulation it is assumed that wage growth (w) as well as returns from capital part of the system (r) and rate of indexation of the accounts in NDC part of the system (g) is equal to 0%.

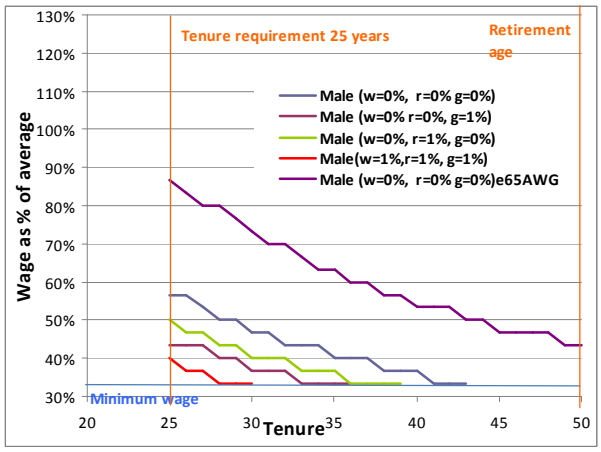
Sensitivity tests were carried out to check what are the consequences of the change in each of the parameters by 1 p.p. and to assess the influence of the different assumptions regarding life expectancy in the future (Figure 10, Figure 11). The increase in the rate of indexation of the NDC component by 1 p.p. as well as an increase in efficiency of the FDC component decrease the risk of the future pension lower than minimum. The influence of indexation rate in the NDC part of the system is slightly higher as the share of old-age contribution in this component is larger. The joint annual increase of g, r and w by 1 p.p. reduces the set of combinations that lead to minimum pension risk even further despite the fact that according to current regulations real wage increase by 1 p.p annually contributes to the real increase in minimum pension by 0.2 p.p.
However, if we apply to the projection the relative life expectancy at retirement age in the year 2055 and 2060 instead of using current actual life tables, the minimum pension risk increases significantly. On average it increases by about 45% for women and 53% for men the wage level required to avoid minimum pension in the base case. The differences in the minimum required tenure, retirement age and the life expectancy between men and women contribute to the relatively higher risk of low pension of women.

Figure 10. Projected combinations of tenure and average wages that lead to minimum pension – Females. Sensitivity analysis.



Source: Own calculations

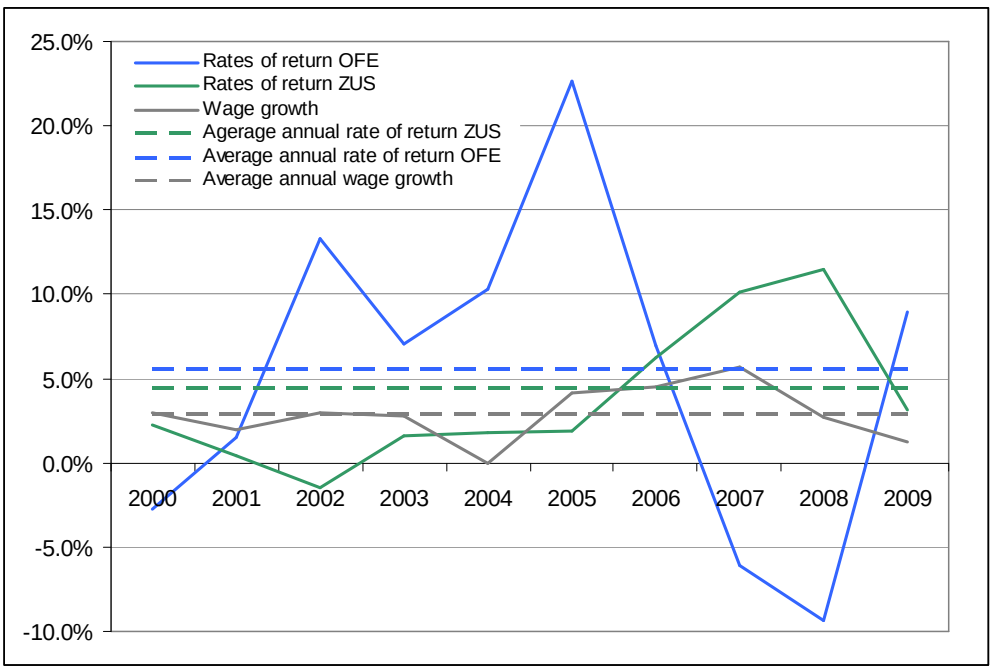
Figure 11. Projected combinations of tenure and average wages that lead to minimum pension –Males. Sensitivity analysis.



Source: Own calculations

The simplest assumptions about the parameters seem to be insufficient if our aim is the projection of the possible future risk of poverty. The observations from the past confirm that the average levels of all parameters were significantly higher than zero (Figure 12). The rate of return from FDC component (OFE) was the most volatile, but in the entire period from 2000 to 2009 the average real annual rate of return was highest and amounted to about 5.6%. The indexation of the contributions in NDC component (ZUS) was more stable, but on average the annual real increase amounted to about 4,4% in the whole period. The real wage growth in the economy was relatively the most stable and on average in real terms it amounted to 2,9% annually.

Figure 12. Real Wage growth, real indexation rule and average real rate of return from capital in the years 2000-2009.

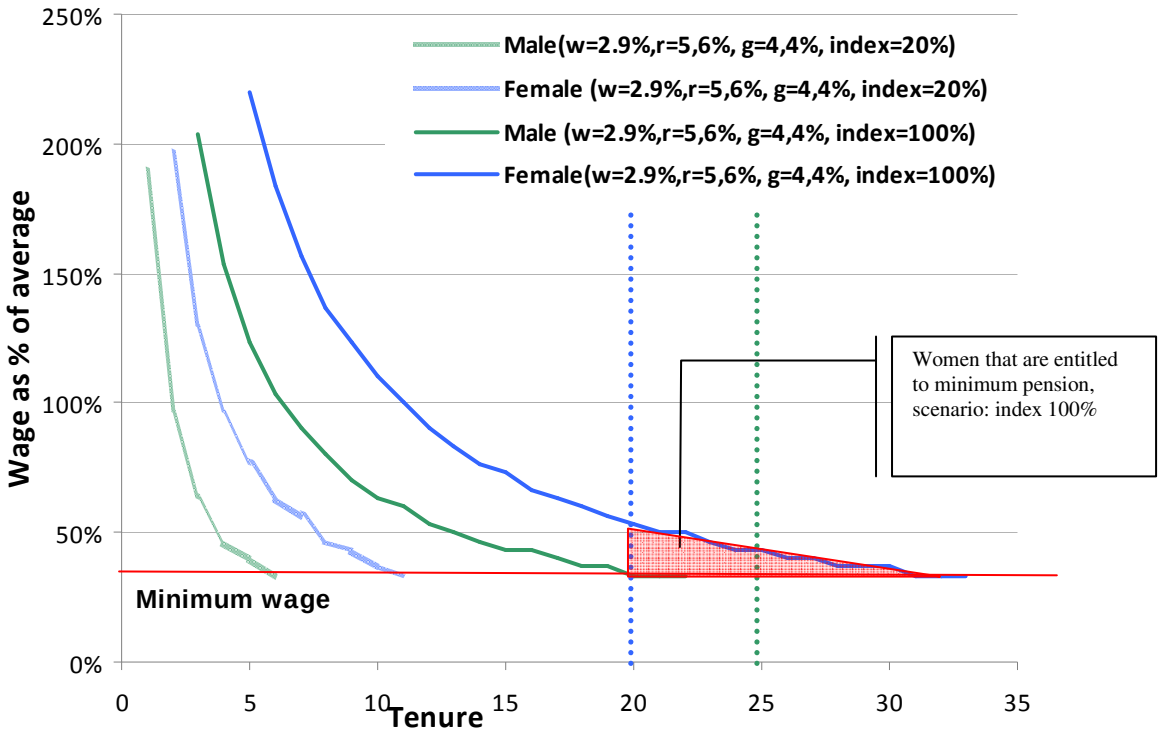


Source: own calculations based on the data from Central Statistical Office, Social Insurance Institution, Polish Financial Supervision Authority

Let's assume that the average values of parameters in the last ten years are a good approximations of the values of parameters *g*, *r* and *w* during the whole working life. The combinations of tenure and wages insufficient to obtain pension higher than minimum are relatively limited (Figure 13).

The results show that if the current mechanism of minimum pension increases will be kept in the next 50 years all persons that fulfil the requirements concerning minimum tenure will have pensions much higher than the minimum pension. As a result, minimum pension will no longer be a viable social policy instrument. This result is an effect of increasing difference between the level of minimum pension and average wage in the economy (see figure 7). If we assume that the minimum pension will increase to maintain the relation between minimum pension and average wage on the constant level (i.e. 100% wage indexation), then minimum pension will remain as a tool of income protection for women with relatively low wages.

Figure 13. Comparison of the influence of the combinations of tenure and wages that lead to minimum pension under current rule of pension indexation (20% of wage growth) and 100% wage indexation. Assumptions based on the average rates from the last 10 years and no increase of life expectancy.

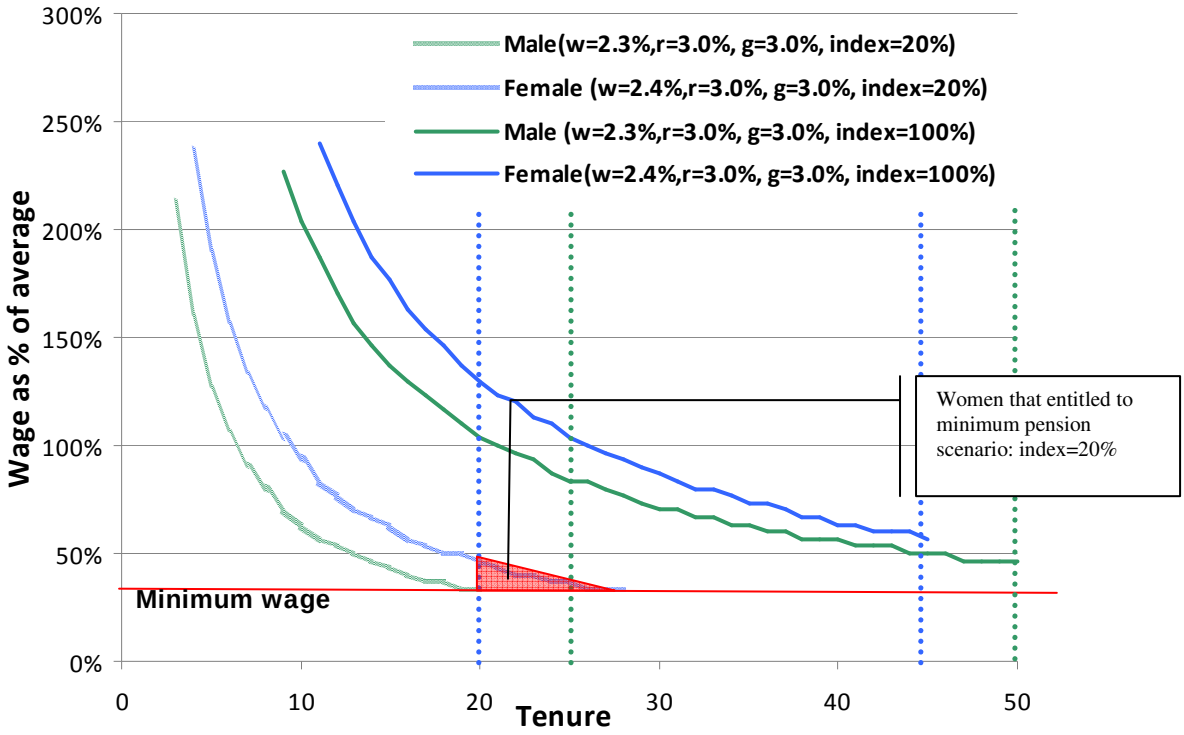


Source: Own calculations

The approach of preparing the assumptions on the basis of the observations from the recent past could be biased in the long term. The possible structural changes in the future economy are uncertain but some of them that are possible to predict can not be ignored. For example the productivity and wage growth (*w*) in the developing country such as Poland can be lower in the distant future because the gap between the developing country and more developed regions will tends narrow in the distant future due to the convergence. Another reason for probably lower pace of growth of the total wages in the economy (*g*) in the future is that because of the ageing process the labour supply after the year 2020 will decline sharply. It should be also mentioned that according to the latest EUROSTAT projection (Eurostat, 2008) the long term trends in the life expectancy would lead in the next 50 years to the increase in

the life expectancy of persons aged 60 by 6,4 years and persons aged 65 by 6,2 years. To include this possible structural changes in the analysis the next simulation based on the assumptions that base on the European Commission long term projection for Poland. This projection was used by Working Group on Ageing (European Commission, 2009) to calculate the long term influence of the process of aging on the public expenditures. According to this projection average wage growth w amounted to 2.3%, real interest rates (returns from capital) amounted to 3.0% and the same rate was assumed as an annual growth of pension liabilities from NDC pillar. The calculations were made for two scenarios: current rule of minimum pension indexation (index=20%) and constant proportion of minimum pension to average wage in the economy (index=100%).

Figure 14. Comparison of the influence of the combinations of tenure and wages that lead to minimum pension under current rule of pension indexation (20% of wage growth) and 100% wage indexation. Assumptions based on European Commission's long term projection form Poland including projection of the increase in life expectancy.



Source: Own calculations

Under these assumptions, women with lowest wages (between minimum wage and 50% of average wage in the economy), can expect pensions below than minimum pension level even without changes in the current rule of minimum pension growth. If the minimum pension would be constant relative to wages the risk of falling below minimum pension level increases to a larger set of combinations of wage and tenure.

2.2. Population at risk of minimum pension

The aim of our analysis in this part is the determination of the percentage of population under the risk of the minimum pension in two scenarios: under the scenario of current rule of pension indexation and under the scenario of 100% wage indexation. In order to achieve that goal we used the data about currently observed combinations of wage and tenure of new pensioners[7]. Our analysis was based on the data for pensioners retiring in 2008 at age 55-59 (women) and 60-64 (men), that is the dominant age group in the population of new pensioners. We limited our analysis to these age cohorts in order to avoid the potential impact of the retirement age on the work tenure for pension calculation.

As the long term assumptions of the Working Group on Ageing seem to be the most reliable in our main analysis we used the results of the simulations presented in Figures 14. The simulations that base on the average assumptions from the last 10 years were treated as sensitivity analysis and are presented in annex. The tables below join the information about the distribution of the tenure and wages of pensioners in 2008 with the results of simulation concerning the combinations of tenures and wages that lead to minimum pension in the future. It is important to mention that such a method of analysis produces the projection of the future minimum pension coverage under the assumption that the work "biographies" of persons in the new system were similar to those observed recently. It is rather not likely that this assumption will be fulfilled in the future, so it should not be taken as a forecast. The tables are organized to reflect the distribution of the currently observed combination of tenure and average wage (the wormer the colour is the higher is the frequency of the combination). The combinations under the risk of minimum pension are selected by the borders and black colour of the numbers.

The results show that under that under the current rule of indexation the minimum pension would have a marginal role in the future (Table 3 and Table 4). It would cover about 0.3% of men with extremely short tenure and low wages and about 2.4% of women with short tenure and relatively low wages.

Table 3. Risk of pension under minimum for men aged 60-64 on the basis of the data concerning wage and tenure distribution of new retirees in 2008. Current wage indexation scenario

Tenure / wage (% of average)		24 and less	25-29	30-34	35-39	40-44	45-49
up to	18%	**0.10%**					
18%	26%						
26%	35%						
35%	44%	**0.10%**	0.10%		0.10%	0.10%	
44%	53%	**0.10%**	0.10%	0.10%	0.30%	0.30%	
53%	62%	0.10%	0.20%	0.20%	0.80%	0.80%	0.10%
62%	70%	0.10%	0.20%	0.40%	1.30%	1.40%	0.20%
70%	79%	0.10%	0.20%	0.50%	1.80%	2.50%	0.40%
79%	88%	0.10%	0.20%	0.40%	2.40%	4.40%	0.80%
88%	110%	0.10%	0.40%	0.90%	5.90%	16.90%	3.80%
110%	132%		0.10%	0.40%	3.70%	14.00%	3.60%
132%	154%		0.10%	0.20%	1.90%	7.80%	2.10%
154%	and more		0.10%	0.20%	2.80%	11.40%	2.30%

[7] The data regarding the distribution of pensioners by average wage and tenure was supplied by Social Insurance Institution.

Table 4. Risk of pension under minimum for men aged 60-64 on the basis of the data concerning wage and tenure distribution of new retirees in 2008. Current wage indexation scenario.

wage (% of average)		Tenure: 24 and less	25-29	30-34	35-39	40-44	45-49
up to	18%	**0.3%**					
18%	26%	**0.2%**					
26%	35%	**0.3%**	**0.2%**	**0.3%**	0.1%		
35%	44%	**0.4%**	0.5%	0.9%	0.2%		
44%	53%	**0.5%**	1.0%	2.5%	0.8%	0.0%	
53%	62%	**0.6%**	1.6%	6.0%	3.3%	0.1%	
62%	70%	0.3%	1.2%	6.6%	5.9%	0.1%	
70%	79%	0.2%	0.8%	5.6%	6.0%	0.2%	
79%	88%	0.1%	0.6%	4.9%	5.4%	0.1%	
88%	110%	0.1%	0.7%	8.4%	9.7%	0.3%	
110%	132%		0.2%	3.9%	5.7%	0.2%	
132%	154%		0.1%	1.9%	3.3%	0.1%	
154%	and more		0.1%	2.4%	4.8%	0.3%	

*Calculations under the assumption that minimum tenure cannot be lower than 15 years
Source: Own calculations

The tables suggest that the differences in the risk of minimum pension between men and women are caused not only by the earlier retirement age reflected by the results of simulation (coverage of black numbers) but have more to do with in general lower tenure and lower wages of women (concentration of yellow and red cells). It is also important that the results show positive relation between average wages and tenure (diagonal accumulation of the yellow and red cells). As we can see, there is a significant differentiation of work experience according to wage levels, which means that those with lower wages also tend to have shorter total work experience, which concerns particularly women. The positive relation between observed wage and tenure may reflect many reasons. Usually wage level depends positively on experience. Higher labour force participation and wages can be also connected with higher general human capital or result from labour market segmentation. Lower wages and work experience can be also a result of discrimination of certain groups. The more visible correlation of tenure and wages between men and women can be a result of the differences in family roles between men and women.

The significance of the differences in the distribution of wages and work experience can be formally confirmed both for men and for women. In order to test such hypothesis, we performed the analysis of variance of wages and work experience for men and women retiring in years 2004, 2006 and 2008 in age groups 60-64 and 55-59 respectively. Results of the analysis are listed in Table 3.

Table 5. Analysis of variance for wages and work experience – results of F-test

	2004	**2006**	**2008**
Men			
F-stat	6,907	6,545	6,087
p-value	*0,0005%*	*0,0005%*	*0,0025%*
Women			
F-stat	14,363	13,407	12,996
p-value	0,0000%	0,0000%	0,0000%
Test F (at α=0,05; df: 6, 84)			

Source: own calculations

The results of the scenario with full wage indexation of the minimum pension (Table 7 and Table 8) assumes that the ratio of minimum pension to average wage remains constant. In such scenario 3.3% of men with relatively the lowest wages would be covered by minimum pension. Relatively short tenure significantly increases the risk of minimum pension, but due to the requirements concerning minimum tenure and pension age of men the share of men with short tenure is relatively low.

Table 6. Risk of pension under minimum for men aged 60-64 on the basis of the data concerning wage and tenure distribution of new retirees in 2008. Full wage indexation scenario.

wage (% of average)		Tenure: 24 and less	25-29	30-34	35-39	40-44	45-49
up to	18%	**0.10%**					
18%	26%						
26%	35%						
35%	44%	**0.10%**	**0.10%**		**0.10%**	**0.10%**	
44%	53%	**0.10%**	**0.10%**	**0.10%**	**0.30%**	**0.30%**	
53%	62%	**0.10%**	**0.20%**	**0.20%**	**0.80%**	0.80%	0.10%
62%	70%	**0.10%**	**0.20%**	0.40%	1.30%	1.40%	0.20%
70%	79%	**0.10%**	0.20%	0.50%	1.80%	2.50%	0.40%
79%	88%	**0.10%**	0.20%	0.40%	2.40%	4.40%	0.80%
88%	110%	**0.10%**	0.40%	0.90%	5.90%	16.90%	3.80%
110%	132%		0.10%	0.40%	3.70%	14.00%	3.60%
132%	154%		0.10%	0.20%	1.90%	7.80%	2.10%
154%	and more		0.10%	0.20%	2.80%	11.40%	2.30%

Table 7. Risk of pension under minimum for women aged 55-59 on the basis of the data concerning wage and tenure distribution of new retirees in 2008. Full wage indexation scenario.

wage (% of average)		Tenure: 24 and less	25-29	30-34	35-39	40-44	45-49
up to	18%	**0.3%**					
18%	26%	**0.2%**					
26%	35%	**0.3%**	**0.2%**	**0.3%**	**0.1%**		
35%	44%	**0.4%**	**0.5%**	**0.9%**	**0.2%**		
44%	53%	**0.5%**	**1.0%**	**2.5%**	**0.8%**	**0.0%**	
53%	62%	**0.6%**	**1.6%**	**6.0%**	**3.3%**	**0.1%**	
62%	70%	**0.3%**	**1.2%**	**6.6%**	**5.9%**	0.1%	
70%	79%	**0.2%**	**0.8%**	**5.6%**	6.0%	0.2%	
79%	88%	**0.1%**	**0.6%**	4.9%	5.4%	0.1%	
88%	110%	**0.1%**	0.7%	8.4%	9.7%	0.3%	
110%	132%		0.2%	3.9%	5.7%	0.2%	
132%	154%		0.1%	1.9%	3.3%	0.1%	
154%	and more		0.1%	2.4%	4.8%	0.3%	

*Calculations under the assumption that minimum tenure cannot be lower than 15 years
Source: Own calculations

The results for the women are different. Under full wage indexation the 41.1% of women would be covered by minimum pension. Such a large percentage is a result of relatively lower pension age, lower average tenure and wages and high frequencies of relatively low wages and short tenure.

Summary and conclusions

The aim of our analysis was to investigate current and potential future developments of the pension system in Poland and its parameters on the role of the minimum pension provision in the new pension system in Poland. The new pension system. based on the defined-contribution mechanism. reduces almost entirely the income redistribution within the pension system. That means that the minimum pension guarantee is the principal mechanism of income protection of old-age pensioners in the future.

Currently, minimum pension in Poland is at level of some 22 per cent of average wage. This relation has been decreasing, following relatively fast development of average wage on the one hand and pension indexation that included up to a fifth of real wage growth on the other hand. Assuming further productivity and wage growth in Poland, we can expect that no policy change in minimum pension indexation will lead to further decrease of share of minimum pension in average wage.

The level of minimum pension relative to wages has a impact on the actual scope of this guarantee. We can already observe that in the past decade the number of minimum pension beneficiaries in Poland has been falling, which can be partially explained by changes in minimum pension level and partially by general growth of wages leading to higher levels of new pensions granted. Evolution of minimum pension level influences also the risk of poverty among pensioners. In particular, the risk of relative poverty increases, as the poverty thresholds is related to median equivalised income changes, that take into account, among others, development of wage levels.

Results of presented microsimulations show, that maintaining the current rules of pension indexation and assuming similar wage growth and financial market returns as observed in the past decade will significantly reduce potential combinations of wage and tenure at retirement age that can lead to the risk of minimum pension. Introduction of longevity changes to the microsimulations show that in the future the overall share of minimum pension beneficiares is likely to be rather small. However, the relative value of the guarantee will be also lower. By mid 2020, the minimum pension should represent less that 15 per cent of average wage, which would be two thirds of current figure.

The minimum pension guarantee in Poland does not provide a stable guarantee of (relative) poverty protection for the old-age, in particular for persons with low wages and low work experience. The latter applies particularly to women. Additionally, women can expect lower pensions due to lower retirement age. Thus, the minimum pension provision in Poland requires changes, that would lead to a higher link of protection of elderly against poverty in the future. The minimum pension level should be established based on independent parameters focusing on its role to protect the elderly from poverty risk.

References

Chłoń, A, M.Góra, M.Lubyova, L.H.Thompson (2001), "Pension reform in Slovakia – background and options: Can lessons be drawn from other transition countries?", OECD working paper, 2001

Chłoń, A., M. Góra, M. Rutkowski, (1999), "Shaping the Pension Reform in Poland – Security through Diversity," WB Pension Primer Series No. 9923. Washington, DC

Chłoń-Domińczak, A., (2002) „The Polish Pension Reform of 1999"in E.Fultz (ed.) Pension Reform in Central and Eastern Europe (Vol. 1: Restructuring with Privatization: Case Studies of Hungary and Poland). Budapest, ILO, Central and Eastern European Team

Deniszczuk L.. Sajkiewicz B. (1997). „Kategoria minimum egzystencji". in: Golinowska S. (1997). Polska bieda II. Kryteria – Ocena – Przeciwdziałanie. IPiSS. Warsaw

European Commission (2009) *The 2009 ageing report: Economic and budgetary projections for the EU-27 Member States (2008-2060).* Forthcoming in European Economy 2/2009. http://europa.eu/epc/publications/index_en.

Eurostat (2008) *New European population projection 2008-2060*, http://www.aaliance.eu/public/news/eurostat-new-european-population-projections-2008-2060, http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/proj_r08c_esms.htm

Góra, Marek, Michał Rutkowski, 2000, "The Quest for Pension Reform: Poland's Security through Diversity", William Davidson Institute Working Paper 286

Holzmann. R. and E.Palmer (2006), "The Status of NDC Discussion: Introduction and Overview", in: R.Holzmann and E.Palmer (ed.), Pension Reform. Issues and Prospects for Non-Financial Defined Contribution (NDC) Schemes, World Bank, Washington DC

Kurowski. P. (2002). *Koszyki minimum socjalnego i minimum egzystencji – dotychczasowe podejście*. mimeo IPiSS

Annex

Under the baseline scenario (w=0%, r=0%, g=0%) the population at risk of minimum pension under the assumption mentioned above is close to 0.9% for men and 1.3% for women. The most exposed to the risk of very low pension benefits are persons with the shortest tenure Using the results of simulations presented in Figures 12 and 13 we assessed the overall impact of the base scenario and sensitivity analysis on the size of population at risk, if the rules of the new pension system were applied to current pensioners (Table 8 and Table 9) .

Table 8. Risk of pension under minimum for men aged 60-64 on the basis of the data concerning wage and tenure distribution of new retirees in 2008 (grey fields – coverage of minimum pension). Baseline scenario, current indexation rule.

wage (% of average)	Tenure	24 and less*	25-29	30-34	35-39	40-44	45-49	50 and more
up to	18%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18%	26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26%	35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
35%	44%	0.10%	0.10%	0.00%	0.10%	0.10%	0.00%	0.00%
44%	53%	0.10%	0.10%	0.10%	0.30%	0.30%	0.00%	0.00%
53%	62%	0.10%	0.20%	0.20%	0.80%	0.80%	0.10%	0.00%
62%	70%	0.10%	0.20%	0.40%	1.30%	1.40%	0.20%	0.00%
70%	79%	0.10%	0.20%	0.50%	1.80%	2.50%	0.40%	0.00%
79%	88%	0.10%	0.20%	0.40%	2.40%	4.40%	0.80%	0.00%
88%	110%	0.10%	0.40%	0.90%	5.90%	16.90%	3.80%	0.00%
110%	132%	0.00%	0.10%	0.40%	3.70%	14.00%	3.60%	0.00%
132%	154%	0.00%	0.10%	0.20%	1.90%	7.80%	2.10%	0.00%
154%	and more	0.00%	0.10%	0.20%	2.80%	11.40%	2.30%	0.00%

Table 9. Risk of pension under minimum for women aged 55-59 on the basis of the data concerning wage and tenure distribution of new retirees in 2008 (grey fields – coverage of minimum pension). Baseline scenario, current indexation rule.

wage (% of average)	Tenure	24 and less	25-29	30-34	35-39	40-44	45-49	50 and more
up to	18%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
18%	26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
26%	35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
35%	44%	0.10%	0.10%	0.00%	0.10%	0.10%	0.00%	0.00%
44%	53%	0.10%	0.10%	0.10%	0.30%	0.30%	0.00%	0.00%
53%	62%	0.10%	0.20%	0.20%	0.80%	0.80%	0.10%	0.00%
62%	70%	0.10%	0.20%	0.40%	1.30%	1.40%	0.20%	0.00%
70%	79%	0.10%	0.20%	0.50%	1.80%	2.50%	0.40%	0.00%
79%	88%	0.10%	0.20%	0.40%	2.40%	4.40%	0.80%	0.00%
88%	110%	0.10%	0.40%	0.90%	5.90%	16.90%	3.80%	0.00%
110%	132%	0.00%	0.10%	0.40%	3.70%	14.00%	3.60%	0.00%
132%	154%	0.00%	0.10%	0.20%	1.90%	7.80%	2.10%	0.00%
154%	and more	0.00%	0.10%	0.20%	2.80%	11.40%	2.30%	0.00%

*Calculations under the assumption that minimum tenure cannot be lower than 15 years

Source: Own calculations

The risk of minimum pension disappears if the assumptions based on the average wage, NDC and FDC returns the last 10 years are applied and the rules of pension indexation remain unchanged. If we assume that the minimum pension stays on the same level relative to average wage, the risk of minimum pension is lower compared to baseline. The 0.2% of men and 0.6% of women can fall below minimum pension guarantee, which is a reduction of 0,7 p.p. for both genders. That means that expected economic and labour market development reduces the risk of receiving the minimum pension in the future.