Piotr Lewandowski
Kamil Stroński
Roma Keister

Institute for Structural Research[1]

Labour market segmentation and pensions in the Polish defined-contribution scheme

Summary

The cohort model of the pension scheme is applied to analyse the impact of labour market segmentation on expected retirement benefits in Poland. The effects of policy instruments aimed at increasing the stream of contributions paid by workers with contracts of mandate are evaluated. It has been found that the expected retirement benefit in the segment of contracts of mandate is lower by 17% than in the segment of employment contracts. The obligation to pay contributions on all contracts of mandate from the minimum wage level will enable closing the pension gap by approx. 4.4 pp unless the obligation increases unemployment risk in the segment of contracts of mandate. Additional saving of 2% of the gross wage during spells of work on contract of mandate reduces the gap by less than 1 pp.

Key words: labour market segmentation, pensions, defined-contribution pension scheme

[1] Institute for Structural Research, Rejtana str. 15/28, 02 516 Warszawa; email: piotr.lewandowski@ibs.org.pl, kamil.stronski@ibs.org.pl, roma.keister@ibs.org.pl

Introduction

Over the past 15 years, two complementary trends were present on the Polish labour market: a decrease in open-ended employment and the growth in the number of a fixed term, civil law contracts, or self-employed contracts. The retirement benefits in the Polish pension scheme are based on a defined contribution,[2] yet the contribution obligation depends on the form of contract. The increasing role of work in forms which do not involve payment of full contributions raises a question about their impact on future retirement benefits. It is significant for several reasons. Firstly, the reduction of (in comparison to the employment contract involving payment of full contributions) the number and amount of the contributions paid by scheme members might reduce the expected retirement benefits. Indeed, Boeri and Galasso (2012) demonstrate that — in the defined-contribution pension scheme — the effects of labour market segmentation on the retirement benefits of people affected thereby are greater than in the defined-benefit pension scheme.[3] Takayami et al. (2012) conclude that labour market segmentation might increase poverty among future pensioners. Secondly, the pension-related consequences can affect various socio-demographic groups unevenly (depending on e.g. sex, age, education) and enhance inequality in retirement benefits arising from heterogeneity of wages and employment opportunities in the life cycle. Thirdly, they have a macroeconomic dimension as they lower contribution payments to the pension scheme and deteriorate current balance of the pension fund. In Poland a special role is played by the widespread use of civil law contracts.

Civil law contracts constitute the focus of this paper which aim is to quantitatively evaluate the effects of their use on expected retirement benefits. To this aim we use a cohort model of the Polish pension scheme and analyse a selected cohort of people born in 1980. This choice is determined by two reasons. The start and development of careers by people born in 1980 was accompanied by rising incidence of fixed-term employment and civil law contracts. On the other hand, people born in 1980 still have the major part of their work life ahead of them. This allows assessment how the potential policies and changes introduced from 2016 would affect the pension prospects of this cohort. We distinguish 10 profiles (5 various education groups, separately for men and women) and for each profile we create two life cycle scenarios — (i) based exclusively on employment contracts and (ii) with spells of work on civil law contracts, in particular contracts of mandate. This enables us to calculate differences in expected retirement benefits arising from labour market segmentation, as well as to analyse the effects of the already introduced and other potential changes affecting the amount of contributions paid by workers with contracts of mandate.

This paper is composed of four sections. Section one presents the segmentation processes that have occurred on the Polish labour market in the recent years and their

[2] This applies to people born after 1949, people born earlier were members of the defined-benefit scheme but reached the statutory retirement age in 2009 (women) or 2014 (men).

[3] A detailed discussion of the defined-contribution pension scheme can be found for example in Palmer (2006).

effects from the viewpoint of participation in the pension scheme. Section two explains the methodology of the cohort model and life cycle work scenarios. Section three presents estimates of the impact of working on civil law contracts on expected retirement benefits. Labour force heterogeneity and various channels of the impact of segmentation on the expected retirement benefits are taken into account. Section four evaluates the effects of policies aimed at reducing the pension gap which results from labour market use of civil law contracts. Summary concludes.

1. Labour market segmentation in Poland

1.1. Labour market segmentation and employment structure

Between 1997 and 2013, the number of people working under temporary contracts in Poland increased more than five times, from 605 thousand in 1997 to 3.24 million in 2013 (LFS data). The growth of temporary workers was noticeable both among men and women (cf. Figures 1–2). At the same time, there was a significant drop in the share of people working under open-ended employment contracts in total employment (from 67% in 1997 to 57% in 2013). However, despite the fact that the incidence of the traditional open-ended employment contract has been decreasing in Poland, it has remained the most common form of employment (in 2013, approx. 8.89 million people worked under such a contract).

Figure 1. Number of women employed under open-ended contracts (the left axis) and temporary contracts (the right axis) (in millions)

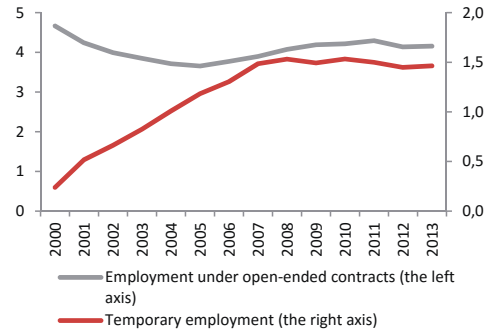
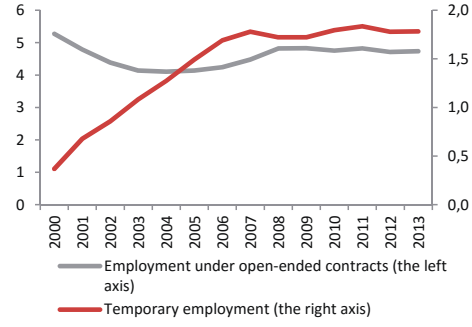


Figure 2. Number of men employed under open-ended contracts (the left axis) and temporary contracts (the right axis) (in millions)



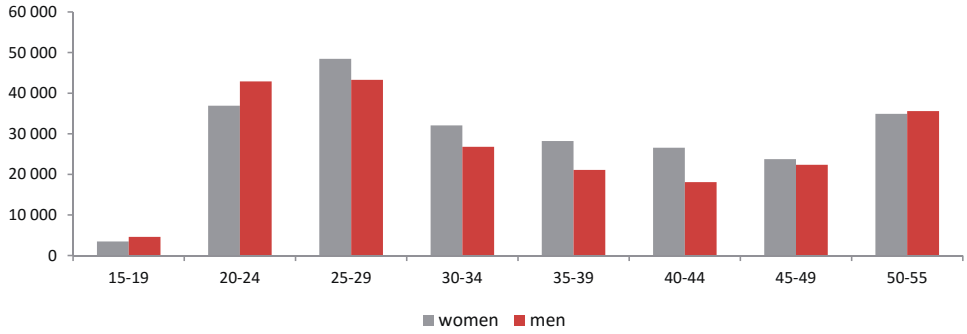
Source: own elaboration based on LFS data.

The increasing number of civil law contracts contributed to the growth in temporary employment. According to the data of Polish Ministry of Finance, 974 thousand people settled their taxes only under civil law contracts in 2013, while in 2002 the number was

approx. 600 thousand. On the basis survey of firms employing at least 9 people, the Central Statistical Office of Poland (GUS 2014) reported that there were 547 thousand people working exclusively under civil law contracts in 2010, 1.01 million in 2011, and 1.35 million in 2012. The data collected by GUS and the Ministry of Finance differ in estimated levels of number of people working under civil law contracts, yet both point to a growth in the scale of the phenomenon. Unfortunately, due to unavailability of appropriate information in LFS,[4] it is impossible to estimate the number of civil law contracts by socio-demographic groups.

Lewandowski (2015) shows that the Social Insurance Institution (ZUS) data is a valuable source of information about the number of people working under civil law contracts (more precisely — contracts of mandate). However, ZUS data does not include information on individuals' education level and excludes people older than 55. This study shows also that contracts of mandate were the only basis for social insurance for approx. 450 thousand people in 2013. Other people with spells of work under contract of mandate were subject to social insurance on different grounds, e.g. under an employment contract. In 2013 there were 228 thousand people who worked simultaneously under an employment contract and a contract of mandate for at least one month (cf. Figure 3). ZUS data indicates that the annual average working time of people who worked exclusively under a contract of mandate was approx. 8 months. Additionally, according to the same source, such workers did not pay social insurance contributions on average for 15% of the time worked, that is for approx. 1.2 months in a year. Hence, in comparison to people who worked under employment contracts, workers under contracts of mandate paid a lower number of pension scheme contributions annually.

Figure 3. People who worked exclusively under contracts of mandate in 2013, by sex and age group (in thousands)



Source: Lewandowski (2015) based on ZUS data.

[4] In the Labour Force Survey, respondents are not asked about the type of temporary contract — whether it is a fixed-term contract or a civil law contract. On the other hand, the Structure of Earnings Survey data cover only persons employed under an employment contract (either fixed-term or open-ended).

1.2. Labour market segmentation versus wages and bases for pension scheme contributions

Empirical research for OECD countries proves that on average temporary contract workers are paid less than those employed under open-ended contracts, even considering the impact of individual characteristics, such as education level or work tenure (Boeri 2011). This is observable also in Poland (Magda, Potoczna 2014). According to LFS data, in 2013, in the first decile of wage distribution 60% of people worked on a temporary basis (compared to approx. 35% in 2001). Figures 4–7 present the hourly wage distribution density for women and men with higher and post-secondary/vocational secondary education, separately for workers under fixed-term and open-ended employment contracts in 2012 (Structure of Earnings Survey (SES) data covers only people working under employment contracts). In both cases, the hourly wage distribution for temporary contract workers is clearly shifted to the left, which means that the average wage of people working under fixed-term contracts is lower than of those working under open-ended contracts. This phenomenon is noticeable for all the analysed education groups.[5] On average, men employed under open-ended employment contracts in 2012 earned 1.4 times more than those working under fixed-term employment contracts (SES data). In the case of women, this proportion was 1.3.

Figure 4. Hourly wage distribution (in PLN) for women with tertiary education, by contract type in 2012

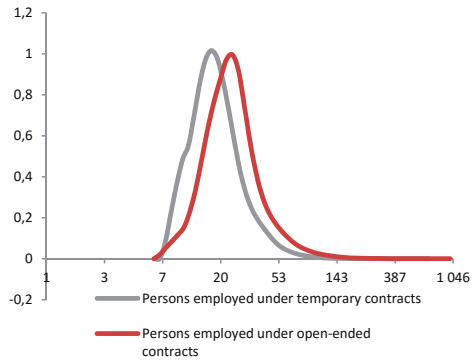


Figure 5. Hourly wage distribution (in PLN) for men with tertiary education, by contract type in 2012

Source: own elaboration based on SES 2012 data.

[5] Distribution of hourly wage density for other groups by education are available at request.

Figure 6. Hourly wage distribution (in PLN) for women with post-secondary / vocational secondary education, by contract type in 2012

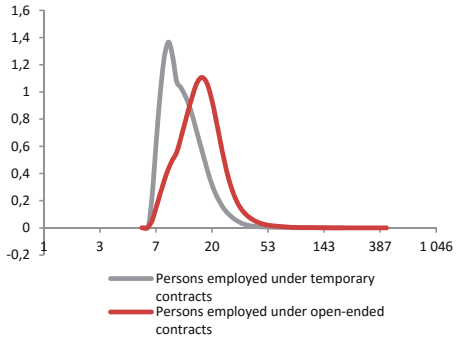
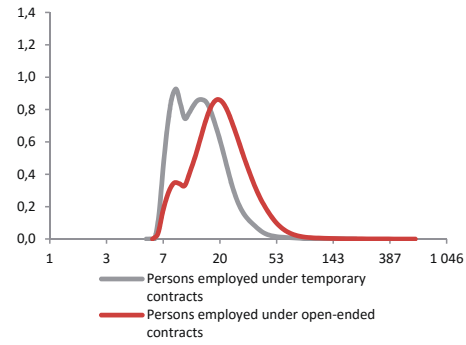


Figure 7. Hourly wage distribution (in PLN) for men with post-secondary / vocational secondary education, by contract type in 2012



Source: own elaboration based on SES 2012 data.

The ZUS data quoted by Lewandowski (2015) indicates, in turn, that the average base of the contribution paid by worker with contracts of mandate in 2013 constituted, for both women and men, 1/3 of the base of the contribution for workers with employment contracts. An even greater discrepancy was demonstrated by medians of both distributions — the median base of the contribution paid by women (men) working under contracts of mandate was almost four times (five times) lower than for women (men) working under employment contracts. The contribution bases of workers with contracts of mandate were similar for all age groups, while they were increasing with age among workers with employment contracts (ct. Fig 8–9).

Figure 8. Average base of assessment of pension security contributions for women in 2013 (PLN)

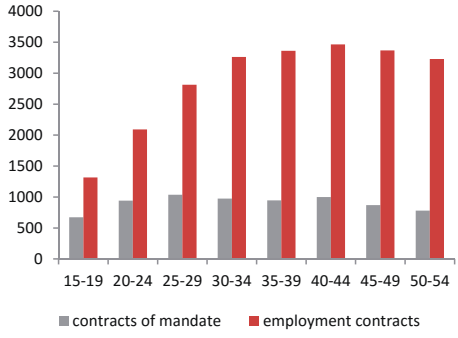
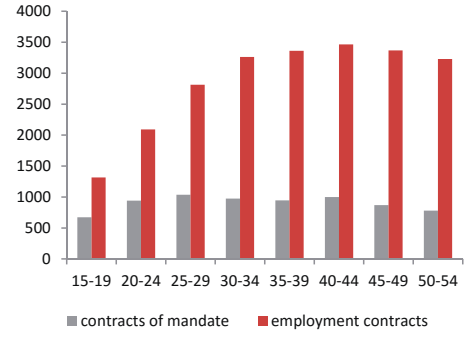


Figure 9. Average base of assessment of pension security contributions for men in 2013 (PLN)



Source: Lewandowski (2015) based on ZUS data.

2. Methodology

2.1. Cohort pension model

The quantitative analysis is carried out with use of the cohort demographic and pension model with annual frequency, developed in the Institute for Structural Research (IBS). The demographic part of the model is composed of historical data and assumptions on fertility, mortality rates and international migration net balance, by sex and one-year age groups until 2050. These assumptions are based on *Employment in Poland 2008* (IBS / CRZL 2010). In the pension part of the model, subgroups — called profiles — are distinguished for each birth cohort, based on sex and education level.[6] In this paper we analyse the cohort born in 1980, but the expected probabilities of having a job and level of earnings in the years of life to come are calculated for each cohort born in the period 1948–1983 (men) and in the period 1950–1985 (women).[7] The next step is to calculate the expected number of years of employment and the accumulated pension capital, i.e. the value of account in both pillars, for each cohort in any projection moment. It is assumed that each member of the scheme retires when reaching the statutory retirement age, and that the retirement benefit is calculated as annuity based on life expectancy in the overall population at a statutory retirement age. The result of the model is the expected retirement benefit for a person of a given sex, born in a given year and given education level attained. Expected retirement benefits for a given sex or given birth cohort are calculated as averages of expected retirement benefits of profiles, weighted by the shares of profiles in the population of insured individuals of given sex (cohort).

The model adopts the macroeconomic scenario compliant with the *Guidelines for applying uniform macroeconomic indicators being the basis for estimating financial effects of bills* of November 2013 used by the Ministry of Finance. Table 1 summarises it by means of annual average growth rates of selected variables in the period 2015–2050. It is assumed that the annual average inflation in Poland will reach approx. 2.1%, yet it will systematically decrease from 2015 on and stabilise at the level of 2% in 2027. The forecast for the annual average real Gross Domestic Product growth rate is 2.8% and the real labour productivity change is at the level of 3.5%. It is also assumed that the real wage growth will be slightly lower than the labour productivity growth, reaching 3.2%. Capital asset profitability indicators are relatively high, reaching 2.7% for profitability of treasury bills, 4.9% for profitability of assets invested on the Warsaw Stock Exchange, and 3.8 for other assets of Open Pension Funds.

[6] Education groups distinguished: tertiary or higher; post-secondary or vocational secondary; upper secondary; basic vocational; primary, lower secondary and below.

[7] We use probabilities of work estimated on LFS data and average wages estimated based on SES data for the period 2000–2013 and construct a projection up to 2050 in accordance with the methodology presented in IBS / CRZL (2010).

Table 1. Summary of the assumptions of the macroeconomic scenario until 2050

	Annual average change (in %)
Inflation	2.1
GDP change (real)	2.8
Labour productivity change (real)	3.5
Real wage growth	3.2
Profitability of treasury bills	2.7
Profitability of the Warsaw Stock Exchange	4.9
Profitability of other assets in Open Pension Funds	3.8

Source: own elaboration.

2.2. Life cycle employment scenarios

Two employment and wage scenarios in the life cycle are established for each profile within the cohort born in 1980: for the employment contract and contract of mandate segments of labour market. All employment scenarios in the life cycle were created on the basis of data derived from the 2013 and 2012 Labour Force Survey, 2012 Structure of Earnings Survey and the 2013 Social Insurance Institution (ZUS) data. It has been assumed that limit distributions are stationary over time, i.e. it is assumed that the distribution of probability of working under a given contract type is constant over time for the individual profiles distinguished by sex and education level. This is assumed due to the fact that there are no relevant panel data which could be used to estimate probabilities of transitions between employment and civil law contracts over the period [t,t+1]. The exact distribution of the probability of working under civil law contracts by age, education and sex is unknown, either (ZUS data provides only information about distribution by age and sex). Therefore, the probabilities of working under civil law contracts have been estimated for the individual education groups based on two datasets — 2012 Labour Force Survey and 2012 Structure of Earnings Survey. LFS contains data about all people working in the economy, while SES — only about people working under (open-ended or fixed-term) employment contracts. Thus, we calculated the distribution of probability of working under civil law contracts (by sex, age and education level) as a difference between probabilities of working temporarily in the LFS and SES data.

Then, making use of the estimated probabilities of working under a given contract type in the life cycle, the individual profiles have been assigned the contract type for which the estimated probability was the highest. Since people with civil law contract employment spells display a higher risk of frictional unemployment (illustrated by the gaps in employment and payment of the contributions, as discussed in subsection 1.2), it is assumed that they work for a shorter period in their life cycles, i.e. the accumulated

number of years of employment for a given profile is lower than the accumulated number of years of employment for those working only under employment contracts (cf. Table 2).

The contributions bases (wages) expressed as a percentage of the average contribution base were estimated on ZUS 2013 data for a given gender and age group. As ZUS data lacks information on education level, we assumed that relative differences between wages in both segments for a given educational profile were identical as for the relevant gender and age group. Using SES (2102) data, for every profile we estimated wages relative to the average wage. These two distributions allowed us to express wages in both segments in relation to the average wage. As in case of probabilities of work, we assumed that limit distributions of wages (relative to average wage) in profiles and segments are stationary over time. Life cycle employment and wage scenarios for people working exclusively under employment contracts (yet with unemployment spells) were created as reference scenarios.

The scenarios of employment paths in the life cycle for both segments and by distinguished profiles are presented in Tables 5–6, and the scenarios of contribution bases in Tables 7–8 in the Appendix.

Table 2. Accumulated years of employment in the life cycle for the individual profiles in model employment scenarios in two segments of the labour market

Sex	Education	Accumulated years of employment	
		Segment of contracts of mandate	Segment of employment contracts
Men	Tertiary	40	43
Men	Post-secondary / vocational secondary	37	40
Men	Upper secondary	32	35
Men	Basic vocational	34	39
Men	Primary and lower secondary	28	36
Women	Tertiary	39	43
Women	Post-secondary / vocational secondary	35	38
Women	Upper secondary	32	36
Women	Basic vocational	34	38
Women	Primary and lower secondary	24	32

Source: own calculations.

Applying these two scenarios in the pension model presented above, we calculated the expected average retirement benefit in two labour market segments which for each profile exhibit: (i) a work career with a use of contracts of mandate, and (ii) a work career based solely on employment contracts. In each segment, the results for a given sex (and total cohort) have been calculated as weighted averages (weighted by the education profile shares) of results for profiles.

3. Labour market segmentation consequences for pensions

3.1. Expected pension gap between labour market segments

In principle, workers affected by labour market segmentation work fewer years under employment contracts and pay lower contributions, which results in lower retirement benefits compared to those with the same socio-demographic characteristics yet working under employment contracts. We express the difference in the expected retirement benefit related to labour market segmentation by two variables: (i) the expected retirement benefit in constant prices of 2015 and (ii) the relation of the expected retirement benefit to the last wage before reaching the statutory retirement age in the given profile (and segment).

According to our results for people born in 1980, presented in Figures 10–11, a career in the labour market segment that commonly applies civil law contracts involves expected retirement benefit lower by PLN 538 (in constant prices of 2015) for men and by PLN 428 for women. Therefore, the expected pension gap in the civil law contract segment amounts to 17.7% in the case of men and to 17.2% in the case of women. In terms of retirement benefit as a percentage of the last wage before retiring, the difference is 12 pp. for men and 9 pp. for women, respectively.

Figure 10. Expected retirement benefit in constant prices of 2015 in the employment contract segment and the civil law contract segment by sex (in PLN)

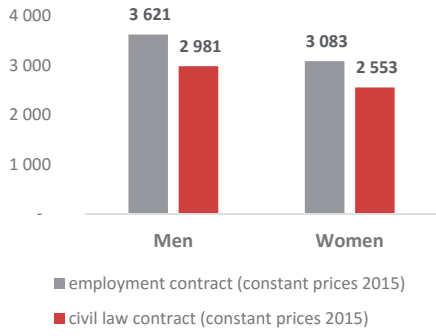
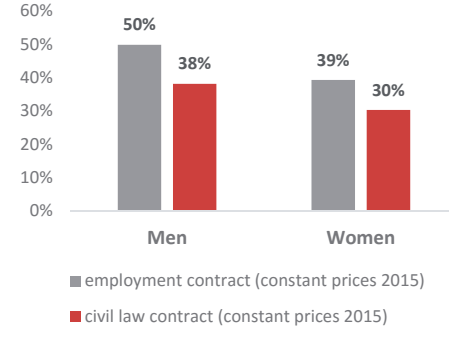


Figure 11. Expected retirement benefit in relation to the expected last remuneration before reaching statutory retirement age in the employment contract segment and the civil law contract segment by sex (in %)



Source: own calculations.

The differences in average expected pensions between segments do not tell the whole story. We find substantial disparities between various profiles by education level (cf. Table 3). The greatest expected pension gap between labour market segments affects workers with primary and lower secondary education, for whom it exceeds 45% (in 2015 prices this means the expected retirement benefit of PLN 1245 in the segment of civil law contracts vs. PLN 2275 in the employment contract segment for men, and PLN 763 vs. PLN 1424 for women). On the other hand, the smallest difference (approx. 10%, below PLN 500 in 2015 prices) in expected retirement benefits between labour market segments occurs among people with tertiary education. In the case of other profiles, the difference in the expected pension ranges from 18% to 27% (with respect to the expected retirement benefit in the segment of employment contracts for a given profile). In terms of retirement benefits expressed in relation to the expected last wage before reaching the retirement age, a negative correlation between the education level and the pension gap between labour market segments can be observed.[8]

Table 3. Expected retirement benefit in 2015 constant prices and in relation to the expected last remuneration before reaching the statutory retirement age, the civil law contract segment and employment contract segment by sex and education level for the cohort born in 1980

Sex	Education	EC retirement benefits (2015 constant prices)	CLC retirement benefits (2015 constant prices)	Difference (in %)	EC retirement benefits(as % of the last pay)	CLC retirement benefits (as % of the last pay)	Difference (in pp)
M	Tertiary	5,557.02	5,063.22	8.9%	41.7%	38.0%	3.7
M	Post-secondary / vocational secondary	3,382.90	2,690.41	20.5%	43.4%	34.5%	8.9
M	Upper secondary	2,837.16	2,121.96	25.2%	38.8%	29.0%	9.8
M	Basic vocational	2,655.81	2,071.03	22.0%	65.6%	51.1%	14.5
M	Primary and lower secondary	2,275.26	1,245.32	45.3%	57.0%	31.2%	25.8
W	Tertiary	4,189.07	3,706.34	11.5%	36.6%	32.4%	4.2

[8] In the case of absolute quantities there is no such correlation, due to a non-monotonic relation between the education level and expected retirement benefit in a given profile.

Table 3.

Sex	Education	EC retirement benefits (2015 constant prices)	CLC retirement benefits (2015 constant prices)	Difference (in %)	EC retirement benefits(as % of the last pay)	CLC retirement benefits (as % of the last pay)	Difference (in pp)
W	Post-secondary / vocational secondary	2,564.28	1,891.34	26.2%	37.6%	27.7%	9.9
W	Upper secondary	2,392.58	1,972.56	17.6%	32.6%	26.8%	5.8
W	Basic vocational	1,788.66	1,308.39	26.9%	45.7%	33.4%	12.3
W	Primary and lower secondary	1,424.30	763.26	46.4%	38.9%	20.8%	18.1

Source: own calculations.

3.2. Impact of differences of employment tenure in the life cycle and contributions paid

To shed light on factors behind the pension gaps, we decompose the differences in the expected retirement benefits in both segments into (i) the part arising from the different total life cycle employment period of people with careers in the civil law contract segment, E_i, and (ii) the part arising from different contributions paid in the segment of civil law contracts (compared to employment contracts), C_i (i indicates the profile).

The impact of differences in the life cycle employment was calculated as the difference between the expected retirement benefit in the segment of employment contracts and the hypothetical retirement benefit that would be obtained (by the given profile) conditional on paying contributions identical to those in the segment of employment contracts, yet in the sequence of the life cycle employment spells like in the segment of civil law contracts, according to the following formula:

Equation 1. Effect of the life cycle employment period on differences in retirement benefits between segments expressed in absolute values of pension account in the employment contract segment

$$E_i = \sum_{t=20}^{t=67} P_{t,i}^{UP} * W_{t,i}^{UP} * g_{67-t+1} - \sum_{t=20}^{t=67} P_{t,i}^{CW} * W_{t,i}^{UP} * g_{67-t+1}$$

E_i — effect of life-cycle employment,
$P_{t,i}$ — part of year t when profile i was employed,

W_t — amount of the annual contribution at age t,
$G_{67\text{-}t+1}$ — accumulated growth rate in year 67-t+1,
CW — variables for civil law contracts,
UP — variables for employment contracts,
i — index for individual profiles.

The effect of differences in contributions paid was calculated as the difference between the expected retirement benefit in the segment of employment contracts and the hypothetical retirement benefit that would be obtained (in the given profile) conditional on a sequence of the life cycle employment spells identical as in the segment of employment contracts, yet with contributions paid like in the segment of civil law contract, according to the following formula:

Equation 2. Effect of contributions paid on differences in retirement benefits between segments expressed in absolute values of pension account in the employment contract segment

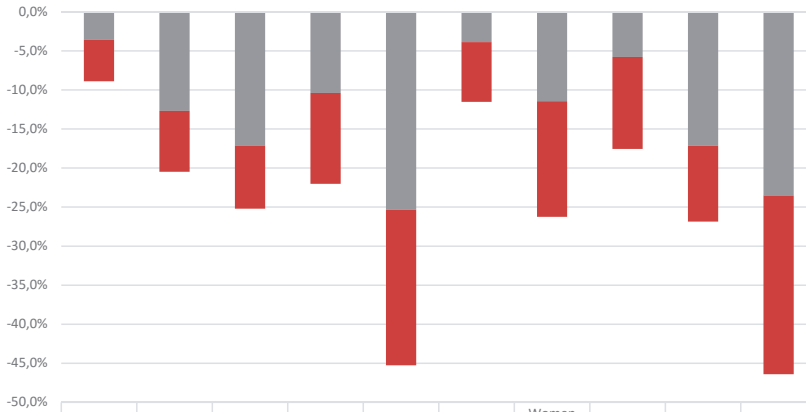
$$C_i = \sum_{t=20}^{t=67} P_{t,i}^{UP} * W_{t,i}^{UP} * g_{67-t+1} - \sum_{t=20}^{t=67} P_{t,i}^{UP} * W_{t,i}^{CW} * g_{67-t+1}$$

C_i — effect of contributions paid,
$P_{t,i}$ — part of year t when profile i was employed,
W_t — amount of the annual contribution at age t,
$G_{67\text{-}t+1}$ — accumulated growth rate in year 67-t +1,
CW — variables for civil law contracts,
UP — variables for employment contracts,
i — index for individual profiles.

Our results show that in the case of men 9.5 pp. out of the 17.7% difference in the expected retirement benefit between segments can be attributed to lower contributions paid, and 8.2 pp. — to shorter employment in the life cycle. In the case of women, the respective numbers are 7.3 pp. and 9.9 pp. Hence, shorter total employment periods in the life cycle are slightly more important for men and lower contributions paid to the scheme — for women.

We also find a significant discrepancy in this respect with regard to the education level (Figure 12). Among people with tertiary education and among women with upper secondary education, the dominant factor underlying differences in retirement benefits is a shorter total employment period in the civil law contract segment. Bases of contributions are less significant and account for approx. 1/3 of the differences. On the other hand, it is the lower total amount of contributions paid in the segment of civil law contracts that plays the dominant role among men with post-secondary or upper secondary education and among women with basic vocational education. Finally, the role of both factors is similar among men with vocational education and women with post-secondary education.

Figure 12. Decomposition of differences of the expected retirement benefits in the segment of civil law contracts and employment contracts into the impact of the employment period in the life cycle and contributions paid by sex and education level for the cohort born in 1980 (in %)



	Men higher	Men post-secondary / vocational secondary	Men upper secondary	Men basic vocational	Men primary and lower secondary	Women higher	Women post-secondary / vocational secondary	Women upper secondary	Women basic vocational	Women primary and lower secondary
E - employment period	-5,3%	-7,8%	-8,1%	-11,6%	-19,9%	-7,7%	-14,8%	-11,8%	-9,7%	-22,9%
C - contributions paid	-3,6%	-12,7%	-17,1%	-10,4%	-25,3%	-3,9%	-11,4%	-5,8%	-17,1%	-23,5%

Source: own calculations.

4. Impact of policy instruments

In this section we analyse how the expected pensions in the contracts of mandate segment would be impacted by two policy instruments:

- paying contributions on all contracts of mandate at least from the minimum wage level, which pursuant to the Social Security System Act, as amended on 23 October 2014, became mandatory on 1 January 2016;
- additional savings in the third pillar with a contribution amounting to (i) 2% of remuneration only during work under contracts of mandate or (ii) 4% of remuneration in 2015–2029 and 4% of remuneration paid only under civil law contracts in 2030–2047.

We assume that both instruments would affect only the stream of paid contributions, while employment paths (in both segments of the labour market) would remain unchanged. We also assume that from 2016 the minimum wage would be pegged to average wage in the economy.[9] Results of simulations of both policies are presented in Table 4.

We find that the obligation to pay contributions from the minimum wage level bridges the expected pension gap by 4.3 pp. of 17.7% gap for men and 4.5 pp of 17.2% gap for women. The slightly greater impact of this policy on women is related to lower average pay among women, and in particular to a slightly wider gap in women's remuneration

[9] i.e. that minimum wage is going to increase at the same pace as average wage.

in the civil law contract segment in relation to the minimum wage. For the same reason, this policy has the strongest effect on the pensions gap in groups with lower education level. It has the greatest impact on expected retirement benefits among women with basic vocational, primary or lower secondary education (among whom it reduces the expected pension gap between segments by almost a half) and men with primary or lower secondary education (among whom it reduces the pension gap by 1/3). On the other hand, it is only of marginal importance for people with tertiary education who work in the civil contract segment. Among men it bridges only 1 pp. of the 8.9% pension gap with respect to the employment contract segment, and 1.6 pp. of 11.5% gap among women. That's because people with tertiary education in the civil law contract segment on average pay contributions based on pay close to the minimum wage. In other profiles an increase of expected pension benefit bridges approx. 1/5 of the gap in retirement benefits with respect to the employment contract segment. The total stream of additional contributions paid in the years 2016–2040 is estimated at PLN 231 billion (in 2015 prices).

Table 4. Differences in expected retirement benefits between the civil law contract segment and employment contract segment, and calculated change in retirement benefits in the civil law contract segment resulting from paying contributions at least from the minimum wage level and additional saving of 2% or 4% of wage in the third pillar

Profile	Pension gap — civil law contracts (in %)	Impact of		
		Contributions paid from minimum wage level (in pp)	Voluntary 2% savings plan (in pp)	Voluntary 4% savings plan (in pp)
Men; tertiary education	8.9	1.0	0.9	3.5
Men; post-secondary/ vocational secondary education	20.5	5.5	0.4	2.5
Men; upper secondary education	25.2	7.1	0.5	2.9
Men; basic vocational education	22.0	5.9	0.5	2.8
Men; primary, lower secondary education or below	45.3	15.5	0.4	2.2
Men	17.7	4.3	0.6	3.0
Women; tertiary education	11.5	1.6	0.9	3.4
Women; post-secondary/ vocational secondary education	26.2	7.0	0.4	2.5

Table 4.

Profile	Pension gap — civil law contracts (in %)	Impact of		
		Contributions paid from minimum wage level (in pp)	Voluntary 2% savings plan (in pp)	Voluntary 4% savings plan (in pp)
Women; upper secondary education	17.6	3.1	0.3	2.4
Women; basic vocational education	26.9	14.8	0.5	2.2
Women; primary, lower secondary education or below	46.4	21.6	0.4	2.0
Women	17.2	4.5	0.6	3.0

Note: Voluntary savings plan in the fully funded pillar amounting to 4% of remuneration in the years 2015–2029 and 4% of remuneration paid exclusively under civil law contracts in the years 2030–2047.

Source: own calculations.

Additional savings in the (third) capital pillar of Polish pension system constitute the second analysed instrument. We assume that people working under civil law contracts set aside additional 2% of their contribution base in the third pillar. The assumption made with regard to the amount of the additional contribution corresponds with ideas put forward in the public debate; e.g. Rutecka et al. (2014) proposed a contribution amounting to 2% under quasi-mandatory workplace pension schemes (initially in companies hiring at least 250 employees). We also assume that future returns in the third pillar are going to be identical as in the second (fully funded) pillar of the general pensions scheme.

This instrument has little influence on the expected retirement benefits in the civil law contract segment, increasing them by 0.7 pp. for women and by 0.6 pp. for men (cf. Table 4). A voluntary savings plan is the most effective solution in profiles with highest average pay, i.e. workers with higher education. Among them, it would reduce the gap with respect to their counterparts in the employment contract segment by 0.9 pp. (for both sexes). The impact is the weakest among women with upper secondary education or basic vocational education (0.3 pp. and 0.4 pp. of the between segments pension gap, respectively). However, this policy increases the stream of contributions in the years 2016–2040 only by PLN 33 billion. This amount is seven times lower than the stream of contributions estimated for paying pension contributions (to the general pension scheme) from the minimum wage level.

Additional savings in the third pillar could translate into a noticeable increase in retirement pensions in the civil law contract segment if contributions were paid for a longer period, in order to compensate for lower contributions paid during work under civil law contracts. Moreover, due to opportunity cost (indexation of and return on contributions paid at an early

stage of career), the additional contribution should also be higher. For instance, if people born in 1980 and working in the civil law contract segment would pay extra contributions of 4% of their pay in the 2015–2029 period, and 4% of their pay only when working under civil law contracts in the 2030–2047 period, it would increase the contribution stream by PLN 228 billion, i.e. an amount close to the one obtained through paying pension contributions (to the general pensions scheme) from the minimum wage level. This policy would bridge the average pension gap between the labour market segments by 3 pp., so less than the obligation to pay contributions from the minimum wage level. However, it would likely affect the labour demand less. Its impact would be to an even greater extent correlated with the wage level than in case of the additional 2% contribution. We find that the higher the worker's level of education, the higher the benefits generated by this policy (cf. Table 4).

Conclusions

Over the last dozen plus years, Poland experienced a substantial rise in the incidence of temporary contracts, in particular civil law contracts. The latter differ from employment contracts not only in how they are concluded and terminated, but also with respect to the obligations to pay social security contributions, in particular pension contributions. In 2013, approx. one million people in Poland worked under civil law contracts, earning on average lower wages and paying lower pension contributions than their counterparts who had similar socio-demographic characteristics but worked under employment contracts. In this paper, a cohort model of the Polish pension scheme is used to assess the results of this labour market segmentation on the level of retirement pension benefits expected in the future. We focus on a selected cohort of people born in 1980 who started and developed their careers in parallel with the spread of temporary work and civil law contracts in Poland. Taking into account differences of unemployment spells and differences in the bases of pension contributions (estimated on the basis of LFS, SES and ZUS data), we calculated expected retirement benefits in the employment contract segment and in the civil law contract segment.

Our results indicate that a career in the civil law contract segment entails a leads to lower expected retirement benefit than in the employment contract segment. For the cohort born in 1980 this difference is 17.7% for men and 17.2% for women. The largest differences between people from the different labour market segments are identified for primary and lower secondary school graduates (above 45%), the smallest for people with tertiary education (approx. 10%), while for the other education level groups they fall in the range of 18% to 27%. We also find significant differences in factors behind the expected pension gap between segments. For men, the more important factor is the lower amount of social security contributions in the civil law contract segment, while for women it is the shorter period of employment in the life cycle. On the other hand, among the better educated, who generally have smaller expected pension gaps between segments, the dominating factor are the cumulated years of work in the civil law contract segment. Among less educated workers, who in general have larger expected pension gaps between segments, lower contributions paid in the civil law contract segment are more significant.

According to our results, the obligation to pay contributions for all contracts of mandate at least from the minimum wage level, which came into force as of 1 January 2016, will enable closing ¼ of the pension gap between labour market segments, assuming that it will not raise the risk of unemployment and decrease the number of years worked in the civil law contract segment. The impact of this policy is regressive — it increases as the contribution bases in the civil law contract segment decrease — which means that on average the impact of policy is larger on poorly educated people than on well-educated people. It can be expected, however, that for the worse educated and low earners it will be more difficult to meet the assumption about maintaining the unchanged employment path. On the other hand, the solution which involves additional savings in the third pillar of the pension scheme while working under civil law contracts is progressive — brings more benefits to those workers who earn relatively well in the contract of mandate segment. Its impact, however, is rather low — in the case of paying a 2% contribution, it does not exceed 1 pp. of the pension gap between the segments, in the case of 4% contribution — 1.2 pp. Additional third pillar savings of 4% of the remuneration in the years 2015–2029 and 4% of the remuneration solely for civil law contracts in the years 2030–2047 would close the gap by 3 pp.

Our policy simulations suggest that actions focused on setting a floor on contribution bases or moderate increases of additional savings will be helpful but not sufficient to fully eliminate the pension gap in relation to the employment contract segment. This is true even under the assumption that the obligation to pay contributions for all contracts of mandate at least from the minimum wage level will not make workers affected unemployed or moving to informal employment. Without transition of workers from civil law contracts to employment contracts, the pension gap will not disappear. Additional steps to limit the incidence of civil law contracts in Poland are needed. An example of such policy is the so-called single contract, as proposed by Arak, Lewandowski and Żakowiecki (2014), which would replace the civil law vs. employment contract duality with a one, uniform contract with bit different termination rules than current civil law and employment contracts, but with contributions paid from all wages on all types of contracts.

Literature

Arak, P., Lewandowski, P., Żakowiecki, P. (2014). *Dual labour market in Poland — proposals for overcoming the deadlock*, IBS Policy Paper 01/2014.

Boeri, T., Galasso, V. (2013). Is social security secure with NDC?. In: Holzmann R., Palmer E., Robalino D., (2013), *Nonfinancial Defined Contribution Pension Schemes in a Changing Pension World: Volume 2. Gender, Politics, and Financial Stability, World Bank.* Available at: https://openknowledge.worldbank.org/handle/10986/12212.

Boeri, T. (2011). Institutional Reforms and Dualism in European Labor Markets. In: O. Ashenfelter, D.E. Card (red.), *Handbook of Labor Economics Volume 4B*, Amsterdam: North Holland. Available at: http://www.sciencedirect.com/science/article/pii/S0169721811024117.

GUS (2014). *Yearbook of Labour Statistics, 2012*, Warsaw: GUS. Available at: http://stat.gov.pl/en/topics/statistical-yearbooks/statistical-yearbooks/yearbook-of-labour-statistics-2012,10,2.html.

IBS (2010). *Employment in Poland 2008. Work over the life course*, Instytut Badań Strukturalnych, Centrum Zasobów Ludzkich. Available at: http://ibs.org.pl/projekty/files/ZWP/Employment_in_Poland_2008_-_Work_over_the_life_course.pdf

Lewandowski, P. (2015). *Zabezpieczenie emerytalne osób pracujących na podstawie umów cywilnoprawnych*, Forum Debaty Publicznej pt. *„Jak zapewnić godziwe dochody na starość — rola dobrowolnych oszczędności emerytalnych"* 19 stycznia 2015, mimeo

Palmer, E. (2006). What is NDC. In: Holzmann R., Palmer E., (2006). *Pension Reforms: Issues and prospects for Non-Financial Defined Contribution (NDC) Schemes*, The World Bank.

Rutecka, J. et al., (2014). *Dodatkowy system emerytalny w Polsce — diagnoza i rekomendacje zmian*, Towarzystwo Ekonomistów Polskich.

Takayama, N., Shiraishi, K. (2012). *Does a Bad Start Lead to a Bad Finish in Japan?* (No. 547), Center for Intergenerational Studies, Institute of Economic Research, Hitotsubashi University.

Streszczenie

W artykule wykorzystano kohortowy model systemu emerytalnego do ilościowej analizy wpływu rozpowszechnienia umów cywilnoprawnych na wysokość oczekiwanych emerytur w Polsce. Ponadto, zostały poddane ocenie rozwiązania zwiększające strumień składek płaconych przez pracujących na umowach cywilnoprawnych. W porównaniu do segmentu umów o pracę, oczekiwana emerytura jest niższa w segmencie umów cywilnoprawnych o 17%. Obowiązek odprowadzania składek od umów zlecenia od wysokości minimalnego wynagrodzenia pozwoli na domknięcie ok. 4,4 pp. luki emerytur między segmentami, o ile nie podniesie ryzyka bezrobocia w segmencie umów cywilnoprawnych. Dodatkowe oszczędzanie w trzecim filarze 2% płacy brutto w trakcie pracy na umowy zlecenia obniża lukę między segmentami o mniej niż 1 pp.

Słowa kluczowe: segmentacja rynku pracy, emerytury, system emerytalny o zdefiniowanej składce

Cytowanie

Piotr Lewandowski, Kamil Stroński, Roma Keister (2016), *Labour market segmentation and pensions in the Polish defined-contribution scheme*, „Problemy Polityki Społecznej. Studia i Dyskusje" nr 33(2), s. 111–137. Dostępny w Internecie na www.problemypolitykispolecznej.pl [dostęp: dzień, miesiąc, rok]

Appendix

Table 5. Model life cycle employment scenarios in the contract of mandate segment

		22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Men	Tertiary			M	M	M	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Post-secondary / vocational secondary	M	M	M	M	M	M	E	E	U	U	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Upper secondary		M	M	M	M	M	M	M	U	U	U	E	E	E	E	E	E	E	E	E	E	E	E
Men	Basic vocational	M	M	M	M	M	U	U	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Primary and lower secondary		M	M	M	M	M	M	U	U	M	M	M	M	M	U	U	U	E	E	E	E	E	E
Women	Tertiary			M	M	M	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Post-secondary / vocational secondary		M	M	M	M	M	M	M	U	U	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Upper secondary			M	M	M	U	U	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Basic vocational		M	M	M	M	M	U	U	E	E	E	E	E	E	E	E	E	E	E	E	M	M	M
Women	Primary and lower secondary			M	M	M	U	E	E	U	U	M	M	M	M	M	M	E	E	E	E	U	U	E
		45	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**
Men	Tertiary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	E	E	E	E	
Men	Post-secondary / vocational secondary	E	E	E	E	E	E	E	E	M	M	E	E	E	E	E	U	U	E					
Men	Upper secondary	E	E	E	E	E	E	E	E	U	M	M	E	E	U	U	U	E						
Men	Basic vocational	E	E	E	E	E	E	E	E	E	M	M	U	U	E	E	E	E						
Men	Primary and lower secondary	E	E	E	E	E	E	E	E	U	U	U	U	M	M	E								
Women	Tertiary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	E	E	E		

Women	Post-secondary / vocational secondary	E	E	E	E	E	E	E	E	E	E	U	U	E	E	U	U	E						
Women	Upper secondary	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	U	E						
Women	Basic vocational	M	U	E	E	E	E	E	E	E	E	E	E	E	E	U	U	U	E					
Women	Primary and lower secondary	E	E	E	U	U	U	U	M	E	E	E	E											

Note: M — spells of employment under a contract of mandate, E — spells of employment under an employment contract, U — unemployment spells. Blank fields mean inactivity.

Source: own elaboration.

Table 6. Model life cycle employment scenarios in the employment contract segment

		22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Men	Tertiary			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Post-secondary / vocational secondary	E	E	E	E	E	E	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Upper secondary		E	E	E	E	E	E	E	E	E	U	U	E	E	E	E	E	E	E	E	E	E	E
Men	Basic vocational	E	E	E	E	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Men	Primary and lower secondary		E	E	E	E	E	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Tertiary			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Post-secondary / vocational secondary		E	E	E	E	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Upper secondary			E	E	E	U	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Basic vocational		E	E	E	E	E	E	U	U	E	E	E	E	E	E	E	E	E	E	E	E	E	E
Women	Primary and lower secondary			E	E	E	E	E	E	U	U	E	E	E	E	E	E	E	E	E	E	E	E	E
		45	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**
Men	Tertiary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	E	E	E	E	E	E
Men	Post-secondary / vocational secondary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	E			
Men	Upper secondary	E	E	E	E	E	E	E	E	U	E	E	E	E	E	E	U	U	E					
Men	Basic vocational	E	E	E	E	E	E	E	E	E	E	E	E	U	E	E	E	E	E					
Men	Primary and lower secondary	E	E	E	E	E	E	E	E	E	E	U	U	E	E	E	E	E						
Women	Tertiary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	E	E	E	E	E	E	E	E
Women	Post-secondary / vocational secondary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	E	E				

Women	Upper secondary	E	E	E	E	E	E	E	E	E	E	E	E	E	E	U	U	E	E	E				
Women	Basic vocational	E	E	E	E	E	E	E	E	E	E	E	E	E		U	E	E	E	E	E			
Women	Primary and lower secondary	E	E	E	E	U	U	E	E	E	E	E	E	E	E	E								

Note: E — spells of employment under an employment contract, U — unemployment spells. Blank fields mean inactivity.

Source: own elaboration.

Table 7. Model life cycle contribution base (as a percent of average wage) scenarios in the employment contract segment

		22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Men	Tertiary	78	74	69	110	109	108	108	106	153	154	152	150	148	177	179	177	175	172	174	176	174	172	169
Men	Post-secondary / vocational secondary	65	64	62	79	79	80	81	81	96	97	96	95	94	100	101	100	99	98	99	100	99	98	97
Men	Upper secondary	69	66	64	85	85	85	85	83	99	99	98	97	96	102	103	102	101	99	96	97	96	95	93
Men	Basic vocational	60	59	57	69	70	70	71	70	78	79	78	77	76	81	82	81	81	79	80	81	80	79	78
Men	Primary and lower secondary	56	55	54	64	65	67	69	65	72	73	72	71	70	75	76	75	75	73	74	75	74	73	72
Women	Tertiary	66	65	64	87	85	85	84	87	109	110	109	109	107	115	116	115	114	113	118	120	119	119	117
Women	Post-secondary / vocational secondary	57	54	52	64	63	63	63	65	72	73	72	72	71	74	75	74	74	73	75	76	76	75	74
Women	Upper secondary	62	59	56	70	68	69	69	72	77	78	77	76	75	75	76	75	74	73	74	75	74	73	72
Women	Basic vocational	49	48	48	51	51	51	52	51	53	54	54	53	52	54	54	54	54	53	53	53	53	53	52
Women	Primary and lower secondary	49	49	48	53	54	55	55	52	53	53	53	52	51	51	52	51	51	50	50	50	49	49	48
		45	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**
Men	Tertiary	166	167	166	164	161	156	157	156	154	152	147	147	146	145	144	143	143	142	141	140	149	149	148
Men	Post-secondary / vocational secondary	96	97	96	95	93	93	94	93	92	91	93	94	93	93	93	96	97	97	97	96	86	87	87

Men	Upper secondary	88	89	88	87	85	83	84	83	82	81	81	82	81	81	80	78	79	78	78	78	81	81	81
Men	Basic vocational	75	76	75	74	73	71	71	71	70	70	69	69	69	68	68	61	62	62	62	62	45	45	45
Men	Primary and lower secondary	69	70	69	68	67	64	65	64	64	63	62	62	62	62	61	55	56	55	55	55	44	44	44
Women	Tertiary	122	124	123	122	121	121	122	121	121	119	122	123	122	122	121	126	126	126	126	125	127	128	127
Women	Post-secondary / vocational secondary	76	77	77	76	75	80	81	80	80	79	85	86	85	85	85	86	87	87	86	86	76	76	76
Women	Upper secondary	72	73	72	71	70	75	75	75	74	73	82	82	82	81	81	77	77	77	77	76	82	82	82
Women	Basic vocational	52	53	52	52	51	51	52	52	51	51	50	51	50	50	50	47	48	48	48	47	43	44	44
Women	Primary and lower secondary	48	48	48	47	46	46	47	46	46	45	45	45	45	45	44	43	43	43	43	42	41	41	41

Source: own elaboration.

Table 8. Model life cycle contribution base (as a percent of average wage) scenarios in the contract of mandate segment

		22	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
Men	Tertiary	19	18	17	27	27	27	27	27	38	38	38	38	37	44	45	44	44	43	43	44	43	43	42
Men	Post-secondary / vocational secondary	16	16	16	20	20	20	20	20	24	24	24	24	23	25	25	25	25	24	25	25	25	25	24
Men	Upper secondary	17	17	16	21	21	21	21	21	25	25	25	24	24	26	26	26	25	25	24	24	24	24	23
Men	Basic vocational	15	15	14	17	17	18	18	17	19	20	19	19	19	20	21	20	20	20	20	20	20	20	19
Men	Primary and lower secondary	14	14	14	16	16	17	17	16	18	18	18	18	17	19	19	19	19	18	19	19	19	18	18
Women	Tertiary	17	16	16	22	21	21	21	22	27	28	27	27	27	29	29	29	29	28	30	30	30	30	29
Women	Post-secondary / vocational secondary	14	14	13	16	16	16	16	16	18	18	18	18	18	18	19	19	18	18	19	19	19	19	19
Women	Upper secondary	16	15	14	17	17	17	17	18	19	20	19	19	19	19	19	19	19	18	18	19	18	18	18
Women	Basic vocational	12	12	12	13	13	13	13	13	13	13	13	13	13	13	14	14	13	13	13	13	13	13	13
Women	Primary and lower secondary	12	12	12	13	13	14	14	13	13	13	13	13	13	13	13	13	13	12	12	13	12	12	12
		45	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**
Men	Tertiary	41	42	41	41	40	39	39	39	39	38	37	37	37	36	36	36	36	35	35	35	37	37	37
Men	Post-secondary / vocational secondary	24	24	24	24	23	23	23	23	23	23	23	23	23	23	23	24	24	24	24	24	22	22	22

Men	Upper secondary	22	22	22	22	21	21	21	21	21	20	20	20	20	20	20	20	20	20	20	19	20	20	20
Men	Basic vocational	19	19	19	19	18	18	18	18	18	17	17	17	17	17	17	15	15	15	15	15	11	11	11
Men	Primary and lower secondary	17	17	17	17	17	16	16	16	16	16	15	16	15	15	15	14	14	14	14	14	11	11	11
Women	Tertiary	30	31	31	31	30	30	31	30	30	30	31	31	31	30	30	31	32	31	31	31	32	32	32
Women	Post-secondary / vocational secondary	19	19	19	19	19	20	20	20	20	20	21	21	21	21	21	22	22	22	22	22	19	19	19
Women	Upper secondary	18	18	18	18	17	19	19	19	18	18	20	21	20	20	20	19	19	19	19	19	20	20	20
Women	Basic vocational	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	12	12	12	11	11	11
Women	Primary and lower secondary	12	12	12	12	12	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11	10	10	10

Source: own elaboration.