

# More Beveridgean or Bismarckian? A Comparative Analysis of Pension Systems in Selected CEE Countries

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## **Abstract**

*The main aim of this study is to compare and assess tendencies in the pension systems in the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia in respect to the level of intra-generational redistribution. They are examined from the current workers' perspective as well as from the current pensioners' perspective. First, the paper discusses institutional features that classify these pension systems as more Beveridgean or Bismarckian. As shown, today's pension system designs tend to link more closely pension benefits and earnings. These findings are supported by the OECD estimates that prove that the theoretical replacement rates for current workers involve very little redistribution, except for the Czech Republic. Second, using aggregated data obtained from the OECD and Eurostat databases covering the time span 2005-2013 the situation of current pensioners is examined. The results of the analysis based on three indicators of intra-generational redistribution show that pension systems in most studied CEE countries contain a strong redistributive component. Thus, they can be described as Beveridgean. However, Slovenia can be perceived as an exception.*

*Keywords: pension system, intra-generational redistribution, Bismarckian factor*

*JEL codes: J14, H55, D31*

## **1. Introduction**

In the 1990s, like most European countries, the CEE countries had to face the unfavourable demographic situation resulting from population ageing and low fertility rates. But there were also additional reasons for pension reforms that were common to the post-Communist countries undergoing transformation. As Mladen (2012) indicates, all the CEE countries suffered from declining economic activity as a consequence of the restructuring of public-owned enterprises, the reduction in the number of taxpayers, the increase of employment in the informal economy and high rates of tax evasion. This was the extra burden that threatened the financial sustainability of PAYG pension systems. The fiscal pressure forced the governments to implement reforms that would reduce public pension expenditures incurred by the state. In most countries in the region the process of privatizing pensions was started.

The reforms undertaken in the 1990s by the CEE countries, both those affecting the architecture of the pension systems as well as those of parametric nature, had an impact on the level of intra-generational redistribution. Before transition all the countries relied solely on the unfunded PAYG schemes and used defined benefit formulas, more popular in the Beveridgean social security model. It is associated with a high level of redistribution within the generation of retirees, as the pension benefits are loosely related to the contributions paid during an individual's working life. In this model, the replacement rates of high income earners are usually lower than the replacement rates of the low-income earners. A pure Beveridgean model provides flat rate benefits. In contrast, the Bismarckian model is characterized by a close link between previous earnings and pension benefits. A pure Bismarckian model implies no intra-generational redistribution, i.e. transfers from the richer to the poorer do not take place. Both models tend to support different goals of the pension system. While the Bismarckian model promotes consumption smoothing, in the Beveridgean model poverty alleviation is the main goal.

Usually only the PAYG unfunded schemes are subjected to categorisation into Beveridgean or Bismarckian models, as the funded schemes are by their nature related to previous earnings

(contributions). However, in this paper these terms will be used in reference to public mandatory pension plans, regardless of the managing entity, whether it is the state or a private institution. First, the overall assessment of a pension system as Bismarckian or Beveridgean depends not only on the design of the PAYG scheme, but also on its capacity i.e. its share in the pension benefit structure. A pension system can include a very limited first pillar, but with a significant redistribution component, and an extended mandatory second pillar and thus be perceived as not highly redistributive. Second, in contemporary systems it can be difficult to distinguish between the components of the pension benefit in respect to their source (the first or the second pillar). For example, in Poland the so called “safety slider” mechanism is implemented: the funds collected in the second pillar will be gradually transferred 10 years ahead of the retirement age to a sub-account (NDC) at the Social Insurance Institution.

The main aim of this paper is to assess the level of intra-generational redistribution in a group of CEE countries. To classify countries as Beveridgean or Bismarckian two approaches are used: an institutional approach based on the analysis of pension system design, as well as an empirical approach based on quantitative data analysis. Consideration of the pension system architecture features such as the pillar structure, the level of contributions paid to different pillars<sup>1</sup>, coverage, defined contribution (DC) vs. defined benefit (DB) formulas etc., to a great extent explains the nature of systems that implies the Bismarckian or the Beveridgean model. However, specifying the nature of the system “at the moment” should take into account the fact that the generation of retirees is not a homogenous group. There are people who relatively recently have gained pension entitlements under the new rules and people who have acquired those rights some time ago under the old, different rules. In view of the fact that pension systems in recent years have not been stable, but undergoing reforms, only empirical analysis of the effects can answer the question what is the actual model at a given time, taking into account the diversity of generations of retirees.

This paper is structured as follows. Firstly, it considers the systemic features of pension systems that influence the level of redistribution in six CEE countries: the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia. In the next section, the issues of intra-generational redistribution measurement in the comparative analyses of pension systems are discussed. The empirical results of such analyses carried out on the basis on the Eurostat and OECD data concerning the examined countries are presented in the subsequent section. The paper ends with synthetic conclusions.

## **2. Pension Systems in the CEE Countries**

As presented in Table 1, in all the six examined countries from the CEE region i.e. the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia, the pension systems have been undergoing reform since the 1990s (for a detailed review of the early reforms see for example Milos and Milos 2011, Aslund 2012, Mladen 2012, Chybalski 2009, Lindeman et al. 2000). The reforms that transformed the exclusively PAYG financing into multi-pillar systems and then changed the balance between the pillars came in two waves. The first lasted from the mid 1990s to the mid 2000s. It comprised strengthening the role of the funded pillars and of private savings in the pension systems. It fostered the connection between pension benefits and previous earnings, and thus was a move towards a Bismarckian system. However, the second wave of the reforms that took place after 2010 seemed to reverse the previously introduced reforms. The second funded pillar with funds managed by private institutions has lost its importance in favour of the first unfunded pillar. In Hungary in 2010 the privately managed second pillar was liquidated, and the assets of the pension funds were transferred to a great extent to the first pillar to ease public finances. Similarly, in Poland in 2014, half of the assets of pension funds were transferred to the notional defined contribution (NDC) scheme. Additionally, the participation in open pension funds belonging to the second pillar became voluntary, and the contribution rate associated with this form of pension schemes has been reduced drastically. Also in Slovakia the second pillar is no longer mandatory. In the Czech Republic the mandatory

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<sup>1</sup> Referring to the World Bank taxonomy of a multi-pillar system: pillar 0 covers so called “social pensions”, pillar 1 includes mandatory publicly managed schemes, pillar 2 comprises mandatory privately managed schemes and pillar 3 relates to the voluntary privately managed savings plans.

private pillar has never been introduced, as the pension system was based on the public pensions of the first pillar and the voluntary pensions of the third pillar. Nonetheless, in 2013 an attempt was made to create a voluntary second pillar as a result of the poor performance of the third pillar in terms of the coverage and the assets collected. However, the experiment has not been regarded as successful and the government plans its liquidation by the end of 2015. Out of the six analyzed countries only in Estonia is participation in the second pillar pension funds mandatory.

Table 1: Pension Reforms Concerning Private Pensions

	First wave pension reforms		Second wave pension reforms
	Pillar 2 Mandatory private pension	Pillar 3 Voluntary private pension	Pillar 2 Mandatory private pension
Czech Republic	-	1994	2013
Estonia	2002	1998	-
Hungary	1998	1994	2010
Poland	1999	1999	2014
Slovakia	2005	1997	2013
Slovenia	-*	2000	-

Note: \* mandatory for public sector, banking sector and for occupations with high occupational risks

Source: Mladen (2012) and author's elaboration

Table 2 presents the multi-pillar structures in the CEE countries. Most of the analyzed pension systems comprise the zero pillar. It provides targeted, basic or minimum pensions, and through this pillar the highest redistribution takes place. Referring to the first pillar that comprises the publicly administrated pension plans, in Estonia and Slovakia a points system is implemented. Only Poland has introduced an NDC scheme which is associated with two features: it is an unfunded and earnings related DC scheme based on individual accounts. The first pillar in the Czech Republic, Hungary and Slovenia is based on a defined benefit formula. In the countries where pension systems include second pillar i.e. in Estonia, Poland and Slovakia it is characterized by the defined contribution formula.

Table 2: Structure of Retirement-Income Provision

	Public (Pillar 0)			Public (Pillar 1)	Private (Pillar 2)
	Targeted	Basic	Minimum	Type	Type
Czech Republic		✓	✓	DB	
Estonia		✓		Points	DC
Hungary				DB*	
Poland			✓	NDC	DC
Slovakia			✓	Points	DC
Slovenia			✓	DB	

Note: DB = Defined benefit; DC = Defined contribution; NDC = Notional accounts, \* Individual accounts

Source: OECD (2013a)

One of the main indicators of the relevance of the particular pillars in a pension system is the level of the contribution rate paid to each pillar. As shown in Table 3, the great majority of the employee's and the employer's contribution goes to the first pillar in all of the studied countries.

Table 3: Pension Contribution Rates (2014)

	Pillar 1			Pillar 2		
	Employee	Employer	Total	Employee	Employer	Total
Czech Republic	6.5	21.5	28.0	-	-	-
Estonia	0.0	16.0	16.0	2.0	4.0	6.0
Hungary	1.5	24.0	25.5	8.0*	-	8.0
Poland	2.5	9.8	12.2	7.3*	-	7.3
Slovakia	7.0	12.8	19.8	-	9.0	9.0
Slovenia	15.5	8.9	24.4	-	-	-

Note: \* contributions paid to the individual accounts in public pension schemes

Source: World Bank HDNSP pensions database

Another crucial indicator of the role of particular pillars in pension provision is the coverage expressed as a percentage of the working age population. As presented in Table 4, the coverage of private mandatory pension plans differs significantly across the studied countries. The highest coverage, which is reported for Estonia, amounts to 69%. In Poland, before the pension reform in 2014, it was 56%, but after the legislative change it is only around 15%.

Table 4: Coverage of Private Pension Schemes by Type of Plan as a Percentage of the Working Age Population (2011)

	Mandatory / Quasi-mandatory	Voluntary		
		Occupational	Personal	Total
Czech Republic	n.a.	n.a.	62.1	62.1
Estonia	68.9	n.a.	..	..
Hungary	1.5	n.a.	20.0	20.0
Poland	56.5	1.3	..	..
Slovakia *	44.4	n.a.	..	..
Slovenia	n.a.	..	..	38.2

Note: .. = Not available; n.a. = Not applicable, \*The data for mandatory private pension plans refer to both mandatory and voluntary personal plans as the division between these is not available

Source: OECD (2013b)

The pension system design may be characterized by several dimensions. The two most important are the financing mechanism (PAYG or fully funded) and the benefit structure (DB or DC). Redistribution usually occurs in PAYG systems, while it does not exist in fully funded systems. Thus, if the share of the mandatory private schemes in pension provision increases substantially in comparison to the share of the PAYG scheme, then the redistribution (if it exists) is also reduced. The defined benefit mechanism also seems to foster higher redistribution, as it loosens the link between contributions and benefits on an individual level. In DB systems, pension benefits do not necessarily correspond to the present discounted values of the contribution paid in the past. As noted by Schwarz (2006) the DB formula is typical for PAYG systems, and the DC formula is more common in fully funded systems, but this assignment in contemporary real-world pensions systems may not be fully valid. As a hybrid solution, the notional account formula has emerged in recent years. It merges PAYG and DC earnings-related systems and, similarly to the funded systems, does not involve intra-generational redistribution.

### 3. Intra-Generational Redistribution Measurement

In the existing literature, relatively few measures of intra-generational redistribution suitable for international comparisons can be found. This phenomenon is usually characterized indirectly by an institutional approach describing the features of pension system design. A review, as well as classification, of quantitative measures of redistribution is provided by Rutecka (2012). This

classification, however, does not comprise the whole variety of approaches to the redistribution measurement. For example, as an indicator of the level of redistribution, Conde-Ruiz and Profeta (2007) apply the “Bismarckian index” defined as a correlation coefficient between pension benefits and pre-retirement earnings calculated for a sample of individuals and based on micro-level survey data.

Typically, intra-generational redistribution measurement relies on the inequalities of pension benefits with respect to previous earnings across the generation of retirees. Redistribution in the pension system serves as a tool of poverty alleviation among the elderly, but affects consumption smoothing, especially those of the highest income. In a highly redistributive system, high income earners receive lower pension benefits in relation to contributions paid in contrast to low income earners. In this section, three different indicators used in the empirical part of this paper are discussed.

A very simple index called *the symptoms of redistribution ratio* based on the net income quintile share ratios in the working-age generation and generation of retirees is proposed by Chybalski (2015):

$$RS = \frac{S80/S20_{65-}}{S80/S20_{65+}} \quad (1)$$

where  $S80/S20_{65-}$  is a ratio between the top quintile of income distribution in the cohort 65-, and the bottom quintile, respectively. The  $S80/S20_{65+}$  ratio refers to the income distribution in the old-age generation<sup>2</sup>.

When  $RS > 1$  then redistribution in a pension system is likely to occur, because this implies that inequalities in the generation of the elderly are smaller than in the working-age generation. In a Bismarckian pension system, the inequalities in both generations should remain the same. If  $RS < 1$  then the pension system can be degressive i.e. it supports inequalities, and redistribution from the poorer to the richer may take place or it results from additional transfers outside the pension system that are directed at more wealthy agents.

Because the proposed indicator employs the net income, including social transfers (pension benefits) obtained by retirees belonging to the 65+ generation, as well as the social benefits aimed at the 65- generation it seems that the  $RS$  indicator can be biased because of the underestimated earnings inequality in the numerator of the ratio. Inequalities in the working generation may in fact be largely offset by social transfers. In this case the indicator  $RS$  also is likely to be underestimated, and therefore the actual redistribution may be greater than implied by the indicator. By analogy, high employment rates in the 65+ cohort may also affect  $RS$  and its interpretation can lead to false conclusions.

A widely used measure of redistribution is the progressivity index (see for example Rutecka 2012). It is based on the ratio of the Gini coefficient calculated for pension benefits and the Gini coefficient for incomes of the working age population:

$$P = 100\% - \frac{\text{Gini}_{\text{pensions}}}{\text{Gini}_{\text{earnings}}} \quad (2)$$

The progressivity index varies between 0% and 100%. For pure Beveridgean pension systems with perfectly flat-rate benefits, this equals 100%, and for the pure Bismarckian systems with pension benefits proportional to the earnings it equals 0%.

Krieger and Traub (2008) proposed a ratio called the Bismarckian factor. It is dedicated to the assessment of the level of intra-generational redistribution in pension systems. The Bismarckian factor accounts for the fact that the real-world pension systems incorporate a mixture of both Bismarckian as well as Beveridgean features. The original formula is as follows:

$$\alpha = \frac{\mu(P^T - P^B)}{\mu(P^T - P^B) + P^B \gamma^T - P^T \gamma^B} \quad (3)$$

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<sup>2</sup> In formula (1) the original notation is preserved, as it directly refers to the indicators provided by the Eurostat and the OECD databases. However, when introducing other measures of redistribution in this section, the more general notation will be applied for income quintile shares i.e.  $w^T$  and  $w^B$  for the top quintile share and the bottom quintile share respectively.

where:  $\alpha$  is the Bismarckian factor,  $\mu$  denotes the mean income of a society,  $P^B$  and  $Y^B$  are the mean pension benefit and the mean income in the bottom quintile of the income distribution in the generation of pensioners and the working generation, respectively, and  $P^T$  and  $Y^T$  are the mean pension benefit and the mean income in the top quintile of the income distribution. The construction of the formula is clearly justified and it originates from the assumption that the pension benefit is a combination of two components: related and unrelated to previous earnings (pension contributions). Due to the lack of data in the comparative analyses of different pension systems, participation equivalence needs to be assumed. This means that in the Bismarckian factor formula instead of the previous earnings of the generation of today's pensioners we can employ the earnings of today's working generation.

Nevertheless, similarly to the previously described ratios, the Bismarckian factor is based on the income inequality measurement. For pure Beveridgean pension systems  $\alpha$  equals 0, because there are only flat pension benefits ( $P^B = P^T$ ). For pure Bismarckian pension systems  $\alpha$  equals 1, as the distribution of pension benefits reflects perfectly the distribution of previous earnings ( $P^B/Y^B = P^T/Y^T$ ). Dividing the numerator and denominator in the formula (3) by  $P^B$  we obtain:

$$\alpha = \frac{\mu \left( \frac{P^T}{P^B} - 1 \right)}{\mu \left( \frac{P^T}{P^B} - 1 \right) + Y^T - \frac{P^T}{P^B} Y^B} \quad (4)$$

Additionally:

$$\frac{P^T}{P^B} = \frac{w_P^T}{w_P^B} \quad (5)$$

$$Y^T = \frac{w_Y^T}{20} \mu \quad (6)$$

$$Y^B = \frac{w_Y^B}{20} \mu \quad (7)$$

where  $w_Y^B$  and  $w_P^B$  are the shares [in %] of the bottom quintiles in the earnings and pension benefits distributions respectively, and  $w_Y^T$  and  $w_P^T$  are the shares [in %] of the top quintiles in the earnings and pension benefits distributions.

Incorporating (5)-(7) into formula (4) allows excluding the mean income from the Bismarckian factor and to operate only on the shares of the top and bottom quintiles:

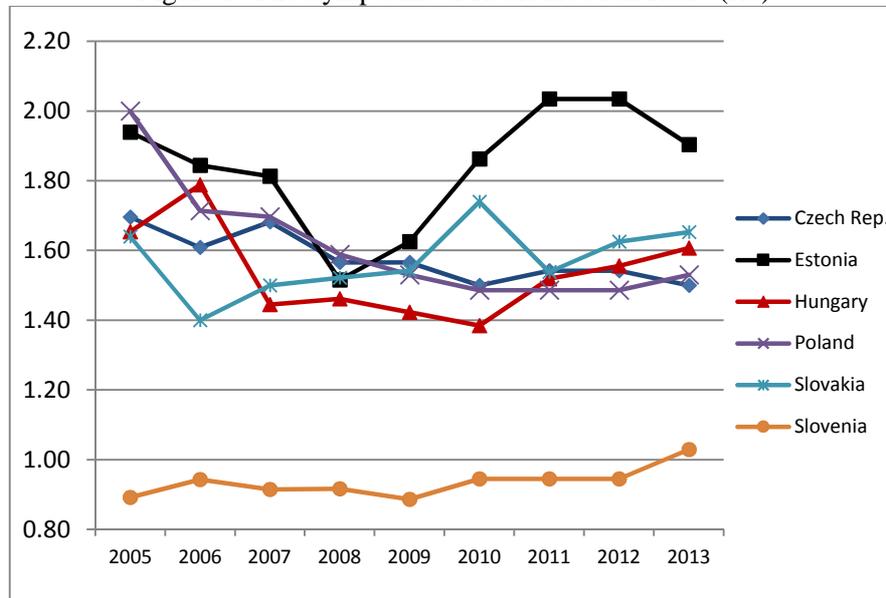
$$\alpha = \frac{\left( \frac{w_P^T}{w_P^B} - 1 \right)}{\left( \frac{w_P^T}{w_P^B} - 1 \right) + \frac{w_Y^T}{20} - \frac{w_P^T}{w_P^B} \cdot \frac{w_Y^B}{20}} \quad (8)$$

The formula (3) implies that the condition for  $\alpha$  to be smaller than 1 is  $P^B Y^T - P^T Y^B > 0$ . This means that the greater the difference between the income inequality ratios in both generations i.e.  $Y^T/Y^B$  and  $P^T/P^B$  (or  $w_Y^T/w_Y^B$  and  $w_P^T/w_P^B$ ) the greater the redistribution in a pension system. The condition can be also expressed as the difference between  $P^B/Y^B$  and  $P^T/Y^T$  which are the replacement rates given for the cohorts from the first and the last quintile of the income distribution. Redistribution takes place if the low-income earners have a more adequate pension benefit than the high-income earners.

#### 4. Empirical Findings

In order to examine the level of intra-generational redistribution in the pension systems of the selected countries the OECD and Eurostat (EU Survey of Income and Living Conditions) data are used. The empirical research comprises the time span between 2004 and 2013 and covers six countries from the CEE region: the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia.

Figure 1: The Symptoms of Redistribution Ratio (*RS*)

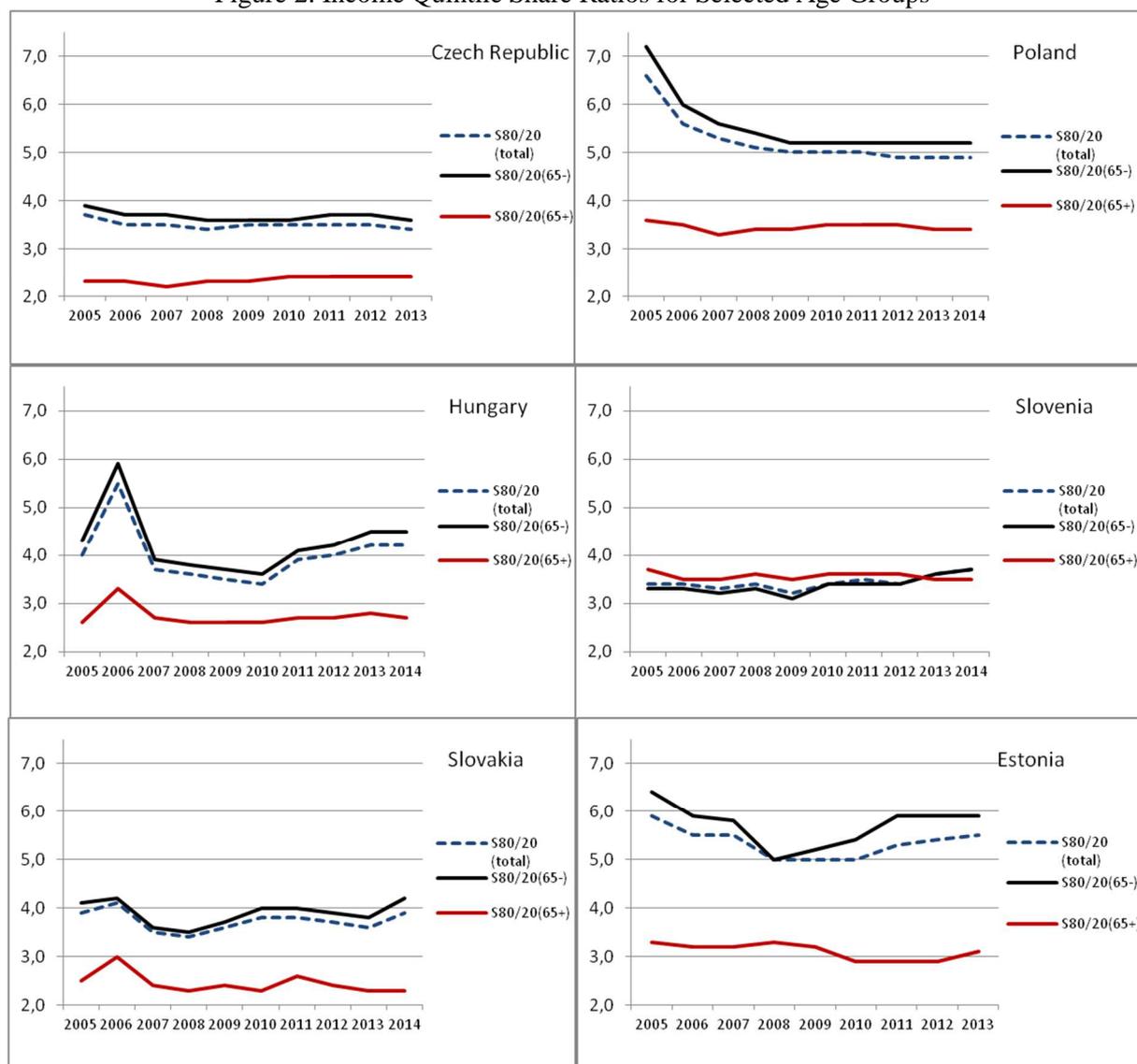


Source: author's calculations based on Eurostat data

Figure 1 presents the symptoms of redistribution ratio. The computed values indicate that four out of the six examined pension systems – the Czech Republic, Hungary, Poland and Slovakia – are characterized by a very similar level of the relative pension benefit inequality. In the period studied, the ratio ranges between 1.4 (Hungary in 2010) to 1.8 (Hungary in 2006) which indicates a similar redistribution level. However, there are two outliers. In Estonia the difference between income inequalities in the 65- and 65+ cohorts has grown noticeably since 2006 to reach its peak in 2011 and 2012. The other country which differs significantly from the rest of the group is Slovenia, for which the lowest values of *RS* ratio are reported. With respect to the period from 2005 to 2012 they are smaller than 1, however close to the line. The income inequalities are slightly larger in the pensioners' generation than in the working-age generation. This implies a more Bismarckian system.

A more profound insight into the obtained results of the analysis of the *RS* ratio is provided by Figure 2. It presents income quintile share ratios for different age groups separately. One can notice, for example, that income inequalities among pensioners in Slovenia are greater than in Estonia. In other words, pensioners in Estonia are a more homogenous cohort in respect to their incomes. However, this does not imply a higher redistribution level than in Slovenia, because of the differences in the income distributions in the working generations in these two countries.

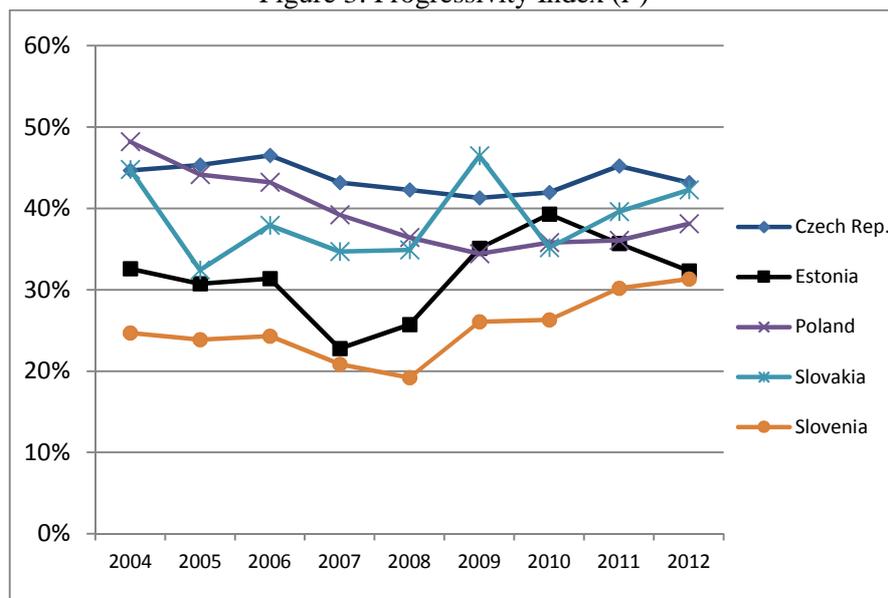
Figure 2: Income Quintile Share Ratios for Selected Age Groups



Source: Eurostat

Figure 3 presents the progressivity indexes calculated using OECD Gini estimates for the studied CEE countries except Hungary, due to the lack of data. In the employed formula (2) as a proxy of  $Gini_{pensions}$  the Gini coefficient for gross income (i.e. before taxes) in the population aged 65+ was applied, and as a proxy of  $Gini_{earnings}$  the Gini coefficient for market income (i.e. before taxes and transfers) in the 18-64 age group was included. The coefficients of inequalities based on the gross and market income were chosen because the pension contributions are proportional to gross income. In this way, the impact of taxation on reducing income inequalities (if it is heavily progressive) in the working age generation is eliminated. The lowest progressivity is reported in Slovenia, and this pension system is closest to the Bismarckian type. However, over examined period of time the dispersion of progressivity indexes were noticeably reduced.

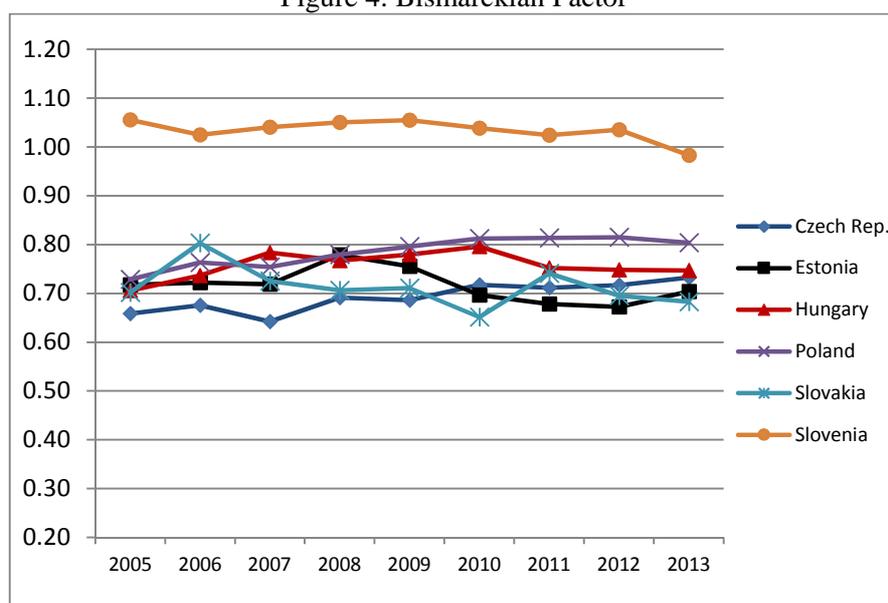
Figure 3: Progressivity Index (*P*)



Source: own calculations based on OECD data

Another indicator applied to empirically evaluate the level of redistribution in the examined CEE countries is the Bismarckian factor. In this analysis, the aggregated data from the Eurostat database is used. It comprises the EU Survey of Income and Living Conditions (EU-SILC). The Bismarckian factor has been evaluated in a simplified procedure, i.e. using publicly available aggregated estimates, not microdata. This approach can bias the results to some extent, so they will serve only as an approximation of the level of redistribution. The ratio  $S80/S20(65+)$  as well as the shares of the top and bottom quintiles of the income distribution in a society are applied in the formula (8). Similarly to the study of Krieger and Traub (2008), the net incomes are taken into account. The results are in line with previous findings, i.e. the pension system in Slovenia can be characterized as Bismarckian, where pension benefits are most closely linked to the earnings. In case of Slovenia, the reported Bismarckian factor exceeds 1. This is a result of the negative difference between the income inequality ratios in the working age generation and the generation of the elderly. This is clearly visible when comparing Figure 2.

Figure 4: Bismarckian Factor

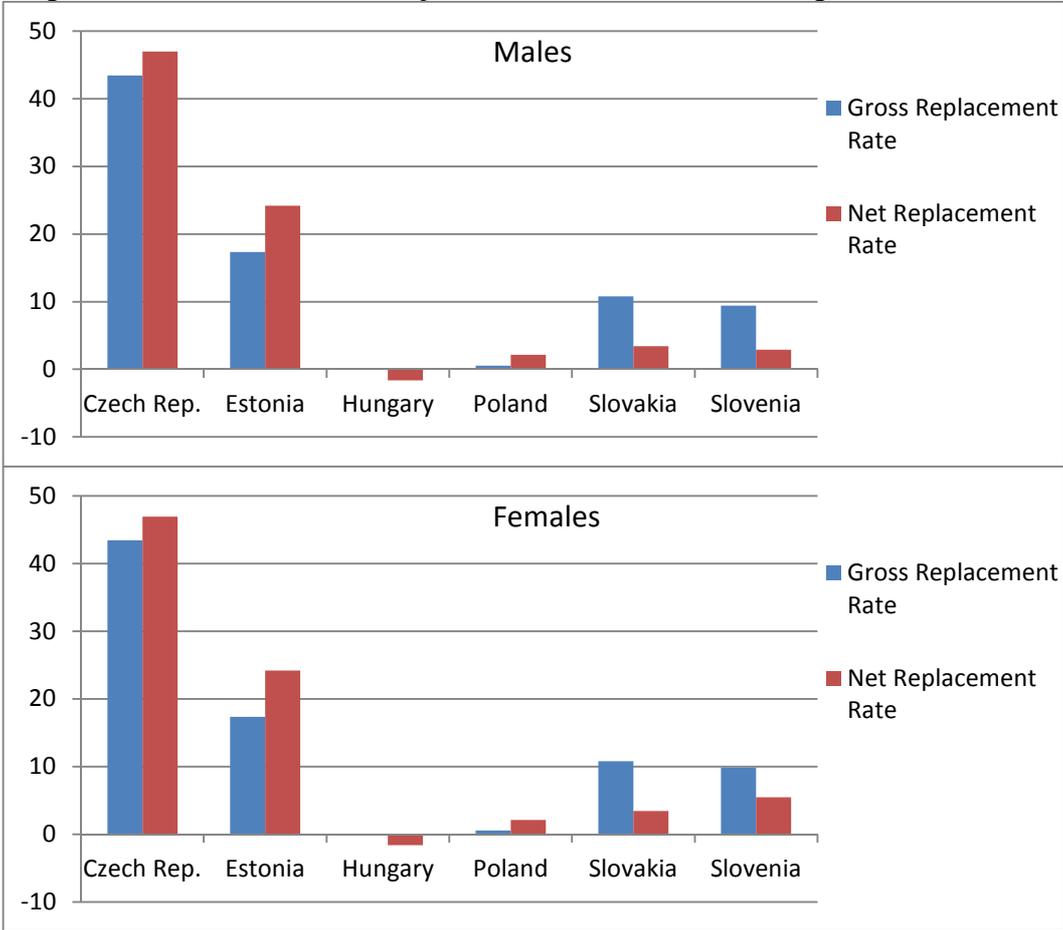


Source: own calculations based on Eurostat data

As argued in the previous section, the Bismarckian factor is to a great extent determined by the magnitude of the difference that forms the condition for  $\alpha$  to be smaller than 1 i.e.  $P^B Y^T - P^T Y^B > 0$ , which can be also expressed as the difference between the income inequality ratios in both generations i.e.  $Y^T/Y^B$  and  $P^T/P^B$ , but also as the difference between the replacement rates given for the cohorts from the first and the last quintile of the income distribution, i.e.  $P^B/Y^B$  and  $P^T/Y^T$ . The same applies to the  $RS$  ratio, however, contrary to  $\alpha$  it is exclusively dependent on the relation between these two factors.

Figure 5 presents the differences in the replacement rates for the model low-income agents and high-income agents, provided by OECD database. They are theoretical replacement rates estimated based on several assumptions. It was assumed that these rates apply to 20-year-old people, single, entering the labour market in 2012 and continuing their careers without interruption, until retirement age as stipulated by law in each country. The calculations made are subject to the rules characteristic for pension system in each country at the moment of creating a model (assuming the rules are constant over time) and relate to the expected benefits pension from both the public and from private pension plans, including those quasi-mandatory if only they cover at least 85% of the working population.

Figure 5: Differences between Replacement Rates for Low- and High-Income Earners.



Note: all the values are expressed in percentage points  
 Source: OECD

Results presented in Figure 5 concern gross and net replacement rates for agents (men and women separately) earning 1.5 of the average wage and 0.5 of the average wage. The estimates are calculated by the assumption of 3.5% rate of return after administrative charges on funded, defined-contribution pensions. Contrary to the previous analysis with  $RS$ ,  $P$  and  $\alpha$  this one refers to the future modelled pension benefits under the parameters and system design in each country as of 2012. The previously calculated indicators rely on the incomes of today's workers and benefits of today's

pensioners, thus they are based on the cross sectional, not longitudinal, data, and require the assumption that between two generations there is no re-ranking of the income and benefit positions. Analysis of the theoretical projected replacement rates comprises the incomes of today's working generation and their benefits simulated for the future, thus it enables the assessment of the current pension system design.

As shown, the greatest disparity between the projected pension benefit adequacy of low-income earners and high-income earners is observed in the case of Czech Republic (above 40 percentage points) and Estonia (around 20 percentage points). Significantly lower differences are estimated for Slovakia and Slovenia, whereas for Hungary and Poland the estimated replacement rates are almost equally proportional to the previous earnings regardless of the level of earnings. This implies that the current pension systems in the Czech Republic and Estonia (as of 2012) are much more redistributive than in other countries, as low-income earners will have higher replacement rates in the future than high-income earners. It is worth noting that no difference between men and women (except for a small disparity in Slovenia) occurs, which indicates that redistribution between these two groups is negligible.

## **5. Conclusions**

The analysis of the level of redistribution in pension systems based on quantitative analysis of historical data reflecting the current situation of pensioners in relation to current employees shows that pension systems in most studied CEE countries contain a strong redistributive component. Thus, they can be described as Beveridgean. Slovenia can be perceived as an exception, as the pension system has a smaller influence on the reduction of income inequalities in the generation of retirees. After making a number of assumptions concerning the analyses and interpreting the results according to the principle of participation equivalence, it can be concluded that in the pension system in Slovenia the linkage between pension benefits and earnings is the strongest, i.e. this system can be characterized as more Bismarckian than in other studied countries. Note, however, that such analyses involve the generation of pensioners, which is not homogeneous due to the participation in the pension system. Members of this generation acquired the right to pension benefits at different times and under different sets of rules. In fact, this generation represents a mixture of pension systems and the current level of redistribution is a result of this mixture. The redistributive impact of the reforms introduced in recent years will be visible in the future when the current working age generation becomes pensioners.

As a supplement, all the pension systems have been examined in regard to their design and its features that make a pension system more Bismarckian or more Beveridgean. Today's pension system designs tend to link more closely pension benefits and earnings in their unfunded first pillar, and despite the relatively weak funded second pillar. As presented, according to the OECD estimates the theoretical replacement rates under the current set of rules involve very little redistribution, except for the Czech Republic. Even the latest reforms conducted in the 2010s in some countries in order to reduce the second pillar have not changed that, as they were aimed at strengthening the earnings related components of the PAYG systems.

This study does not consider the determinants of such a course of pension system reforms in CEE countries. It seems that the main reasons are motivated by the particular economic situation, especially with regard to public finances. Historical reasons are also likely, as all the countries inherited generous welfare state models from the communist era and there are still high expectations in societies with regard to the generosity of pensions, also or especially for low income earners. The study of Conde-Ruiz and Profeta (2007) presents some interesting findings in this matter. It empirically demonstrates that a weak middle class in a society, with no, or a very small, political impact, with the background involving strong income inequalities is the main factor that tends to foster the Beveridgean pension system model.

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## References

- ASLUND, A. (2012). *Lessons from Reforms in Central and Eastern Europe in the Wake of the Global Financial Crisis*. Working Paper Series 12-7. Washington DC: Peterson Institute for International Economics.
- CHYBALSKI, F. (2009). *Liberalization of pension systems in Central and Eastern Europe*. EVN Working Paper 7. Praha: European Values Network.
- CHYBALSKI, F. (2015). Pomiar redystrybucji w międzynarodowych analizach systemów emerytalnych. In CHYBALSKI, F., MARCINKIEWICZ, E. (eds.) *Współczesne problemy systemów emerytalnych. Wybrane zagadnienia*. Łódź: Łódź University of Technology, pp.18–27.
- CONDE-RUIZ, I., PROFETA, P. (2007). The Redistributive Design of Social Security Systems. *Economic Journal*, vol. 117, no. 520, pp. 686–712.
- KRIEGER, T., TRAUB, S. (2008). *Back to Bismarck? Shifting Preferences for Intragenerational Redistribution in OECD Pension Systems*. Working Paper Series 2008–06. Canberra: Center for International Economics.
- LINDEMAN, D., RUTKOWSKI, M., SLUCHYNSKY, O. (2000). The Evolution of Pension Systems in Eastern Europe and Central Asia: Opportunities, Constraints, Dilemmas and Emerging Practices. In *Insurance and Private Pensions Compendium for Emerging Economies*. Paris: OECD Publishing, pp. 2–51.
- MIŁOS, L., MIŁOS, M. (2011). Impact of the Financial Crisis on the Pension System Reform. Lessons from Central and Eastern European Countries. In *Proceedings of 13th International Conference on Finance and Banking*. Opava: Silesian University, pp. 427–437.
- MLADEN, L. (2012). A Comparative Review over the Pension Systems' Performance in Central and Eastern European Countries. *Journal of Knowledge Management, Economics and Information Technology*, vol. 2, no. 5, pp. 1–16.
- OECD (2013a). Architecture of national pension systems. In *Pensions at a Glance 2013: OECD and G20 Indicators*. Paris: OECD Publishing.
- OECD (2013b). Coverage of private pensions. In *Pensions at a Glance 2013: OECD and G20 Indicators*. Paris: OECD Publishing.
- RUTECKA, J. (2012). *Zakres redystrybucji dochodowej w ubezpieczeniowym systemie emerytalnym*. Warszawa: Szkoła Główna Handlowa w Warszawie.
- SCHWARZ, A. (2006). Pension System Reforms. In COUDOUEL, A., PATERNOSTRO, S. (eds) *Analyzing the Distributional Impact of Reforms*. Washington D.C.: The World Bank, pp. 1–42.