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Income redistribution and the state's fiscal system

INTRODUCTION

As a result of the global financial crisis and the subsequent recession, income inequality has increased in most countries around the world. According to H. Immervoll and L. Richardson, the recent crisis, in contrast to previous global crises, was characterized by a higher impact on income distribution in OECD countries (Immervoll, Richardson, 2011, p. 4). In addition to changes in the labour market caused by recession, current global trends, such as demographic changes and changes in the size and composition of households, also impacted the level of inequality. The problem of income inequalities has not only affected the Anglo-Saxon model countries in their conduct of a liberal economic policy, but also countries classified as egalitarian, such as Germany or Sweden. Governments of many countries have attempted to hinder this process by using fiscal policy tools. Counteracting the increase in income inequality is one of the priorities of the state, according to the concept of maximin wellbeing (the level of overall wellbeing determines the wellbeing of the poorest social groups), or A. Sen's account of wellbeing (inequalities reduce the level of overall wellbeing).

The aim of this article is to classify OECD countries into fiscal models based on the criterion of the structure of tax revenues and public expenditure and to compare them in terms of the scope of redistribution by means of taxation and social transfers and the level of income inequalities. Based on a comparative analysis of the structure of tax revenues and public expenditure in 30 countries classified into six fiscal models and the Redistribution Index, Progression Index and Gini Index before tax and social transfers, the following hypotheses were verified: there is a relationship between the structure of tax revenues and public expenditure and the scope of redistribution; there is a relationship between the structure of tax revenues and public expenditure and the level of income inequalities; and countries with high levels of income inequality are characterized by a higher scope of re-

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distribution implemented through taxation and social transfers. The analysis uses data from the OECD database from 2004–2017. Classification of fiscal models was made by means of a cluster analysis using the Ward method.

THE IMPACT OF SELECTED FISCAL POLICY INSTRUMENTS ON THE REDISTRIBUTION SCOPE – LITERATURE REVIEW

Reducing inequality and the scope of poverty is the goal of the redistributive function of fiscal policy. Direct redistribution is carried out by the state taking over part of the revenues of individuals and legal entities, and then distributing them in the form of transfers to specific social groups (Zembura, 2006, p. 220). Public services such as health care or the education system also play an important redistributive role (indirect redistribution). The tool of redistribution by taxes is tax progression in personal income tax, tax exemptions and tax relief pursuing a similar purpose as expenditure on social purposes, tax-free amount. Public transfers that significantly affect the scope of redistribution include pensions, annuities, benefits for the disabled, and benefits for the unemployed.

The results of previous studies indicate that expenditure on social purposes has a greater impact on the scope of redistribution in comparison with taxation. H. Immervoll and L. Richardson (2011) state that the effect of expenditure on social goals exceeds the scope of impact of PIT and social security contributions (SSC) despite a much higher relative amount of these taxes in GDP in relation to social benefits. According to Ch. Wang and K. Caminada (2011) social transfers account for an average of 85% of the redistributive effect, while taxes only for 15%. Pensions have the highest impact on the scope of redistribution, however, the scale of their impact varies depending on the economic model of a given country. Also M. Hanni, R. Martner, A. Podesta (2015), based on the analysis of the impact of income tax and public transfers on distribution in 17 Latin American countries in 2011, found that on average 61% of redistribution was the result of public transfers, especially pensions and annuities. In their opinion, this is the result of low revenue from PIT in developing countries. Also the results of the research of J. Martinez-Vazquez, B. Moreno-Dodson and V. Vulovic (2012), carried out using the multiple linear regression method on a set of panel data from 150 countries from the period from 1970 to 2006, showed a higher impact of SSC on reducing income inequalities than that of PIT. Expenditure on health care also had a positive effect on income distribution. In contrast, consumption taxes, SSC, and expenditure on education led to an increase in inequality. According to E. Guillaud, M. Olckers and M. Zemmour (2017), various combinations of taxes and SSC achieve the same effect of reducing inequalities. Researchers did not observe in any of the analyzed 22 OECD countries a combination of high tax progression and high SSC in the period between 1999 and 2013. The research results quoted, apart from demonstrating a higher impact on the redistribution of SSC, also point to another important issue: the impact of individual

fiscal instruments varies across groups of countries. The goal of eliminating income inequalities can therefore be achieved by a combination of different measures. The effect of using individual redistribution tools depends on several factors.

Firstly, the factor determining the degree of impact of fiscal instruments on the scope of redistribution is the level of income differentiation resulting from the market mechanism. The more egalitarian the society, the weaker the impact of fiscal policy instruments. The second factor is the nature of individual taxes. The effect of the functioning of tax progression depends on the distribution of not the nominal but the average tax burden of individual income groups. The use of tax incentives, the beneficiaries of which are most often the most affluent, weakens tax progression. The third important factor is the structure of tax revenues and public expenditure, showing the scale of their impact. Tax progression with a low level of income from PIT will not play a significant redistributive role. This problem is especially true for developing countries that base their budget on indirect taxes. The regressive nature of indirect taxes and the high cost of administering the PIT system translating into low economic efficiency (PIT solutions were usually copied from highly developed countries, inadequate to the needs and situation of a developing economy) means that the progression introduced not only has no effect in the form of redistribution, but also raises costs for taxpayers (settlement costs and future costs in the form of taxation financing current administrative costs). In contrast, the structure of public expenditure shows the degree of use of direct and indirect redistribution. While the scope of redistribution measured using the Reynolds-Smolenski index shows the effect of expenditure on social purposes (direct redistribution tools), the impact of other categories of expenditure does not have a direct impact on the change in the distribution of income. However, it is possible to show the relationship between volume and share in the structure of these expenses, and the level of income inequality in society. Public expenditure related to the provision of services and the provision of public goods (e.g. education, health care, security) are an instrument to reduce income inequalities by also providing development opportunities for the poorest social groups.

PUBLIC FINANCE AS A COUNTRY CLASSIFICATION CRITERION — LITERATURE REVIEW

The scale of state interference in shaping the well-being of citizens and the set of means used to achieve this goal depends on the economic model developed over the years. In the academic literature one can find many classifications of economic models, separated on the basis of various criteria from the political, economic and social sphere. Due to the impact of public finances on almost every sphere of activity of economic entities, they are treated as one of the classification criteria. An important factor taken into account by the creators of the most popular classifications is the extent of the impact of fiscal instruments on the distribution of income in society.

The author of the classification of economic models most frequently cited in academic literature is G. Esping-Andersen (1990). He distinguished three main types of welfare state functioning in Western countries: the liberal (Anglo-Saxon, residual), conservative and social-democratic models. The classification was created based on the criteria of de-commodification, social stratification and the public-private combination. According to Esping-Andersen, de-commodification is “the degree to which individuals or families can uphold a socially acceptable standard of living independently of market participation” (Esping-Andersen, 1990, p. 37). The result in the de-commodification category is shaped on the basis of the index of eligibility conditions for pensions, sickness benefits and unemployment benefits. Stratification is considered from the perspective of corporatism, statism, private health expenditure, eligibility for government assistance, universalism and equality of benefits (Powell, Barrientos, 2004, pp. 84–85). The liberal welfare regime (Great Britain, Ireland, the USA, Australia, Canada) is based on the lowest scope of state intervention. Small shifts are made in the level of social security established by market forces. The recipients of social benefits are people with the lowest income. The conservative or conservative-corporationist regime (Germany, the Netherlands, France and Belgium) offers a higher level of social benefits compared to the liberal one. Redistribution is based on social security as risk hedging instruments. In the social-democratic model (Sweden, Norway, Finland, Denmark) access to benefits is universal. The importance of combining family care functions with work is emphasized. The Mediterranean model (Italy, Spain, Portugal, Greece) was distinguished in subsequent years. It is also referred to as clientelistic because it is oriented towards satisfying the needs of the electorate and is based on the social security network (Golinowska, 2018, pp. 19–24 and 79–80). East Asian welfare states represent a separate unique regime. C. Aspalter (2006) and A. Walker and C.K. Wong (2005) as the characteristics of the Confucian welfare state model of Japan, South Korea, Taiwan and Singapore defined: a relatively low level of state intervention and social care, a high level of investment in education and emphasis on work ethics. In contrast, B. Farkas (2011; 2016) divided the post-socialist countries into three groups: Baltic, Visegrad and Southeastern Europe. Her research shows that the Baltic States, the Czech Republic, Slovakia, Romania and Bulgaria form a unique cluster, characterized by low social and education expenditure. On the other hand, Poland and Hungary are similar to the continental countries of Western Europe with relatively high social spending, especially on pensions (with low family benefits). D. Bohle and B. Greskovits (2012) also conducted a classification study on a group of post-socialist countries. Based on the criteria: government, corporatism, welfare state, macroeconomic coordination, market efficiency and democracy, they distinguished four types of capitalism of post-socialist economies: neoliberal (Estonia, Lithuania, Latvia), embedded neoliberal (Czech Republic, Poland, Slovakia, Hungary, Croatia), neocorporatist (Slovenia), countries with an unspecified profile of capitalism (countries of Southeastern Europe). These countries differ in the degree of acceptable state interference in providing social protection and compensation of the costs of systemic transformation (Bohle, Greskovits, 2012). Post-communist countries, like most de-

veloping countries, struggle with the problem of a high level of informal economy, inefficient tax administration, the lack of appropriate tools for monitoring and analyzing data, and the existence of politically strong groups of people with the highest incomes that prevent the construction of a tax system detrimental to their interests. This results in the creation of a specific tax structure, based mainly on indirect taxes and social security contributions, and a small contribution of company tax (Clements, Gupta, Inchauste, 2004, p. 12). Social transfers perform the redistributive function to the greatest extent. The impact of income taxation on the scope of redistribution is low due to the low progressive taxation (in most of these countries there is a linear tax on the income of individuals) and low budget income from PIT, CIT or property taxes.

RESEARCH METHODOLOGY

The aim of the study was to identify fiscal models with a similar structure of tax revenues and public expenditure and to compare them in terms of the scope of redistribution through taxation and public transfers. The study was conducted on a group of 30 OECD countries. Data from the OECD database from 2004–2017 were used. The cluster analysis method was employed.

The analysis uses variables that are averaged results of the OECD indicators from 2004–2017:

- X_1 – average share of consumption taxes in the structure of tax revenues,
- X_2 – average share of property taxes in the structure of tax revenues,
- X_3 – average share of social security contributions in the structure of tax revenues (according to the OECD methodology),
- X_4 – average share of CIT in the structure of tax revenues,
- X_5 – average share of PIT in the structure of tax revenues,
- X_6 – average share of administrative expenditure in the structure of public expenditure,
- X_7 – average share of allocation expenditure in the structure of public expenditure,
- X_8 – average share of social expenditure in the structure of public expenditure,
- X_9 – average share of economic affairs in the structure of public expenditure.

Variable X_7 was built based on the share index of educational expenditure, expenditure on health care, housing, environmental protection, recreation, national defense as well as security and public order. The isolation of variables X_6 , X_7 , X_8 and X_9 is associated with a typology of public expenditure: related to ensuring public authority the ability to perform tasks (administrative), related to the performance of social tasks of the state, related to the economic activity of the state and related to the provision of public goods and services. Variables X_1 , X_2 , X_3 , X_4 , X_5 refer to the classification of tax revenues developed by the OECD².

² In the OECD classification, the term “taxes” is confined to compulsory, unrequited payments to general government. Taxes are unrequited in the sense that benefits provided by government to

The cluster analysis was carried out using the Ward method. It involves combining clusters that ensure a minimum sum of squares of distance from the focus of the newly created cluster. This method is considered very effective (Stec, Janas, Kuliński, 2005, pp. 136–137). When forming clusters, Euclidean distance was used as a measure of the distance between objects. To eliminate the effect on the distance of differences between units between dimensions, data was standardized, as a result the variable obtained an average of 0 and a standard deviation of 1. The research results were presented using a dendrogram (Figure 1).

The choice of the number of classes into which the examined set of objects should be divided was made using the Hubert and Levine index:

$$G(u) = \frac{D(u) - I_w * D_{min}}{I_w * D_{max} - I_w * D_{min}}$$

Where:

- $D_{(u)}$ – the sum of all n_d within cluster distances,
- D_{min} – is the sum of the n_d smallest pairwise distances in the data set,
- D_{max} – is the sum of the n_d biggest pairwise distances.
- I_w – number of pairwise distances in the data set.

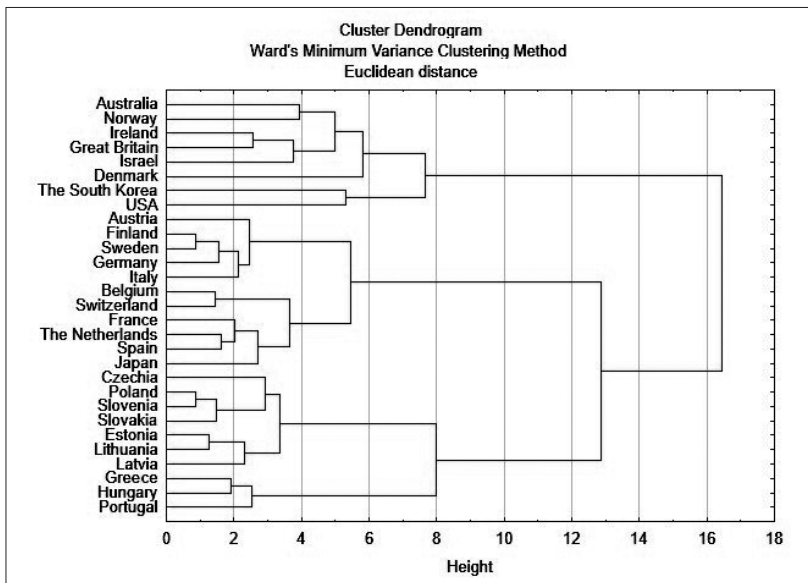


Figure 1. Classification of countries based on the structure of tax revenues and public expenditure

Source: own study based on Statistica.

tax payers are not normally in proportion to their payments. For this reason, social security contributions are included in tax revenues.

Table 1. Hubert and Levine index values for the number of classes examined

Numer of classes	Index value	Numer of classes	Index value
2	0.5	6	0.238261
3	0.621673	6*	0.415975
4	0.538678	7	0.358741
5	0.283479	8	0.453821

Source: own study.

The $G_{(u)}$ index assumes values in the range [0; 1]. The criterion for choosing the number of classes is the lowest level of the index. The study included from 2 to 8 classes. The index value was the lowest in the case of 6 classes, therefore it was decided to isolate 6 fiscal models. Six classes were obtained in two variants. The first variant was obtained by dividing Central and Eastern European countries into two clusters: the Czech Republic, Poland, Slovenia and Slovakia as well as Lithuania, Latvia and Estonia, leaving as a single cluster the group of Anglo-Saxon countries together with Denmark, South Korea and Israel. In the second variant, a group of Central and Eastern European countries was left as one cluster, and the following division was made: South Korea, the USA and Australia, Norway, Ireland, Great Britain, Israel and Denmark. The index value was determined in both variants. The first variant (6) obtained a lower result, therefore it was decided to classify fiscal models based on the division of countries used in it. The clusters isolated during the study are presented in Table 2. The statistical characteristics of the models obtained were based on the average of individual diagnostic features and the coefficient of variation. A comparative analysis of fiscal models in terms of the scope of redistribution by means of taxation and social transfers was made on the basis of the Redistribution Index, based on the Reynolds-Smolenski Index. It was calculated as the ratio of the difference between the Gini index of the distribution of income before and after tax and social transfers to the Gini index before tax. To determine the degree of PIT progression, the Progression Index was used, calculated as the ratio of the average income taxation of 167% and 67% of the average remuneration of a taxpayer with the status of a childless single.

Grouping countries on the basis of cluster analysis using the Ward method allowed us to distinguish fiscal models with a similar structure of tax revenues and public expenditure. The criterion differentiating models to the greatest extent was the share of social security contributions, consumption taxes and PIT in the structure of tax revenues and the share of social and allocation expenses in the structure of public expenditure. The fiscal models identified coincide with the classifications cited of economic models. Countries classified as G. Esping-Andersen's liberal market economies have been grouped into two fiscal models characterized by a high share of direct taxes and allocation expenditure. In contrast, the countries with a conservative model or coordinated market economy create two fiscal models with a high share of social expenditure in the structure of public expenditure. Contrary to the results of C. Aspalter (2006), A. Walker and C.K. Wong (2005), Asian countries

did not create a separate model: Japan showed a similar structure of tax revenues and public expenditure to the countries of continental Western Europe, and South Korea – similar to Australia, Denmark, Israel and the USA. The Mediterranean countries also were not classified into one model. Spain was put with Western Continental Europe, and Italy was classified with Austria, Germany, Finland and Sweden. Greece and Portugal together with Hungary have created a separate fiscal model, characterized by a lower share of expenditure on social purposes and a higher share of consumption taxes and administrative expenditure, compared to the other two models. In the case of post-socialist countries, fiscal models coincide the closest with the classification of D. Bohle and B. Greskovits (2012), which recognizes the Baltic republics as a type of neoliberal market economy, and the Czech Republic, Poland and Slovakia as a type of embedded neoliberal economy. Both fiscal models differ in the level of the share of social security contributions and social expenses. In terms of the structure of public revenues and public expenditure, the Czech Republic, Poland, Slovakia and Slovenia show similarity to countries considered in the abovementioned classifications as a coordinated / conservative market economy.

Table 2. Fiscal models and their statistical characteristics – average share of individual categories of tax revenues and public expenditure (m) and coefficient of variation (V)

Countries	I		II		III		IV		V		VI	
	m	V	m	V	m	V	m	V	m	V	m	V
	Australia, Denmark, Israel, South Korea, the USA, Great Britain, Ireland, Norway		Austria, Germany, Finland, Sweden, Italy		Belgium, Switzerland, France, the Netherlands, Spain, Japan		Czechia, Poland, Slovakia, Slovenia		Estonia, Lithuania, Latvia		Greece, Hungary, Portugal	
consumption	30.2	19.9	28.62	7.20	24.76	15.71	35.79	6.55	40.13	3.31	39.8	5.0
property	8.62	42.67	2.98	54.38	7.37	23.68	2.15	64.75	1.76	73.54	4.3	46.9
contributions	15.36	64.75	31.08	16.92	34.17	16.58	40.21	7.88	33.66	11.71	30.6	10.9
CIT	12.19	44.43	5.79	13.18	8.68	30.72	8.06	33.53	5.70	11.63	7.0	30.9
PIT	31.1	38.8	26.69	11.72	22.82	24.76	12.48	18.84	18.13	11.45	16.7	10.4
administrative	13.42	17.45	14.95	10.11	13.37	14.45	12.24	7.20	11.21	12.78	18.8	13.3
allocation	46.53	14.64	34.68	5.67	36.94	7.06	40.06	4.47	45.08	3.44	34.7	11.0
social	30.5	31.1	41.39	3.63	37.91	6.94	34.88	9.99	30.47	2.69	34.7	3.8
economy affairs	10.2	42.7	9.25	21.24	10.91	13.38	12.55	14.33	12.82	21.43	11.4	15.8
Gini before tax and transfers	0.47	13.39	0.48	6.12	0.46	10.60	0.45	5.38	0.49	3.38	0.5	5.4
R index	30.16	37.02	41.38	9.41	33.98	24.94	40.60	11.05	29.74	6.16	37.5	9.1
Progression Index	2.45	61.90	1.98	11.68	2.39	55.51	1.89	22.13	1.25	12.41	3.2	51.3

Source: own study.

Model I is characterized by the highest, among other models, share of property taxes, CIT and PIT in the structure of tax revenues and allocation expenditure in the structure of public expenditure. This model is also characterized by one of the lowest shares of expenses for social purposes and expenses supporting the economy, and, when considering tax revenues, the lowest share of social security contributions. In terms of the level of the progression index, this model ranks second. It should be noted, however, that the group is highly diversified in this area: Ireland, Israel and South Korea have a strong tax progression (progression index above 2.5), while in other countries the tax progressivity is low (progression index below 1.73). The analysis of the scope of redistribution with the use of the Redistribution Index showed that public authorities in the countries of this model use the fiscal policy instruments to change the market distribution of income to the lowest extent. However, it should be noted that this model also has a low average Gini index before tax and transfers. Therefore, the progressive taxation of income and property and the prioritization of allocation expenditure may affect the market distribution of income. Tax progression may discourage increasing workload to avoid an increase in the fiscal burden (Gerber, Klemm, Liu, Mylonas, 2018). In contrast, allocation expenditure is classified as productive expenditure that stimulates economic growth through, for example, impact on the quality of human capital. They also facilitate the improvement of the quality of life of the poorest social groups.

Model II is characterized by a high share of social expenditure in the structure of public expenditure, as well as the lowest share of allocation and economic affairs expenditure from the other models. The structure of tax revenues is balanced (however share of CIT and property taxes are low). Both in terms of the share of PIT, as well as social security contributions or consumption taxes, this model obtains the middle values for the examined group. Taking into account the structure of income, it can be stated that benefits for families related to raising children and benefits for the unemployed, which are usually financed from the central budget and not from special purpose funds, have a high redistributive significance in these countries. Countries of this model are also characterized by a moderate level of tax progression. The level of income inequality before tax and transfers takes the average values in the group. The countries of this model have the highest level of redistribution index among the countries surveyed. Thus, the combination of moderately progressive taxation with a broad catalog of social expenditure allows for a significant change in the market distribution of income, even despite the relatively low level of inequality before state interference.

Model III is characterized by the lowest share of consumption taxes in the structure of tax revenues among the other models, a relatively high share of property taxes and social security contributions, as well as a high share of social expenditure. It can therefore be concluded that the redistribution in this model takes place mainly through the system of social transfers and social security

contributions financing them, which may indicate the priority of pensions and annuities in the state's redistributive activity. However, the progression index is also at a high level, and the PIT share is average for the group. In this model, the level of income inequality before tax and transfers is low, which also confirms the results of studies by C. Gerber *et al.* (2018), regarding the impact of high progression on market income distribution. The extent of state redistribution is moderate, however, with such a low level of income inequality before fiscal interference, it can be concluded that the combination of social expenditure with progressive taxation has resulted in a relatively high scale of redistribution.

Model IV stands out from the other models with the highest share of social security contributions and the lowest share of PIT in the structure of tax revenues. Property taxes also have a low share in the structure of tax revenues. The PIT tax progression rate is at a low level. Given the structure of expenditure, this model has a relatively high share, compared to other models, of social, allocation and economic support expenditure. Thus, redistribution in this model takes place mainly through public expenditure in the form of social transfers and public services, and tax progression is of marginal importance. The high share of social security contributions demonstrates the high redistributive importance of retirement, disability, sickness benefits etc. This model achieved a high Redistribution Index at the lowest pre-tax and public transfer Gini index rates among the other models, so a high share of social spending despite the marginal importance of progressive taxation can contribute to high scope of redistribution even with low levels of inequality. The low level of income inequality as a result of market distribution may be affected by a high level of allocation and economy supporting expenditure.

Model V has the highest share of consumption taxes in the structure of tax revenues among all fiscal models. Income from property taxes, PIT and CIT have marginal significance. The PIT progression rate is at the lowest level among the models. Given the structure of public expenditure, this model stands out from the other models with the highest share of expenditure economic affairs and a high share of allocation expenditure. At the same time, it is characterized by high efficiency of the administrative system, as evidenced by low administrative expenses. Thus, this model focuses on indirect redistribution, ensuring wide access to public services financed mainly from consumption taxes. Based on the structure of tax revenues and public expenditure, it can be stated that the priority of the countries in this model is to stimulate economic growth, not to level income inequalities. This is reflected in the low level of Redistribution Index. Despite the high share of allocation expenditure and expenditure supporting the economy, the level of income inequality as a result of market distribution is at a high level. The reason may be the low share of income taxes in the structure of tax revenues and linear taxation of income.

Model VI stands out from the other models with the highest share of administrative expenses and almost the lowest allocation expenses. Consumption taxes predominate

in the structure of tax revenues. The share of income from PIT and CIT is relatively low compared to other models, and the share of property taxes and social security contributions take average values. The Progression index is the highest among all models. The countries of this model redistribute income mainly through social transfers financed by social security contributions and regressive taxes. The use of highly progressive taxation with a low share of PIT in the structure of income and the extensive use of regressive levies gives the impression that the instruments of fiscal policy are used in a chaotic manner without focusing on a specific goal. Despite the similar structure of tax revenues to that of model V, this model is marked by low efficiency of the administrative apparatus. Almost 1/5 of the funds are used to finance administrative purposes (including debt management). This model is distinguished by the highest level of the Gini index before tax and transfers with an average level of Redistribution Index. The reasons for the high level of inequality can be seen in the weak impact of tax progression due to the low share of PIT in the structure of income and the low share of allocation expenditure.

CONCLUSION

The research results confirmed the hypothesis that there is a relationship between the structure of tax revenues and public expenditure, and the scope of redistribution. The results of the analysis of the scope of income redistribution by means of taxation and social transfers in the isolated fiscal models are consistent with the conclusions of previous studies, stating the high impact of social expenditure on the scope of income redistribution (Immervoll, Richardson, 2011; Wang, Caminada, 2011; Hanni, Martner, Podesta, 2015). Fiscal models with a high share in the structure of public expenditure were characterized by a high level of Redistribution Index, showing the ratio of the difference between the level of income inequality before and after tax and social transfers to the level of primary income inequality. In particular, benefits financed from social security contributions, such as pensions, annuities, etc. are important. They play the highest role in post-socialist countries (except the Baltic Republics) and in Austria, Germany, Finland, Sweden, Italy (model II). In contrast to post-socialist countries, in states of model II the share of income from PIT was at a relatively high level, and it played a moderate redistributive role. Thus model achieved the highest Redistribution Index. Thus, the combination of progressive taxation with social expenditure such as family benefits (child upbringing) or unemployment, also allows for a high degree of income redistribution. It should be noted, however, that fiscal models characterized by the highest share of consumption taxes in the structure of tax revenues with a relatively low share of social security contributions and PIT obtained a low Redistribution Index. The reasons can be found in the regressive nature of consumption taxes as well

as the insufficient impact of PIT and social transfers due to their low level in relation to other sources of public income and expenditure.

Comparative analysis also showed a relationship between the structure of tax revenues and public expenditure and the level of income inequalities. The models with a high share of allocation expenditure in the structure of public expenditure obtained the lowest average Gini index before tax and social transfers. The exception was the Baltic countries, where allocation expenditure had a high share in the structure of public expenditure, and which are characterized by a relatively high level of income inequality. Unlike other models with a low income inequality index, they were characterized by a high share of consumption taxes and a lack of progressive taxation of individuals' income. The results of studies by C. Gerber, A. Klemm, Li Liu, V. Mylonas (2018), conducted on a group of OECD countries between 1981 and 2015 showed that tax progression leads to a reduction in inequalities resulting from the operation of the market mechanism, even before redistributive activities of the state, distorting taxpayers' decisions regarding labour inputs. High progression may, in fact, discourage from increasing labour input if it results in a higher tax burden (Gerber, Klemm, Liu, Mylonas, 2018).

Based on the analysis of the level of inequalities arising as a result of the market mechanism and the scope of redistribution by means of taxation and social transfers as measured by the Redistribution Index, the hypothesis assuming the lower scope of redistribution in egalitarian countries was negatively verified. Two models characterized by a low level of income inequality achieved a high level of Redistribution Index. In contrast, in two models characterized by the highest income inequalities, the Redistribution Index was at a relatively low level. It should be noted, however, that in previous studies the extent of redistribution was measured as the difference of the Gini index before and after taxation, while in this article the scope of redistribution was expressed as the ratio of this difference to the level of inequality before tax and transfers.

BIBLIOGRAPHY

- Aspalter, C. (2006). The east Asian welfare model. *International Journal of Social Welfare*, 15 (4), 290–301. DOI: 10.1111/j.1468-2397.2006.00413.x.
- Bohle, D., Greskovits, B. (2012). *Capitalist Diversity on Europe's Periphery*. New York: Cornell University Press.
- Clements, B., Gupta, S., Inchauste, G. (2004). The Cyclical and Long-Term Behavior of Government Expenditure in Developing Countries. *IMF Working Paper*, 04 (202). DOI: 10.5089/9781451874433.001.
- Esping-Andersen, G. (1990). *Three Worlds of Welfare Capitalism*. Princeton: University Press.
- Farkas, B. (2016). *Models of Capitalism in the European Union. Post-crisis Perspectives*. London: Palgrave Macmillan.

- Farkas, B. (2011). The Central and Eastern European model of capitalism. *Post – Communist Economies*, 23 (1), 15–34. DOI: 10.1080/14631377.2011.546972.
- Gerber, C., Klemm, A., Liu, Li., Mylonas, V. (2018). Personal Income Tax Progressivity: Trends and Implication. *IMF Working Paper*, 18 (246). DOI: 10.5089/9781484383087.001.
- Golinowska, S. (2018). *Modele polityki społecznej w Polsce i Europie na początku XXI wieku*. Warszawa: Fundacja im. Stefana Batorego.
- Guillaud, E., Olckers, M., Zemmour, M. (2017). Four levers of redistribution: the impact of tax and transfer system on inequality reduction. *LIS Working Paper Series*, 695.
- Hanni, M., Martner, R., Podesta, A. (2015). The redistributive potential of taxation in Latin America. *Cepal Review*, 116. 7–26. DOI: 10.18356/4bfdcb5d-en.
- Immervoll, H., Richardson, L. (2011). Redistribution Policy and Inequality Reduction in OECD Countries: What Has Changed in Two Decades? *Institute for the Study of Labor IZA Discussion Paper*, 6030. DOI: 10.1787/5kg5dlkhjq0x-en.
- Martinez-Vazquez, J., Moreno- Dodson, B., Vulovic, V. (2012). The Impact of Tax and Expenditure Policies on Income Distribution: Evidence from a Large Panel of Countries. *Hacienda Publica Espanola*, 200, 95–130. DOI: 10.2139/ssrn.2188608.
- Powell, M., Barrientos, A. (2004). Welfare regimes and the welfare mix. *European Journal of Political Research*, 43, 83–105. DOI: 10.1111/j.1475-6765.2004.00146.x.
- Stec, M., Janas, A., Kuliński, A. (2005). Grupowanie państw Unii Europejskiej ze względu na zasoby kapitału ludzkiego i intelektualnego. *Nierówności Społeczne a Wzrost Gospodarczy*, 6, 135–146.
- Walker, A., Wong, C.K. (2005). Introduction: east Asian welfare regimes. In: A. Walker (ed), *East Asian welfare regimes in transition*, (pp. 3–20). Bristol: University Press.
- Wang, Ch., Caminada, K. (2011). Disentangling income inequality and the redistributive effect of social transfers and taxes in 36 LIS countries. *Munich Personal RePEc Archive*. 1–53. DOI: 10.2139/ssrn.1909941.
- Zembura, W. (2006). Zakres polityki fiskalnej i jej zadania w gospodarce rynkowej. *Studia Ekonomiczne Akademii Ekonomicznej w Katowicach*, 38, 217–230.

Summary

The aim of the article was to classify the OECD countries in fiscal models, based on the criterion of the structure of tax revenues and public spending, and to compare them in terms of the scope of redistribution created by means of taxation and social transfers and the level of income inequality. The analysis was conducted on a group of 30 OECD countries using data from the OECD database from 2004–2017. The classification was made using a cluster analysis using the Ward method. In the course of the study, seven fiscal models were distinguished, in which countries were characterized by a similar share of individual categories of tax revenues and public expenditure. Comparative analysis of fiscal models showed the occurrence of a relationship between the structure of tax revenues and public expenditure, and the level of income inequalities and the scope of redistribution, measured using the Redistribution Index. Compared to other models, models with a high share of social expenditure in the structure of public spending obtained a higher Redistributive Index. The use of various types of social transfers, financed not only by social security contributions, but also by taxes, has significant redistributive significance. The study also revealed the impact of the structure public expenditure on the level of income inequality. Fiscal models with a high share of allocation

expenditures were characterized by a low level of income inequalities. The analysis did not confirm the assumption of a higher scale of redistribution in countries with a high level of income inequality.

Keywords: income redistribution, structure of tax revenues, structure of public expenditure, fiscal model, income inequalities.

Redystrybucja dochodów a system fiskalny państwa

Streszczenie

Celem artykułu było dokonanie klasyfikacji modeli fiskalnych państw OECD na podstawie kryterium struktury dochodów podatkowych i wydatków publicznych oraz porównanie ich pod względem skali redystrybucji dokonywanej przy pomocy opodatkowania i transferów socjalnych oraz poziomu nierówności dochodowych. Analiza została przeprowadzona na grupie 30 państw OECD z wykorzystaniem danych z bazy OECD z lat 2004–2017. Klasyfikacji dokonano przy pomocy analizy skupień z wykorzystaniem metody Warda. W toku badania wyodrębniono sześć modeli fiskalnych, w ramach których państwa charakteryzowały się zbliżonym udziałem poszczególnych kategorii dochodów podatkowych i wydatków publicznych. Analiza porównawcza modeli fiskalnych wykazała istnienie zależności między strukturą dochodów podatkowych i wydatków publicznych, a poziomem nierówności dochodowych oraz skalą redystrybucji dokonywaną przy pomocy opodatkowania i transferów socjalnych, mierzoną przy pomocy Indeksu Redystrybucji. Modele cechujące się wysokim udziałem wydatków na cele socjalne w strukturze wydatków publicznych uzyskały wyższy Indeks Redystrybucji na tle pozostałych modeli. Istotne znaczenie redystrybucyjne posiada stosowanie zróżnicowanych rodzajów transferów socjalnych, finansowanych nie tylko składkami na ubezpieczenia społeczne, ale i z podatków. Badanie ujawniło również wpływ struktury wydatków publicznych na poziom nierówności dochodowych. Modele fiskalne o wysokim udziale wydatków alokacyjnych cechowały się niskim poziomem nierówności dochodowych. Analiza nie potwierdziła założenia o wyższej skali redystrybucji w krajach o wysokim poziomie nierówności dochodowych.

Słowa kluczowe: redystrybucja dochodów, struktura dochodów podatkowych, struktura wydatków publicznych, model fiskalny, nierówności dochodowe.

JEL: H11, D31.