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## **The structure of income inequality with particular emphasis on the economic middle class**

### INTRODUCTION

The economic stratification of society in developed countries has become an area of special interest as a result of the growing inequalities observed over the past two decades. In a vast majority of papers, authors focus on analysing the situation of the extreme income groups. This seems fully justified. The need to reduce poverty is indisputable; on the other hand, social groups that accumulate disproportionately high income also attract attention and require multifaceted analysis. However, in view of such a difference of emphasis, there is a gap in research regarding economic inequalities. It fails to adequately address the group that lies between the extremes, i.e. the middle-income group (class). The gap has been gradually bridged by researchers in recent years, mainly because of the changes observed in the middle class which, in many developed countries, lead to the erosion of this social group.

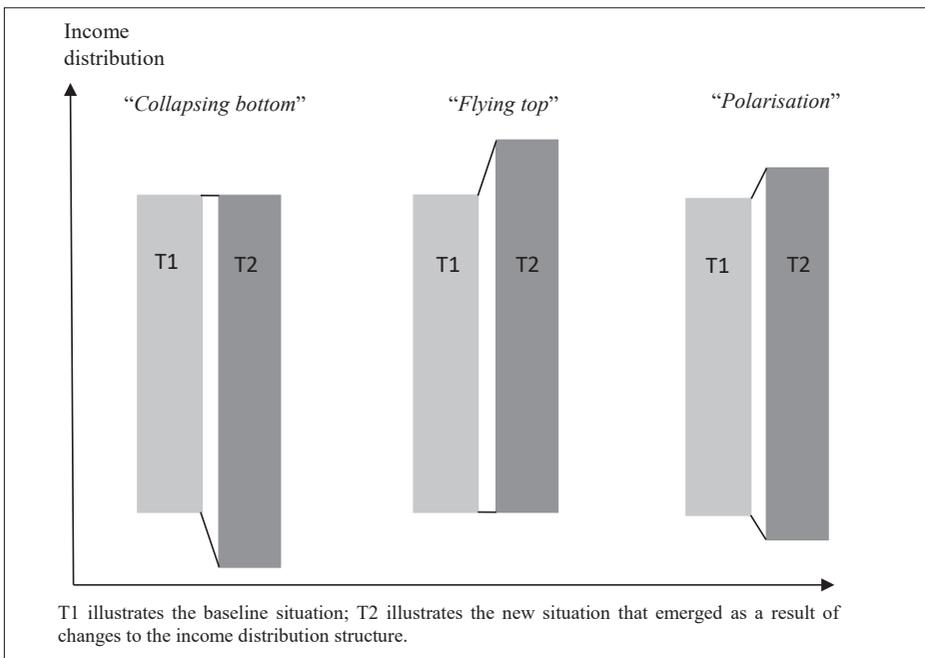
The purpose of the paper is to explore the significance of the middle class for the development of a modern economy and to estimate its size in selected OECD countries. The most important aspect of the analysis is to verify the hypotheses that high inequalities are accompanied by a shrinking of the middle class. Additionally, the article presents the trend determinants that are usually identified in literature and the recommended socioeconomic policy activities that could strengthen the position of the group in question.

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## DESCRIPTION OF INCOME DISPARITIES

Rising income inequality has been addressed by a number of economic analyses, which usually explore changes in the income distribution structure that expand the income disparities. Such changes can go in various directions (Figure 1). Income may increase in the groups on the top of the “income ladder” (the “flying top”) or may fall in the groups at the bottom (the “collapsing bottom”). The share of a particular social group in income distribution may rise or fall because of the rise or fall of the total income of the population. This happens when the consequences of changes are not borne by all groups in equal measure (e.g. the rich grow their income at a greater rate than the rest of the society). The changes can also result from income shifts between social groups without changes to the size of the total income.

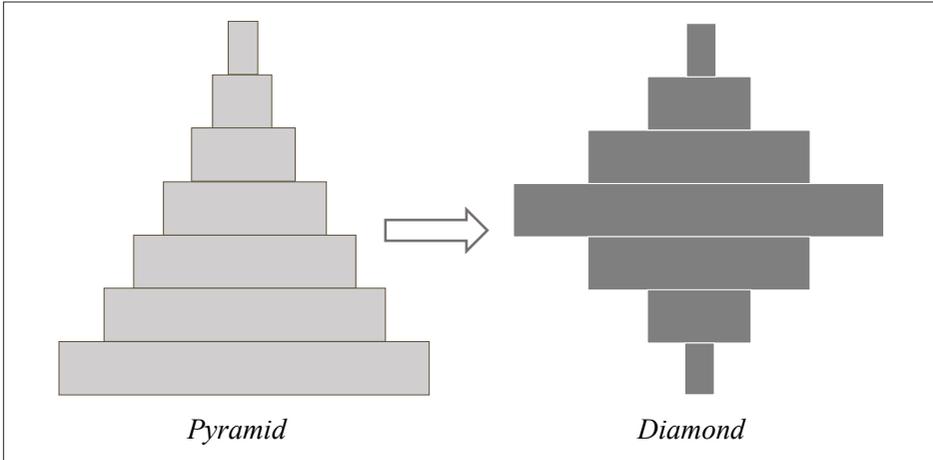


**Figure 1. Models of income inequality changes**

Source: own compilation based on (ILO, 2008, p. 25).

Economic polarisation is a situation particularly harmful to social structure. It should be understood as a process where the number of individuals from the middle-income class is falling, while the number of individuals from the higher- and lower-income class is increasing (Panek, 2017, pp. 41–42). In such a case, some middle class individuals move to the higher class (increase their income), and some to the lower class (become poorer).

The changes in income distribution re-shape the social structure dependent on the size of particular income groups (classes). Figure 2 presents two extremely different income structures.



**Figure 2. Different types of income inequalities**

Source: own compilation based on (Kelley, Evans, 2017, p. 56; Vaughan-Whitehead, Vazquez-Alvarez, Maitre, 2016, p. 28).

In the case of the “pyramid” variant, society has a narrow elite of wealthy people, a slightly bigger middle-income group and the biggest group of people with low income. Such a structure is usually connected with the presence of poverty at a considerable scale. In the other case, referred to as the “diamond” structure, the proportions of particular income groups differ. Both the richest and the poorest represent a relatively small part of the society, while the middle-income group dominates. In the context of reducing of inequalities, the desired direction is to transform the society towards a diamond-shaped structure, which is the most beneficial from the perspective of economic development and social cohesion.

#### THE ROLE OF THE MIDDLE CLASS FOR THE DEVELOPMENT OF THE ECONOMY

The social structure dominated by the middle class is emphasised as a desired from both a social and an economic perspective. A considerable share and the proper importance of that group in society are essential for economic development and political stability. The middle class is a buffer for potential social conflicts between the extreme income groups. Furthermore, for the majority of individuals

in the society, achieving the middle class status entails a sense of success and personal satisfaction. What usually matters to people is their financial status in relation to their environment as this is the perspective from which they evaluate their prosperity (Pressman, 2007, p. 181).

The economic middle class gains the vast majority of its income from work, while poorer social strata are usually supported by various welfare transfers, and the affluent profit from their financial investments (Vaughan-Whitehead, Vazquez-Alvarez, Maitre, 2016, p. 1). Since work as the main source of income is high in the hierarchy of values for the middle class, individuals from that group represent the most important source of labour supply.

Factors significant for economic development include: a high tendency of the group in question to invest in education, health and housing; the enforcement of high-quality public services; intolerance for corruption; and trust in democratic institutions. What seems of particular essence is that they invest in their own education and that of their children, which contributes to the growth of human capital, both current and future. And human capital accumulation is an essential contributing factor to economic growth and development (cf. Brueckner et al., 2017; OECD, 2003). In addition, economists emphasise the substantial entrepreneurial activity of the middle class, especially in the area of small and medium-sized enterprises. The middle class is ultimately found to have a significant positive impact on economic growth (Brueckner et al., 2017; Easterly, 2001, pp. 317–335).

#### IDENTIFICATION OF THE ECONOMIC MIDDLE CLASS

Analyses of the economic differentiation structure usually identify three basic social classes: lower, middle and upper class, with an additional division into lower middle class, middle middle class (main, basic, central) and upper middle class within the middle class. The criteria for identifying particular classes are to a certain degree set arbitrarily by individual researchers but income remains the primary indicator used in economic analyses. On the one hand, this is a practical analysis solution since data about the population's income are relatively widely collected and shared by various public institutions. On the other hand, the population's income is largely determined by factors included in middle class analyses conducted within other fields of science, such as sociology, philosophy or anthropology (Reeves, Guyot, Krause, 2018; Atkinson, Brandolini, 2011, pp. 3–11). Where the income criterion is the only one for identifying social classes, the term 'middle-income class' seems more precise than the term 'middle class'; still, economists tend to use those two interchangeably.

Economic literature offers four concepts for identifying the middle class based on the income criterion (Reeves, Guyot, Krause, 2018). According to the most popular one, the middle class consists of those individuals whose income falls

within the percentage range defined in relation to the income median for the whole population. For instance, Thurow (1984) assumed that middle class consisted of individuals with income representing 75–125% of the income median for the whole population, while Blackburn and Bloom (1985) expanded that range to 60–225% of the median. Other authors have suggested other values of the ranges, usually adopting 75% of the median as the lower threshold and 125–250% as the upper threshold (see Gornick, Jantti, 2013, p. 10). In the OECD 2019 report *Under Pressure: The Squeezed Middle Class*, the authors use the range of 75–200% of the median, additionally identifying a lower middle class for 75–100% of the median, a central middle class for 100–150% of the median, and a higher upper class for 150–200% of the median. On the other hand, those with income below 75% of the median are classified into the lower income class, 50% of the median being the poverty threshold (OECD, 2019a).

According to the other concept, the middle class consists of people between the 2nd and 8th decile of the income spread, i.e. the central 60% of the population with middle-level income. A ratio defining what part of the total income is achieved by that part of the society would be useful in that case (Levy, 1987, pp. 17–21).

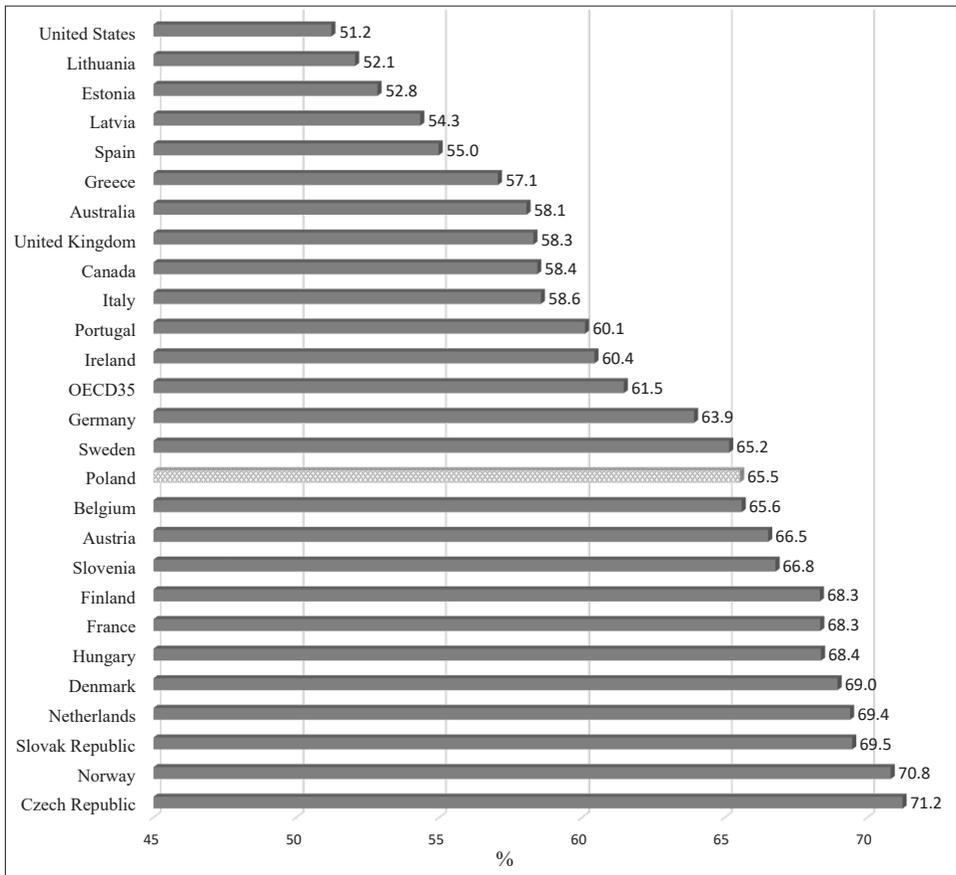
The two remaining concepts are much less common. They utilise the distance from the poverty threshold (the middle class consists of people whose income is above e.g. 150% of the poverty threshold) and an income measure based on purchasing power parity (e.g. from USD 10 to USD 100 a day).

## MIDDLE CLASS BENCHMARKING IN OECD COUNTRIES

Assuming that the middle class consists of individuals whose income falls within the range of 75–200% of the income median for the whole population, the middle class represents the majority of the society in OECD countries, with considerable middle class ratio differences between particular countries (Figure 3) – from over 51% in the USA to over 71% in the Czech Republic<sup>2</sup>.

<sup>2</sup> Quantitative analysis of the distribution of the income in a society (population) uses data regarding **mean annual equivalent disposable income per capita** according to the equivalence scale. The income is calculated based on the total annual income of a household as divided by the number of equivalent units assigned to particular people in that household. According to the original OECD scale, 1 is the weight assigned to the first person in the household at the age of 14 and more; 0.7 – to every subsequent person at the age of 14 and more; 0.5 – to every child up to 14 years of age; in the modified EU scale, 1 is the weight given to the first person in the household, 0.5 – to every subsequent person at the age of 14 and more; 0.3 – to every child below the age of 14. For instance, when a household has an annual income of 25,000 euros and it consists of four people, i.e. the parents, one child over the age of 14 and one child under the age of 14, the income per capita in that household is:  $25000/(1+0.5+0.5+0.3) \cong 10,870$  euros (Polish Central Statistical Office, <https://stat.gov.pl/metainformacje/slownik-pojec/pojecia-stosowane-w-statystyce-publicznej/3218,pojecie.html>; Poland's population income..., 2018, p. 19. OECD, <https://stats.oecd.org/>; The World Bank, <https://databank.worldbank.org/source/poverty-and-equity>).

Above the mean value for OECD countries were those countries where the redistribution range is traditionally quite significant, which directly reduces income inequality, especially in the extreme income groups. Below the mean value were Anglo-Saxon countries, where the acceptance for substantial income inequality is quite high. It should be noted that countries where the middle class size ratio is relatively high include such countries of Central and Eastern Europe as: Poland, the Czech Republic, Slovakia, Hungary and Slovenia. This does not apply to Estonia, Latvia and Lithuania, which were situated at the opposite end of the scale.

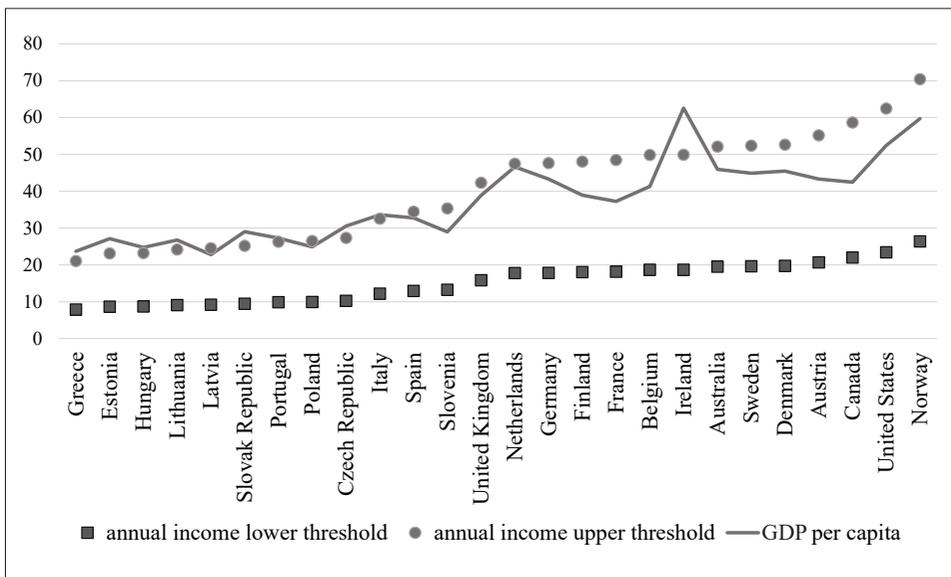


**Figure 3. Percentage of populations with disposable income representing 75–200% of the median in OECD countries in 2016**

Source: own compilation based on OECD data, <https://doi.org/10.1787/888933955121>.

The level of annual income per capita in middle class households differs considerably between the analysed countries (Figure 4). The 2016 lower threshold

for annual income defined as 75% of the median for the population was from USD 7,900 in Greece to USD 26,400 in Norway. For the upper threshold, the range was from USD 21,100 in Greece to USD 70,400 in Norway. It should be noted that the upper income threshold in Greece was lower than the lower income threshold in Norway, which means that those representing the middle class in Greece would be a part of the lower income class in Norway. The standard of living of the middle class in particular countries is highly diverse depending on the income median in the country. GDP per capita is clearly a contributing factor to the standard of living for the middle class as the value thereof in all the studied countries is very similar to the upper threshold for the middle class income.

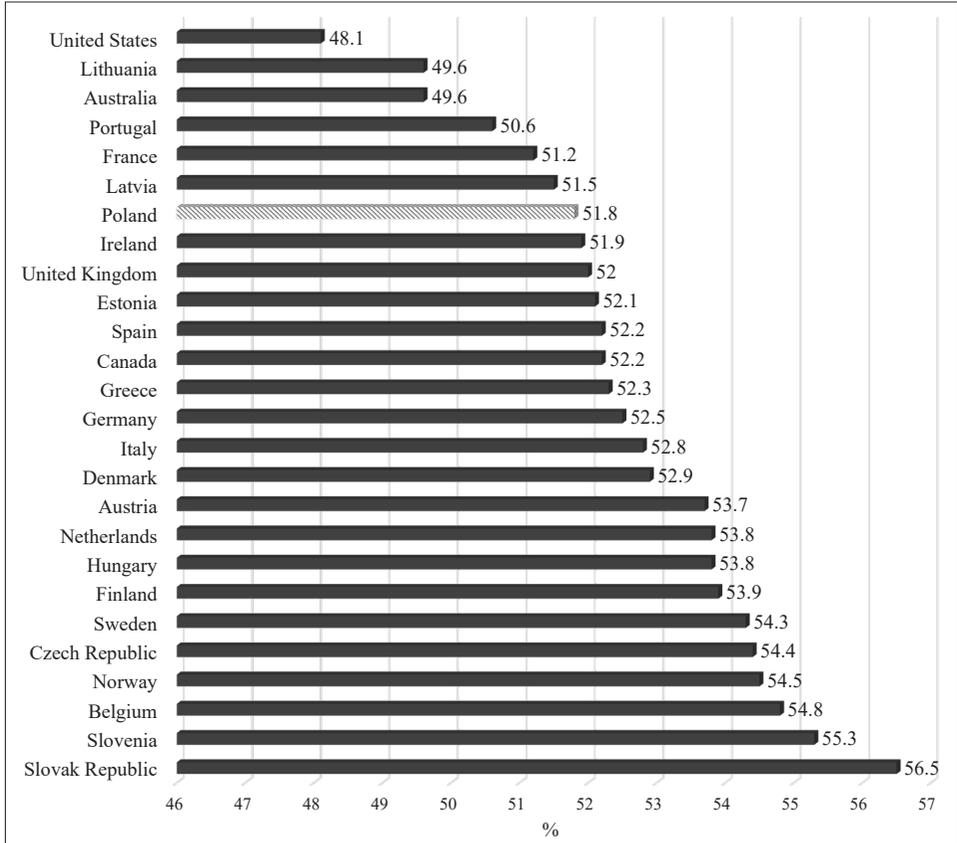


**Figure 4. The upper and lower threshold of annual disposable income per capita in the middle class group and the GDP per capita in USD by purchasing power parity [in thousands] in OECD countries in 2016**

Source: own compilation based on OECD data, <https://doi.org/10.1787/888933955463>; <https://stats.oecd.org/>.

Middle class measurement according to the concept assuming that the group consists of people between the 2nd and 8th decile of the income distribution enables assessing the affluence of the middle class (Figure 5). The size of that class remains unchanged because in any case it represents the central 60% of society; what changes is the income level of that group, defined as a percentage of the income of the whole population of the country. In the case of that ratio, the values differ considerably between particular countries (8.4 percentage points). The middle class can be called relatively (when compared to the whole society)

affluent in Scandinavian countries and Central and Eastern European countries (Slovakia, Slovenia, Czech Republic, Hungary), while for the remaining countries of the region, Poland included, the analysed ratio is relatively low.



**Figure 5. Percentage of the total income of the population that is between the 2nd and 8th decile of the income distribution in OECD countries in 2016**

Source: own compilation based on data of The World Bank, <https://databank.worldbank.org/source/poverty-and-equity>.

At this point it should be mentioned the concept proposed by Jose Gabriel Palma from Cambridge University, which has gained popularity in the recent years, and the measurement proposed by that scientist has been regularly used in the statistical database provided by the OECD (the Palma ratio). J.G. Palma shows in his research that the middle class and the upper middle class are characterised by a “noteworthy” degree of homogeneity between regions/countries in terms of the share of that group in the income of the whole population. That share is about 50% and it is relatively stable. That finding led the author to

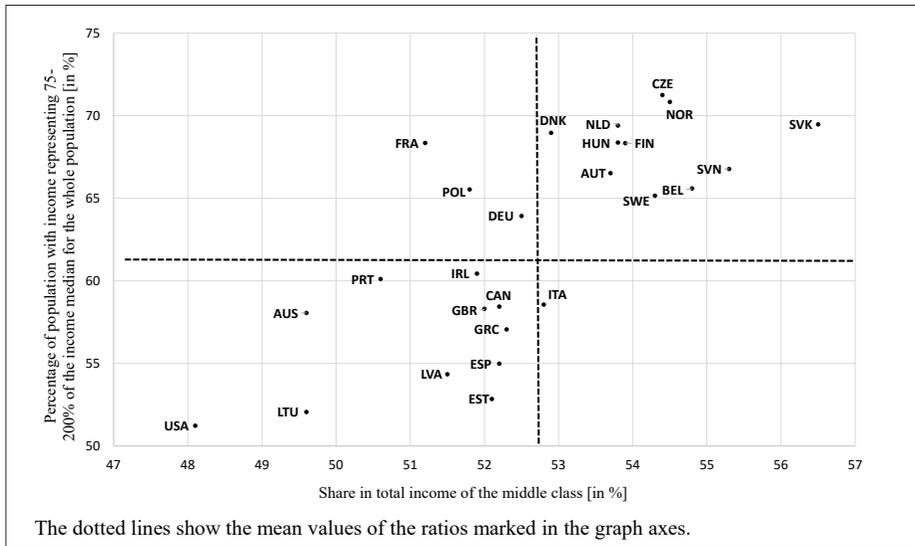
conclude that the most important changes in terms of income inequalities result from the changes taking place in the upper and bottom decile groups so he proposed a measurement reflecting those changes, calculated as the ratio of the income share of the richest 10% to that of the poorest 40% (Palma, 2011; 2016). The proposed ratio (as the author himself emphasised) is simple in its structure and as such easy to apply.

The concept by J.G. Palma became popular but the conclusions from the works of that scientist may seem to deny the statement that the middle class is eroding. A closer analysis shows that the differing conclusions actually result from adopting different research methods and objectives. First of all, J.G. Palma assumed in his study that middle class represented 50% of the population between the 5th and 9th decile of the income range (Palma, 2011, p. 99). Furthermore, the majority of the countries analysed by the researcher were grouped according to the regional criterion (e.g. East Asia, Latin America, Sub-Saharan Africa, Mediterranean EU etc.) which considerably limited the possibility of identifying the differences between particular countries; besides the majority of those countries were at a low and medium development level (Palma, 2011, p. 89)<sup>3</sup>. The adoption of different criteria for identifying the middle class (the author himself also notes that perhaps this group should not be termed 'the middle class' but rather 'the median class' (Palma, 2011, p. 102) than those generally used in OECD countries may result from the fact that the research focused mainly on developing societies, with a relatively large stratum of poor people, which moves the middle class up to higher deciles than in developed countries. Still, what seems of the greatest significance is that the term 'homogeneous middle class' used by J.G. Palma is relative, which means that changes within this group are much less dynamic than those taking place in the remaining groups (Palma, 2016). The statement that the middle group (middle class) is relatively stable is not very precise and is quite arbitrary. In this context, the measurement of inequalities proposed by J.G. Palma, which addressed the extreme income groups only (leaving out the middle groups), seems justified mainly in relation to countries at a low and medium development level (Stiglitz, 2018, p. 61).

Detailed benchmarking analysis of the middle class focusing on highly developed countries reveals certain differences between those countries.

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<sup>3</sup> The conclusions from the studies of J.G. Palma were verified for instance by T. Hazledin, who used data from the database of the World Bank (just like J.G. Palma did) to analyse 107–155 countries, depending on the availability of data. The results led T. Hazledin to conclude that even if any mean income of the studied group in the analysed countries indeed represented 50% of the income of the whole population, the differences between particular countries and the changes taking place over time were significant (from 30% to 66% between the countries in the studied group and from –19.8 to 14.9 percentage points for particular countries in respect of the changes in the studied period) (Hazledin, 2014, p. 1412).



**Figure 6. Summary of the middle-income class measurement ratios for OECD countries in 2016**

Source: own compilation based on data for Figures 3 and 5.

Comparing the two analysed ratios (Figure 6) of the economies of particular countries makes it possible to assign them into one of the three groups:<sup>4</sup>

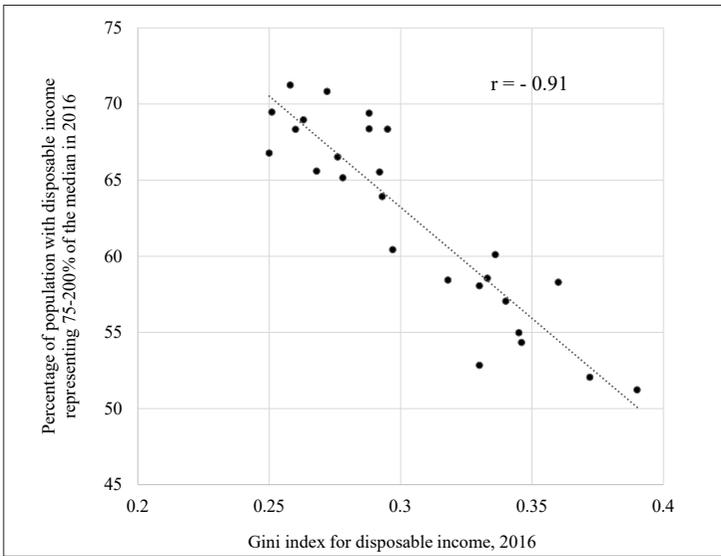
- Group one consists of countries with a relatively large and affluent middle class: Slovakia, Slovenia, Norway, Czech Republic, Netherlands, Denmark, Hungary, Finland, Belgium, Sweden and Austria;
- Group two includes countries where the middle class is large but not too affluent: France, Poland, Germany;
- Group three represents countries where the middle class is relatively small and quite affluent: the lowest values of the analysed parameters characterise the middle class in the USA.

#### HYPOTHESIS VERIFICATION AND CAUSES OF THE CHANGES OBSERVED

The empirical research results have confirmed the initial hypothesis that there is a negative relationship between the extent of income inequality in the society and the size of the middle class.

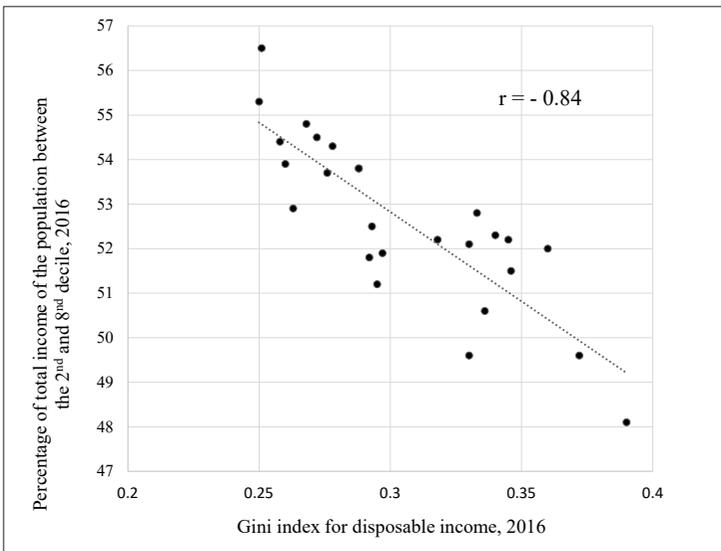
Both the ratio defining the size of the middle class (-0.91) and the ratio defining the wealth of the middle class (-0.84) were inversely correlated with the basic income inequality ratio, i.e. the Gini index for disposable income. Those interrelations were presented in Figures 7 and 8.

<sup>4</sup> Except for Italy but it is very close to the group three.



**Figure 7. Summary of the Gini index values and the ratios representing the share of the population with disposable income of 75–200% median in the whole population in OECD countries in 2016**

Source: own compilation based on data for Figure 3 and based on OECD data, <https://stats.oecd.org/>.



**Figure 8. Summary of the Gini index values and the ratios representing the share of the population between the 2nd and the 8th decile in the income of the whole population in OECD countries in 2016**

Source: own compilation based on data for Figure 5 and based on OECD data, <https://stats.oecd.org/>.

As income inequalities intensify, the middle class shrinks. In the majority of countries, some people move up from the middle class to the richest group as a result of their growing income, while in other cases the stratum of poverty expands. There are several significant phenomena underlying the observed trends.

The most important factors include changes in the work demand structure. The demand for work requiring average, routine skills has been observed to be falling for a few decades now. Jobs are polarising, since the demand for high-skill workers and for simple manual work is increasing (Vaughan-Whitehead, 2016, p. 20). The process directly limits the size of the middle class because of the shortage in the jobs traditionally done by people from that group and (to a smaller extent) due to the relative decline of salaries in that labour market segment (Salvatori, Manfredi, 2019, pp. 14–17). According to estimations for the OECD countries, one out of six middle-income employees does a job threatened by automation, while in the group of low-income workers that proportion is one out of five, and in the group of high-income jobs – only one out of nine. In such countries as Greece, Poland, Slovakia and Spain, at least one out of five employees does a job threatened by automation, while in Finland or the USA the ratio is one out of ten (OECD, 2019a, pp. 79, 96). As a result of those processes, some jobs traditionally done by the middle class disappear or salaries in that labour market segment stagnate. One of the main causes of the observed processes is the rapid development of information and communication technologies (ICT). The increasingly cheaper access to those technologies reduces the demand for employees performing routine tasks (substitution effect), while the demand for employees capable of performing non-routine tasks that require flexibility, creativity, problem-solving skills and communication skills increases (complementarity effect) (Autor, Levy, Murnane, 2003, p. 1322). The latest research additionally points to other highly advanced phenomena connected with work digitalisation, especially: new digital technologies, artificial intelligence, the Internet of Things, learning machines etc., which intensify job polarisation (see OECD, 2019b).

Another factor that has a significant impact on the position of the middle class, whose income comes primarily from work, is the growing gap between work productivity (counted as the GDP per employee) and the increase of real wages. The gap emerges where work productivity grows faster than wages (ILO, 2018, p. 13). As a result, the share of income from work in the total income of the society is falling in favour of income from capital. Consequently, income-related inequalities exacerbate since the income growth rate for the richest groups, whose income come primarily from capital, is greater than the income growth rate for the middle class. The participation of work in the creation of the GDP declines mainly due to rapid technological progress, relative decline in the prices of investment goods, and processes related to globalisation (IMF, 2017, pp. 121–125).

Observed simultaneously with the described phenomena is the decreasing significance of labour market institutions, such as trade unions or collective bargaining, or the prevalence of atypical employment forms, which additionally weakens the leverage of employees with average, routine qualifications.

## CONCLUSIONS

The analysis has made it possible to phrase the following final conclusions:

- As income inequalities intensify, the middle class shrinks, mostly due to changes in the work demand structure.
- Globalisation, technological progress, new digital technologies, artificial intelligence, the Internet of Things, machine learning – all this results in the polarisation of jobs, which directly reduces the size of the middle class.
- The decreasing share of income from work in the total income of the society reflects the expanding gap between productivity growth and the wage increase. This leads to a higher growth rate for income from capital than income from work.
- Weakening labour market institutions, such as trade unions, collective bargaining or minimum wage, as well as non-traditional jobs are unable to counteract the described mechanism.
- The growing polarisation and the shrinking of the middle class hamper social mobility, especially between generations, while income inequalities result in unequal chances of economic promotion.

Socioeconomic policy plays an important role in preventing the erosion of the middle class. The crucial issue is to provide easy access to education to allow young people to align their qualifications and skills with the labour market and allow adults to continue to gain new qualifications throughout their whole professional life. Soft skills should also be mentioned as they are important for employers and they are shaped starting from early childhood. Another matter is related to the instruments boosting professional activity, especially of women and older people, which may help increase the share of households with income at a middle-class level. The recommendations that the tax system should be restructured to limit the processes of capital accumulation from generation to generation are also worth considering. Such processes contribute to limitation of the intergenerational economic mobility (it is hard for children from less affluent families to compete with children from rich families). The progressing changes show that without appropriate actions to support the social cohesion policy, the income polarisation will continue to exacerbate.

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### Summary

This study presents the main facts related to the development of income inequalities in OECD countries in recent years. In particular, the focus was on analysing the economic position of the middle class (middle income class), which is often neglected in analyses, in favour of the two extreme income groups, i.e. the poverty sphere and the group of the richest. It is worth filling this gap because the middle class is the backbone of modern society and decisively determines the possibilities of economic development. The analysis of the coefficients allowing the estimation of the size and affluence of the middle class indicates that this class is highly diversified among OECD countries. In countries such as: Slovakia, Slovenia, Norway, the Czech Republic, the Netherlands, Denmark, Hungary, Finland, Belgium, Sweden and Austria, there is a relatively large and affluent middle class. In contrast, in Anglo-Saxon countries, the middle class is relatively small and moderately affluent. The article empirically confirms the hypothesis that higher income inequalities are accompanied by middle-class erosion. Using the basic income ratio, in the form of the Gini coefficient for disposable income, a very strong negative correlation was identified both between this coefficient and the coefficient determining the size of the middle class (-0.91) and between the Gini coefficient and the coefficient determining the affluence of the middle class (-0, 84). Attention is paid to possible causes of the occurrence of the phenomenon of economic polarization. Proposals for solutions in the field of socio-economic policy aimed at limiting the scale of observed phenomena were also presented.

*Keywords:* income inequalities, middle class, polarization.

## Struktura zróżnicowania dochodów ze szczególnym uwzględnieniem ekonomicznej klasy średniej

### Streszczenie

W opracowaniu przedstawiono główne fakty związane z kształtowaniem się w ostatnich latach nierówności dochodowych w krajach OECD. W szczególności skoncentrowano się na analizie położenia ekonomicznej klasy średniej (klasy średniego dochodu), która często jest pomijana w ana-

lizach, na rzecz dwóch skrajnych grup dochodowych, tzn. sfery ubóstwa oraz grupy osób najbogatszych. Warto uzupełniać tą lukę gdyż klasa średnia stanowi trzon nowoczesnego społeczeństwa i w decydującym stopniu rozstrzyga o możliwościach rozwoju gospodarki. Analiza współczynników pozwalających na oszacowanie rozmiarów oraz zamożności klasy średniej wskazuje, iż wśród krajów OECD klasa ta jest mocno zróżnicowana. W krajach takich jak: Słowacja, Słowenia, Norwegia, Czechy, Holandia, Dania, Węgry, Finlandia, Belgia, Szwecja i Austria występuje relatywnie duża i zamożna klasa średnia. Natomiast w krajach anglosaskich klasa średnia jest relatywnie mała i umiarkowanie zamożna. W artykule empirycznie potwierdzono hipotezę, iż większym nierównościom dochodowym towarzyszy erozja klasy średniej. Wykorzystując podstawowy wskaźnik zróżnicowania dochodów, w postaci współczynnika Giniego dla dochodów rozporządzalnych, zidentyfikowano bardzo silną korelację ujemną zarówno pomiędzy tym współczynnikiem i współczynnikiem określającym wielkość klasy średniej (-0,91), jak i pomiędzy współczynnikiem Giniego i współczynnikiem określającym zamożność klasy średniej (-0,84). Zwrócono uwagę na możliwe przyczyny występowania zjawiska polaryzacji ekonomicznej. Przedstawiono również propozycje rozwiązań w zakresie polityki społeczno-gospodarczej mającej na celu ograniczenie skali obserwowanych zjawisk.

*Słowa kluczowe:* nierówności dochodowe, klasa średnia, polaryzacja.

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