
Elements of household income and income inequality in selected EU countries

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Abstract

Aim: The aim of this study was to identify the most influential factors impacting the level and dynamics of general income inequalities in Poland, Denmark, Germany, Spain and Romania in the period 2007-2019.

Methodology: The study was based on unpublished individual data from the European Survey of Income and Living Conditions carried out by the European Commission. The research was conducted using the procedure of decomposing the Gini coefficient to the general assessment of inequalities as per income source.

Results: The study enabled the conclusion that the biggest inequalities in household gross income were present in Romania, and the smallest in Denmark. In Romania and Poland income inequalities are slowly but continuously rising, whilst in Denmark, Spain and Germany, they are in decline. The gross income in the analysed EU households was based on three main elements, namely paid employment, self-employment and pensions, which constituted 86-96% of household financial resources. The diversity of inequality was predominantly influenced by the income from paid employment, interests, dividends and profit from capital investments in unincorporated businesses, self-employment as well as old-age benefits; such benefits showed an equalising effect on income inequalities.

Implications and recommendations: Analyses carried out on the basis of microdata can contribute to the formulation of policies, the targeting of interventions, and the monitoring and measurement of the impact of ongoing interventions and policies on the situation of households.

Originality/value: This study contributes to the literature on income inequality by providing a comparative analysis of five European countries. By utilizing unpublished microdata from the European Survey of Income and Living Conditions (EU-SILC), this research offers a novel approach to identifying the distinct contributions of employment income, self-employment, capital income, and pensions to inequality levels. The study's cross-country comparison covering the period 2007-2019 also provides valuable insights into the heterogeneous impacts of socioeconomic policies across both Western and Eastern European countries. This original dataset and analytical approach support the development of more effective, evidence-based public policies aimed at reducing income disparities.

Keywords: Gini coefficient decomposition, income inequality, Gini coefficient semi-elasticity, pseudo-Gini index, total household gross income

1. Introduction

Inequality is a wide, ambiguous and multidimensional concept (Tomeczek, 2017). Crucially, however, as pointed out by Sztompka (2002), social inequalities “concern not individual characteristics, but the other kind of characteristics, the intermediate ones, which make specific groups similar to each other – social groups or only certain locations within the social structure, that is social statuses”, and therefore affect “the situation in which people are not equal not on account of their physical or mental attributes, but due to their affiliation to various groups or occupation of particular social positions” (Sztompka, 2002, p. 389). Osberg (2001) indicated that inequality means “the differences among people in their command over social and economic resources” (Osberg, 2001, p. 7371). Berreman (2015) adopted the definition of social inequality popular among anthropologists and explained it as “the sanctioned differential access to valued things, experiences and conditions in human societies” (Berreman, 2015, p. 894). Goodman defined inequalities as “differences between individuals that result from uneven distribution of goods by the society and from the fact that some people work harder than others or have chosen a profession or career that gives more power than others” (Rackowska, 2015 after Goodman, 1988).

There is a large variety of inequality, including social, material, educational, cultural, political, legal and digital inequalities. The three most important ones, to which others may be assigned, are material, social and cultural inequalities. Material inequalities refer to differences in access to material resources, such as income, assets, education or access to services. and are related to economic inequalities between individuals or social groups. Social inequalities, on the other hand, refer to differences in social status (social hierarchy), prestige, power and social opportunities, which can result from factors such as gender, age and ethnicity. Cultural inequalities, on the other hand, refer to differences in how different cultures, traditions, languages, social norms or practices are treated and valued. They concern the exclusion, discrimination and/or marginalisation of specific groups based on their culture,

ethnicity, religion, language and customs (Ridgeway, 2014; Solarz, 2011). One of the elements of social inequality is economic inequality, which in turn embraces income inequality. It should be emphasised that the issue of economic inequalities does not apply exclusively to income or wealth discrepancies, but also disparities in terms of health, wellbeing, happiness or respect (Tomeczek, 2017).

The analysis of how different sources of income affect income inequality has long been important for interpreting economic trends and shaping public policy. Understanding the inequalities that exist in society by analysing the sources of income allows for a better understanding of why there are differences in earnings between different social groups. Having a detailed knowledge of income sources allows governments and social organizations to develop more effective and targeted policies to reduce income inequality. This can include income redistribution programmes, support for education, labour market policies and many other measures. In addition, understanding the sources of income enables the better targeting of interventions to reduce inequality. As a result, resources and means can be used more efficiently, bringing greater benefits to those who are most affected by inequality. Note that the analysis of income sources and their impact on income inequality makes it possible to identify the barriers and constraints that may make it difficult for certain social groups to access different sources of income. In turn, attempts to remove these barriers and provide equal opportunities to earn income can contribute more to a just society. In addition, informing the public about income inequality and its sources can strengthen awareness of the problem and support efforts to reduce it. Thus, knowledge of the sources of income and their impact on income inequality is key to taking appropriate action to create a more equal and just society. This enables a better understanding of the problem of inequality and a more effective fight against this challenge.

The relevance of the topic addressed was confirmed by its inclusion in the Sustainable Development Goals adopted by all the United Nations member states in 2015. This goal includes the reduction of broad inequality in all forms, including inequality involving economic, social and political aspects (Makarenko et al., 2022).

The issue of the disproportionate distribution of income and wealth in society has been under discussion not only from the economic angle, but also from the perspective of numerous other fields (Tusińska, 2017). The first deliberations over the social inequalities date back to Confucius at the turn of the 6th and 5th centuries BC (Wołoszyn, 2020). The study by Pareto (1898) and Gini (1912) is considered the beginning of modern research on inequality. Subsequent studies included Dalton (1920) on normative considerations for measuring income inequality, Kuznets (1955), who showed the inverse U-shaped relationship between income inequality and per capita income, Piketty and Saez (2003), and Piketty (2014) on inequality trends in the US. Reflections on the measurement of inequality and income distribution, on the other hand, began in the 1960s and 1970s, and Atkinson (1970) and (Sen, 1973, 1991, 1995, Sen, 1997) can be considered leaders in that field (Kanbur, 2021; Makarenko et al., 2022).

The will to measure this phenomenon rose significantly in the 20th century, when researchers, such as Pigou (1912), Gini (1912), Dalton (1920), Theil, (1967), Atkinson (1970), Sen (1973), Kolm (1976) and Shorrocks (1984), made their initial assumptions (Jancewicz, 2016).

Economic disparity is an essential element of socio-economic policies in all countries, at the same time being considered an important component of the integrity policy in EU countries (Leszczyńska, 2008). The inequality of income distribution is an innate trait of market economies, and through its secondary distribution, the state attempts to apportion the financial resources in a just manner. In order to even the growing social disproportions out, including income inequalities, the state endeavours to adjust the market through its policies (redistribution of income), e.g. based on supporting the poorest parts of society with social transfers (Leszczyńska, 2008; Nagaj, 2013).

In economics, there are two approaches to measuring inequalities: either positive or normative. The positive approach allows the issue of inequality to be described and explained through the

identification of its sources or the forms it takes, using various classifications and methods or by observing the manner in which it changes over time. The normative approach, on the other hand, seeks to answer the question of the extent to which inequalities could be permissible, when exactly they become an issue and how to assess the scale of inequalities from ethical and moral perspective (Tomeczek, 2017). When analysing economic inequalities, it should be taken into consideration that two different criteria are distinguished – subjective and objective. The objective criterion allows to analyse inequalities from the perspective of the subject of the study.

It has been noted that inequalities might be treated in two ways – as a functional sensation within the social system or an undesirable problem. The approach to this phenomenon is dictated by ideological assumptions related to market economies (the elitist, meritocratic or egalitarian approach) (Zwiech, 2013). In the context of state interventionism, the analysis of inequalities in question was perceived by Keynesians, among others (Keynes, 1936), as a problematic phenomenon, whereas the advocates of neoliberalism (neoliberal economics), e.g. Hayek (1960), treated these inequalities with indifference, considering them to be the price worth paying for individual freedom (Rutkowski, 2016; Wołoszyn, 2020).

The phenomenon in question might bring either positive or negative results. Many researchers pointed out that the inequalities are necessary as a motivation for activity, which in consequence leads to better efficiency (Leszczyńska, 2008). In his studies, Sen hinted at the fundamental human quality of diversity, e.g. individual heterogeneity (sex, age, state of health), the environment in which people function, prospects for the future and income distribution within the family. He emphasised that people are not born equal, therefore the inequalities are not fuelled exclusively by socio-economic factors. The author pointed out that equality in one dimension is associated with inequality in another dimension. Referring to social and political factors, Sen stressed that inequality in society was not only due to differences in income or resources, but also unequal access to knowledge, education, health care and other social spheres. In addition, he pointed out the importance of such social factors as discrimination, lack of equal opportunities and political injustice, thus emphasising the need for a broad view of inequality taking into account various aspects (Sen, 1991, 2000, Sen et al., 1997).

The issue of income disparity was also researched by Budzyńska and Dobrska (1990) who pointed out that the reason for this phenomenon should be sought in structural maladjustment, especially in countries undergoing economic transformation. The researchers argue that income inequality is a source of numerous conflicts and social issues, threatening the implementation of cohesion policies and that decreasing the existing inequalities would improve the general wellbeing of people (Głowicka-Wołoszyn, & Wołoszyn, 2018; Wilkinson, & Pickett, 2011; Zwiech, 2013). Many studies claimed that the excessive diversity of income has an unfavourable effect on economic growth and development (Przekota, 2021). Therefore, monitoring the existing inequalities is fundamental for the maintenance of social harmony (Głowicka-Wołoszyn, & Wołoszyn, 2018).

Income diversity is determined, apart from internal factors stemming from the qualities of an individual, by external factors, such as the socio-economic policy of a given country, especially the employment, income and social policies (Leszczyńska, 2008).

Households belong to the most important entities in any economy, since the decisions taken within households affect the way these economies change. At the same time, they are the smallest social units, and their elementary purpose is to satisfy the needs of its members, while the income generated by these households translates into the level of affluence within society (Mazurek-Krasodomska, 2017; Wołoszyn, 2020). In the analysis of household income, researchers employ a variety of approaches and definitions. This paper analysed the total gross household income, specifically the level of inequality.

Therefore, the aim of this study was to compare household income inequalities and to name the elements of income that have the strongest impact on such inequalities in selected EU member states. The analysis included five countries – Germany, Denmark, Spain, Poland and Romania – because of

their economic and geographic diversity and importance in the context of the European Union. The choice of these countries was dictated by several key factors, namely economic and social diversity, the size of the economy and the representation of different models of economic (socio-political) systems. Countries such as Germany are among the largest economies in the European Union, while Poland and Romania are important players in Central and Eastern Europe, hence their inclusion allows to understand the impact of income inequality at different economic scales. Denmark is known for its extensive welfare system, which has results in reducing inequality, while Spain, Poland and Romania differ in their approaches to social policy. The selection of these countries therefore allows for an analysis of different approaches to combating income inequality. The subject at hand concerns income inequalities, with sources of earnings taken into consideration. The study focused on the period 2007-2019, with particular attention paid to its last two years.

2. Outline of the study (conducted surveys)

Income inequalities belong to a group of issues studied in the literature on the subject of economic growth very often. Already in 1955, Kuznets put forward a hypothesis of the inverted U-shaped relationship between economic growth and income inequalities (Paleologou, 2019), who indicated the positive relation between income inequalities and economic growth, but only to a specific level of these inequalities. Paleologou (2019), when researching these relations, surveyed the gross income of households in 149 countries, measuring income inequality with the use of the Gini coefficient. The author concluded that household income inequalities drive economic growth only if these inequalities are relatively small; when they exceed the threshold, they become detrimental to economic prosperity. The study also pointed out that in the periods 1970-2007 and 1981-1996, India presented the biggest income inequalities, followed by the Philippines, Chile, Ethiopia, Indonesia and Ecuador, with Denmark closing the list (Paleologou, 2019).

The importance of the subject matter is highlighted by a number of reason analyses related to the study of household income inequalities. When investigating the influence of various factors on the alterations of household income inequalities, researchers take into consideration the following aspects: changes in the household structure, impact of tax and benefits system, presence of children in the household, age and gender of household members, contribution of individual household members to income generation (Pezer, 2020), ageing of population (Hwang et al., 2021), health (Monheit, 2021), indebtedness of households (Iacoviello, 2008; Berisha et al., 2015; Fasianos et al., 2017; Loschiavo, 2021), relations between spouses (Haussen, 2019), property owned by the household (furnishings and appliances) (Li et al., 2019), preferences in terms of public redistribution of wealth (Haussen, 2019), and systemic changes (tax and transfer) (Tusińska, 2017). Others, while seeking the causes of this phenomenon, decided to allow additionally for the role of the financial market and demographic composition (Sologon et al., 2021), the financial crisis of 2008 (Ilie, 2020), structure of employment, segmentation of the labour market, the role of labour market institutions (Cecchi, & Garca-Pealosa, 2008) as well as the structure or form of tax on the income of natural persons (Stephenson, 2018).

Alvarez-Garcia et al. (2004) in their analysis of inequalities in the distribution of income in EU countries in 1993-1996, indicated that the lowest level of income inequalities was recorded in Denmark, Sweden and Finland, an average level in Germany, Austria, the Netherlands, France and Luxembourg, a high level in Belgium, Great Britain, Italy, Ireland and Spain, whilst the highest disparities were present in Greece and Portugal (Alvarez-Garcia et al., 2004).

Nagaj (2013) analysed income inequalities in selected countries from around the world, taking the OECD data into account. The author also examined the instruments employed by the Polish state for the purpose of levelling out income inequalities in society and assessed whether these instruments work as intended. In the course of the analysis, it was revealed that social transfers and minimum wage laws were the basic methods for balancing the economic inequalities, whereas the performed

correlation proved that both of these instruments can propel the decrease of income inequalities in society to a large extent. Through the analysis of the Gini coefficient, it was demonstrated that the lowest diversity in income distribution within a society was present in Scandinavian countries and German-speaking countries, while Poland displayed an average level of economic disparity (34.2%) (Nagaj, 2013).

Skare and Stjepanovic (2014) defined and presented the determinants of income distribution and inequality in the biggest economies in the world, showing a pattern in which the distribution of income and wealth affect the main macroeconomic variables. The result of the study showed that, regardless of the amount or category of the disposable income, the variables impacting income distribution are always identical, namely: consumer price index, employment, labour force and population. The impact of these variables turned out to be very strong and evenly distributed, irrespective of expenditure class to which specific households belong (Skare, & Stjepanovic, 2014).

Breen and Andersen (2012) conducted research on the relation between the impact of changing educational assortative mating and income inequalities in Denmark in the period 1987-2006. They argued that the low income inequalities in Denmark resulted from high tax rates and the redistribution policy of the Danish welfare state, which ensures the minimum standard of life for all its citizens through transferring financial resources from the high-income groups to the those that earn less. Using the detailed records of income for the entire population, they ascertained that changes in educational assortative mating increased income inequalities, however these changes were propelled by the altering distribution of education among men and women, and not by the individuals' tendency to choose a life partner with a certain level of education (Breen, & Andersen, 2012).

Biewen and Juhasz (2012) examined the factors behind the growing income inequalities in the most populated economy of Europe. As they pointed out, between 1999/2000 and 2005/2006, Germany experienced an unprecedented increase of net income inequalities and poverty. During that period, unemployment rate grew to a record high, the number of people employed on a part-time basis increased, and there were signs of the broadened distribution of income from paid employment. Among other factors which probably contributed to the increase of income inequalities were the changes introduced to the tax and transfer system, alterations in the household structure (especially the growing number of single-parent households) and changes in other socio-economic attributes (e.g. age or education). The results suggest that the growing inequalities of income from paid employment had the biggest impact on this growth, but they also contributed to changes in the employment structure and the tax system. At the same time, the alterations in the structure and characteristics of households as well as the changes in the transfer system played a minor role in this process (Biewen, & Juhasz, 2021).

Schmid and Levsen (2013) defined the main factors conducive to the rising income inequalities in the early 1990s in Germany. While explaining the changes in the concentration of income, they came to the conclusion that cyclical and structural changes in the labour market, the increased significance of capital income and the decreased effectiveness of public income redistribution mechanisms were the main factors behind the development of income inequalities. They also indicated that the structure of tax incidence and social security contributions, as well as the growing importance of value-added taxes, showed the negative redistribution effects for low-income households (Schmid, & Levsen, 2013).

Biewen et al. (2019) evaluated what factors were responsible for inhibiting the upward trend of income inequalities in Germany after 2005. As the authors suggested, the main reasons for this impediment after 2005 included the less rapid general growth of wage disparity prior to 2005 and the stabilisation of inequalities in annual income from paid employment after 2005 due to better chances of finding employment during the year (which compensated for the growing inequalities). They specifically established that income inequality did not fall in a more marked way after 2005, because the middle and upper parts of the distribution also benefited from the employment boom after 2006. They also provided evidence that the influence of a number of other factors, which are often suspected of impacting the distribution, such as capital income, household structure, ageing population, changes in

the tax and transfer systems and the financial crisis of 2008, did not cause the distribution to change significantly after 2005 (Biewen et al., 2019).

Precupețu (2013) researched income inequalities in Romania during the transformation of the political system and observed that these disparities increased to a large extent, making the country one of the most unbalanced in the EU. The study stressed that the value of the Gini coefficient positioned Romania among one of the most balanced countries in Europe in 1990, which then became the most unbalanced European country in 2007, and was fifth in the ranking of EU members as regards the Gini coefficient in 2011. The researcher noted that the inequalities were visible in the division into social and demographic groups, also at local level. This division did not exist only between a small elite of very wealthy people and a large group of the poor; there are considerable inequalities between several well-developed big cities and the rest of the country, between urban and rural areas, between bigger and smaller cities, between bigger and smaller, poorer villages, and between various regions of the country. It was pointed out that the transformation had created new opportunities for some categories, yet at the same time it significantly reduced the potential in others. The author remarked there was no evidence that would suggest the existing divisions were diminishing; on the contrary, they seemed to be deeply rooted and showed a tendency to remain unchanged (Precupețu, 2013).

The aim of the research by Militaru and Stanila (2015) was to better understand the determinants for income inequalities in Romania. The conclusions from the conducted survey demonstrated that despite some positive economic changes and strong concerns of the government, income inequalities in Romania were still high and had barely altered in the last 15 years. Having decomposed income inequalities into groups of households based on their socio-economic characteristics, it was found that education and employment status were among the main determinants of income variability (Militaru, & Stanila, 2015).

Gradín (2016) researched the causes of high-income disparities in Spain in the context of inequalities within the EU and what caused their growth in the last years of the study. He indicated that these disproportions, higher than in Germany and other countries, were fuelled by the inequality among the households active in the labour market. The results showed that higher inequalities observed in Spain were mainly related to the lower employment rate, the higher self-employment rate, the lower education level as well as the recent increase in the immigration of professionally active households. Income inequalities in Spanish households were balanced out by the diversification of income sources, especially in the case of families with many children and pensioners (Gradín, 2016).

Anghel et al. (2018), through the analysis of inequalities in Spain in the period 2008-2014, took into account income inequalities based on the total gross household income. The researchers noted that the high unemployment rate in Spain led to a high level of inequality in terms of gross income (GDP level) in comparison with other countries; however, when the total gross household income was left out, the recorded level of inequality was lower. The reason was apportioned, among others, to average-sized households in Spain, which results from the fact that young Spaniards reside longer with their parents, and pensioners in smaller households were usually in the lower parts of income distribution. The authors emphasized that income inequalities measured with the use of household income were usually lower than financial inequalities, which results from the fact that high-income households tend to save up more (Anghel et al., 2018). The results of the research carried out by Cerniauskas and Ciginas (2020), concerning income inequalities in Lithuania in comparison with other EU countries, indicate that the inequality of income distribution in Lithuania is one of the highest in the entire European Union. The decomposition of values showed that a large share of inequalities between particular groups can be explained with the unbalanced distribution of income from paid employment, especially if a member of the household is self-employed. Ilie (2020) determined the manner in which various income sources contributed towards the general disparity rate in Romania in 2007-2016. Their analysis pointed out the causes of inequality in Romania, indicating that earnings and pensions, as the pillars of household budget, had the biggest influence on global inequalities, although with opposite impacts (wages as a pro-balancing factor).

Muszyńska et al. (2021) researched the level of income inequality in Polish and Irish households from the angle of tax and pension systems that mitigate these inequalities. Their main concern was whether the differences in the regime of welfare states, which shape these systems in Poland and Ireland, were reflected in the role played by taxes and social transfers in counteracting income disparities. The results revealed that the redistribution effect was stronger in Ireland, thus inducing, through specific unemployment, social and tax policies, a higher reduction of income inequalities than in Poland. It was also shown that among all of the factors conducive to the increase of income inequalities in both countries, the strongest influence was exerted by the income from paid employment, self-employment as well as old-age and survivor benefits.

Most studies focused on overall income redistribution, but more detailed analyses were conducted on the impact of individual income components on overall inequality (Gustafsson, & Shi, 2001; Quintano et al., 2009; Zhou, 2009; Novignon, 2017; Caminada et al., 2019; Wędrowska, & Muszyńska, 2020). Examples include studies on countries other than those covered in this study. Zhou (2009) examined the causes of rural inequality in China since 2000. Using the Gini decomposition method, he showed that wages from local employment, income from agricultural economic activities and income from non-agricultural economic activities were the three income components that contributed most to the increase in inequality. In addition, the author pointed out that income transferred by relatives and friends had a negative impact on the increase in overall inequality. Quintano et al. (2009) examined the marginal impact of different components of household income on inequality in Italy. The results suggest that self-employment income was a major source of inequality in Italy. Using a regression-based approach to decompose household income by source, Caminada et al., (2019) found that in most of the analysed 31 countries, social transfers were the dominant instruments for reducing income inequality. The two dominant income components responsible for 50-80% of the total reduction in income inequality were public pensions and survivor programmes (including disability pensions) and income taxes. However, the authors stressed that the differences between the countries they studied were huge, with public pensions and survivor benefits accounting for a large share of total redistribution in the continental, central and southern European countries, with much lower numbers in English-speaking countries (29-53%), and Scandinavian countries (48-60%). On the other hand, Wędrowska and Muszyńska (2020), conducting a decomposition of the Gini index by income source for Poland, showed that in 2016, compared to 2015, income inequality decreased in groups of households with children, while it increased in groups of households without children. It was further shown that taxes and social transfers, with the exception of pensions and survivor benefits, reduced income inequality regardless of household group, but income taxes and social security contributions were the most important factor in reducing income inequality.

The financial standing and material well-being of households are defined through income, consumption and welfare. The aggregate of income, consumption and welfare describes the condition of households for the purpose of examining the macroeconomic policy, while the distribution of these contributors, based on micro data, is employed to assess the disparities in the context of social policies.

3. Material and methods

3.1. Calculation of income inequality

Household income inequality in Germany, Poland, Denmark, Spain, and Romania was assessed using the Gini index, one of the very few measures in statistics that have several alternative forms. The one presented below is the so-called covariance formula (Lerman, & Yitzhaki, 1985):

$$G = \frac{2 \operatorname{cov}(Y, F(Y))}{\mu}, \quad (1)$$

where Y is the total gross household income, μ – the average of the income, and F – the cumulative distribution function.

The Gini coefficient is a measure of income inequality and takes values from 0 to 1. The value of 0 assumes a perfectly egalitarian distribution (equal distribution of income), while the value of 1 assumes a distribution in which the individual has all the income (Cowell, 2011).

Keeping in mind that total gross household income Y consists of several components Y_k from different sources, the Gini index can be written using the following formula (Lerman, & Yitzhaki, 1985):

$$G = \sum_k S_k C_k, \quad (2)$$

where S_k is the share of k -th income source in total, and C_k is the **concentration index** of k -th source income with respect to the total income. The concentration index is also called **pseudo-Gini**. Unlike the standard Gini index, it measures inequality of a given income source, when individual households are ranked according to their total, rather than k -th source, income. Consequently, the formula for C_k is given as:

$$C_k = \frac{2 \operatorname{cov}(Y_k, F(Y))}{\mu_k} \quad (3)$$

The concentration index C_k takes on values between -1 and 1 .

The pseudo-Gini is never interpreted alone but always compared to the value of the Gini index itself. When it is smaller ($C_k < G$) then its source can be considered equalising – and when larger ($C_k > G$) – disequalising. A more precise measure of the impact an income source may exert on total income is given by the **semi-elasticity** of the Gini index (Lerman, & Yitzhaki, 1985):

$$\frac{\partial G/G}{\partial \mu_k} = \frac{S_k(C_k - G)}{G}. \quad (4)$$

The semi-elasticity measures by what percentage would the Gini index increase if the mean of the income source grew by a unit of income.

The semi-elasticity of the Gini coefficient determines the percentage change in the value of this coefficient relative to a measure of the average level of total gross household income from a k -source and is a proxy for the impact of this source on the level of income inequality (Lerman, 1999, p. 346).

3.2. Data

The study drew on unidentifiable microdata from the EU Statistics on Income and Living Conditions (EU-SILC), surveyed from 2007 to 2019. Note the fact that the national accounts and the European Union Statistics on Income and Living Conditions of the Population (EU-SILC) are two separate sources of statistical data, and information from these two sources may not always lead to the same conclusions regarding the well-being of the population.

The sizes of the household samples adopted for the analysis are shown in Figure 1. In some households, the declared income was not a sum of its components and consequently, they were excluded from the sample. The percentage of exclusions was as follows: 6.5% in Germany, 5.1% in Spain, 6.4% in Romania, and 0% in Poland and Denmark.

The study's interest regarding income type was the total gross household income (the HY010 variable in EU-SILC database), defined as the total monetary and non-monetary income earned by a household over a specified period of time, before deducting income tax, regular wealth taxes, compulsory social security contributions of employees, the self-employed and the unemployed (if applicable), and employers' social security contributions, but after taking into account inter-household transfers received (EUROSTAT, 2020). Total gross household income (HY010) is the sum of gross personal income components of all household members as well as some household-level components.

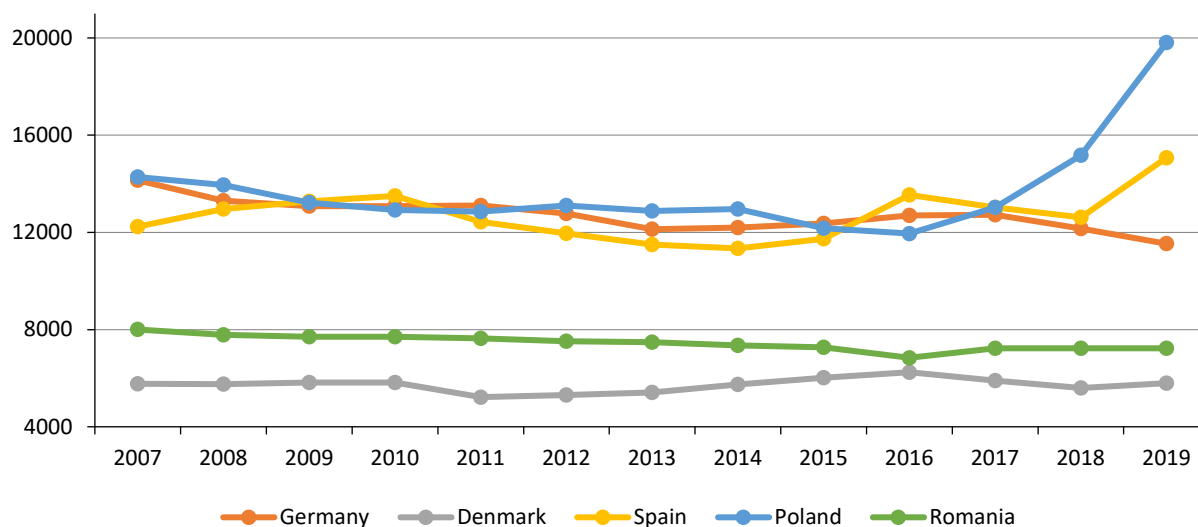


Fig. 1. Number of sampled households

Note: the presented numbers account for exclusions due to income equation violations but also for the removal of households with negative income.

Source: own compilation based on unidentifiable microdata from EU-SILC conducted by the EUROSTAT from 2007-2019.

The elements of gross personal income for all household members are:

- Gross employee cash or near cash income (PY010G) (**recognised as income from hired work**),
- Company car (PY021G),
- Gross cash benefits or losses from self-employment (including royalties) (PY050G) (**recognised as income from self-employment**),
- Pensions received from individual private plans (other than those covered under ESSPROS) (PY080G),
- Unemployment benefits (PY090G),
- Old-age benefits (PY100G),
- Survivor benefits (PY110G),
- Sickness benefits (PY120G),
- Disability benefits (PY130G),
- Education-related allowances (PY140G).

The components of gross income at household level were:

- Income from rental of a property or land (HY040G),
- Family/children related allowances (HY050G),
- Social exclusion not elsewhere classified (HY060G),
- Housing allowances (HY070G),
- Regular inter-household cash transfers received (HY080G),
- Interests, dividends, profit from capital investments in unincorporated business (HY090G),
- Income received by people aged under 16 (HY110G) (EUROSTAT, 2020).

Therefore, total gross household income (HY010) can be written as follows:

$$HY010 = HY040G + HY050G + HY060G + HY070G + HY080G + HY090G + HY110G + [for all household members](PY010G + PY021G + PY050G + PY080G + PY090G + PY100G + PY110G + PY120G + PY130G + PY140G).$$

The microdata used for the analysis, obtained from the European Commission, represent high-quality statistical information at European level, which allows very accurate comparisons to be made between

the countries. This comparability is ensured by the conceptual harmonisation of the target variables obtained by their detailed definition, as well as by Eurostat's active coordination role. Conducting surveys in the context of households using microdata allows for an in-depth understanding of their situation and the impact of ongoing socioeconomic policies in European countries. Thus, analyses carried out on the basis of microdata can contribute to the formulation of policies, the targeting of interventions, and the monitoring and measurement of the impact of ongoing interventions and policies on the situation of households.

4. Results and discussion

The analysis of household income in 2007-2019 showed that the highest average total annual income among the surveyed countries was recorded in Denmark and Germany, followed by Spain, while the lowest income was documented in Poland and Romania. In 2019, the average total annual gross income per capita of Danish households amounted to nearly 39.60 thousand EUR, and they showed the lowest growth rate when compared to 2007 among the analysed countries (around 2%). In 2019, German households generated average annual gross income per capita at a level of 35.12 thousand EUR, while in Spain this value amounted to around 22.65 thousand EUR, in Poland – roughly 16.65 thousand EUR, and in Romania – a mere 11.8 thousand EUR (Figure 2). In comparison to 2007, these values were higher by 9%, 11%, 62% and 143%, respectively.

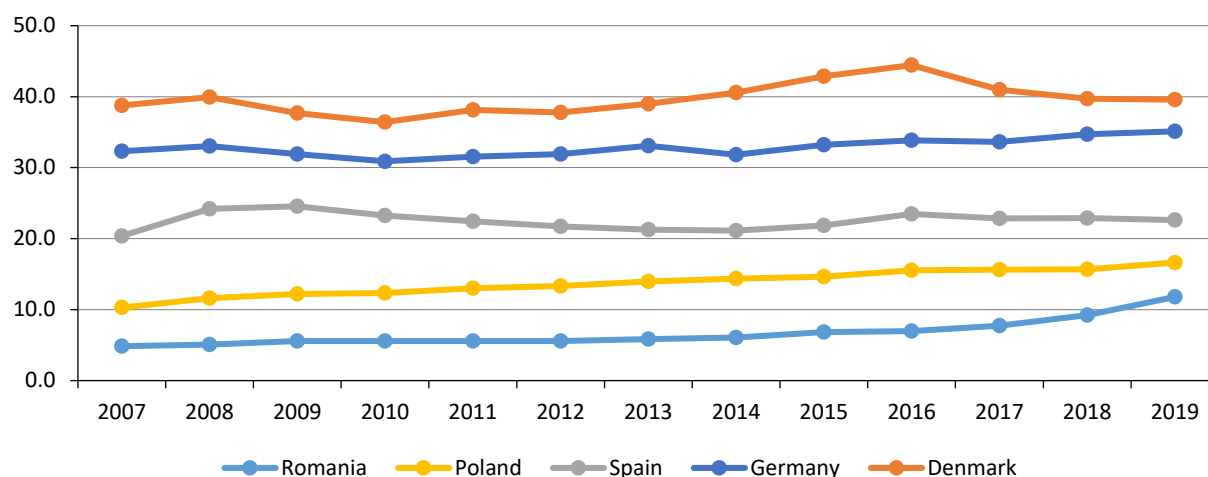


Fig. 2. Average total annual gross income per capita of household in selected EU countries in 2007-2019 (per equivalent unit, in PPP, in thousands of EUR)

Source: own calculations using unpublished EU-SILC data from 2007-2019.

In all the years included in the survey, the income from paid employment, old-age benefits and self-employment remained the most important sources of total gross income of households. From 2007 to 2019, the contribution of paid employment in the total gross household income in the studied countries was from 52% to 73%. In recent years, the share of this particular income source has been rising in Germany and Romania, while in Denmark, Spain and Poland, it showed a downward tendency. The contribution of earnings from old-age benefits to gross income ranged from 8% to 36%. The highest values were recorded in Romania (20% to 36%) and Poland (22% to 24%), whereas a lower significance of this income source was observed in Spain (13% to 17%) and Denmark (8% to 21%). It was observed that the share of old-age benefits in the total gross household income in all of the analysed countries was increasing. At the same time, the share of income from self-employment (cash income or loss from employment) was from 4% to 11%, with its biggest share recorded in Poland (9% to 11%), and the smallest in Romania (4% to 9%) and Denmark (4% to 7%). In 2019, the accumulated share of the remaining sources of earnings in the total income amounted to 13% in Spain, 10% in Denmark, 9% in Germany, 9% in Poland and 4% in Romania (Table 1).

Table 1. Shares of main components of total gross household income in selected EU countries in 2007-2019 (%)

Source of income	Country	Year												
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Income from hired work	Germany	59	59	62	62	62	63	63	62	62	62	62	62	63
	Denmark	71	69	73	73	72	71	69	67	66	64	64	62	62
	Spain	65	63	64	63	63	62	59	58	59	60	61	61	62
	Poland	57	59	59	58	57	58	58	58	57	58	57	57	56
	Romania	62	60	57	54	53	54	55	54	52	59	59	63	69
Income from self-employment	Germany	9	8	7	6	6	5	6	6	6	6	6	7	6
	Denmark	7	6	5	4	5	5	6	5	6	6	5	6	5
	Spain	9	10	8	7	7	7	7	7	7	8	8	8	8
	Poland	10	10	11	11	11	11	11	10	10	10	9	9	10
	Romania	9	8	7	7	7	6	6	6	6	7	7	5	4
Old-age benefits	Germany	19	20	20	20	19	19	20	21	20	20	20	20	21
	Denmark	8	8	9	10	11	12	13	14	14	16	17	19	21
	Spain	18	14	15	16	13	14	14	16	16	16	17	16	17
	Poland	23	22	22	23	23	22	23	23	24	24	23	24	24
	Romania	21	24	27	30	32	32	33	35	36	30	30	27	23
Interests, dividends, profit from capital investments in unincorporated business	Germany	3	2	2	3	2	2	2	2	1	1	1	1	1
	Denmark	3	7	2	1	1	1	1	3	4	5	4	3	3
	Spain	1	4	4	4	3	3	3	3	3	2	2	2	1
	Poland	1	0	0	1	1	0	0	1	0	0	0	0	0
	Romania	0	0	0	0	0	0	0	0	0	0	0	0	0
Other income	Germany	11	10	10	10	11	10	10	10	10	10	10	10	9
	Denmark	11	11	11	12	12	12	11	11	10	10	10	10	10
	Spain	8	10	9	11	14	14	16	16	15	14	13	13	13
	Poland	9	8	7	7	8	8	8	8	8	8	10	10	9
	Romania	9	9	9	9	8	7	7	6	5	5	5	4	4
	Germany	11	10	10	10	11	10	10	10	10	10	10	10	9

Source: own calculations using unpublished EU-SILC data from 2007-2019.

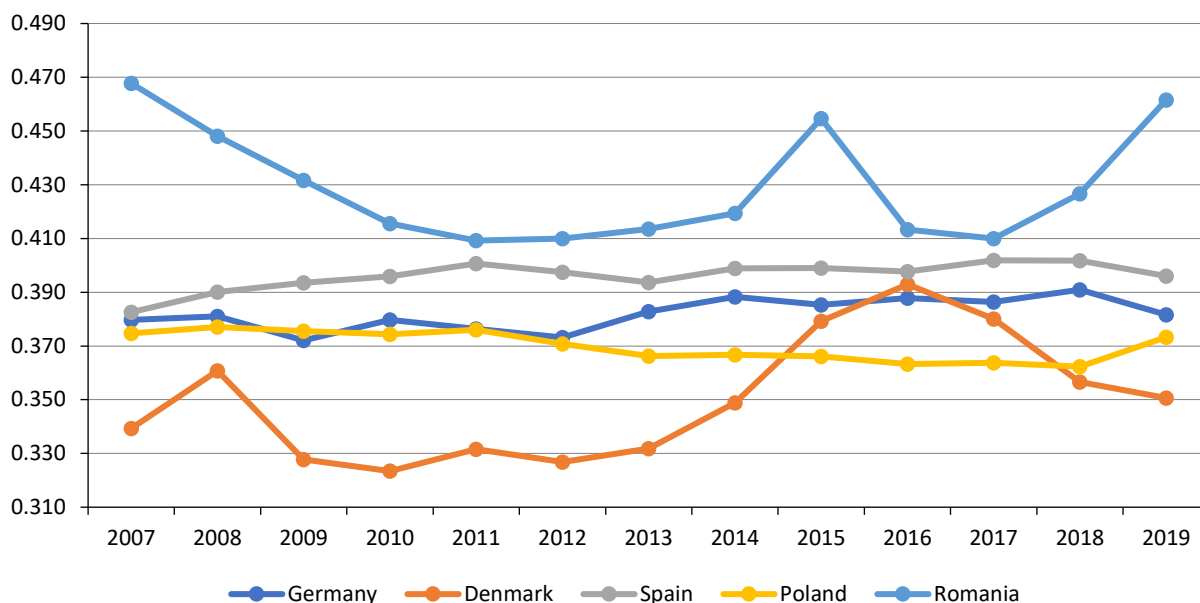


Fig. 3. Gini coefficient for income inequalities in selected EU countries in 2007-2019

Source: own calculations using unpublished EU-SILC data from 2007-2019.

The Gini coefficient is a measure of income inequalities with the value range from 0 to 1. The closer it is to 0, the more balanced the income, whereas if the coefficient is closer to 1, the income shows the higher disparity.

In 2007, income inequalities in the examined countries, measured with the Gini coefficient, were contained within the range from 0.34 to 0.47, whereas in 2019 – from 0.35 to 0.46. The highest income inequalities in the entire time period in question was recorded in Romanian households (0.41–0.47) (Figure 3). Militaru and Stanila (2015) indicate that the main reasons for income inequalities between households are the level of education and the status in the labour market. The analysis of Romanian population confirmed that the percentage of people with higher education was low and was from 11% to 18% in 2019. The lowest income disparities, on the other hand, were among Danish households (0.32 to 0.39). One of the reasons for this could be the high percentage of educated people – from 26% to 39% in 2019. This might validate the findings of Bosch (2009), who concluded that education and training play a crucial role not only in active labour market policies but also in the general education policy that provides generous subsidies to finance further education courses for adults, which is described as “empowerment strategy” and is aimed at increasing the individual bargaining power of employees (Bosch, 2009, p. 348). In Germany, the percentage of people with higher education hovered between 22% to 28%; in Spain, it was 26% to 39%, while in Poland – 16% to 28%. It can be noticed that the number of educated citizens in the analysed countries has been increasing over time, which might have a positive effect on the reduction of income inequalities in the future. The average Gini coefficient was recorded in Spain (0.38–0.40) and Germany (0.37–0.39). Gradín (2016), in order to explain the high level of inequality in Spain, indicates that it is mainly related to a lower employment rate, a higher self-employment rate, a lower education level as well as a recent increase in the immigration of professionally active households. In 2010-2019, the unemployment rate in Spain was higher than in the other four countries, running from just above 14% to over 26%; despite the decreasing pattern, it remained at a high level (based on the EUROSTAT database accessed on 23.08.2022).

Grabka and Kuhn (2012) and Biewen and Juhasz (2012) perceive the unequal distribution of market income (which is conducive to high unemployment rate), but also the demographic factors related to the aging of population and increased number of single-person households and childless families as the main reason for the stratification of income in Germany. On the other hand, the unemployment rate in Germany was at a level from 3% to almost 7%, decreasing as time went on. Still, the analysis of German population shows that around 28% of German citizens are 65 years of age and older (based on EUROSTAT database accessed on 23.08.2022).

Slightly lower values of the Gini coefficient were recorded in Poland (0.36–0.38) where the unemployment rate hovered between 3% and nearly 11%, gradually dropping as years passed by. In the analysis of the percentage of people above 65 years of age, it can be noted that the share of this age group in Poland is the lowest in comparison with the other surveyed countries, running from 13% to almost 18% in 2019 (based on the EUROSTAT database accessed on 23.08.2022).

The concentration coefficient C_k showed the concentration of income from the analysed source in relation to the arrangement of households according to the total gross household income, and was calculated as values between -1 and 1 (Wołoszyn, 2020). In these countries, high values of coefficient C_k were observed for the following income sources: interests, dividends and profits from capital investments in unincorporated businesses, self-employment, paid employment and rental of property and/or land. The highest values of the concentration coefficient C_k in German households applied to self-employment income and earnings from rental of property or land, whereas in Danish households the highest values were recorded for the income from interests, dividends and profits from capital investments in unincorporated businesses as well as self-employment earnings. Similar findings were reported for Spanish, Polish and Romanian households, where the highest concentration index was related to the income from interests, dividends and profits from capital

investments in unincorporated businesses. Nonetheless, the share of these sources of earnings in the total gross household income was not large (not more than 7.5% in Denmark in 2008). In addition, it was noted that C_k coefficient, related to the self-employment earnings in Romania, significantly decreased over time from 0.402 to 0.168. The reason for this might be the fact that self-employed Romanians often work in agriculture, which generates earnings comparable to the social minimum income (Militaru, & Stanila, 2015, p. 232). In Germany, the C_k coefficient values that are similar to those of Gini coefficient, show income from interests, dividends and profits from capital investments in unincorporated businesses, whereas in Romania it was income from sickness benefits. Income from social transfers (allowances for the socially excluded, housing allowances, regular money transfers between households, unemployment benefits, survivors' benefits, disability benefits, and old-age benefits) recorded well below the Gini coefficient, for which the value of C_k was negative (Table 2).

Table 2. Concentration coefficient C_k for components (sources) of total gross household income in selected EU countries in 2007 and 2019

Source of income	Country and year									
	Germany		Denmark		Spain		Poland		Romania	
	2007	2019	2007	2019	2007	2019	2007	2019	2007	2019
Income from rental of a property or land	0.57	0.54	0.37	0.42	0.56	0.44	0.47	0.54	0.42	0.24
Family/children related allowances	0.28	0.42	0.29	0.40	0.34	0.05	0.03	0.28	0.34	0.34
Social exclusion not elsewhere classified	-0.37	-0.53	x	x	-0.08	-0.17	-0.48	-0.50	-0.24	-0.58
Housing allowances	-0.53	-0.72	-0.66	-0.62	0.14	-0.33	-0.32	-0.32	x	x
Regular inter-household cash transfers received	-0.05	-0.13	0.05	0.19	-0.01	-0.06	-0.12	-0.05	0.02	-0.53
Interests, dividends, profit from capital investments in unincorporated business	0.40	0.43	0.93	0.79	0.59	0.62	0.84	0.87	0.80	0.35
Income received by people aged under 16	0.33	0.30	0.43	0.58	0.23	0.06	0.03	0.24	0.45	0.30
Income from hired work	0.51	0.52	0.41	0.51	0.50	0.51	0.54	0.55	0.66	0.65
Income from self-employment	0.74	0.75	0.71	0.69	0.40	0.50	0.49	0.55	0.40	0.17
Unemployment benefits	-0.18	-0.19	-0.14	-0.04	0.11	0.13	0.04	-0.04	0.26	0.08
Old-age benefits	-0.04	-0.04	-0.34	-0.10	-0.01	0.15	0.05	-0.01	0.04	0.00
Survivor benefits	-0.14	-0.28	0.32	-0.56	-0.06	-0.18	0.01	-0.20	-0.35	-0.32
Sickness benefits	0.19	0.14	0.02	0.12	0.19	0.20	0.06	0.39	0.55	0.49
Disability benefits	-0.04	-0.23	-0.05	-0.03	0.05	0.14	-0.01	-0.05	0.05	0.01
Education-related allowances	-0.08	-0.06	-0.28	-0.26	0.26	0.14	0.19	0.07	0.30	0.02

Note: the values higher than G , i.e. the ones that are conducive to income inequalities, are in grey, while the values lower than G , i.e. the equalising ones, are left uncoloured.

Source: own calculations using unpublished EU-SILC data from 2007-2019.

To sum up, by scrutinising the values of concentration coefficient C_k and the Gini coefficient, one could determine which sources of earnings in the analysed years can be defined as conducive to the increase of income inequalities, and which can be perceived as equalising for the general level of income inequalities. In the surveyed countries, income sources conducive to the growth of inequalities include the following: income from interests, dividends and profits from capital investments in unincorporated

businesses, income from paid employment, income from self-employment (with the exception of Romania), income from rental of a property or land and family allowances of recent years in the case of Germany and Denmark.

It should be emphasised that old-age benefits, which remain one of the three main income sources, demonstrated a positive impact on income inequalities and had an equalising influence on them, unlike the other two. Among other income sources favourable to balancing the inequalities were social transfers, such as housing allowances, unemployment benefits, survivor benefits, sickness benefits (with the exception of Poland and Romania), disability benefits, education-related allowances and regular money transfers between households. Yet, it was observed that housing allowances in Romania as well as sickness benefits in Poland showed de-equalising characteristics. Through the analysis of the impact of family or children-related allowances, the author concluded that these sources of income were a predominant contributor to the increase of income inequalities in the surveyed years in Germany, Denmark and Poland.

Table 3. Components of the Gini coefficient in selected EU countries in 2007 and 2019

Source of income	Country and year									
	Germany		Denmark		Spain		Poland		Romania	
	2007	2019	2007	2019	2007	2019	2007	2019	2007	2019
Income from hired work	0.301	0.331	0.289	0.315	0.328	0.315	0.309	0.309	0.405	0.450
Income from self-employment	0.063	0.046	0.048	0.033	0.035	0.038	0.051	0.055	0.035	0.007
Family/children related allowances	0.008	0.009	0.004	0.004	0.001	0.000	0.001	0.011	0.006	0.003
Income from rental of a property or land	0.009	0.007	0.000	0.000	0.009	0.008	0.001	0.002	0.000	0.000
Interests, dividends, profit from capital investments in unincorporated business	0.011	0.005	0.030	0.022	0.005	0.009	0.004	0.003	0.002	0.000
Sickness benefits	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000
Income received by people aged under 16	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Education-related allowances	0.000	0.000	-0.002	-0.002	0.001	0.000	0.000	0.000	0.000	0.000
Regular inter-household cash transfers received	0.000	-0.001	0.000	0.000	0.000	0.000	-0.001	0.000	0.000	0.000
Social exclusion not elsewhere classified	-0.003	-0.001	x	x	0.000	-0.001	-0.001	-0.001	-0.002	-0.001
Unemployment benefits	-0.004	-0.002	-0.005	-0.001	0.002	0.003	0.000	0.000	0.001	0.000
Disability benefits	-0.001	-0.003	-0.001	-0.001	0.001	0.004	0.000	-0.001	0.001	0.000
Housing allowances	0.000	-0.003	-0.002	-0.004	0.000	0.000	-0.001	0.000	x	x
Survivor benefits	-0.001	-0.004	0.000	0.000	-0.001	-0.007	0.000	-0.003	-0.004	-0.002
Old-age benefits	-0.008	-0.007	-0.027	-0.020	-0.002	0.026	0.011	-0.002	0.008	0.000

Source: own calculations using unpublished EU-SILC data from 2007-2019.

Based on the Gini coefficient components, it was concluded that in all of the examined countries, within the analysed time period, the highest positive influence on income inequalities was demonstrated by the following sources of income, listed in descending order: paid employment, self-employment and interests, dividends and profits from capital investments in unincorporated businesses (Table 3, Figures 4, 6 and 7). The biggest negative impact on income inequalities was shown by old-age benefits (Table 3, Figure 8) The measure directly interpretable as the evaluation of the influence of particular income sources on the level of inequality was the Gini coefficient semi-elasticity.

The income from paid employment, as already mentioned, was the biggest part of household income and therefore played a dominant role in determining the general inequality. In Germany, the earnings from paid employment had the greatest impact on household income inequalities. In this country, the value of semi-elasticity for the income from paid employment had been on the rise since 2007 or had remained at similar levels, and achieved a record high of 0.287 in 2012, which means that an increase of average gross income by 100 EUR pushed (*ceteris paribus*) the Gini coefficient up by almost 29%, resulting in the change of its value from 0.373 in 2012 to 0.480. Next, the value in question considerably dropped by 2015, amounting to 0.180 (the Gini coefficient rose by 18%). From 2016 to the end of the period in question, this index remained almost unchanged, with slight fluctuations between 0.274 and 0.283. On the other hand, the lowest values of the semi-elasticity coefficient were recorded in 2007-2008 and 2015-2016 in Denmark, respectively 0.141–0.085 and 0.165–0.190. In the remaining years, the lowest semi-elasticity was recorded in Spain, where it was at a level of 0.181 to 0.209, which means that the increase of average gross income by 100 EUR (*ceteris paribus*) caused the Gini coefficient to rise from 18% to almost 21%. In Poland, the value of semi-elasticity amounted to 0.235–0.279, while in Romania, the equivalent value appeared in the range of 0.180 to 0.287 (Figure 4).

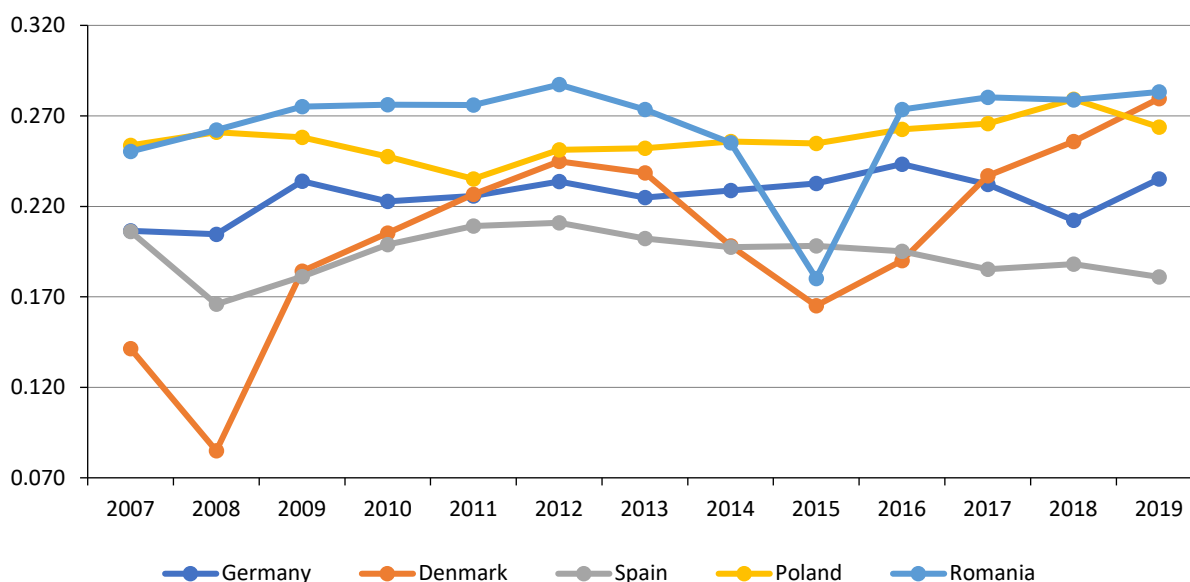


Fig. 4. Impact of paid employment cash or near cash income on the existing income inequalities (semi-elasticity of Gini) in selected EU countries in 2007-2019 (%)

Source: own calculations using unpublished EU-SILC data from 2007-2019.

When observing the Gini coefficient semi-elasticity for income from interests, dividends and profits from capital investments in unincorporated businesses, its biggest contribution towards income inequalities in all the analysed years was recorded in Denmark. The highest value of the coefficient was at 0.124 in 2008, while in recent years its level dropped to 0.035 in 2019. This particular source of income was the probable cause of the increased income inequality in Denmark in 2008 and in the period 2012–2016, as indicated not only by the semi-elasticity but also its growing share in the total income in that period (Table 1).

The level of semi-elasticity for this particular income source indicated that it showed negative values in 2008 and 2009 in Germany. With regard to the other countries, the impact of this income source was irrelevant, and the semi-elasticity coefficient was from 0 to 0.013, which means that the increase of average gross income by 100 EUR drove (*ceteris paribus*) the rise of the Gini coefficient by 1.3% (Figure 5).

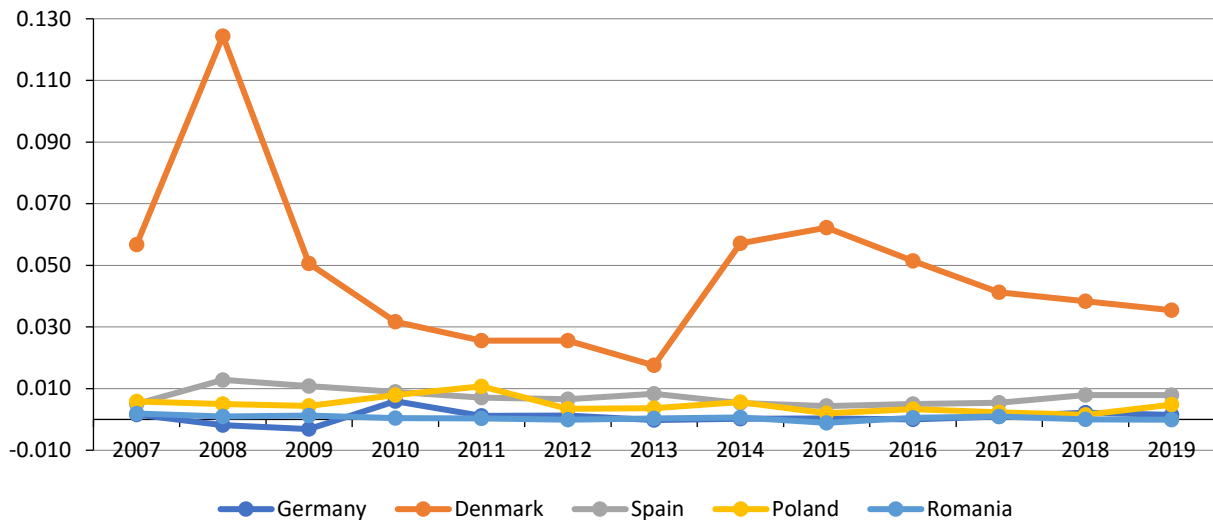


Fig. 5. Impact of earnings from interests, dividends and profits from capital investments in unincorporated businesses on the existing income inequalities (semi-elasticity of Gini) in selected EU countries in 2007-2019 (in %)

Source: own calculations using unpublished EU-SILC data from 2007-2019.

In the course of analysing semi-elasticity for the income from self-employment, it was found that it had the most significant impact on income inequalities in Germany and Denmark. In the period 2007-2009, this coefficient was from 0.041 to 0.082 in Germany, and from 0.042 to 0.075 in Denmark. A slightly lower level of semi-elasticity was recorded in Poland – from 0.023 to 0.047. In Spain, the semi-elasticity for the income from paid employment was from 0.03 to 0.020. In Germany, Poland and Spain, this index had been rising since 2016, whereas in the two remaining countries it was decreasing, which can be interpreted as the diminishing influence of this income source on the creation of income inequalities. It is significant that the impact of this source of earnings on income inequalities in Romania in the studied time period was negative, running from -0.008 to -0.039, which proves that it exerted a positive influence on the level of disparities (being conducive to the equalisation of income), although its decreasing values showed a diminishing positive impact (Figure 6).

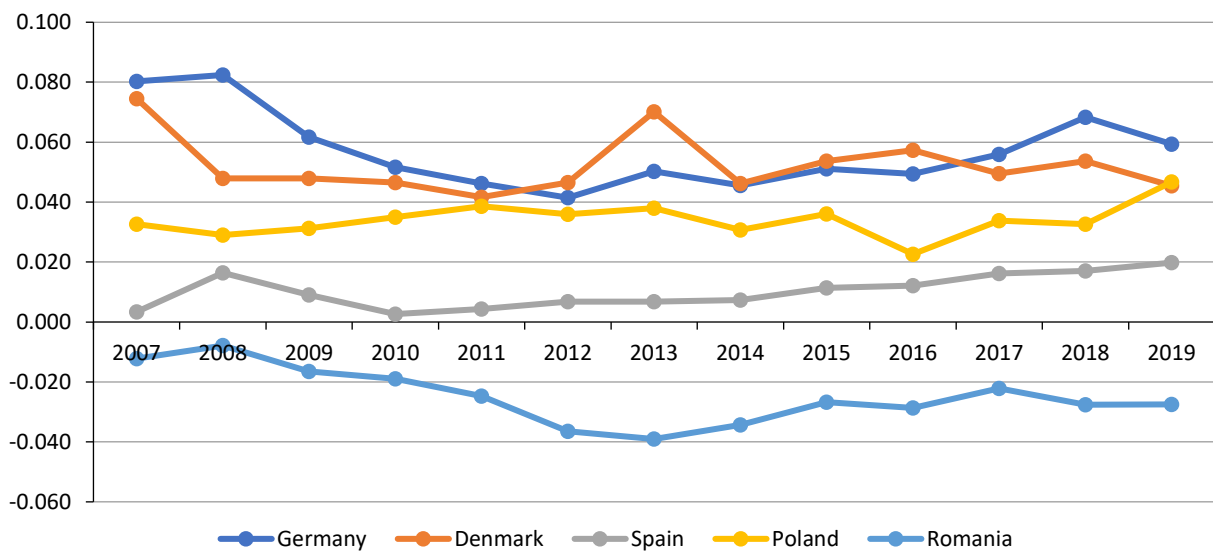


Fig. 6. Impact of self-employment income on the existing income inequalities (semi-elasticity of Gini) in selected EU countries in 2007-2019 (%)

Source: own calculations using unpublished EU-SILC data from 2007-2019.

The Gini coefficient semi-elasticity for income from old-age benefits took negative values in each analysed country. In 2019, compared to 2007, the biggest change recorded was related to the influence of old-age benefits on the level of income inequalities in Denmark (from -0.158 to -0.267) and Spain (from -0.180 to -0.102). For Denmark, this meant an increase in the significance of income from old-age benefits, whereas in Spain, the importance of pensions in terms of levelling out the inequalities diminished. In 2016–2019, the significance of pensions in terms of balancing income inequalities increased in all the countries, as shown by the growing negative values of the Gini coefficient semi-elasticity (Figure 7). Moreover, it was observed that the income from old-age benefits was probably the reason behind the rise of income inequalities in Romania in 2015, as indicated by their increased share (36%) and the increment of the semi-elasticity to -0.10 (Table 1).

The positive influence of old-age benefits could be seen through the comparison of Gini coefficient for the equalised disposable income before social transfers, where pensions were excluded from social transfers, i.e. taken into consideration, while in the other case pensions were included in social transfers (Figures 8 and 9). The Gini coefficient, from which the old-age benefits were not excluded, reached higher values in the latter case, which confirmed the assumption that pensions are conducive to diminishing income inequality.

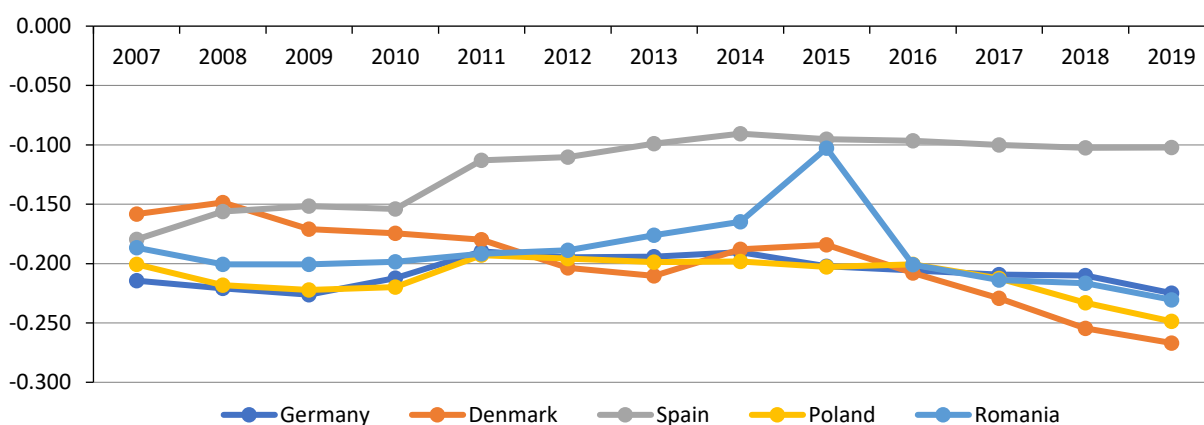


Fig. 7. Impact of pensions on the existing income inequalities (semi-elasticity of Gini) in selected EU countries in 2007-2019 (in %)

Source: calculations using unpublished EU-SILC data from 2007–2019.

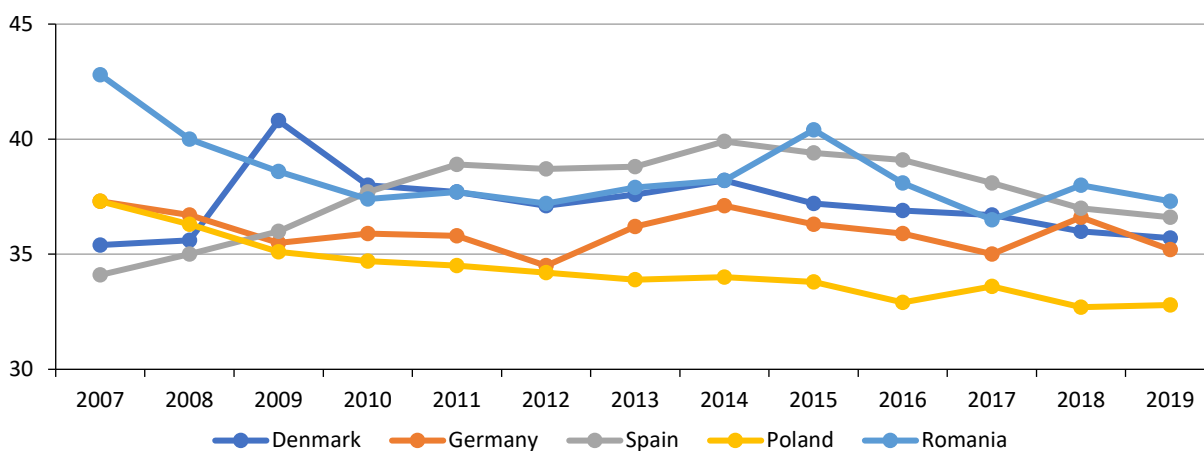


Fig. 8. The Gini coefficient of equalised disposable income before social transfers (with pensions excluded from social transfers) in the selected EU countries in 2007-2019 (in %)

Source: own calculations using EUROSTAT data published in 2007–2019.

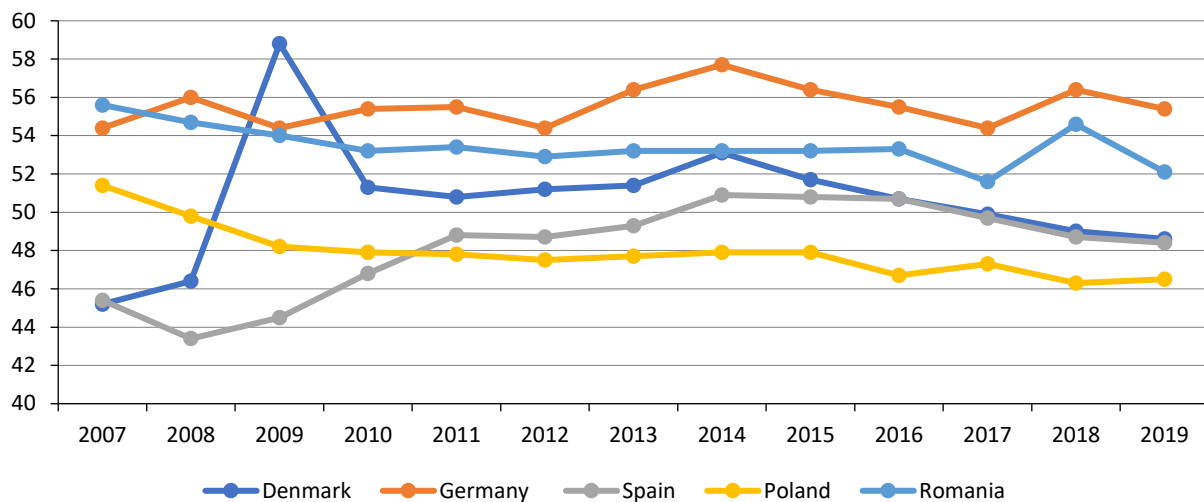


Fig. 9. The Gini coefficient of equalised disposable income before social transfers (with pensions included in social transfers) in the selected EU countries in 2007-2019 (in %)

Source: own calculations using the EUROSTAT data published in 2007-2019.

In the literature on income inequality, one can note important determinants affecting its increase or decrease. Militaru and Stanila (2015) indicated that the main reasons for income inequalities between households were the level of education and the status in the labour market. Molnar (2010) suggested that the reason for the relatively high inequality in Romania was the transition from a centrally controlled economy to a market economy. He also pointed to the persistence of a large percentage of low and very low-income households, lack of qualifications and education, and lack of employment opportunities (growing numbers of unemployed) as determinants of rising inequality. Gradín (2016), in order to explain the high level of inequality in Spain, showed that this was mainly related to a lower employment rate, a higher self-employment rate, a lower education level as well as a recent increase in the immigration of professionally active households. Grabka and Kuhn (2012) and Biewen and Juhasz (2012) noted the unequal distribution of market income (which is conducive to high unemployment rate), but also the demographic factors related to the ageing of population and the increasing number of single-person households and childless families as the main reason for the stratification of income in Germany.

The results obtained by the above researchers can explain the income inequality found in the examined countries. The analysis of Romanian population confirmed that the percentage of people with a higher education was low: 11% to 18% in 2019. The high percentage of educated people – from 26% to over 39% in 2019 – may have contributed to Denmark's low level of income inequality. This may validate the findings of Bosch (2009), who concluded that education and training play a crucial role not only in active labour market policies, but also in the general education policy that provides generous subsidies to finance further education courses for adults, which is described as 'empowerment strategy' aimed at increasing the individual bargaining power of employees (Bosch, 2009, p. 348). In Germany, the percentage of people with higher education hovered between 22% to 28%, while in Spain it was 26% to 39%, and in Poland – 16% to 28%. It can be noted that the number of educated citizens in these countries was increasing over time, which could have a positive effect on the reduction of income inequalities in the future.

Romania's unemployment rate ranged from 5% to 9% during the period under review, taking its lowest values in 2019. In the period 2010-2019, the unemployment rate in Spain was higher than in the other four countries, from just above 14% to over 26%; despite the decreasing pattern, it remained at a high level (based on the EUROSTAT database accessed on 23.08.2022). On the other hand, the unemployment rate in Germany ranged from 3% to almost 7%, decreasing as time went on. Yet, the analysis of German population showed that around 28% were 65 years of age and older (based on

EUROSTAT database accessed on 23.08.2022). The unemployment rate in Poland ranged between 3% and nearly 11%, gradually declining over time. In the analysis of the percentage of people above 65 years of age, it was noted that the share of this age group in Poland was the lowest in comparison to the other examined countries, i.e. from 13% to almost 18% in 2019 (based on the EUROSTAT database accessed on 23.08.2022).

The dominant role in determining household income inequality, as mentioned above, was least attributed to income from labour. When discussing the influence of income from paid employment on the stratification of income, it is worth taking the socio-economic system (income policy) of the government into consideration. Therefore, a crucial role in income policy, along social benefits, was played by the minimum wage (or its equivalents) that, as confirmed by the correlation estimated in the research by Nagaja (2013), can strongly drive attempts to diminish income inequalities in society. The main role of the minimum wage is to even out the imperfections of the labour market related to the information asymmetry, also aimed at ensuring the fair distribution of income and reducing poverty (Krajewska, & Roszkowska, 2016). The advocates of increasing the minimum wage tend to underline its part in fighting poverty and reducing income inequalities (Szarfenberg, 2014). It must be noted, however, that there is no statutory minimum wage in Denmark, and instead the Danish social partner organizations establish an effective minimum remuneration, with higher rates available under collective labour agreements (McLaughlin, 2009). Denmark has adopted a strategy of flexicurity, which consists in balancing liberal employment security with generous social policies. The main determinant of maintaining flexicurity is the dialogue with the social partners, without whom it is impossible to decide on systemic matters concerning the employment (Golinowska, 2018). As stressed by McLaughlin (2009), Denmark utilises a highly institutionalised system that ensures fair wages and good working conditions through a mosaic of collective agreements, which apply to around 75-85% of labour force. Thus, in this particular country, as opposed to the others, matters such as the minimum wage, overtime pay and working hours are not regulated legally, but rather through collective labour agreements. Furthermore, the share of workers classified as low-paid is rather small in Denmark, where the trade unions adopted the so-called unanimous wage policy, also present in other Scandinavian countries. The introduction of this policy by the trade unions resulted in limiting wage discrepancies between different groups of workers, with their gender, job qualifications and region taken into consideration. As pointed out by Bosch (2009), this was possible due to the “strength of the umbrella union organization” (Bosch, 2009, p. 344). In his study, Bosch (2009) also demonstrated that the persistent high wage disproportions between different industries (e.g. in Germany) resulted from the ineffectiveness of trade unions (collective bargaining), and therefore it was required to supplement them with minimum wage laws in order to ensure that it is not too low. It is worth mentioning that in Germany before 2015, some lines of business collectively negotiated minimum wage rates which were then applied to entire sectors of economy, e.g. construction and postal services (Bosch, 2009). In conclusion, the highest minimum wage in the period 2007-2019 was recorded in Germany, the average in Spain and Poland, while the lowest in Romania (Figure 10). Over time, the minimum wage rate in the surveyed countries increased, which could lead to the reduction of income inequalities (Szarfenberg, 2014).

In the context of research undertaken by Alvarez-Garcia et al. (2004), Breen and Andersen (2012), Nagaj (2013), Precupețu (2013) and Militaru and Stanila (2015), it was confirmed that lowest income inequalities were recorded in Denmark, while the highest ones in Romania. In the survey carried out by Nagaj (2013), the author noted some discrepancies, and proved that income inequalities in Germany (as in Scandinavian countries) showed the lowest diversity, and that in Poland, the scale of this phenomenon was average. The results of the conducted analysis indicate, however, that the level of income inequality, including total gross income of households, was comparable in Poland and Germany. The reason for these discrepancies was the different approach to the analysis of inequality. In the former, it shows the distribution of family income, while in the latter the perspective of the total gross household income was adopted.

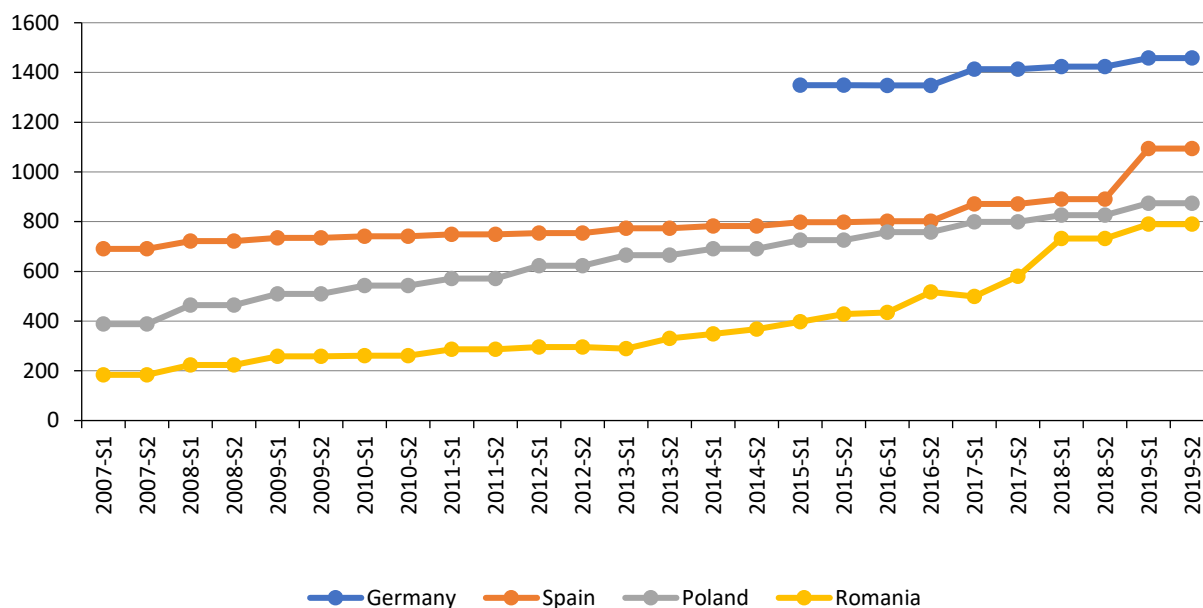


Fig. 10. The monthly minimum wage in selected EU countries in 2007-2019 (bi-annual data, in PPP, in EUR)

Source: own calculations using the EUROSTAT data published in 2007-2019.

https://ec.europa.eu/eurostat/databrowser/view/EARN_MW_CUR_custom_7039203/default/table?lang=en

The analysis proved that a large share of disparity between households in the respective EU countries can be explained with the unbalanced distribution of income from paid employment, self-employment and old-age benefits. Additionally, in the course of examining which components of total household gross income have the biggest impact on the existing income inequalities, it was discovered that income from paid employment, income interests, dividends and profits from capital investments in unincorporated businesses, income from self-employment and income from old-age benefits were the strongest determinants. However, the influence of these sources was not always equalising, and among the above-mentioned, the most equalising were old-age benefits. Biewen and Juhasz (2012), Schmid and Levsen (2013), Gradín (2016), Cerniauskas and Ciginas (2020), Ilie (2020) and Muszyńska et al. (2021) arrived at similar conclusions, which was the increased importance of capital income.

5. Conclusions

The Gini coefficient used for the purpose of analysing income inequalities in the period 2007-2019 was based on unpublished data from the European Survey of Income and Living Conditions carried out by the European Commission. Using the decomposition procedure for the assessment of inequalities as per income sources, the study aimed at the identification of factors that were most influential regarding the level and dynamics of income inequalities in Germany, Denmark, Spain, Poland and Romania. This paper complements the existing literature on searching the determinants of income inequalities in the European context, and due to the use of individual and unpublished data on household income, it is quite unique as it extends the analysis to include the determinants of inequality variables.

The highest inequalities in household gross income were in Romania, whereas the lowest ones in Denmark. These two countries also demonstrated the biggest changes in the recorded values. As shown by the presented results, income inequalities in Romania and Poland are slowly but continuously rising, whereas in Denmark, Spain and Germany, these values are in decline.

In the entire analysed time period, the gross income in the European households was based on three main elements, i.e. paid employment (PY010G), self-employment (PY050G) and old-age benefits (PY100G), which constituted 86-96% of household financial resources in the last year. The income from paid employment proved the strongest determinant for inequality in gross income when compared to the accumulated share of the two other sources of earnings. The diversity of inequality was predominantly influenced by the income from paid employment (PY010G), interests, dividends and profit from capital investments in unincorporated businesses (HY090G), self-employment (PY050G) as well as old-age benefits (PY100G). The impact of these income sources did not always show the equalising effect on the inequalities. Among the above-mentioned, the old-age benefits turned out to be the strongest equaliser in terms of income disparities. In Romania, it was also noted that although the share of income self-employment was decreasing over time, this particular income source remained conducive to levelling out incomes. The conducted research revealed factors impacting income inequalities to a limited extent. In order to better depict the existing social inequalities, one should employ other measures of disparities in the level of economic well-being and broaden the analysis to include the level of consumption, which would enable the comparison of consumption and income inequalities. It would also be interesting to complement the above analysis by the decomposition of income inequalities as per social-economic factors and the determination of the impact of fiscal policy or integrity policy on these inequalities. The examination of various aspects of this phenomenon, as mentioned by Anghel et al. (2018), would facilitate a better understanding of the reasons and consequences of income inequalities (Anghel et al., 2018).

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