DANUBE • 15(4) • pp. 356–369
DOI: 10.2478/danb-2024-0020

sciendo Danube

# The Effects of Social Protection Expenditures in Relation to Selected Socio-Economic Indicators in EU Countries

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**Abstract**

The extent of social and economic issues has an impact on current society, and ways of solving them reflect not only on social policy but also on results of economic policies. The paper aims to evaluate the effects of social protection expenditures/benefits in relation to selected socio-economic indicators in the EU countries. By use of panel data analysis in the period 2010–2021, the effect of social protection expenditures/benefits (total and by individual function) on GDP per capita, income inequality and on the risk of poverty and social exclusion is examined. The results show a positive effect of social protection expenditures/benefits (total and by selected function-housing, family/children, social exclusion, survivors) on GDP per capita and a negative impact of social protection benefits (total and by functions – social exclusion, family/children, sickness/health care) in the case of the risk of poverty and social exclusion. Conversely, social protection benefits by selected functions have a combined effect on income inequality. The acquired findings demonstrate the significance that is attached to specific areas of social protection policies in the EU countries.

**Keywords**

Social Protection Expenditures/Benefits, GDP per Capita, Income Inequality, Poverty and Social Exclusion, EU Countries, Panel Data Analysis

## I. Introduction

The idea behind welfare state is a range of redistribution processes, defined by the volume of public social protection of the population. (Pestieau, 2006; Halásková, Slovák, 2016; Halásková, Bednář, 2020; Santos, Simões, 2021). Social protection system "can be defined by its degree of redistributiveness and by its generosity. The first one is characterized by the

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level of flat benefit awarded to everyone, or by the parameters of means-testing. The second one can be proxied by the share of spending to GDP. This distinction is quite important when comparing countries" (Pastieau 2006, p. 41; Halásková, Slovák, 2016, p. 202). Social protection encompasses "all interventions from public or private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs". The risks or needs addressed in relation to social protection include: "Sickness/Health care, Disability, Old age, Survivors, Family/children, Unemployment, Housing and Social exclusion not elsewhere classified" (European Commission, 2019, p. 8; Eurostat, 2022).

A number of researches examine social protection, redistribution, and assessment of social protection expenditures with different perspectives (Antošová, Stávková, 2019; Halásková, Bednář, 2020; Androniceanu et al. 2022). "The differing designs of social programmes influence the distribution of household incomes in different ways. In assessing these effects, it is important to distinguish between targeting, progressivity, and redistribution. *Targeting* is a means for determining either the eligibility for benefits or the level of entitlements for those eligible. In a sense, all benefit systems – apart from a universal 'basic income' scheme – are targeted to specific categories of people, such as the unemployed, people with disabilities or those over retirement age. *Progressivity* refers to the profile of benefits when compared to market or disposable incomes – how large a share of benefits is received by different income groups – e.g., do the poor receive more than the rich from the transfer system? *Redistribution* refers to the outcomes of different tax and benefit systems – how much does the benefit system actually change the distribution of household income" (Förster and Whiteford, 2009, p. 35; Halásková, Slovák, 2016, p. 203).

The majority of studies examine total social protection expenditures and their relations/effects on selected economic and social issues (Androniceanu et al. 2022; Szymanska, 2023; Kaplan et al., 2023; Popova, 2023) or they focus on the effects of social transfers with an emphasis on specific socio-economic risks, such as income inequality (Sanchez, Perez-Corral, 2018; D'Agostino, et al. 2020; Verberi, Yasar, 2021) or reduction poverty (Miežienė, Krutulienė, 2019; Caminada at al., 2021; De Andres-Sanchez et al., 2021; Notten, Guio, 2024). Smaller attention is paid to relations or effects of social protection expenditures with an emphasis on individual areas (functions) of social protection.

Motivation of authors is to evaluate the effects of (total) social protection expenditures as well as social protection expenditures/benefits by functions in the context of social and economic issues by use of an analytical approach. The aim of this paper is to analyse social protection expenditures and evaluate the effects of social protection expenditures (benefits total and by function) in relation to selected socio-economic indicators in the EU countries. In connection with the aim, the subject of research are selected areas of social protection and social and economic development in a narrow perspective. Quantitative research implies the selection of suitable instruments associated with the topic in question. By use of panel data analysis, in the period 2010 to 2021, the effects of social protection expenditures/benefits (total/all functions and by individual function) on i) GDP per capita, ii) on income inequality (measures by use of the Gini coefficient of equivalised disposable income) and iii) on the risk of poverty and social exclusion are in examined more detail. Two research questions (RQs) are verified in EU countries in the period 2010–2021:

RQ1: Do social protection benefits (total and by selected functions) have a positive effect on the economic level and living standards of EU countries?

RQ2: Do social protection benefits (total and by selected functions) have a negative effect on income inequality and the risk of poverty or social exclusion?

## II. Literature Review

Scholars are paying closer attention to the actual developments in social policy and to the conditions and effects of social investment policies (Kazepov, Ranci, 2017). In relation to an adequate use of financial resources of social protection, social expenditure programmes are evaluated with a particular emphasis on redistribution effects of public and private social programmes, social transfer programmes and taxes (Caminada et al., 2021; Andronicеanu et al., 2022).

Poverty and income inequality "attract attention among politicians, as well as scientists, who are trying to find a solution to these socio-economic issues. State intervention is commonly expected in this field, however, there is no agreement on the most efficient methods and instruments, as well as the scale of public expenditure for the purpose of limiting poverty and inequality" (Cyrek, 2019, p. 405). Also, an increasing number of countries attach significance to expenditures on social security for the sake of sustainability of economic growth (Kaplan et al., 2023). In the context of these social and economic topics, many researches predominantly analyse total social protection expenditures and indicators of socio-economic development, namely in connection with mitigation of social risks (Balvociute, 2020; Kraftová et al., 2020; Krasota, Melnyk, 2020; Verberi, Yasar, 2021; Popova, 2023; Notten, Guio, 2024; Tejero et al., 2024) or in relation to economic risks, economic activities and growth (Kazepov, Ranci, 2017; Cammeraat, 2020; Kaplan et al, 2023; Szymanska, 2023).

Most of the attention of older and more recent research has been on the relationship or impact of social protection expenditures and poverty reduction. Available studies suggest a negative relationship between poverty and social expenditures in EU countries (Celikay, 2017; Miežienė, Krutulienė 2019; De Andres-Sanchez et al. 2021; Tejero et al. 2024). According to Miežienė, Krutulienė (2019, p. 157) social protection transfers reduce the risk of poverty in all countries, but to different degrees. Specifically, social protection expenditures by function (family/children and social exclusion) have the largest effect in reducing poverty. De Andres-Sanchez et al. (2021) examined the effectiveness of social expenditures in reducing poverty in a sample of 28 EU countries. Caminada et al. (2021, p. 1055) analysed the effectiveness of social transfers and income taxes in alleviating poverty. Only three social programmes account for the bulk of total poverty reduction. These were the old-age/disability/survivor scheme (81%), social programmes for family and children (14%) and the unemployment scheme (8%). Noten, Guio (2024, p. 301) examined the impact of the income transfer approach by analysing the effects of social transfers in poverty reduction for 32 European countries. The authors find that the effects vary according to characteristics such as the level of deprivation of the country and households or the type of social transfers received. Tejero et al. (2024) analyzed social benefits and risk of poverty in the working-age population in Spain. The authors concluded that the combination of

labour income and social benefits is a way to avoid the risk of poverty. In contrast, family allowances and transfers from the minimum income system have less impact on poverty reduction.

Cyrek (2019, p. 405) evaluated the efficiency of government social expenditures in reducing poverty and income inequality in EU countries. Her findings "suggest some substitution between the extent, and effectiveness, of social expenditures and differences between Southern European countries that focus primarily on reducing inequality and Scandinavian countries that direct support primarily towards poverty alleviation". Popova (2023, p. 697) examined whether "greater equity in government social protection expenditures is associated with positive changes in income poverty and inequality". Her results "confirm that equity in social expenditures (measured by the share of social protection expenditures) has a strong impact on poverty and income inequality". Research studies (D'Agostino, et al., 2020; Verberi, Yasar, 2021) have assessed the effects of social expenditures/social transfers on income inequality in OECD countries. The findings of both studies confirm that in the countries evaluated, increases in social expenditures reduce income inequality.

In a broader context, Szymanska (2023, p. 2273) investigated the relationship between social protection expenditures and indicators that capture economic activity (represented by the growth rate of real GDP per capita and the unemployment rate) for 26 EU countries. Kaplan et al. (2023) examined the effects of social expenditures on economic growth in selected countries and found that social expenditures have a positive effect on economic growth. Kazepov, Ranci (2017, p. 90) evaluated social investment policies and their impact on inequality and economic growth in a broader context. The authors argue that social investment policies can have ambiguous effects on economic growth and on equality of opportunity. Nordheim, Martinussen (2020) examined the impact of social expenditures on individual satisfaction in OECD countries. Their results showed that social expenditures should be analysed in terms of basic sectors (categories).

## III. Data and Methods

For the analysis, we use data from available databases (Eurostat) in the years 2010 to 2021. The selected period corresponds to the availability of data for all the variables analyzed. The data used from the Eurostat database include Social protection expenditures/benefits – ESSPROS expenditures – Tables by functions, aggregated benefits and grouped schemes (Eurostat, 2024e). The European System of integrated Social PROtection Statistics (ESSPROS) is an instrument of statistical observation which enables international comparison of the administrative national data on social protection in the EU Member States. According to the classification by function of social protection: eight functions (Sickness/Health care; Disability; Old age; Survivors; Family/children; Unemployment; Housing; Social exclusion not elsewhere classified) and the total of social benefits; (European Commission, 2019; Eurostat, 2024e).

Socio-economic indicators are applied for the analysis. Data from Eurostat database in years 2010–2021include main GDP aggregates per capita (Eurostat, 2024b), indicators of income inequality – the Gini coefficient of equivalised disposable income (Eurostat, 2024a) and income and living conditions – Persons at risk of poverty or social exclusion

(Eurostat, 2024c; 2024d). Nine categories of social protection expenditures/benefits (total/all functions and by individual function) represent independent variables and socio-economic indicators – GDP per capita, Gini coefficient of equivalized disposable income and Persons at risk of poverty or social exclusion represent dependent variables. All variables utilised are stated in Table 1.

**Table 1: Variables for analysis**

| Variables | Abbreviation | Unit | Source |
|---|---|---|---|
| *Independent variables* | | | |
| Social protection benefits – total | SPB all | Percentage of GDP | Eurostat |
| Social protection benefits – sickness/health care | SPB sick/health | Percentage of GDP | Eurostat |
| Social protection benefits – disability | SPB disa | Percentage of GDP | Eurostat |
| Social protection benefits – survivors | SPB surviv | Percentage of GDP | Eurostat |
| Social protection benefits – old age | SPB old | Percentage of GDP | Eurostat |
| Social protection benefits – family/children | SPB fam | Percentage of GDP | Eurostat |
| Social protection benefits – unemployment | SPB unem | Percentage of GDP | Eurostat |
| Social protection benefits – housing | SPB house | Percentage of GDP | Eurostat |
| Social protection benefits – social exclusion | SPB exclu | Percentage of GDP | Eurostat |
| *Dependent variables* | | | |
| GDP per capita | GDP p.c. | current prices, Euro per capita | Eurostat |
| Gini coefficient of equivalised disposable income | GINI | scale from 0 to100 | Eurostat |
| Persons at risk of poverty or social exclusion | AROPE | Percentage | Eurostat |

*Source: Authors*

Panel data is "a dataset in which the behaviour of each individual or entity (in this case a country) is observed at multiple points in time. Using panel data accounts for variables that change over time, but not across entities" (Baltagi, 2021; Princeton University Library, 2023). The data in this work has a characteristic of a balanced panel where the cross-sections are countries with $n = 27$ individuals and $T = 12$ time periods. We have models with either $k = 1$ or $k = 8$ independent variables.

In this work we focus on time effects in the models.
Let

* $Y_{it}$ are the dependent variables,
* $X_{jit}$ are the independent variables,
* $\alpha$ is the common intercept,
* $\alpha_t$ are the time efects,
* $\beta_j$ are the parametric coefficents,
* $u_{it}$ are the error terms,

where $i = 1, 2, \ldots, n$; and $t = 1, 2, \ldots, T$ and $j = 1, 2, \ldots, k$. According to (Baltagi 2021) it is used the Lagrange multiplier test to test the consistence of the pooled OLS model

$$Y_{it} = \alpha + \beta_1 X_{1it} + \cdots + \beta_k X_{kit} + u_{it}, \tag{1}$$

againist the panel regression time fixed effect model

$$Y_{it} = \alpha_t + \beta_1 X_{1it} + \cdots + \beta_k X_{kit} + u_{it}, \tag{2}$$

which has different intercepts for each time period.

Except for one, our models do not have low $p$-values of the Lagrange multiplier test, thus the OLS model was better, then the time effect panel regression model. All computation of the panel regression were carried on R-package plm (Croissant, Millo 2008).
The selected set comprises 27 EU countries. Three models have been selected for our analysis in the period 2010–2021, which examine the effect of social protection benefits (by all functions and by individual function) i) on GDP per capita (Model M.1.1, M.1.2); ii) on income inequality measured by the Gini coefficient (Model M.2.1, M.2.2); iii) on the risk of poverty or social exclusion (Model M.3.1, M.3.2). Types of regression models are shown in Table 2.

**Table 2: Type of regression model selection based on Lagrange Multiplier Test**

| Model | p-value of LMT | Regression |
|---|---|---|
| M.1.1 | 0.9275 | pooling |
| M.1.2 | 0.2626 | pooling |
| M.2.1 | 0.9794 | pooling |
| M.2.2 | 0.9744 | pooling |
| M.3.1 | 0.001286 | time effect |
| M.3.2 | 0.06029 | pooling |

*Source: Authors*

## IV. Results

This section presents the results of a regression analysis for the 27 EU countries. Examined are the effects of social protection expenditures/benefits (total/all functions and by individual function) on selected socio-economic indicators in the years 2010–2021. We focus on GDP per capita, (ii) the Gini coefficient of equivalized disposable income and (iii) the risk of poverty and social exclusion.

### The Effects of social protection benefits on economic level of EU Countries

For the period 2010–2021, we examine the effect of social protection benefits (social benefit total and by function) on the economic level for the EU countries, which is represented by GDP per capita. The results for EU countries (Table 3, Model M.1.1) show that

total social protection benefits (SPB all) have a statistically significant positive effect on GDP per capita at the 0.1% level. This means that a 1% increase in total social protection benefits has an effect on increase GDP per capita of 1277 Euro.

**Table 3: The Effect of social protection benefits (total) on GDP per capita in years 2010–2021 (Model M.1.1 – GDP p.c.)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| (Intercept) | −3406 | 3533 | −0.9641 | 0.3357 | |
| SPBall | 1277 | 150.1 | 8.506 | 6.889e-16 | *** |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

**Table 4: The Effect of social protection benefits by function on GDP per capita in years 2010–2021 (Model M.1.2 – GDP p.c.)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| (Intercept) | 4335 | 3458 | 1.254 | 0.2109 | |
| SPBdisa | 3280 | 1188 | 2.761 | 0.006096 | ** |
| SPBfam | 8218 | 1300 | 6.323 | 8.781e-10 | *** |
| SPBhouse | 9459 | 3728 | 2.537 | 0.01166 | * |
| SPBold | −2529 | 383.3 | −6.598 | 1.768e-10 | *** |
| SPBsick.health | 694.4 | 553.8 | 1.254 | 0.2108 | |
| SPBexclu | 10927 | 2224 | 4.912 | 1.45e-06 | *** |
| SPBsurviv | 7183 | 1322 | 5.432 | 1.114e-07 | *** |
| SPBunem | 1531 | 1050 | 1.458 | 0.1457 | |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

Regarding the social protection benefits by function assessed (Table 4, model M.1.2), social protection benefits by five functions (family/children, survivors and social exclusion) have a statistically significant positive effect at the 0.1% level; social protection benefits on disability at the 1% level, and social protection benefits on housing at the 5% level. That means that an increase in social protection benefits (SPBfam, SPBexclu, SPBsurviv, SPBdisa, SPBhouse) by 1% GDP has an effect on the increase of GDP per capita in EU countries. (Specifically, SPBfam leads to an increase in GDP per capita by 8,218 EUR; SPBexcl by 10,927 EUR; SPBsurviv by 7,183 EUR; SPBhouse and SPBdisa by 9,459 and 3,280 EUR, respectively). Conversely, social protection benefits on the aged have a statistically significant, yet negative effect on GDP per capita at the 0.1% level. That means that an increase in social protection on the aged by 1% GDP leads to a decrease

in GDP per capita by 2,529 EUR. Based on the results, we can also argue that in the case of two social protection benefits by function (sickness/health care and unemployment) assessed, a positive, yet statistically insignificant effect on GDP per capita was observed.

### The Effects of social protection benefits on income inequality of EU Countries

In this part of the results we examine the effects of social protection benefits (total/all functions and by individual functions) on income inequality in the period 2010–2021 (measured by the Gini coefficient of equivalized disposable income-GINI). Tables 5 and 6 provide more information about the effects of social protection benefits on income inequality.

**Table 5: The Effect of social protection benefits (total) on income inequality in years 2010–2021 (Model M.2.1 – GINI)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| (Intercept) | 35.1 | 0.8407 | 41.75 | 5.74e-132 | *** |
| SbPall | −0.232 | 0.03573 | −6.494 | 3.166e-10 | *** |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

In 2010 to 2021 in EU countries (Table 5, model 2.1), social protection benefits (total) have a statistically significant negative effect of 0.1% on income inequality (represented by the GINI coefficient). This means that in EU countries, an increase in total social protection benefits by 1% of GDP affects the reduction in income inequality by 0.232 standard deviation.

**Table 6: The Effect of social protection benefits by function on income inequality in years 2010–2021 (Model M.2.2 – GINI)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| (Intercept) | 36.66 | 0.9002 | 40.73 | 1.484e-127 | *** |
| SPBdisa | 0.6572 | 0.3092 | 2.126 | 0.03431 | * |
| SPBfam | −1.49 | 0.3383 | −4.404 | 1.459e-05 | *** |
| SPBhouse | 0.5973 | 0.9705 | 0.6154 | 0.5387 | |
| SPBold | 0.1411 | 0.09977 | 1.414 | 0.1584 | |
| SPBsick.health | −1.061 | 0.1441 | −7.362 | 1.591e-12 | *** |
| SPBexclu | −2.364 | 0.579 | −4.083 | 5.645e-05 | *** |
| SPBsurviv | 0.4182 | 0.3441 | 1.215 | 0.2252 | |
| SPBunem | 0.682 | 0.2733 | 2.496 | 0.01309 | * |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

In the EU countries from the social protection benefits by function assessed (Table 6, model M.2.2), we can observe that five selected areas of social protection benefits have a statistically significant effect on income inequality (GINI coefficient). Social protection benefits by function (family/children, sickness/health care and social exclusion) have a statistically significant negative effect on the GINI coefficient at the 0.1% level. That means that an increase in social protection benefits (SPBfam, SPBsick/health, SPB exclu) by 1% GDP has an effect on the decrease of the GINI coefficient (SPBfam by 1.4900, SPBsick/health by 1.061 of standard deviation, and SPBexclu by 2.364). By contrast, social protection benefits by function (disability and unemployment) affect income inequality in a statistically significant and positively at the level of 5% in EU countries. That means that an increase in social protection benefits (SBPsick/health, SPBunem) by 1% GDP affect decrease of the GINI coefficient (by 1.061 standard deviation in the case of SBPsick/health and by 0.682 in the case of SPBunem). Based on the results, we can also state that a positive, yet not statistically significant effect has demonstrated in three assessed social protection benefits (SPBhouse, SBPold a SPBsurviv).

## The Effects of social protection benefits on the risk of poverty or social exclusion of EU Countries

This section examines the impact of social protection benefits (total/all functions and by individual functions) on the risk of poverty or social exclusion (AROPE) in the period 2010–2021.

The results of the EU countries (Table 7a, model M.3.1) show that social protection benefits – total have a statistically significant negative effect at the 0.1% level on the risk of poverty or social exclusion. That means that an increase in social protection benefits (total) by 1% GDP leads to a decrease in the share of people at the risk of poverty or social exclusion by 0.5635 percentage.

**Table 7a: The Effect of social protection benefits – total on the risk of poverty or social exclusion in years 2010–2021 (Model M.3.1 – AROPE)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| SbPall | −0.5635 | 0.06497 | −8.673 | 2.374e-16 | *** |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*

*Source: Authors*

Table 7b shows the effect of social protection benefits (total) on the risk of poverty or social exclusion (AROPE) in years 2010–2021. The results show that the largest impact of social protection benefits on AROPE manifested in years 2012 and 2013. By contrast, the smallest effect of social protection benefits on the risk of poverty or social exclusion can be seen in 2019.

**Table 7b: Time Effect of social protection benefits (total) in years 2010–2021 (Model M.3.1 – AROPE)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| 2010 | 37.78 | 1.964 | 19.24 | 6.84e-55 | *** |
| 2011 | 38.26 | 1.944 | 19.68 | 1.446e-56 | *** |
| 2012 | 38.66 | 1.952 | 19.8 | 4.837e-57 | *** |
| 2013 | 38.63 | 1.961 | 19.7 | 1.18e-56 | *** |
| 2014 | 37.89 | 1.95 | 19.44 | 1.238e-55 | *** |
| 2015 | 36.67 | 1.93 | 19 | 5.574e-54 | *** |
| 2016 | 36.06 | 1.925 | 18.74 | 5.865e-53 | *** |
| 2017 | 34.94 | 1.902 | 18.37 | 1.547e-51 | *** |
| 2018 | 33.81 | 1.895 | 17.84 | 1.592e-49 | *** |
| 2019 | 33.38 | 1.901 | 17.56 | 1.894e-48 | *** |
| 2020 | 34.66 | 2.055 | 16.87 | 8.755e-46 | *** |
| 2021 | 34.04 | 1.991 | 17.1 | 1.162e-46 | *** |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

The results of the impact of social protection benefits by individual function on the risk of poverty or social exclusion in EU countries are presented in Table 8.

**Table 8: The Effect of Social protection benefits by function on the risk of poverty or social exclusion in years 2010–2021 (Model M.3.2 – AROPE)**

| | Estimate | Std. Error | t-value | p-value | |
|---|---|---|---|---|---|
| (Intercept) | 38.06 | 1.668 | 22.82 | 1.046e-68 | *** |
| SPBdisa | 0.9653 | 0.5729 | 1.685 | 0.09297 | |
| SPBfam | −2.375 | 0.6269 | −3.789 | 0.000181 | *** |
| SPBhouse | 0.8722 | 1.798 | 0.4851 | 0.628 | |
| SPBold | 0.189 | 0.1849 | 1.022 | 0.3074 | |
| SPBsick.health | −2.105 | 0.2671 | −7.883 | 5.285e-14 | *** |
| SPBexclu | −4.454 | 1.073 | −4.152 | 4.251e-05 | *** |
| SPBsurviv | 0.9482 | 0.6377 | 1.487 | 0.138 | |
| SPBunem | 0.5534 | 0.5064 | 1.093 | 0.2754 | |

*Note: * statistical significance at the .05 level, ** statistical significance at the .01 level, *** statistical significance at the .001 level*
*Source: Authors*

The assessed social protection benefits by function (Table 8, model M.3.2) show that three categories of social protection benefits by function (family/children, sickness/health care and social exclusion) have a statistically significant negative effect at the 0.1% level in the case at the risk of poverty or social exclusion (AROPE). That means that an increase in social protection benefits (SPBfam, SPBsick/health and SPBexclu) by 1% GDP in EU countries affects the reduction of people at the risk of poverty or social exclusion (SPBfam decreases AROPE by 2.375 percentage point, SPBsick/health decreases AROPE by 2.105, and SPBexclu leads to a decrease in AROPE by 4.454 percentage point. In the other social protection benefits by function (SPBdisa, SPBold, SPBhouse, SBPsurviv and SPBunem), no statistically significant effect on AROPE has been proven.

## V. Discussion and Conclusion

In our research the effect of social protection expenditures/benefits (total and by individual function) on GDP per capita, income inequality and on the risk of poverty and social exclusion in the period 2010–2021 was examined. With respect to the research, two research questions (RQs) were verified. RQ1: Do social protection benefits (total and by selected functions) have a positive effect on the economic level and living standards of EU countries? RQ2: Do social protection benefits (total and by selected functions) have a negative effect on income inequality and the risk of poverty or social exclusion?

The results of the regression analysis for the EU countries in the period 2010–2021 have proved a positive effect of social protection expenditures/benefits (total and by selected function – housing, family/children, social exclusion, survivors) on GDP per capita and confirm the answer to RQ1. At the same time, the results have confirmed a negative impact of social protection benefits (total and by selected functions – social exclusion, family/children, sickness/health care) in the case of the risk of poverty or social exclusion. Also, a negative impact of social protection benefits (total) has been proved relative to income inequality. Conversely, social protection benefits by selected functions have a combined effect on the income inequality. In particular, social protection benefits by function (family/children, sickness/health care and social exclusion) had a significant negative effect on income inequality. By contrast, social protection benefits by function (disability and unemployment) had a positive effect on income inequality. Based on these findings, the answer to RQ2 has been confirmed in the case of total social protection benefits and for selected functions of social protection benefits (family/children, illness/healthcare, social exclusion) in relation to income inequality and the risk of poverty or social exclusion.

The research conducted was not without limitations. The effects of social protection expenditures/benefits were analyzed for only one set of EU countries. The analysis in this form did not allow comparisons between countries or groups of countries. Nevertheless, the results obtained contribute to the findings of earlier research that confirms the positive relationship of social protection expenditures on economic activity and economic growth (Kaplan et al. 2023; Szymanska, 2023). In the context of our results, we can state that other researches in the case of the effects of the relationship between total social protection expenditures and the at-risk-of-poverty rate (Celikay, 2017; Cammeraat 2020;

Halásková, Bednář, 2020, Tajero et al., 2024), as well as researches (Sanchez, Perez-Corral, 2018; D'Agostino, et al., 2020; Verberi, Yasar, 2021) in the case of the effects of social expenditures (total) on income inequality confirm similar findings. Our research also confirms the differences in the case of evaluating the effects of social protection expenditures by function. Other research (Miežienė, Krutulienė, 2019; Cammeraat 2020; Caminada et al., 2021) also points to a more detailed examination of the effects of specific areas of social protection expenditures in addressing social risks.

The acquired findings demonstrate the significance that is attached to specific areas of social protection policies in the EU countries. This information can be useful for policy-makers in the creation of economic policies, social policies and social protection policies. For future research in this area, the authors foresee a more in-depth analysis of selected groups of EU countries according to their economic level or according to welfare state approaches and the volume of social protection expenditures.

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