COHESION POLICY AND POVERTY IN THE EUROPEAN UNION

Analysis of the impact of European Structural and Investment Funds on the risk of poverty or social exclusion in the 2007-2018 period

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AUTHOR'S DECLARATION FORM

I, the undersigned *Borbála Dombrovszky* hereby declare that I am the sole author of this thesis. To the best of my knowledge this thesis contains no material previously published by any other person except where proper acknowledgement has been made. This thesis contains no material which has been accepted as part of the requirements of any other academic degree or non-degree program, in English or in any other language. This is a true copy of the thesis, including final revisions.

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ABSTRACT

In 2010 the European Commission published the ambitious goal of decreasing the risk of poverty or social exclusion by 25%, "lifting" 20 million people out of poverty by 2020. The European Union allocates significant financial resources through the European Structural and Investment Funds (ESIF) into policy goals, one of them being social cohesion within its residents, regions, and Member States, while the ratio of people at risk of poverty or social exclusion generally decreased up until the Covid-19 pandemic. However, the change in poverty rates varies across Member States and regions, and still more than one fifth of the population, more than 90 million people experiences one or more aspects of poverty. The present research aims to answer the following questions. (1) Did the European Union lifted 20 million people out of poverty? (2) Did the European Structural and Investment Funds affect poverty in the EU? (3) Did the European Structural and Investment Funds have a different impact in the post-socialist Member States and regions? To answer these questions, the research uses publicly available data on ESIF expenditure and the risk of poverty or social exclusion indicator to determine the impact of EU spending between 2007-2018 with panel data regression models. Based on the quantitative findings and the available EU social policy literature, the research concludes that (1) the EU did not "lift" 20 million people out of poverty, (2) the effect of ESIF expenditure on poverty is close to zero and statistically insignificant, (3) while there is indication that ESIF spending had a slightly stronger impact, it cannot be stated conclusively based on the present research. These disappointing answers can be attributed to the fact that social considerations have always came second compared to economic objectives, the limits of the open method of coordination, and compliance issues, but the limitations of the present research may also be unable to detect the nuances of otherwise weak effects.

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1. Introduction

In 2010 the European Commission published the ambitious goal of decreasing the risk of poverty or social exclusion by 25%, “lifting” 20 million people out of poverty by 2020. The European Union allocates significant financial resources through the European Structural and Investment Funds (ESIF) into policy goals, one of them being social cohesion within its residents, regions, and Member States, while the ratio of people at risk of poverty or social exclusion generally decreased up until the Covid-19 pandemic. However, the change in poverty rates varies across Member States and regions, and still more than one fifth of the population, more than 90 million people experiences one or more aspects of poverty. The present research aims to answer the following questions. (1) Did the European Union lifted 20 million people out of poverty? (2) Did the European Structural and Investment Funds affect poverty in the EU? (3) Did the European Structural and Investment Funds have a different impact in the post-socialist Member States and regions? To answer these questions, the research uses publicly available data on ESIF expenditure and the risk of poverty or social exclusion indicator to determine the impact of EU spending between 2007-2018 with panel data regression models. Quantitative findings are to be interpreted with the help of EU social policy literature, bringing up issues such as the presence of economic considerations EU level social policy, the limits of the open method of coordination.

2. Institutional and policy framework of European Cohesion policy and Social policy

The European Structural and Investment funds are center and main instrument of European Cohesion Policy. More than third of the EU budget is dedicated to cohesion objectives, more than half of Cohesion policy spending happens through five European Structural and Investment Funds. The ESI Funds are described by the European Commission in the following way: (European Commission n.d.)

(1) European Regional Development Fund – European Regional Development Fund (ERDF) aims to decrease territorial development disparities between less developed, transition regions, and more developed regions.

(2) European Social Fund – European Social Fund (ESF) which aims to develop human capital especially for young people, jobseekers, and employees, and investment into social infrastructure and/or inclusion

(3) Cohesion Fund – Cohesion Fund (CF) resources are available for Member States where the nation GDP per capita is below the 90% of the EU mean, it should be invested into transportation development and environmental protection

(4) European Agricultural Fund for Regional Development – European Agricultural Fund for Regional Development (EAFRD) aims to support with the challenges of rural regions

(5) European Maritime and Fisheries Fund – European Maritime and Fisheries Fund (EMFF) is specifically for fishers and the maritime sector to transition to more environmentally friendly operations and support the population in coastal regions.

Social objectives may come up in the first three Funds.

The ESI Funds are agreed upon based on the 7-years EU budgeting and programming periods but should be in line with the horizontal strategies of EU, the Lisbon Strategy (Lisbon I of 2000 and Lisbon II of 2005) and the Europe 2020 Strategy adopted in 2010.

The Lisbon Strategy set a strategic goal for EU for the 2000-2010 period: *"to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion."* It named core objectives such as completing internal markets, etc. one of the three main directions being *"modernising the European social model, investing in people and combating social exclusion"*, and listed education, training, and employment, the modernization of social protections, and promotion of social inclusion as areas to develop. The Strategy named the open method of coordination as its main tool. The Lisbon Strategy was revised in 2005, putting more emphasis to employment. (European Council 2000)

The Europe 2020 strategy is more detailed than the Lisbon Strategy, and it explicitly states that *"20 million less people should be at risk of poverty* and declares the goal of *lifting 20 million people out of poverty"*, but also mentions employment, education, and training targets too in terms of social policy. (European Commission 2010, 3, 9) The text refers to the crisis and global challenges, among others it announces an *"An Agenda for new skills and jobs"* (European Commission 2010, 16) and more importantly, it starts "European Platform against Poverty" (European Commission 2010, 17). The latter mentions that in terms of poverty reduction the open method of coordination should be replaced by coordination. Among others, it aims to design programs *"providing innovative education, training, and employment opportunities for deprived communities, to fight discrimination (e.g., disabled), and to develop a new agenda for migrants'*

integration to enable them to take full advantage of their potential". (European Commission 2010, 18)

Investment areas, thematic objectives, principles are determined according to the above-mentioned principles, objectives and priorities in the 7-years programming cycles. The present research focuses on the 2007-2018 time interval, hence concentrating on ESIF expenditure from the 2007-2013 period and the 2014-2020 period. General implementation rules are stated in the Common Provisions Regulations (Regulation (EU) No 1303/2013 n.d., Council Regulation (EC) No 1083/2006 n.d.).

For the 2007- 2013 period the Common Provisions Regulation states, that EUR 308 041 000 000 (at 2004 prices) are available (Art. 18). It declares the main principles of the ESI Funds (Art. 9-17.); complementarity, consistency, coordination and compliance, programming, partnership, territorial level of implementation, proportional intervention, shared management, additionality, equality between men and women and non-discrimination, and sustainable development. It requires that each ESI Fund should have guidelines that "give effect to the priorities of the Community" and promote "harmonious, balanced, and sustainable development" and are in line with the economic and employment policies of the EU. (Art. 25.) The ERDF is directed towards convergence and regional competitiveness, the ESF is directed towards employment. In both cases the priorities are listed in the regulations. (REGULATION (EC) No 1080/2006 n.d., REGULATION (EC) No 1081/2006 n.d.) The CF is aimed towards transport infrastructure and environmental protection, while excluding expenditure such as debt payments, housing, etc. from eligible expenses. (1164/94 n.d.)

For the 2014-2020 period 330,105,627,309 EUR was allocated for cohesion (Art. 91.), the Common Provisions Regulation lists 11 thematic objectives, (Art. 10) out of which (8)-(10) are

concerning social inclusion, education, training, and employment. (Regulation (EU) No 1303/2013 n.d.) The use of ERDF, ESF, and CF are regulated similarly than in the 2007-2013 period. (Regulation (EU) No 1301/2013 n.d., Regulation (EU) No 1304/2013 n.d.)

As for implementation, ESIF funding is based on a partnership agreement between the Member State and the EC, in which the Member State and the European Commission define the objectives, priorities and general rules for the implementation of the operational programs that the Member State wishes to implement using the ESF funds allocated to it. Different calls for application are launched under each operative program, programs, projects, applicants are selected under the call for applications. (Hoffman 2018, 25-33)

3. Review of the European Social policy literature

There are three main directions and topics in the literature regarding the European Structural Investment Funds and poverty relevant to the present research. There are texts that (1) describe history of Cohesion policy, the ESI Funds as a whole, their role in European policy and politics, while other literature (2) discuss a certain policy area in relation to Cohesion policy and the ESI Funds, in this case the policy area is social policy. The third type (retrospectively) analyzes or evaluates the implementation of ESI Funds or Cohesion policy measures. There are three general types of these studies, where the effects of the ESI Funds or Cohesion policy are in focus, (3.1) quantitative studies analyzing the impact with a narrow focus (e.g., impact in a single region, program, or measure), (3.2) qualitative studies with similar focus and objective (evaluating the impact of certain programs, or certain regions), (3.3) usually quantitative analysis on the level of the whole Cohesion policy. (Fratesi 2016, 443) The present research aims to study the social impact of the ESI Funds from the above-mentioned third perspective, on the level of the whole policy (with quantitative methods).

In terms of the entirety of the Cohesion policy, the original idea behind cohesion and the ESI Funds was to mitigate regional disparities within the European Union by "*defining and targeting regions as recipients for different assistance"*. While there had been financial instruments in place already, such as the Common Agricultural Policy, when the United Kingdom joined the EU in 1973, *"it was judged necessary"* to adopt policies that could benefit this new net contributor, hence the European Regional Development Fund was created. The amount and share of these financial instruments have steadily grown since the 1970s. These funds are the main explicitly redistributive instrument of the EU. (D. Allen 2010, 230-232) The name "Cohesion policy" and the general structure and principles of ESI funds – economic growth, measurability, additionality, sustainability, sound financial management, and result orientation – were crystallized throughout the 1980s, they began to operate in their current form in 1989. From the start the primary nature of Cohesion policy was economic. (Leonardi and Holguin 2016)

As for the place of social policy considerations within Cohesion policy, literature discussing European Union level social policy (or Social Europe) tend to universally agree that social and related considerations always came secondary to economic objectives, such market integration, cohesion in an economic sense, and ensuring growth, in line with the aforementioned principles. It is treated as common knowledge that "*social dimension of cohesion has never reached the same status as the economic dimension*". (Fargion and Profeti 2016, Saraceno 2013) Most authors attribute this to the fact that in the framework of the Treaties, where social policy is declared to be the competence of Member States, therefore EU level action could only be additional. The primary position of (neo-liberal) economic thinking also shows in the nature of interventions made to enhance the social dimension of cohesion. (Begg 2010, 80, Fargion and Profeti 2016, 475) Mechanisms that redistribute for local development purposes or employment policies (e.g., active labor market policies or human resource development) take up more space than *"more explicitly*

social" policies (e.g. poverty reduction, anti-discrimination, etc.). While the social component gained visibility and probably legitimacy as well, EU bodies still have not found the balance between solidarity and growth objectives. (Fargion and Profeti 2016)

While secondary position of European level social policy did not change, the importance and the attention paid to social policy aspects fluctuated throughout the last more than two decades. The objective of social cohesion in terms of reducing disparities among regions had already come up in 1985 with the Single Europe Act social aspects came up, (Fargion and Profeti 2016, 476) many authors refer to the first Lisbon Agenda in 2000 as the document that signaled a change in attitude towards non-economic objectives. (Fargion and Profeti 2016, Daly 2007) This agenda was revised and formally relaunched in 2005 by the Lisbon II strategy as its predecessor did not deliver the desired results. (Daly 2007, 1-6, Fargion and Profeti 2016, 477, Zeitlin and Vanhercke 2014, 6) The later linked Cohesion policy together with social objectives, which together with new methods of EU governance lead to the "Lisbonisation" of Cohesion policy, where "*lack of clarity and prioritization over EU Cohesion objectives*" (Mendez 2011, 534, Begg 2010) turned Cohesion policy into rather *"a shopping list of actions"* instead of a combination of strategy and priorities. (Mendez 2011, Fargion and Profeti 2016) In relation to Lisbon II, it comes up that the economic and pro-growth approach of Cohesion policy and the ESI Funds may weaken the explicitly social objectives if they are linked together, (Daly 2007, 14-15) that the Operative Programs under ESIF were biased towards employment measures instead of those social policy measures that do not have a clearly economic benefit. (Fargion and Profeti 2016, 477-482)

The Europe 2020 Strategy adopted in 2010 is viewed as a document that integrated social policy more into EU policies and economic governance and put more emphasis on social policy considerations – a development is not unrelated to Global Financial Crisis and its impacts. (Zeitlin

and Vanhercke 2014, Fargion and Profeti 2016) Although there is a wide agreement that the Europe 2020 strategy and the target of lifting 20 million people out of poverty is "ambitious", reasons for skepticism are also mentioned. The process leading up to the adoption can be interpreted as if the target were a compromise, a result of political opportunity rather than a meaningful agreement about furthering European level social policy. (Copeland and Daly, Varieties of poverty reduction: Inserting the poverty and social exclusion target into Europe 2020 2012, 276-283) The most telling sign of the compromise nature is that Member States are allowed to choose the poverty indicator they wish to improve and can also set the target for this indicator, which opens up the door for Member States to opt for minimal resistance type of solutions. (Copeland and Daly, Varieties of poverty reduction: Inserting the poverty and social exclusion target into Europe 2020 2012, 483, Fargion and Profeti 2016, 486) A study published in 2018 qualitative research of 290 policy Country Specific Recommendations and 29 interviews found that EU social policy is (still) characterized by a lack of agreement, political commitment, while social policy was more oriented towards *"market development than to correcting for market failures"*, and advances of EU social policy happened under and despite "*relatively unfavorable conditions"*. (Copeland and Daly 2018)

The question of the open method of coordination comes quite often in the literature concerning social policy on the EU level. Some of the authors found this method to be unsuccessful in terms of poverty reduction or social policy. They describe the open method of coordination as weak, ineffective as EU institutions may be unable to Cohesion policy with this approach. (Daly 2007, Fargion and Profeti 2016, Sabato, et al. 2018) On the other hand, for example, one book chapter specifically dedicated to the "obstacles of Social Europe" did not even mention the open method of coordination. (Bailey 2017) Some text describe the development of this governance instrument from the "experimental" phase up to Europe 2020 in a neutral tone. (Zeitlin and Vanhercke 2014)

As for the evaluation literature, the position of social policy is reflected by the available studies. Most of the research carried out over the past years focus *"on the (controversial) effects of cohesion policy have focused on regional and local economic development, with the social dimension rarely autonomously scrutinized"* When social impacts are measures, it is usually done from an employment perspective, for e.g.,*"1.5 million jobs were created between 2007 and 2015 (considering both the ERDF, and ESF projects, and assuming that the projects were not the same)"*. Another issue is that *"ex post evaluations are undertaken in a segmented manner, with a distinction drawn between the impact of the ERDF/Cohesion Fund and that of the ESF."* (Graziano and Polevari 2020)

For example, in terms of Cohesion Policy, Fratesi mentions that Cohesion policy is multi-faced, and social impact may be more long-lasting than economic ones, it still focuses on the measurement of economic impact and looks at research that dealt with outputs mostly of economic relevance, e.g., GDP, productivity, or employment. (Fratesi 2016)

Despite mostly pragmatic and sometimes critical attitude of the above cited literature, the texts describing generally the European level social policy however share a rather significant blind spot regarding the Eastern European and/or formerly state socialist Member States. Other than the ones that directly focus on these regions or their subsets, (Faragó and Varró, Shifts in EU Cohesion Policy and Processes of Peripheralization 2016) there is no reflection on the enormous differences between the intra-European power relations, current economic capacities between countries, the differences between living conditions, or the historical inequalities within the European Union (Faist 2014, Egri 2017, Faragó, Az EU területi politikájának a változásai közép-kelet-európai nézőpontból [Spatial policy changes from a Central Eastern European perspective] 2016). It is unfortunate, that while the varieties in state level social policies are considered in some literature,

or the inter-regional, or intra-national differences are mentioned broadly, the same texts disregard varieties in history, economic system, and similar differences, and the power relations within Europe. While some authors from the EU Social policy field advocate for more solidarity elements in the European level policy, (Vanderbroucke 2020) even them refrain from more critical statements concerning the EU or its relationship towards economy, market, or capitalism.

4. Methods

The aim is to evaluate the impact of EU expenditure on social conditions, namely poverty and inequality. The main part of the research is built on regression analysis using "modelled annual expenditure" from ESI funds in million EURs as treatment variable, and the risk of poverty or social exclusion rate as an outcome variable. In order to isolate the effect of ESIF spending, the analysis uses panel data methods and incorporates control variables. To answer the question about the potential different effect in the post-socialist Member States, a dummy variable is included as a covariate to account for this feature of each NUTS-2 regions. The analysis is carried out in R Studio, regression tables are created with the "Stargazer package". (Hlavac 2022)

The indicator of the treatment is rather self-explanatory, and the European Commission publishes this information regularly. The measurement of the outcome would leave more room for choosing an indicator, if it were not for the indicator composed specifically for a very similar purpose – as described in the literature review. The present research uses this indicator, the risk of poverty or social exclusion rate, it is also probably the most comprehensive metric. This indicator shows the percentage of the population who are either (1) at risk of poverty, meaning that they have income less than 60% of the national median, (2) experience severe material deprivation, (3) live in households with very low work intensity (joblessness), (4) or multiple of these apply.

The research focuses on the relationship between ESIF spending and the risk of poverty or social exclusion for the 2007-2018 period. Data for ESIF expenditure by NUTS-2 regions is available up to 2018 from the 1980s. Based on the programming cycles, the present research uses data from the last two programming periods, the 2007-2013 and the 2014-2020 period. As NUTS-2 level spending data is not available yet in 2022 for the last two years of the 2014-2020, the main part of the analysis will use data for the 2007-2018 period.

4.1. Content of the dataset

The dataset used for the analysis was composed for the purposes of this thesis using publicly available tables provided by EU institutions. The independent variable of interest, the amount of EU spending (in EUR) by NUTS2 region, year, programming period, and fund comes from the "Historic EU payments – regionalized and modelled" dataset made available by the European Commission. This dataset distinguishes between actual annual payments and modelled expenditure. The present research uses the latter, as that variable was generated specifically to closely estimate the actual EU spending in a given period, as opposed to the annual payment, the yearly breakdown of which *"follows the cycle of the European Commission payments to the Member States and not the date on which real expenditures took place on the ground.*" (European Commission n.d.) The treatment values are in a million EUR unit format. The first outcome variable, the risk of poverty and social exclusion by NUTS-2 region uses Eurostat data (ilc_peps01 table). Control variables were also gathered from Eurostat regional statistics, from tables demo_r_d2jan (population), nama_10r_2gdp (regional gross domestic product), lfst_r_lfu3pers (unemployment), and edat_lfse_04 (education). The variable for the yearly change in the risk of poverty or social exclusion rate (pse_nuts2_change) has been calculated in the program,[1] while post-socialism dummy variable has been added manually.

The dataset contains observations for the NUTS-2 regions of the United Kingdom as well, but the former EU Member State is not part of the impact analysis. Even though the United Kingdom was still a member of the EU between 2007 and 2018, the people at risks of poverty or social exclusion data regarding the NUTS-2 regions of the UK is missing from the Eurostat table I have used. Therefore, those regions are left out as missing values from the main part of the analysis. The risk

[1] $pse\_change(Year_i)=pse\_nuts2(Year_i) - pse\_nuts2(Year_{i-1})$

of poverty or social exclusion data is also missing in case of Poland. Despite this, as Poland is a Member State of the EU it was still included in the analysis.

4.2. Regression analysis and panel data methods

The analysis uses the OLS method, and in order to isolate the effect of ESI funds, and to offer more plausible explanations control variables are included. The dataset contains multiple units of observations, the NUTS-2 regions of the EU28, all observed at multiple occasions, which make it possible to use panel data methods, such as including time fixed effects and country fixed effects. (Békés and Kézdi 2021, 649-662) Country differences, that are not very sensitive for time (ranging from historical, geographical, long-standing societal characteristics, or the level of general economic development, to economic and policies, welfare regimes, etc.) can be absorbed by country fixed effects. Although some of these differences, for e.g., geographical situation differ within country between NUTS-2 level regions, it is hard to come by all of the relevant variables, and access them in a comparable way to all (or most) NUTS-2 regions in all 27 EU Member States. Other differences, such as economic and social policies are often country-wide and likely to greatly influence NUTS-2 regions across the country. All of these exclusively or somewhat country specific characteristics can be "absorbed" by the county fixed effects.

The research incorporates time fixed effects as well in order to account for general time-sensitive factors, trends that may influence the state of poverty across all NUTS-2 regions. The Global Financial Crisis of 2008 and the subsequent years, as well as the sovereign debt crisis all happened within the time-interval in focus. These economic events, as well as the global trends associated with the Financial Crisis and its aftermath impacted most European economies and the financial situation, employment status, and living conditions of the population, and caused poverty either short-term or long-term for many households and individuals. (Ötker-Robe and Podpiera 2014, 4,

15-20) For this reason, in the present research attributes great importance to time fixed effects that are able to encapsulate these general trends.

To account for delayed effects of ESIF spending, cumulative effects of multiple years of ESIF spending, and to have a chance to follow the time path of the effects, lagged terms are introduced, up to 5 years prior to a given year. By the 6th year (the given year) a project realized with ESIF funds is likely to be finished and has already started to impact the local economy and/or social context, as ESIF supported programs must be completed in 5 years according to Article 71. of the Common Provisions Regulation. Besides the lagged terms, the analysis includes interaction terms to investigate whether there is a difference in the impact of ESI Funds in case of the post-socialist NUTS-2 regions versus the average impact.

The analysis starts out with regressions focusing on the level of the risk of poverty or social exclusion rate. These models show the relationship between ESIF spending in million EURs and the risk of poverty or social exclusion rate. After that, the change in the risk of poverty and social exclusion is used as an outcome variable.

The analysis is based on the results from the following regression models:

1. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil$
2. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \gamma 1 * post\_soc\_dummy + controls$
3. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$
4. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \beta 2 * mod\_an\_ex\_mil * post\_soc\_dummy + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$
5. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \beta 2 * lag\_1\_mil + \ldots + \beta 6 * lag\_5\_mil +$
6. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \beta 2 * lag\_1\_mil + \ldots + \beta 6 * lag\_5\_mil + \gamma 1 * post\_soc\_dummy + controls$

7. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \beta 2 * lag\_1\_mil + \ldots + \beta 6 * lag\_5\_mil + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$
8. $\Delta pse\_nuts2 = constant + \beta 1 * mod\_an\_ex\_mil + \beta 2 * lag\_1\_mil + \ldots + \beta 6 * lag\_5\_mil + \beta 7 * mod\_an\_ex\_mil * post\_soc\_dummy + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$
9. $\Delta pse\_nuts2 = constant + \beta 1 * lag\_5$
10. $\Delta pse\_nuts2 = constant + \beta 1 * lag\_5\_mil + \gamma 1 * post\_soc\_dummy + controls$
11. $\Delta pse\_nuts2 = constant + \beta 1 * lag\_5\_mil + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$
12. $\Delta pse\_nuts2 = constant + \beta 1 * lag\_5\_mil + \beta 7 * mod\_an\_ex\_mil * post\_soc\_dummy + \gamma 1 * post\_soc\_dummy + time\ FE + country\ FE + controls$

4.3. Explanation of covariate choices

Apart from the time and country fixed effects, the analysis includes control variables in order to avoid the omitted variable bias. (Cunningham 2021) For this reason, the dataset contains variables that can be considered alternative causes of poverty, or common causes behind ESIF expenditure and poverty or their differences. To control for the most general differences, the population and general economic conditions, the number of population and NUTS-2 level gross domestic product has been incorporated. Other covariates have been selected based on literature about poverty in Europe (and in Europe and America). Unemployment, (low) level of education, household structure, and level of urbanization have been commonly mentioned (Brady 2019, Copus, et al. 2015, Lelkes and Zólyomi 2008), for the purposes of this research partially following the rationale of the EU described above, also due to data access conveniences, the following research focuses on those indicators that are associated more easily with structural approaches. (Bradshaw and Nieuwenhuis 2021) Therefore the dataset contains an indicators of education and unemployment. (Data for NUTS-2 level were not publicly available for the level if urbanization). The education (educ_nuts2) indicator shows the percent of the 15-64-years-old population with educational attainment level lower than finished lower secondary education (ISCED 0-2). The unemployment

variable contains values for the unemployment rate among the 15-64-years-old population. The unemployment_nuts2 variable has not been used in the regression models. Initial analysis showed that there is a strong correlation between the educ_nuts2 and unemployment_nuts2 variables. Furthermore, as job-creation, job-seeking services are often supported by ESIF funds, with the aim to achieve short-term development with unemployment, which raises the question whether unemployment is a common cause or can be interpreted as an intermediary variable between ESI funding and the risk of poverty or social exclusion rate. To avoid the potential problems of multicollinearity or including an intermediary variable as a covariate (Cunningham 2021) unemployment has been excluded from the regression models.

The values of the post-socialist dummy are assigned based on historical facts, 0 indicates that the NUTS-2 region is not on a post-socialist territory, while the value 1 indicates that the region is a post-socialist region. A NUTS-2 region qualifies as post-socialist region if it is in a Member State that has been part of the Soviet Union or was ruled by a state socialist or communist regime before 1989-1990. In case of Germany, those NUTS-2 regions that can be found on the territory of the former Democratic Republic of Germany (GDR) are accounted for as post socialist regions. Berlin NUTS-2 region is also registered as post-socialist for the purposes of this research, as while more than half belonged to the Federal Republic of Germany in terms of territory and population according to the Statistisches Bundesamt (Federal Statistical Office of Germany), the other half belonged to the state-socialist GDR and more importantly, it was surrounded by GDR territories.

5. Results & analysis

The trends regarding the Union's ESIF spending and the risk of poverty or social exclusion rate can be considered generally positive from the perspective of poverty reduction. Poverty has been declining in the EU in general between 2007 and 2020, especially in Bulgaria and Romania. While the Global Financial Crisis of 2008 caused the poverty rate to rise in 2009 and the early 2010s, after 2015 poverty decreased more or less steadily in most EU countries up until the Covid-19 pandemic. As Figure 1 shows, there is a greater variation in poverty rates among the post-socialist Member States, albeit they are converging in the observed period, while poverty rates of Bulgaria and Romania getting closer to the rest of the Member States'.

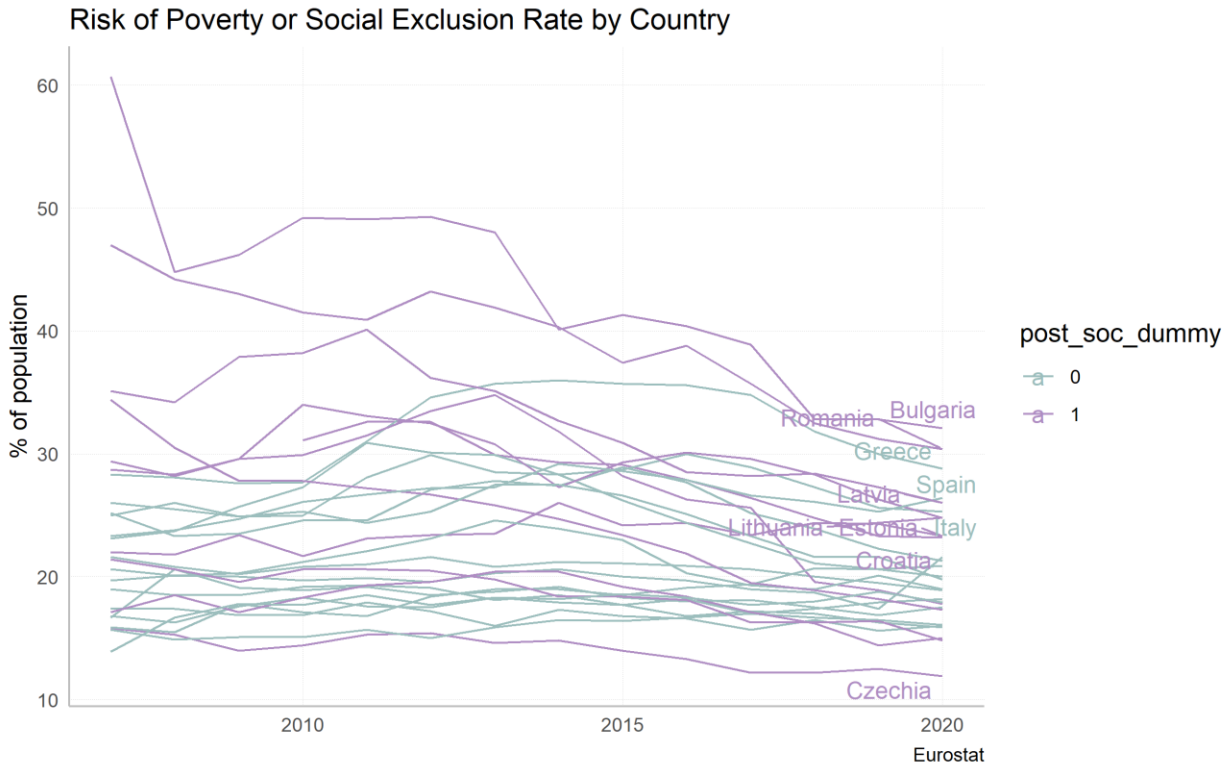

Figure 1. People at risk of poverty or social exclusion by county (2007-2020)

ESIF expenditure at the same time has fluctuated, also, different countries, regions received funding at different times, and according to different programs and priorities. In total, 590614.2

million EURs have been spent via the European Structural and Investment funds in the observed period. The mean ESIF support for a NUTS-2 region was 180.948 million EUR/year, the median 80.49665 million EUR/year. Figure 2 illustrates this variation, and how Poland, the most populous and large post-socialist Member State has been a top receiver of EU funding.

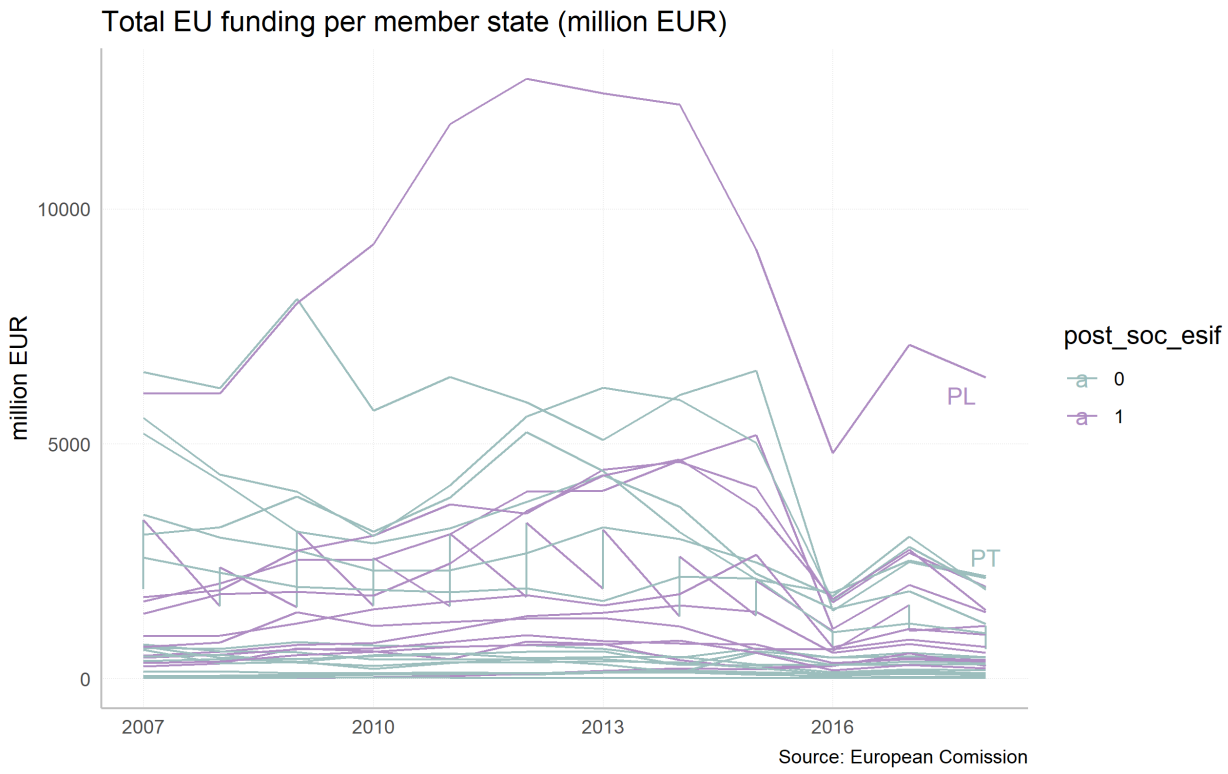

Figure 2. ESIF modelled expenditure by country

The first question is "Did the EU lift 20 million people out of poverty?". If we only look at the number of persons at risk of poverty or social exclusion, the question can easily be answered with a firm no. In 2010 there were 116.5 million people at risk of poverty or social exclusion in the then EU27 including the United Kingdom but not yet including Croatia. According to Eurostat data,[2] in 2019, before the Covid-19 pandemic and its adverse economic and social effects this number was 105.5 and 106.4 million respectively, depending on whether Croatia is excluded from the

[2] Eurostat ilc_peps01 table

count or including in it (the United Kingdom was still a member of the EU in 2019). The difference between the two points in time is only around 10-11 million. However, these aggregate numbers do not account for changes in individual living situations, in theory there is a possibility that there are indeed 20 million people in the EU who experienced being at risk of poverty or social exclusion in 2010 but their livelihoods or circumstances improved, and they do not fit into the category anymore. (However, that would mean that there are people who became at risk of poverty or social exclusion in this period, either by birth, immigration, or worsened livelihood or circumstances.) This decrease in the number of persons at risk of poverty or social exclusion came at the same time with a constant increase in population.

Having established that probably there have not been 20 million people getting out of poverty, let alone lifted out of poverty as a result of EU policies, the analysis of the impact of ESI Funds on poverty and social exclusion rate at the NUTS-2 level may provide a more nuanced picture. Firstly, looking at the relationship between poverty rate and EU spending, the relationship can be described as a medium-strong positive relationship with a correlation of +0.3730935 (using the Pearson method). The positive relationship means that the higher the ESIF spending is in a given year, the higher is the poverty rate is in the same year. It would be rather counter-intuitive to assume that higher spending causes with greater poverty (within less than a year) but seeing the positive relationship should not come surprising. Considering the eligibility criteria of certain funds, the principles that promote economic convergence by supporting less developed areas, it is more than realistic to find a higher level of EU spending in those NUTS-2 regions where poverty is higher. In this case only correlation can be established, causation

The graph below illustrates the lack of obvious linear trends, and the fact that excluding the outliers, NUTS-2 regions in post-socialist regions received more ESIF support, and at the same time they show more variety in the levels of poverty and social exclusion risk.

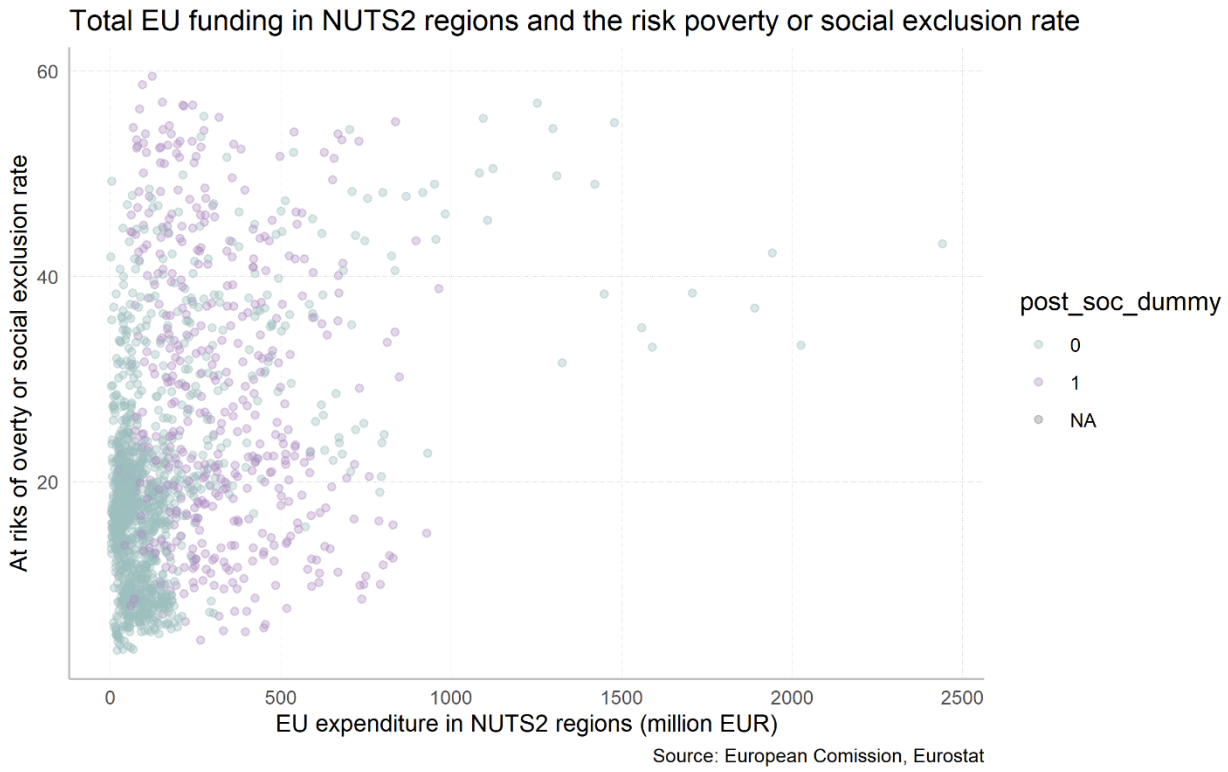

Figure 3. ESIF funding and the people at risk of poverty or social exclusion

Comparing ESIF funds received in a given year and the risk of poverty and social exclusion rate in the same year may not be informative due to the factors mentioned earlier. Yearly changes in the poverty and social exclusion rate should be more useful in determining the impact of European Union spending. Figure 4 lists the regressions of yearly change of the poverty and social exclusion rate on ESIF spending, adding control variables, as well as time and country fixed effects. The constants are all negative, meaning that at 0 EURs the poverty and social exclusion rate is still lower in a given year than was in the previous year. This is in line with the general downward sloping trend of the poverty in Europe. Despite this, the coefficients for mod_an_ex_mil are

positive (even if small) indicating that an additional million EUR in EU expenditure in a region corresponds with a slightly higher level of poverty. (This can also be put down to the fact that in line with EU convergence priorities, regions in worse situation receive more funding in a given year.) However, almost all of the coefficients and constants are not significant at the traditional 95% significance level. The R^2 and adjusted R^2 values are also low, F-statistics are high indicating the low explanatory value of the models included in the table. The only strongly significant coefficient belongs to the post-socialism covariate; it is -1.011 which has a higher absolute value than the constant, meaning that the decrease of poverty is sharper in the post socialist regions of the EU.

Figure 4. Regression of yearly change in poverty on ESIF expenditure

	Dependent variable:			
	pse_nuts2_change			
			Including country and time fixed effects	
	(1)	(2)	(3)	(4)
mod_an_ex_mil	0.00004	0.001**	0.0005	0.0005
	(0.0003)	(0.0004)	(0.0005)	(0.001)
pop_nuts2		-0.00000	0.00000	0.00000
		(0.00000)	(0.00000)	(0.00000)
gdp_nuts2		-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)
educ_nuts2		0.001	-0.004	-0.004
		(0.006)	(0.014)	(0.015)
post_soc_dummy1		-1.011***	-0.701	-0.700
		(0.217)	(0.684)	(0.689)
mod_an_ex_mil:post_soc_dummy1				-0.0001
				(0.001)
Constant	-0.177*	-0.038	-0.242	-0.242
	(0.091)	(0.218)	(2.550)	(2.551)
Observations	1,482	1,432	1,178	1,178
R^2	0.00001	0.024	0.088	0.088
Adjusted R^2	-0.001	0.021	0.061	0.060
Residual Std. Error	2.691 (df = 1480)	2.690 (df = 1426)	2.535 (df = 1144)	2.536 (df = 1143)
F Statistic	0.016 (df = 1; 1480)	7.001*** (df = 5; 1426)	3.330*** (df = 33; 1144)	3.229*** (df = 34; 1143)
Note:				*p<0.1; **p<0.05; ***p<0.01

Figure 5 shows the lack of obvious trends in terms of ESIF funding and yearly changes in the poverty and social exclusion risk. Despite the lack of clear trends, the graph below indicates that the higher the ESIF expenditure is, the closer the yearly change is to 0 (be it negative or positive.

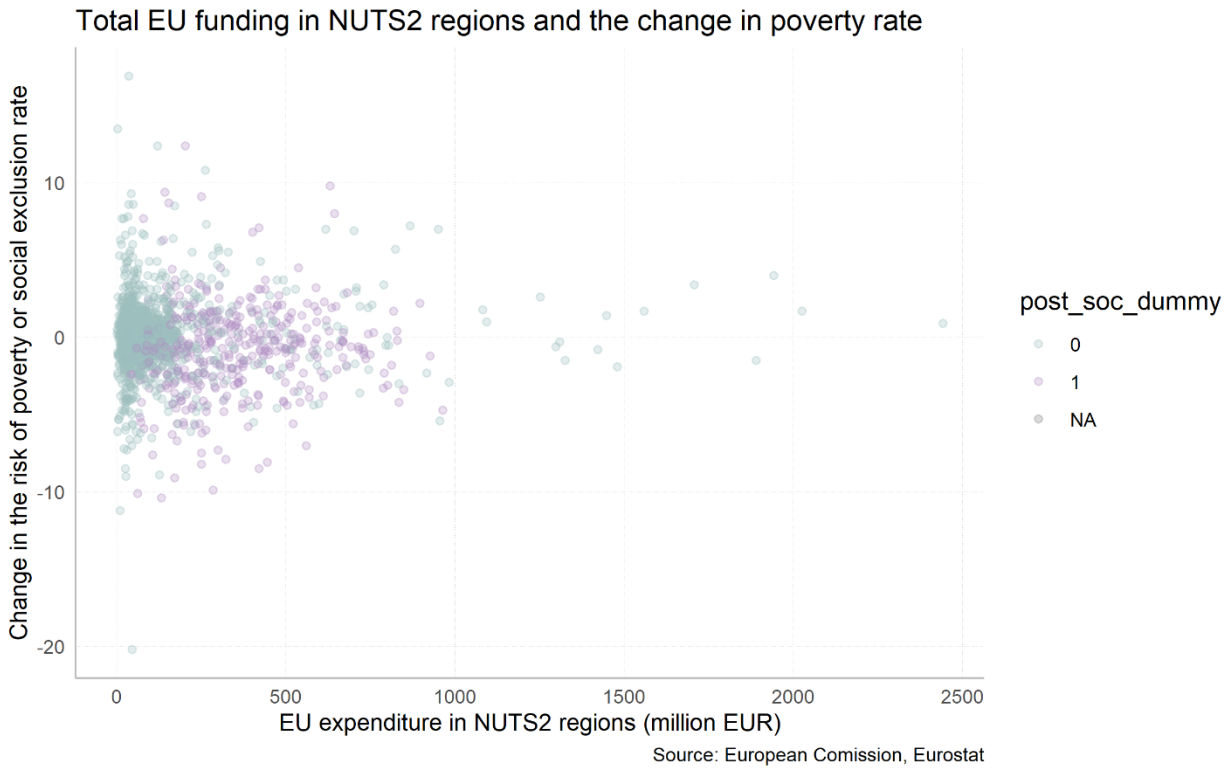

Figure 5. ESIF expenditure and the change in poverty rate

Lagged effects may tell us more about the impact of ESIF spending on the risk of poverty and social exclusion rate. The dataset used in this research records (or models) payments made in each year, not the years when certain investment projects were completed, were ready to be used, or when it started to affect local communities. Therefore, it is to be expected that the effects of ESIF spending would manifest in the change in poverty rate later. The table below shows the correlations between the change in poverty from the previous year to the given year and ESIF spending in that year (mod_an_ex_mil), the year before (lag_1_mil), two years before (lag_2_mil), three years before (lag_3_mil), four years before (lag_4_mil), and five years before (lag_5_mil).

The relationships between previous spendings and the yearly change in the poverty or social exclusion rate (see Figure 6) all have small absolute values bur are all negative, meaning that the more spending ocurred in 1-5 years before, the bigger the decrease in poverty is. The strongest

relationship is between the 5 years prior ESIF spending and poverty and social exclusion risk rate with -0.063.

Figure 6. Correlation of ESIF expenditure (0-5 years prior) and the change in poverty

	mod_an_ex_mil	lag_1_mil	lag_2_mil	lag_3_mil	lag_4_mil	lag_5_mil	pse_nuts2_change
mod_an_ex_mil	1	0.917	0.850	0.786	0.741	0.725	0.003
lag_1_mil	0.917	1	0.916	0.845	0.803	0.765	-0.026
lag_2_mil	0.850	0.916	1	0.918	0.860	0.821	-0.045
lag_3_mil	0.786	0.845	0.918	1	0.957	0.916	-0.047
lag_4_mil	0.741	0.803	0.860	0.957	1	0.963	-0.045
lag_5_mil	0.725	0.765	0.821	0.916	0.963	1	-0.063
pse_nuts2_change	0.003	-0.026	-0.045	-0.047	-0.045	-0.063	1

The models including lagged effects suffer from the same problems as the previous ones (see Figure 7). Most of the coefficients for the variables of interest (mod_an_ex and the previous spending variables) are close to 0 and are not significant at the traditional 95% significance level. Based on the low R2, adjusted R2 values and the high F-statistics, the explanatory value of these models are also rather low. However, the general picture painted by these otherwise not satisfactory models is in line with the generally decreasing risk of poverty or social exclusion rate, and the fact that the Union delegates more ESIF resources to those NUTS-2 regions characterized by worse economic and/or living conditions. All of the (insignificant constant) constants are negative, indicating that even in the absence of ESIF spending, the in average, risk of poverty and social exclusion rate is getting lower and lower year after year. The coefficient for mod_an_ex_mil is +0.001 in all of these models, indicating that in a given year an additional million EUR from the ESI sources are associated with a slightly higher poverty rate, probably due to the ESI fund general policies that prioritize worse off regions. The coefficients for previous spending are also close to 0, but for 2-3 of the 5 lagged term are negative, signaling that ESIF resources invested in a region may contribute to the decrease in poverty after 1-5 years. The only highly significant result is the

coefficient for the post_soc_dummy variable with the value of -1.243 in model (2) where control variables are included, but country or time fixed effects are not. It shows that in post-socialist regions the decrease in poverty is greater (|(-1.234) + (-0.114)| versus |-0.114| percentage points) than the EU average. On the other hand, if time fixed effects and country fixed effects are also incorporated as in model (4), the coefficient for the post-soc dummy is positive, indicating that if general trends and country differences are considered, the socialist past corresponds with a smaller decrease in poverty compared to the EU mean (however, this value is not significant at the traditional significance levels). Looking at the interaction between post-socialist nature and ESIF spending, model (4) shows that within year post-socialism sets the bar for ESIF funding access in terms of poverty, as in case of an average region an additional million EUR in ESIF funding corresponds with an a 0.001 percentage points higher poverty rate, but in case of post-socialist regions the additional million does not come together with a 0.001 percentage point higher poverty rate (the +0.001 coefficient for mod_an_ex_mil and the -0.001 coefficient for mod_an_ex_mil* post_soc_dummy cancel each other out for the post-socialist NUTS-2 regions). This may be put down to the economic convergence priority of the ESI funds. As for the delayed effects for pots-socialist regions, three out of the five (interacted) lag terms have negative coefficient, which implies that ESI investments made 1-5 years prior to a given year may contribute slightly even more to the yearly decrease in poverty in post-socialist areas than the EU average. The coefficient for the post_soc_dummy* lag_5_mil is negative and significant (even though only at 90% significance level), indicating that in case of post-socialist regions an additional million in ESIF expenditure contributes to the decrease of poverty, with an additional -0.006 change in the risk of poverty or social exclusion rate.

Figure 7. Regression of yearly change in poverty on ESIF expenditure including lagged terms

	Dependent variable:			
	pse_nuts2_change			
			Including country and time fixed effects	
	(1)	(2)	(3)	(4)
mod_an_ex_mil	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
pop_nuts2		0.00000	0.00000	0.00000
		(0.00000)	(0.00000)	(0.00000)
gdp_nuts2		-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)
educ_nuts2		-0.003	0.008	0.008
		(0.008)	(0.018)	(0.018)
post_soc_dummy1		-1.243***	-0.521	0.436
		(0.285)	(0.746)	(0.855)
lag_1_mil	0.0001	0.0002	-0.001	-0.0003
	(0.001)	(0.001)	(0.001)	(0.001)
lag_2_mil	-0.001	-0.001	-0.0003	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
lag_3_mil	0.001	0.001	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)
lag_4_mil	-0.001	-0.0003	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
lag_5_mil	0.0003	-0.001	-0.0002	0.003
	(0.001)	(0.001)	(0.002)	(0.002)
mod_an_ex_mil:post_soc_dummy1				-0.001
				(0.002)
post_soc_dummy1:lag_1_mil				-0.001
				(0.002)
post_soc_dummy1:lag_2_mil				0.003
				(0.002)
post_soc_dummy1:lag_3_mil				0.003
				(0.003)
post_soc_dummy1:lag_4_mil				-0.001
				(0.004)
post_soc_dummy1:lag_5_mil				-0.006*
				(0.004)
Constant	-0.285**	-0.114	-0.467	-0.440
	(0.116)	(0.259)	(2.586)	(2.582)
Observations	1,003	981	819	819
R^2	0.007	0.037	0.094	0.104
Adjusted R^2	0.001	0.027	0.056	0.059
Residual Std. Error	2.719 (df = 996)	2.707 (df = 970)	2.564 (df = 785)	2.559 (df = 779)
F Statistic	1.139 (df = 6; 996)	3.694*** (df = 10; 970)	2.457*** (df = 33; 785)	2.316*** (df = 39; 779)
Note:				*p<0.1; **p<0.05; ***p<0.01

Looking at the effects of only those ESI spendings that happened 5 years prior to the given year show similar resultst (See Figure 8). (These regressions were inculded because as it is demonstared in the correlation table above, the spendings made 5 years prior to a given year showed the strongest relationship with the yearly change in poverty rate.) The constants are negative in line with the general decrease in povery in most of the period, and the coefficients for the variable of interest (lag_5_mil) are all small but negative, implying that an additional million EUR in ESI expenditure in a given NUTS-2 region might contribute to additional decrease in the risk of poverty or social exclusion rate. In models (2) and (3) the negative coefficients of the post_soc_dummy represent how poverty has decreased in the post-socialist regions more steaply than in the entirety of the EU. However, in model (4) where the interaction of ESIF expenditure and post-socialist nature are also part of the regression, the coefficient for the post_soc_dummy is positive indicating that in post_socialist countries the decrease was smaller. In the same model, the coefficient for the interaction term is negative, indicating that an additional million ESIF spending has an additional poverty-decreasing effect (compared to the effect in the entire EU) in the post-socialst regions. However, most of the results are not significant, the models have low R^2 and adjusted R^2 scores, high F-statistics all indicating that the models displayed in the table below have rather low explanatory value.

Figure 8. Regression of yearly change in poverty on ESIF expenditure made 5 years prior

	Dependent variable:			
	pse_nuts2_change			
			Including country and time fixed effects	
	(1)	(2)	(3)	(4)
lag_5_mil	-0.001**	-0.0002	-0.0003	0.0003
	(0.0004)	(0.0005)	(0.001)	(0.001)
pop_nuts2		0.00000	0.00000	0.00000
		(0.00000)	(0.00000)	(0.00000)
gdp_nuts2		-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)
educ_nuts2		0.0001	0.008	0.005
		(0.008)	(0.018)	(0.018)
post_soc_dummy1		-1.018***	-0.569	0.259
		(0.257)	(0.735)	(0.836)
lag_5_mil:post_soc_dummy1				-0.003**
				(0.001)
Constant	-0.279**	-0.185	-0.462	-0.406
	(0.113)	(0.256)	(2.582)	(2.577)
Observations	1,003	981	819	819
R^2	0.004	0.031	0.090	0.095
Adjusted R^2	0.003	0.026	0.058	0.062
Residual Std. Error	2.716 (df = 1001)	2.708 (df = 975)	2.560 (df = 790)	2.555 (df = 789)
F Statistic	3.968** (df = 1; 1001)	6.232*** (df = 5; 975)	2.799*** (df = 28; 790)	2.860*** (df = 29; 789)
Note:				*p<0.1; **p<0.05; ***p<0.01

The following table (see Figure 9) shows the coefficients for time and country fixed effects. Model (1) depicts the regression of the (level) risk of poverty or social exclusion rate on all covariates but leaves out the ESIF spendings, the model is included in the table to show the impact of the fixed effects on the poverty rate. The rest of the table summarize those regression models form the previous tables, where time and country fixed effects were included, as well as the interactions of ESIF spending with the post-socialist dummy variable. In all of the latter models, the majority of coefficients for time dummies are significant (at the 90% or 99% significance level) and larger than the coefficients of the ESIF variables. In models (2) to (4) where the variable of interest is the yearly change in the risk of poverty or social exclusion rate, the constants in these models are all

negative, meaning that even in case of 0 EURs in ESIF spending, the poverty would have decreased between 0.255-0.441 percentage points yearly. The coefficients for time dummies in these models are all positive without exception, indicating that despite the downward sloping trend in the poverty and social exclusion, in the years featured, the given years (or rather trends grasped by the time dummies) held back the decrease of poverty. In the years after the Global Financial Crisis, between 2009 and 2013 the coefficients were above +1, indicating that just being in those years added over 1 percentage points to the change in poverty rate (in the increasing direction) across the European Union. At the same time even the cumulated effect over of 5 years of spending before a given year did not add up a percentage points (to either the increase direction or the decrease direction) in the yearly change in the poverty or social exclusion risk rate. This indicates that when it comes to the decrease in poverty, time or factors grasped by time, general (even European or global level) trends matter more than ESIF spending.

Figure 9. Regressions showing time and country fixed effects (continues on next page)

	Dependent variable:			
	pse_nuts2 without ESIF expenditure		pse_nuts2_change delayed effects	only 5-years delay
	(1)	(2)	(3)	(4)
mod_an_ex_mil		0.0004	0.001	
		(0.001)	(0.001)	
post_soc_dummy1		-0.678	0.374	0.169
		(0.689)	(0.847)	(0.828)
lag_1_mil			-0.0003	
			(0.001)	
lag_2_mil			-0.002*	
			(0.001)	
lag_3_mil			-0.001	
			(0.002)	
lag_4_mil			-0.001	
			(0.002)	
lag_5_mil			0.003	0.0003
			(0.002)	(0.001)
pop_nuts2	0.00000***	0.00000	0.00000	0.00000
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
gdp_nuts2	-0.00000	-0.00000	-0.00000	-0.00000
	(0.00000)	(0.00000)	(0.00000)	(0.00000)
educ_nuts2	0.668***	-0.003	0.008	0.005
	(0.024)	(0.014)	(0.018)	(0.018)
post_soc	9.626***			
	(1.046)			
dummy2007	-3.825***			
	(0.690)			
dummy2008	-3.764***	0.278		
	(0.646)	(0.374)		
dummy2009	-2.364***	1.752***		
	(0.643)	(0.352)		
dummy2010	-1.521**	1.560***		
	(0.640)	(0.350)		
dummy2011	-0.643	1.164***		
	(0.638)	(0.350)		
dummy2012	0.167	1.284***	1.107***	1.089***
	(0.633)	(0.352)	(0.388)	(0.371)
dummy2013	1.159*	1.178***	1.160***	1.027***
	(0.626)	(0.352)	(0.395)	(0.363)
dummy2014	0.946	0.272	0.191	0.165
	(0.602)	(0.349)	(0.381)	(0.349)
dummy2015	0.821	0.232	0.243	0.156
	(0.601)	(0.337)	(0.370)	(0.336)
dummy2016	0.984*	0.518	0.587	0.436
	(0.530)	(0.327)	(0.373)	(0.331)
dummy2017	0.469	-0.061	-0.104	-0.071
	(0.528)	(0.286)	(0.331)	(0.286)
dummy2018				
AT_dummy	-2.929	-0.123	-0.161	-0.059
	(4.795)	(2.579)	(2.591)	(2.585)
BE_dummy				
BG_dummy	12.548**	-1.096	-2.479	-2.307
	(4.893)	(2.657)	(2.689)	(2.679)
CY_dummy	-14.680***	-0.060	-0.134	-0.075
	(4.935)	(2.657)	(2.729)	(2.724)
CZ_dummy	-9.473*	-0.233	0.109	0.153
	(4.882)	(2.658)	(2.701)	(2.664)

DE_dummy	-3.588	-0.166	-0.113	-0.061
	(4.765)	(2.561)	(2.572)	(2.567)
DK_dummy	-7.447	-0.418	-0.210	-0.130
	(4.782)	(2.568)	(2.591)	(2.585)
EE_dummy	-17.727***	0.145	0.158	0.034
	(5.044)	(2.760)	(2.859)	(2.823)
EL_dummy	3.032			
	(4.916)			
ES_dummy	-13.925***	-0.331	-0.634	-0.438
	(4.795)	(2.577)	(2.602)	(2.592)
FI_dummy	-2.147	-0.546	-0.405	-0.308
	(4.796)	(2.576)	(2.603)	(2.598)
HR_dummy	-2.151	0.350	-0.420	-0.269
	(5.209)	(2.858)	(2.894)	(2.886)
HU_dummy	-2.255	-0.745	-0.950	-0.948
	(4.889)	(2.666)	(2.718)	(2.673)
IE_dummy				
IT_dummy				
FR_dummy	-18.639***	-0.410	-0.420	-0.297
	(4.758)	(2.555)	(2.569)	(2.562)
LT_dummy	28.015***	-1.063	3.047	1.369
	(5.891)	(3.687)	(3.996)	(3.838)
LV_dummy	-15.044***	0.138	0.262	0.088
	(5.046)	(2.779)	(2.926)	(2.848)
LU_dummy	-19.290***	-0.284	-0.094	-0.007
	(4.935)	(2.657)	(2.730)	(2.724)
MT_dummy	-43.161***	-0.612	-0.793	-0.691
	(5.019)	(2.710)	(2.787)	(2.781)
NL_dummy	-8.536*	0.180	0.108	0.146
	(4.804)	(2.593)	(2.603)	(2.598)
PL_dummy				
PT_dummy	-20.506***			
	(5.126)			
RO_dummy	4.340	-1.166	-0.835	-0.812
	(4.890)	(2.661)	(2.704)	(2.674)
SI_dummy	-10.157*	-2.100		
	(5.413)	(3.200)		
SE_dummy	-2.554	-0.350	-0.200	-0.130
	(4.770)	(2.561)	(2.578)	(2.573)
SK_dummy	-5.903	-0.368	-0.203	-0.125
	(4.905)	(2.671)	(2.715)	(2.684)
mod_an_ex_mil:post_soc_dummy1		-0.0002	-0.002	
		(0.001)	(0.002)	
post_soc_dummy1:lag_1_mil			-0.001	
			(0.002)	
post_soc_dummy1:lag_2_mil			0.003	
			(0.002)	
post_soc_dummy1:lag_3_mil			0.003	
			(0.003)	
post_soc_dummy1:lag_4_mil			-0.001	
			(0.004)	
post_soc_dummy1:lag_5_mil			-0.006*	
			(0.003)	
lag_5_mil:post_soc_dummy1				-0.003*
				(0.001)
Constant	9.334**	-0.257	-0.441	-0.403
	(4.749)	(2.550)	(2.565)	(2.562)
Observations	1,383	1,201	834	834
R^2	0.845	0.088	0.104	0.095
Adjusted R^2	0.840	0.059	0.056	0.059
Residual Std. Error	4.727 (df = 1344)	2.535 (df = 1163)	2.543 (df = 791)	2.540 (df = 801)
F Statistic	192.476*** (df = 38; 1344)	3.030*** (df = 37; 1163)	2.183*** (df = 42; 791)	2.619*** (df = 32; 801)
Note:				*p<0.1; **p<0.05; ***p<0.01

As for country fixed effects, in model (1), where the outcome variable is the rate of the poverty or social exclusion risk (level), and ESIF expenditure is not part of the equation, most of the coefficients are significant at the 99% significance level and are not close to 0 in most cases. This indicates that the country and all the factors absorbed by country fixed effects (ranging from geography, history, economic and social policy, etc.) have a larger role in the level of the poverty or social exclusion risk rate the ESIF spending of a given year. In models (2) to (4) however, where the outcome variable is the yearly change in poverty or social exclusion rate, almost all of the coefficients are insignificant at the traditional significance levels.

(Repeating previous models with the subset of the post-socialist NUTS-2 regions lead to rather similar findings; negative constants indicating a decrease in poverty across regions, coefficients for ESIF expenditure variables that are close to zero. The explanatory value of these models are similarly low according to the low R^2 and adjusted R^2 and high F-statistic. The impact of time sensitive trends and country differences are showing similarly.)

6. Discussion of results & limitations

The results presented in the previous chapter indicate that poverty has not decreased as much as the European Union aimed for in the Europe 2020 Strategy, furthermore the ESI Funds and Cohesion policy had somewhat disappointing impact on the state of poverty in the EU. The effect of ESIF expenditure is rather small, even cumulative effects of six consecutive years are close to zero, and in most models statistically insignificant at the traditional 95% significance level. At the same time country-specific factors absorbed by the country fixed effect seem to be a much stronger influencing factor for the level of the risk of poverty or social exclusion rate across NUTS-2 regions. When it comes to the changes in poverty or social exclusion rates, time seems to be a stronger determining factor, time fixed effects encapsulating all the trends with potential to affect the different regions in the EU were larger than the effects attributed to ESIF expenditures and were mostly statistically significant.

The time fixed effects are key contributors to both the level of poverty and more importantly to the changes in the risk of poverty or social exclusion rate. The effects and the path they draw up can probably be explained by the Global Financial Crisis of 2008 and its aftermath. According to the model where the outcome variable is the risk of poverty or social exclusion rate, and control variables, as well as time fixed effects are included, between 2009 and 2013 the risk of poverty or social exclusion turned from negative to positive. This means that controlled for country, population, GDP, and education, in years between 2007 and 2011 the level of poverty was lower than the average poverty rate of NUTS-2 across in the 2007-2018 period, while from 2012 the poverty rate became higher than the average poverty rate of the period in focus. (However, findings are only statistically significant for the first sub-period.) As for the change of the poverty or social exclusion rate, in the 2009-2013 period the general trends represented by time fixed effects “held back” the decrease in poverty by more than 1 percentage points in each year. These are in line with

the general common knowledge and the literature about the impact of the Global Financial Crisis. (Ötker-Robe and Podpiera 2014, Lelkes and Zólyomi 2008)

The variety in country fixed effects shows in both the level of poverty and its changes, but in the models of this study only the regression of risk of poverty or social exclusion rate on all variables except ESIF expenditure produced statistically significant results. (In terms of the change in poverty the country effects are not statistically significant.) Due to the general differences in history, geography, economic structure, demographic make-up, etc. Country level heterogeneity can also appear in the varieties of different models of welfare regimes, economic and social policies. Even among countries with similar characteristics (e.g., the Central Eastern European members states) the context to which ESIF funded programs, projects arrive can be different. (Kovács, Polese and Morris 2017, 213)

Even tough based on the literature reviewed in Chapter 3, weak effects were to be expected, at this point the question arise. Why is poverty so determined by factors (mostly) external to EU Cohesion policy? And why do Cohesion policy and the ESI Funds have so little and/or almost negligible effects? There are three possible answers to these questions two assuming that the ESIF expenditure happened according to planned, and one assumes non-compliance from either low-level state (or local government) actors or private parties. (1) The results are to be attributed to the limits and weaknesses of European Social policy. (2) The limitations of the present research made it impossible to find more defined results in the realm of "weak effects". (3) There is a gap between the rules and principles of Cohesion and Social policy and how ESIF funded projects actually materialize due to poor planning, bad management, non-compliance, corruption, etc. The three explanations are not mutually exclusive and can be plausible at the same time.

Firstly, as described in Chapter 3, while social considerations gained importance and legitimacy during the observed period, ESI Funds and the Cohesion policy of the Union is still mainly an economic instrument aiming to mitigate territorial disparities in order to realize the truly integrated single market. During the first three years of the observed period the Lisbon II strategy was still in place with its rather economic approach toward social policy, best summed up by the term "jobs and growth". From 2010 this attitude changed for a more socially oriented one, but a lack of political will or commitment, a lack of agreement, and market focused ideas are still very much present in European social policy. At the same time the ESI Funds framework is still somewhat inflexible and keeps certain types of social policy interventions (e.g., income support for individuals) ineligible for ESIF funding. (Fargion and Profeti 2016, 485, Regulation (EU) No 1301/2013 n.d.)

The flexible target setting option for Member States, where they can decide how and which targets (income poverty, material deprivation, joblessness) to set and to where opens the door to cherry-pick those that is easier to achieve in the given social and economic context. This option and the different contexts lead to great differences among Member States in terms of how much of the available ESI funding do they dedicate social policy objectives, as well as in terms of the social interventions. In the 2007-2013 program cycle for example the Netherlands devoted 50% of their ERDF + ESF + CF funds to social-themed priorities (labor market, human capital, social inclusion, and social infrastructure), while Slovenia dedicated only 14% of these resources to similar objectives. (Fargion and Profeti 2016, 480) At the same time these funds could be distributed differently among explicitly social (inclusion, social infrastructure) and economic-type social priorities (employment and related directions). In case of Sweden, the county allocated almost 40% of the funds devoted to social objectives to employment and human resource development measures, while giving less than 2% for the explicitly social priorities. (Fargion and Profeti 2016,

481) On one hand, this and the typology of welfare states (Esping-Anderson and Myles 2011) complements the role of country effects, on the other hand may imply that the open method of coordination and the economic logic may have weakened the effectiveness of social policy.

Secondly, it can be argued that the present research is structurally biased towards underestimating the social effects of ESI Funds and Cohesion policy, partially resulting from missing data, partially due to research design, and partially due to the nature of the research. Missing data concerning the United Kingdom and Poland is likely to have affected the research negatively, as these countries are populous countries, with relatively large number of NUTS-2 units with significant regional differences in social conditions. The lack of Polish regional data is especially unfortunate, as Poland received the largest sum of ESIF financial resources, the risk of poverty or social exclusion rate decreased from 34.4% to 17.3% between 2007 and 2013 (Eurostat), and it is the most populous post-socialist Member State, with the highest number of NUTS-2 regions. Including data from Polish NUTS-2 regions (through the relatively high number of observations accounting, and a remarkable decrease in poverty) might have slightly increased the estimated effect of ESIF spending and could have accentuated the post-socialist-non-post-socialist difference (even though it is possible that the rather high number of EUR millions could just as well diminish the effects in these models).

As for research design, the dataset composed for the purposes of the present research contains ESIF expenditure aggregated into one number to each NUTS-2 region for each year. All ESIF expenditure means that not only the ERDF, the ESF, and the CF is included under the mod_an_ex_mil (ESIF expenditure) variable, but the European Maritime and Fisheries Fund (EMFF) and the European Agricultural Fund for Rural Development as well, which two has only distant and indirect links to social policy. While this may fit the economic logic of cohesion policy,

it can cause the underestimation of those financial instruments that were actually (partially) aimed towards social objectives. Another issue is the loss of observations when it comes to those regressions that include lagged terms as well. As the dataset was composed to contain EU ESIF expenditure between 2007 and 2018, the inclusion the delayed effects (five years later) into the regressions is only possible for the years 2007-2013. Although the loss of more than half of the observations is a negative in itself, the bigger problem is that by losing observations about the second part of the time interval in focus, the results are only presenting the achievements from 2007-2013 program period, and overrepresent the Lisbon II era best characterized by the terms "jobs and growth" and underrepresents the more social Europe 2020 period. In addition, the ESIF spending values include programs and projects that were adopted in an earlier programming cycle (and under a previous strategy) but payments were made during the next period which increases the bias towards past, more economic and least social EU Cohesion policies.

All uses of ESI Funds that are somehow against the general idea of economic and social cohesion, or poverty reduction can fall under third possible explanation of the weak effects of ESI Funds. However, detailed discussion of these uses and their social policy relevance would fall outside of the scope of the present research. Instead, the following example should illustrate how ESIF resources can be mishandled even without explicitly bad management incompetence or directly criminal activity.

> In 2017, Nyíregyháza town in North-Eastern Hungary received ERDF and ESF funding for two projects, titled "Social urban rehabilitation in segregated areas of Nyíregyháza" (TOP-6.7.1.-NY1-2017-00001) and "Together for the way out" (TOP.9.6.1-16-NY1-2017-0001). The funds were given for municipal housing development, social integration and desegregation. The main elements of the project were the demolition of a segregated Roma-majority housing estate, Keleti lakótelep (Estates I) and the development of municipal housing in another segregated area of Nyíregyháza, Huszártelep (Estates II). However, in contrast to the declared principles and objectives of the funding agreement, the Operative Program, and EU laws and strategies, the project resulted in the resegregation of 131 Roma residents out of 157 from Estates I into Estates II. The demolition of the segregated Estates I meant that the residents

> were moved to the segregated Estates II. Estates II is also in the immediate vicinity of the segregated Sója Miklós Greek Catholic Kindergarten and Primary School, which had been closed down due to "unlawful separation" (segregation), but then was allowed to reopen and is now also a Roma majority school. During the relocation from Estate I to Estate II some residents were reportedly persuaded or coerced, such as threatening to take away the custody of the children from parents, if the parents' housing situation is not settled to the satisfaction of the municipality. At the same time some households were evicted in Estates II. Although the renovated properties in Estates II provide better living conditions than those in the late Estate I, some families with multiple children and/or multi-generational households find them renovated dwellings crowded, inadequate. The persons affected are offended by their resegregations. Following the moves/relocations, most of the children arriving to Estate I, who took part in integrated education previously have been transferred to the segregated, due to its proximity and accessibility (the lack of school bus service may play a role). While Hungarian authorities responsible for the implementation of ESI Funds did not start legal procedure, the European Commission found the project retrospectively ineligible, 1.7 billion HUF (roughly 4.3 million EUR) is to be repaid. The municipality maintains that the program benefits the local Roma and is in line with their social integration policies. Fundamental rights proceedings are still ongoing. (Czinkóczi 2022, Hátrányos Helyzetű Családok Országos Egyesülete 2022, Egyenlő Bánásmód Hatóság [Equal Treatment Authority; Hungary] 2020)

Similar problematic uses, have been reported from other Hungarian settlements, (Doros 2017, Hátrányos Helyzetű Családok Országos Egyesülete 2021) from Romania, Estonia, Poland, etc. (S. Allen 2021, Validity Foundation 2020) where ESIF funds were implemented contrary to cohesion or social objectives and contrary to EU principles. Evidence from Poland and Hungary suggest that ESI Funds may contribute to territorial disparities within countries in case where political loyalty interferes with ESIF resource distribution, and/or there is a lack of *"differentiation between the more and the less prosperous regions"*. (Medve-Bálint 2017) As for corruption, in some countries the presence of ESI Funds may even increase corruption risks. (Fazekas and Tóth 2017) These problems are encoded in the system, as EU Cohesion policy historically came with a principal-agent dynamic and relatively weak control-mechanisms. (Blom-hansen 2005) These third set of concerns are not specific to social impact, but as Cohesion policy is the main vehicle of European Social policy, its issues filter into the questions of social impact as well.

7. Conclusion

The present research started out with three questions. As for the poverty target, (1) the poverty rate is above 20%, more than 90 million people are at risk of poverty or social exclusion in the EU. The European Union did not "lift" 20 million people out of poverty. As for the impact of ESI Funds (2) the effect is close to zero, even if delayed effects are accounted for. The level of poverty is more determined by county specific factors, while changes in poverty are closely tied to general time sensitive trends, for example the Global Financial Crisis and the recession, which means that factors external to EU Social or Cohesion policy have more impact on the state of poverty than EU policies. This can be explained by the omnipresent economic logic in social policy, or the secondary position of social considerations compared to economic objectives. It is also possible that the open method of coordination gives to much leeway for Member States in the implementation of social policies and its targets. The many accounts of corruption, mishandling, political bias, local level discriminatory behavior can also weaken the possible impact made by one additional million EUR in ESIF funding. However, the limitations of the present research addressed in Chapter 6 may have caused the results (expectedly low) to be underestimated, due to missing data and the bias in the research design towards the "less social" periods of the 2007-2018 interval. For post-socialist Member States and regions (3) the effects are slightly stronger, but the volume of effects and the many statistically insignificant results indicate that at this point it cannot be stated that ESIF funds contributed more to the decrease of the risk of poverty or social exclusion rate in post-socialist regions than the EU average.

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