

ORIGINAL ARTICLE

Poverty in Europe: How long-term poverty developed following the financial crisis and what drives it

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Email: axel.franzen@unibe.ch**Abstract**

The purpose of this paper is to provide an update on the development of the long-term relative poverty rate in Europe. We use European Statistics on Income and Living Conditions data (EU-SILC) for 26 European countries between 2009 and 2018. In addition to describing the development of long-term poverty, we also analyse the drivers of poverty on the country level via fixed effects panel regression analysis. We are particularly interested in how economic growth, employment rates, social expenditure, and short-term poverty rates are related to long-term poverty. Overall, the results show that long-term poverty has increased in 13 out of 26 countries, but was unchanged or decreased in 13 countries. Gross domestic product growth is not related to the development of long-term poverty. However, we find that male employment and social welfare expenditure reduce poverty rates. Furthermore, short-term poverty is negatively associated with long-term poverty. Hence, short-term poverty and long-term poverty rather substitute than complement each other.

KEYWORDS

current poverty, EU-SILC data, fixed effects panel regression, long-term poverty, relative poverty

INTRODUCTION

Europe and the world have experienced almost constant economic growth in the past several decades. However, this is only one side of the coin. In academic, public, and political discussions, rising income inequality has become a major concern. For example, Nobel prize-winning economist Angus Deaton wrote ‘While I do not believe that there is any statement about income inequality that is true in every country of the world—except that it is difficult to measure—it is clear that the general trend has been towards higher income inequality, especially in

recent years’ (Deaton, 2013, p. 259). Similar conclusions are drawn in many other studies on inequality (e.g., Keeley, 2015; Piketty & Saez, 2014; Wilkinson & Pickett, 2009). In this paper, we focus on the lower end of the income distribution—the poor, and particularly on that part of the population that remains in poverty for a longer period. We want to shed light on the most recent development of long-term poverty in the aftermath of the financial crisis in 2008. We use European Statistics on Income and Living Conditions (EU-SILC) data for 26 countries. The SILC data are gathered via personal or telephone interviews in a 4-year rotating panel. Hence,

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we can describe countries' poverty rates during seven 4-year time spells starting with 2009–2012 up to and including the period of 2015–2018.

Poverty research is relevant from a sociological perspective because it has major consequences on the living conditions of the affected individuals. Peter Townsend (1979, p. 31) wrote the 'resources [of the poor] are so seriously below those commanded by the average individual or family that these are, in effect, excluded from ordinary living patterns, customs and activities'. More particularly, poverty leads to shorter life expectancy (Chetty et al., 2016), bad health (e.g., Bor et al., 2017; Madden, 2015; Wagstaff, 2002), depression (Abbott & Wallace, 2014; Riumallo-Herl et al., 2014), low educational performance (e.g., Blanden & Gregg, 2004; Ferguson et al., 2007), and low social and political participation (Mood & Jonsson, 2016). Poverty not only creates problems for the affected individuals, but high levels of poverty—and therefore unequal living conditions—may also jeopardise the social order and cohesion of societies. Hence, countering poverty is a major goal of practically every Western welfare state as well as of the European Commission (European Commission, 2010).

Cross-sectional poverty indicators tell us how many households or individuals live in poverty in a given year. This information is of course interesting and informative, but it tells us only one part of the story. The other interesting question is how long households stay in poverty and whether or not they succeed in leaving this state again. Long-term poverty is often defined as households that stay in poverty for more than 2 years. A short period of poverty has a lower impact on the living conditions of individuals. Savings, assets, or financial aid from relatives can compensate for short periods of economic hardship. However, if spells of poverty become longer or more frequent, savings vanish and poverty will have a more serious impact on individuals' living conditions, health, and ability to participate in social life (Corcoran, 1995; Holmes & Kiernan, 2013; Whelan et al., 2003). This is one reason why long-term poverty should receive special attention. The other reason is that the current relative poverty rate is susceptible to small changes in income located around the poverty threshold. Hence, small changes in income may lead to shifts in the poverty rate without substantial changes in living conditions. A long-term poverty measure is more robust with regard to this problem since short periods of poverty do not affect it.

This article is structured into five sections. In the second section, we briefly discuss the literature concerning poverty rates, particularly long-term poverty rates in Europe. Furthermore, we discuss the main macro-economic drivers of poverty as well as institutional differences as described in the literature. The third

section describes the EU-SILC data we use. The fourth section presents the latest trends in long-term poverty for 26 European countries. Furthermore, the section describes the multivariate panel data analyses and presents the results concerning the main drivers of poverty rates. Finally, the last section summarises and discusses the main findings.

LITERATURE REVIEW

While there is a great deal of literature that describes and analyses absolute poverty rates (e.g., Bárcena-Martín et al., 2014; Dudek, 2019; Duiella & Turrini, 2014; Nelson, 2012; Nolan & Whelan, 2010; Whelan et al., 2004; Whelan & Maître, 2012), or relative poverty rates (e.g., Alper et al., 2021; Bosco & Poggi, 2020; Caminada et al., 2012; Cammeraat, 2020; Cantillon, 2011; Duiella & Turrini, 2014; Nelson, 2013), research devoted to long-term poverty is sparse. The existing articles present mainly descriptive results (Layte & Whelan, 2003; Maître et al., 2011; Vaalavuo, 2015), focus on the causes of entry into and exit from poverty at the individual level (Andriopoulou & Tsakoglou, 2016; Polin & Raitano, 2014; Şeker & Dayioğlu, 2015), or have used cross-sectional analysis to determine macro-level characteristics on poverty rates (Ingensiep, 2016). However, to date, there is no study examining macro-level effects on long-term poverty in Europe using a panel regression approach. The main reason for this gap is the lack of availability of longitudinal data. In the past, such data was available only for selected countries such as the USA, the UK, the Netherlands, or Germany. This situation improved when the European Statistical Office (Eurostat) started the European Community Household Panel Survey (ECHP) in 1994. The ECHP collected income data from representative samples of households over 8 years which allows the observation of household income dynamics. A first analysis of this data with respect to poverty was presented by Layte and Whelan (2003). One of their main findings is that many more households experience poverty during a 4-year time span as compared to the proportion falling under the current poverty definition in a given year. However, long-term poverty, that is, being poor for 3 or 4 years is relatively rare. Hence, a large number of households move in but also out of poverty during a 4-year period. Ingensiep (2016) uses EU-SILC data (the continued ECHP) from 2005 to 2012 to describe the development of long-term poverty rates. She concludes that long-term poverty increased during this period in every country besides Poland.

The purpose of our study is to replicate and extend the analysis of Layte and Whelan (2003) and Ingensiep

(2016). Layte and Whelan (2003) compare the poverty rates for 15 countries in the period 1994–1998. Ingensiep (2016) compares the long-term poverty rate of 19 countries for the period of 2005–2012. Our analysis extends former research by incorporating all 4-year spells of the EU-SILC data starting in 2009 after the financial crisis. Hence, we observe long-term poverty for seven 4-year spells in 26 countries. Because of the increased number of available time spells as well as the number of countries it is now also possible to analyse the data via fixed effects (FE) panel regressions at the country level. Such an analysis is better suited for a causal investigation of macro-economic effects on countries' poverty rates than ordinary OLS or logistic regression approaches.

As does most poverty research, we use a relative poverty definition and measure the proportion of individuals whose household equivalence income is below 60% of a country's median income (e.g., Krämer, 2000). In addition to describing the trend, we are also interested in how key macro-economic characteristics such as economic growth, employment rates, and countries' social expenditure influence poverty rates. The effect of economic growth on relative poverty rates is theoretically indeterminate and an empirical question. If all income groups profit proportionately from economic growth then relative poverty rates should remain unchanged with increasing gross domestic product (GDP). But if the income of the non-poor rises disproportionately more, GDP growth leads to a rise in poverty. Only if the poor benefit more than the non-poor, can relative poverty rates diminish. This scenario is also referred to as 'pro-poor growth' in the literature (e.g., Kakwani & Pernia, 2000). With respect to absolute poverty, empirical research mostly finds that economic growth decreases poverty (Bárcena-Martín et al., 2014; Dudek, 2019; Duiella & Turrini, 2014; Kraay, 2006; Škare & Pržiklas Družeta, 2016; Whelan & Maître, 2012).

Relative poverty rates are less responsive to growth than absolute poverty rates. Dollar and Kraay (2002) and Dollar et al. (2016) analyse more than 120 countries and find that the income of the poor benefit proportionately to the income of the non-poor during periods of economic growth. However, more recent panel studies of European countries show mixed evidence. Bosco (2019) uses a quantile regression approach for 31 European countries for the time span of 2002 until 2011. He uses the 'at risk of poverty and social exclusion' (AROPE) measure of Eurostat as the dependent variable which considers households falling either into relative poverty, absolute poverty, or low work intensity. He finds that income growth leads in all poverty quantiles to a reduction of the AROPE. Cammeraat (2020) applies a FE panel regression for 22 European countries from 1990 to 2015

and reports that a 1% GDP increase decreases relative poverty by 0.15%. He uses OECD data and 50% of the national median income as the relative poverty threshold. But there are also studies reporting zero effects. Caminada et al. (2012) find no effects of GDP on relative poverty rates for 22 OECD countries for the five-observation points of 1985, 1990, 1995, 2000, and 2005. This result is also confirmed by Duiella and Turrini (2014), Domonkos and Ostrihoň (2015), and Bosco and Poggi (2020). Summing up, evidence to date finds predominately no relation between GDP growth and relative poverty. Hence, we expect that this zero effect also holds true for the most recent time span of long-term poverty. This is hypothesis 1.

Unemployment is of course a major risk to fall into poverty. Accordingly, growth in employment should lead to reductions in relative poverty. However, an analysis by Cantillon (2011) between 2004 and 2008 for 27 EU countries did not find any relationship between employment and relative poverty. Cantillon (2011) concluded that jobless households were only sparsely affected by job growth, and that wealthy households profited more from employment growth. Moreover, if employment growth occurs predominantly in low-paid sections of the labour market, the newly created jobs may promote in-work poverty. Hence, the relationship between change in the rate of employment and poverty is not as straightforward as it appears at first glance. Marx et al. (2012) investigated the effects of employment on the poverty rate via a simulation study. Among others, they differentiate two scenarios: (1) the effect of an increase in the employment rate to 75% for the poverty rate of the working-age population (20–64), and (2) for the poverty rate of the whole population. In Scenario 1, the majority of the countries experience a fall in relative poverty rates. But in Scenario 2, almost half of the countries experience a rise in the relative poverty rate. Marx et al. (2012) conclude that newly employed individuals indeed move out of poverty. But this change in employment also affects the median income and hence the poverty threshold and deteriorates the relative position of others, for example, elderly people or people depending on social transfers. In a more recent study, Gábos et al. (2019) examine employment and poverty dynamics before and after the financial crisis. Their panel regression analysis reveals a negative relationship between employment and poverty in 27 EU countries from 2005 to 2012 for the population aged between 20 and 59. The results, therefore, support the simulation results of Marx et al. (2012) for Scenario 1. Also, Scenario 2 is supported by a recent panel analysis of 22 EU member states between 1990 and 2015 by Cammeraat (2020). His analysis uses the whole population and reveals no relationship between the unemployment rate and poverty.

Furthermore, the effect of employment depends on the type of employment. Previous research found a positive relationship between low-wage jobs and relative poverty (Alper et al., 2021; Crettaz, 2013; Lohmann & Gießelmann, 2010). A more recent panel analysis for Germany from 1992 to 2011 supports these findings. Brülle et al. (2019) find that relative poverty in Germany increased by 2 percentage points. Most of this increase (92%) is due to the increase in low-paid jobs. Hence, the effect of an employment increase on the relative poverty rate of the whole population depends on the type of jobs created in an economy. Employment growth can decrease poverty if the benefit to the poor is over-proportionate, and if the new jobs are created not only in low-wage sectors.

The reasoning that higher employment should decrease poverty rates applies also, or even more so, to the female employment rate. Assuming that the main breadwinners are still males in most European countries, one would expect that female labour market participation does not substitute male incomes but complements the household income. In particular, women in poor households have a higher need to participate in the labour market, and their additional income should improve the household income of the poor, in turn decreasing the poverty rate. Hence, the findings of the effects of employment on poverty are very mixed. The effects depend on the type of jobs that were created in a certain time period. The way how the European labour market changed after the financial crisis is highly speculative. Hence, we assume that both low-paid and high-paid employment increased proportionately in most countries leaving a neutral effect on poverty rates. Therefore, we hypothesize that there is on average no effect of employment on the long-term poverty rate. This is hypothesis 2.

Another important factor in poverty rates is the social security spending of governments. Social expenditures are implemented by welfare states to redistribute income from the rich to the poor. Hence, the more a country spends on social security the lower should be relative poverty rates. This hypothesis seems to be confirmed by the literature (e.g., Bosco & Poggi, 2020; Caminada et al., 2012; Jenkins, 2000). Notten and Guio (2019) find reductions in relative poverty rates of between 51.2% and 64.8% for Germany, Poland, Greece, and the UK by comparing household incomes before and after receiving social security funds. However, their analysis takes only direct transfers into account, not government spending on social services and institutions. Cammeraat (2020) uses countries' total social expenditure as a percentage of GDP and finds that an increase in social expenditures by 1% leads to a decrease in relative poverty of 0.337%.

So far, only the study by Ingensiep (2016) examines the relationship of macro-economic drivers on persistent poverty. Ingensiep (2016) conducts a cross-sectional analysis of the individual data and estimates the effects by assigning the macro characteristic (e.g., a country's social protection expenditure) to every individual in a given country. Taking four 4-year periods from 2006 to 2012 for 19 European countries into account, she finds that an increase of social protection expenditures by 1 percentage point of GDP decreases the probability of being persistently poor by between 0.011 and 0.024. However, her statistical model is not an optimal use of the data structure since causal hypotheses can be better tested via FE panel regressions (Brüderl & Ludwig, 2015; Wooldridge, 2010). Hence, we conduct FE panel regressions at the country level for seven 4-year periods from 2009–2012 to 2015–2018 in 26 European countries. In line with previous findings, we hypothesize that increases in social protection expenditures decrease long-term poverty rates. This is hypothesis 3.

To sum up, the purpose of this study is to investigate the trend in countries' long-term poverty rates and to identify the main macro-economic drivers of its development. Given previous research findings that increase in GDP are not related to relative current poverty rates, we expect that long-term poverty has also not decreased during the last 10 years. Hence, consistent with previous findings, we expect that GDP changes are not related to long-term poverty rates (Hypothesis 1). Concerning the effect of employment, previous research found different results depending on whether employment growth occurred predominantly in the low-paid sector or in the more well-paid parts of the labour market. Given these undetermined findings, we also expect to find no relation between employment rates and long-term poverty. As a matter of fact, individuals with long-term poverty should find it harder to return to the labour market. Hence, they should profit less from employment growth leaving long-term poverty rates unchanged (Hypothesis 2). Finally, the existing literature suggests that countries' spending on social welfare reduces poverty rates. This effect should be stronger for long-term poverty as compared to current poverty since individuals in long-term poverty are more dependent on social transfers (Hypothesis 3).

DATA AND METHODS

To describe and analyse the recent trend in long-term poverty we use the EU-SILC. EU-SILC is a coordinated survey on the income and living conditions of individuals in private households in 31 European countries. The data is collected in each country by the national statistical

offices and is harmonised and provided by Eurostat. EU-SILC is designed as a rotational 4-year panel. Each year a random sample of private households is drawn and surveyed for four consecutive years. In some countries (Denmark, Finland, the Netherlands, Norway, Sweden, and Slovenia) some of the data (e.g., income) are retrieved from administrative sources, but in most countries, the data are obtained by survey interviews. The mode of data collection varies between the countries. In some countries, the surveys are conducted via personal interviews (face-to-face), while others use telephone interviews, and Germany conducts the data collection via a web-based online survey (for a critique of these differences in the data collection see Iacovou et al., 2012; Polin & Raitano, 2014).

Most countries use either simple random sampling (Denmark, Malta, and Norway) or stratified random sampling where the geographical region is the main stratification criterion. All members of the selected households aged 16 or older are surveyed. The individual response rates vary between 37% (Denmark in 2015) and 96% (Romania in 2014). Since EU-SILC is a rotational panel, the cross-section for each year consists of four groups; individuals who are interviewed for the first time, the second time, the third time, and the fourth time. Eurostat provides weights to account for selection probabilities, non-response rates, and characteristics of households and individuals (e.g., sex and age) (Eurostat, 2020). Generally, attrition is an issue in longitudinal data collection, and this is also true in some countries included in EU-SILC (see Jenkins & Van Kerm, 2017). This attrition can be incorporated by using an appropriate weight. However, in our case incorporating this weight does not influence the results and hence we are not using longitudinal weights.

The number of surveyed individuals varies in the longitudinal 4-year time periods from 1661 in Denmark (2010–2013) to 13,037 in France (2008–2011). The detailed number of observations is reported in the supplement (Table S3a–c). In each cross-section, the number of observed individuals differs from a minimum of 9283 in Cyprus in 2009 to a maximum of 56,447 in Greece in 2018 (see Table S4a–c). Since a description of the long-term poverty rate for the period of 2005–2012 is already contained in Ingensiep (2016), our analysis focuses on the development following the financial crisis until 2018. Therefore, we use seven sequential 4-year periods from 2009 to 2018 to obtain the long-term relative poverty rates. A more detailed description of the data structure is contained in Figure S5. Longitudinal data is available for 27 of the 31 countries in our observation period. However, for Germany data exists only for the most recent 4-year period, and hence, has only one observation period. Furthermore, robustness checks identified

Hungary as a statistical outlier. Therefore, the panel analysis with respect to long-term poverty is based on 25 countries.

Because income is usually shared between household members, we use the households' equivalence income for each individual as provided by Eurostat. It is calculated by summing up all individual net incomes generated in a household and by dividing this sum by the weighted number of household members. Following the definition of the OECD, the first adult receives a weight of one, each additional household member aged 14 or older has a weight of 0.5, and each child below the age of 14 receives a weight of 0.3. The relative poverty rate is defined as the ratio of individuals who have less than 60% of the equivalent national median household income. We define individuals as long-term poor if they fall under this 60% threshold for 3 or 4 years in a 4-year time spell. In contrast, short-term poverty is defined as individuals being poor for 1 or 2 years.

Since we are interested in the macro-economic determinants of the long-term poverty rates our data consists of 25 countries (units of analysis) which are observed for seven 4-year time spells starting from 2009–2012 to 2015–2018. Hence, we have panel data consisting of 173 observations (24 countries times seven 4-year spells, plus Switzerland for which the data is only available for five 4-year time spells). The data structure allows us to differentiate between individuals who never fell into poverty during a given 4-year time spell, who went into poverty during 1 or 2 years (short-term poverty), or who spent 3 or 4 years in poverty (long-term poverty). Since we have panel data which describes the trend of the countries' poverty rate for the seven time spells we employ a FE panel regression approach. FE regressions only analyse the within-unit variances by demeaning the data as shown in (1):

$$y_{it} - \bar{y}_i = (x_{it} - \bar{x}_i)\beta + \varepsilon_{it} - \bar{\varepsilon}_i, \quad (1)$$

where y_{it} denotes a country's (i) poverty rate in year t and \bar{y}_i the countries' average poverty rate for the whole observation period. x_{it} denotes the vector of the exogenous variables for country i in time t , and \bar{x}_i the averages for the whole observation period. FE panel regressions have the advantage of taking only the within-country variation into account, and not the between-country differences. This avoids biased estimates due to unobserved heterogeneity between the countries. Furthermore, estimates can also be biased due to unobserved heterogeneity in time-varying variables (or different slopes or trends). The problem of different slopes can be taken into consideration by estimating FE individual slopes (FEIS) models. FEIS estimators are obtained by applying pooled OLS regression to the detrended data (Brüderl & Ludwig, 2015;

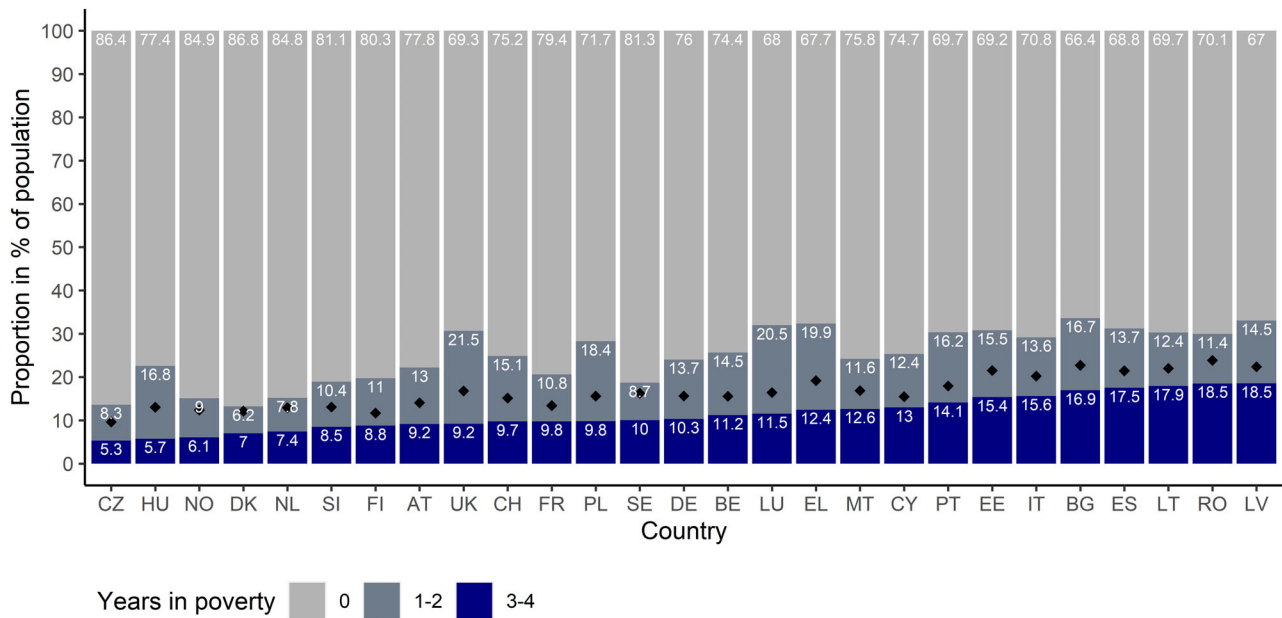


FIGURE 1 The proportion of the population in poverty by duration in the period 2015–2018. Note: Data base is the EU-SILC from 2016 to 2019 which refers to the income conditions in 2015 to 2018. Countries are ranked according to the proportion of individuals falling for three or four years under the 60% of median income poverty definition.

Rüttenauer & Ludwig, 2023; Wooldridge, 2010). The model can be written as

$$\tilde{y}_{it} = \tilde{x}_{it}\beta + \tilde{\varepsilon}_{it}, \quad (2)$$

where \tilde{y}_{it} denotes the detrended values of the dependent variable and \tilde{x}_{it} a vector of the detrended independent variables. We regress detrended poverty rates on detrended GDP, employment rates and countries' social protection expenditures. The effects can be causally interpreted under the assumption that none of the exogenous variables x_{it} is correlated with the error ε_{it} . The assumption is known as the strict exogeneity assumption. The data for countries' GDP, employment rates and social protection expenditures are provided by Eurostat (2021). The latter includes expenditures on old age pensions, sickness and healthcare benefits, social support for families and children, and unemployment payments. The statistical analyses are conducted with the software packages R 4.0.3 and STATA 16.0.

RESULTS

Figure 1 depicts the proportion of the population that falls under the relative poverty definition of having less than 60% of the median income from 2015 to 2018, which is the latest available 4-year spell. The graph describes the proportion of four different groups. First, the light grey

section of the bars shows the proportion that experienced no poverty at all during the 4 years. Second, the dark grey bars show the proportion that experienced short-term periods of poverty by falling once or twice under the poverty threshold within the 4-year period. Third, the lower section of the bars depicts the proportion of inhabitants living in long-term poverty, that is, 3 or 4 years. Fourth, the black rhombus in each bar depicts the proportion that falls under the poverty definition in a given year termed current poverty. Cross-sectional data would only reveal this proportion. However, the panel data show that the proportion of those who report living in low-income conditions at least once during a 4-year time spell is larger than the cross-sectional proportion. For some countries, this difference is quite substantial. For instance, for the UK the cross-sectional data shows a poverty rate of 16% (average of the 4-year period), but 30.7% of the population experienced poverty at least once during the observed time span. The data also reveal that in most countries the long-term poverty rate is much lower than the short-term poverty rate. However, this is not true for the Baltic countries (Lithuania, Estonia, Latvia), some Eastern countries (Romania, Bulgaria), and some Southern countries (Italy and Spain) that experience high long-term poverty rates within Europe. The countries with the lowest long-term poverty are Hungary, the Czech Republic, and the Northern European countries, that is, Norway, Denmark, and the Netherlands. Overall, the

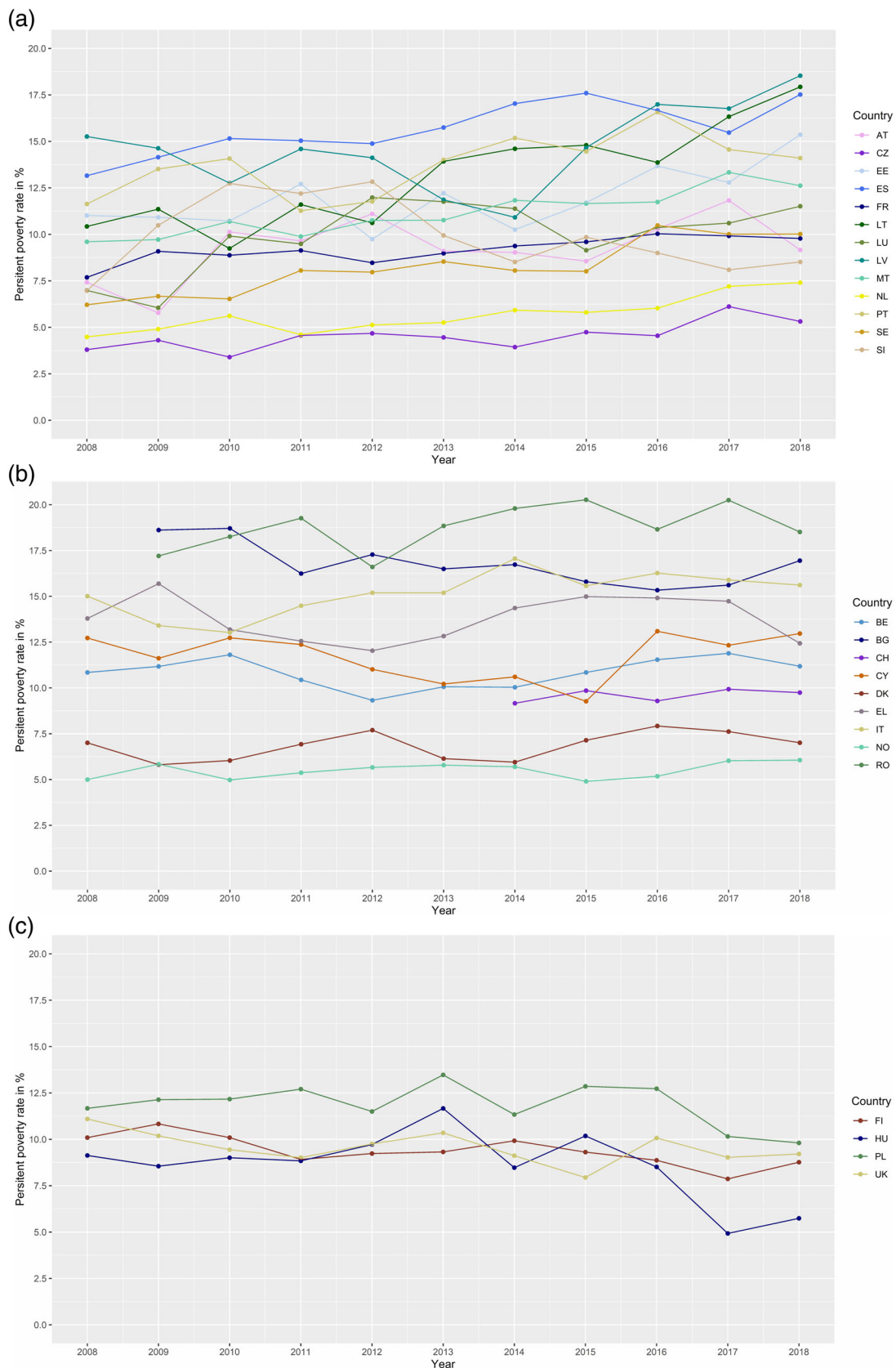


FIGURE 2 (a) Countries with increased long-term poverty rates. (b) Countries with unchanged long-term poverty rates. (c) Countries with decreased long-term poverty rates. Note: Data base is the EU-SILC from 2005 to 2019, referring to the income conditions in 2005 to 2018. Countries are grouped according to their trend in long-term poverty. We compared the first and the last year and assigned the countries to the various groups according to the results of a t-test.

TABLE 1 Panel regression analysis of current and long-term poverty rates.

	Current poverty rate		Long-term poverty rate		
	FEIS estimator		FEIS estimator		
	(1)	(2)	(3)	(4)	(5)
GDP per capita in 1000 EURO	−0.450*** (0.134)	−0.302 ⁺ (0.174)	0.396 (1.139)	−0.714 (0.847)	−0.646 (0.773)
Male employment rate	−0.041 (0.266)	0.129 (0.267)	−4.528** (1.622)	−4.718** (1.553)	−4.410** (1.393)
Female employment rate	−0.554 (0.321)	−0.538 ⁺ (0.320)	2.804 ⁺ (1.555)	1.240 (1.107)	1.738 ⁺ (1.048)
Social expenditures in % of GDP	−0.346** (0.114)		−1.136 ⁺ (0.583)		
Unemployment exp. in % of GDP		−0.035 (0.084)		0.070 (0.396)	0.070 (0.363)
Pension and survivor exp. in % of GDP		0.110 (0.252)		−3.260*** (0.860)	−2.248** (0.907)
Sickness and disability exp. in % of GDP		−0.230 (0.169)		0.270 (1.152)	−0.237 (1.088)
Family and child benefits in % of GDP		−0.064 (0.098)		0.128 (0.548)	0.205 (0.551)
Short-term poverty rate					−0.277*** (0.080)
Within R ²	0.18	0.18	0.06	0.13	0.20
<i>n</i>	30	30	25	25	25
<i>n</i> × <i>T</i>	300	300	173	173	173

Note: Unstandardized regression coefficients of logarithmized variables with standard errors in brackets. The effects can be interpreted as elasticities. All standard errors are panel-robust. Iceland is an outlier and excluded in Models 1 and 2. Hungary is an outlier and excluded in Models 3–5. The data source is the EU-SILC Cross and Long UDB 2010–2019—version of 2021–3 for the poverty rates. GDP, employment rates, and social protection expenditures are from Eurostat (2021).

Abbreviations: FEIS = fixed effect individual slope; GDP = gross domestic product.

⁺*p* < 0.10, **p* < 0.05, ***p* < 0.01, ****p* < 0.001.

distribution depicted in Figure 1 demonstrates that there are substantial differences in Europe with respect to long-term poverty ranging between 5% and 6% at the bottom of the distribution to 15% and 18% at the top.

Table S1a,b contains more detailed information and indicates the proportion of the population suffering from poverty by the exact number of years for the periods 2007–2010, 2011–2014, and 2015–2018.

Next, Figure 2 shows the trend of long-term poverty from 2008 to 2018. Each year represents the last year of the 4-year observation period. We grouped countries into those that experienced an increase in poverty, those with unchanged poverty rates, and those with decreased poverty rates. As can be seen from Figure 2, half (13/26) of the countries for which the data is available experienced an increase in long-term poverty, but nine experienced no change, and poverty rates decreased in four countries. All groups are fairly heterogeneous. For instance, the group with increasing rates contains mostly East and South European countries. Only five of the wealthy mid and northern European countries (Austria, France, Luxembourg the Netherlands, and Sweden) are in this group. The other middle and northern European countries experienced either no change in long-term poverty (Belgium, Switzerland, Denmark, and Norway) or even a decrease (Finland and the United Kingdom). 58% of the population of the 26 observed countries are located in countries with

unchanged or decreased long-term poverty. Overall, the long-term poverty rate increased by 1.38 percentage points between the first observation point and the last. This increase is statistically not significant ($t = 1.25$, $N = 52$).

The results of the FEIS panel regressions are shown in Table 1. First, we analyze the current poverty rate in Models 1 and 2. Hence, Models 1 and 2 are a replication of Caminada et al. (2012), Duiella and Turrini (2014), Bosco (2019), and Cammeraat (2020). Models 3–5 estimate the effects of GDP, employment, and social expenditure on the long-term poverty rate. In Models 1 and 2, values of the independent variables (GDP, employment, and social expenditures) are used on a yearly basis. However, for the analysis of long-term poverty, we use the rolling 4-year averages of the periods for which we observe the long-term poverty rates. The analysis of the current poverty rate is based on 30 countries. We excluded Iceland from the regression because it causes non-robust coefficients. Model 1 shows that GDP is statistically significantly related to the countries' current poverty rate. Since we use the natural logarithm of all variables, all coefficients in Table 1 can be interpreted in terms of elasticities. Hence, the effect of GDP means that the current poverty rate diminished by 0.45% with every percentage increase in GDP in the decade from 2009 to 2018. This finding rejects Hypothesis 1 and supports the results of Bosco (2019) and Cammeraat (2020). It means

that the lower incomes did profit over-proportionately from economic growth after the financial crisis.

Furthermore, the analysis (Model 1 in Table 1) shows that female and male employment rates have no statistically significant effects on current poverty rates which is in line with most evidence reported in the literature. Theoretically, employment rates only reduce current poverty if the incomes generated are above the 60% median income of a country. This was not the case in most European countries in the last decade, and employment seems to have benefited all labour market sectors (low-paid and otherwise) leaving the current poverty rate unchanged.

Countries' social welfare spending is associated with lower current poverty rates as expected by Hypothesis 3. Surprisingly, the relation of governmental social spending with the current poverty rate is relatively modest; a 1% increase in social expenditure (in terms of the proportion of GDP) is associated with a decrease in the current poverty rate by only 0.35%. Eurostat distinguishes social expenditures into six categories which in theory enables a more detailed analysis of the effect of different types of social expenditures. However, our analysis reveals that the decomposition of the expenditure variable does not produce any statistically significant effect for any subgroup (see Model 2 of Table 1). Hence, the beneficial effect of total social expenditure is due to the sum of the subcategories, and not caused by any specific subcategory.

Next, we repeat the analyses with the long-term poverty rate, that is with the proportion of the population that falls under the poverty rate for 3 or 4 years. First of all, GDP is not related to long-term poverty (Models 3–5 in Table 1). This finding is surprising since GDP is negatively associated with the current poverty rate. However, male employment rates and also social expenditure are negatively related to long-term poverty. The effect of male employment is strong; a 1% increase in employment decreases long-term poverty by more than 4%. Also, the dampening effect of social expenditure is much stronger with respect to long-term poverty as compared to current poverty. An increase in social expenditure by 1% decreases long-term poverty by 1.14%. Moreover, a decomposition of social expenditures suggests that the effect is due to expenditures for survivors and old age pensions. Finally, in Model 5 we investigate how short-term and long-term poverty are related. The result indicates a negative relation between the two. If short-term poverty increases long-term poverty decreases. At first glance, this effect looks counterintuitive, since one might think that short-term poverty leads to long-term poverty as is the case for individual poverty trajectories. But on the country level, it might be the case that a country has a large proportion of individuals living in long-term poverty, but only a small proportion with short poverty spells

(see Romania), or vice versa. An example of the opposite pattern is the UK which has relatively high short-term poverty rates and relatively low long-term poverty rates. A good number of individuals fall into poverty, but they also manage to move out of it again, leading to low long-term poverty rates. The results of Model 5 in Table 1 says, that this pattern applies to most countries in Europe.

All estimates reported in Table 1 were tested extensively for robustness. First, all models were repeatedly analysed excluding one country each time from the regression. All results depicted in Table 1 remained robust, meaning that the results are not driven by a single country. Second, we trimmed the income distribution of all countries and for all years by the top 1% and the bottom 1%. All results displayed in Table 1 are robust to this trimming of the income distribution. Third, we repeated the analysis of Models 3–5 with weighted poverty measures, as suggested by Jenkins and Van Kerm (2017) and find only minor differences in the coefficients. Forth, all parameters are checked for non-linearity via penalised splines FEIS regressions (Ruppert et al., 2003). Fifth, we also controlled for possible autocorrelation and heteroscedasticity of standard errors by using panel-robust standard errors. Sixth, we conducted the Frank test (Frank et al., 2013) examining the proportion of cases that would have to change to make the effects insignificant. The proportion of cases necessary to change our results varies between 21% (for social expenditures in Model 5) and 48% (for social expenditures in Model 4). Hence, the results are very robust. Furthermore, we conducted the Hausman test (Croissant & Millo, 2008; Hausman, 1978) to find out if the estimates of the FE regression model differ from the estimates of a first-difference model. This is not the case and suggests that there are no substantial feedback effects. Finally, we also considered if the effects of employment and social expenditure depend on the proportion of the population above 65 years of age. For this purpose, we included a country's proportion of the elderly (>65) in the analysis. None of the coefficients reported in Table 1 changed due to this model extension. The same holds true if the models are controlled for the proportion of individuals receiving pensions. None of these model extensions changed the results reported in Table 1.

CONCLUSIONS AND DISCUSSION

This paper analyses the recent trend of long-term poverty in Europe since 2008. We find that long-term poverty increased in 13 out of 26 countries, but remained unchanged in 9, and decreased in 4 countries. Rises in long-term poverty are observed in southern and eastern European countries. But the majority of middle and

northern European countries experienced unchanged or decreasing long-term poverty rates. In terms of the number of inhabitants, the majority of individuals surveyed by EU-SILC (58%) live in countries with unchanged or decreasing long-term poverty rates. Hence, the trend for the latest decade is much more optimistic than the trend from 2005 to 2012 reported by Ingensiep (2016), who found increasing long-term poverty rates.

With respect to the current poverty rate, we find that economic growth (GDP) is associated with decreases in poverty rates which refutes the findings of Caminada et al. (2012), Duiella and Turrini (2014), Domonkos and Ostrihoň (2015), Bosco and Poggi (2020), but confirms the findings of Bosco (2019) and Cammeraat (2020). Also, the employment rate does not affect the current poverty rate, which is in line with the results of Cammeraat (2020). Moreover, social expenditure is associated with decreases in the current poverty rate as is also shown by Caminada et al. (2012), Bosco and Poggi (2020), and Cammeraat (2020).

Concerning long-term poverty we do not find an association with GDP confirming Hypothesis 1. Increases in employment, however, do decrease long-term poverty rates. This result is surprising since it only applies to male employment and long-term poverty but not to current poverty rates. The result suggests that the poor are not permanently disconnected from the labour market.

In line with former research (Ingensiep, 2016), and confirming Hypothesis 3 we find that social protection expenditures are negatively related to long-term poverty as well as current poverty. Interestingly the association of social welfare spending with the long-term poverty rate is about three times as strong as the association with the current poverty rate. However, whether this effect can be interpreted causally is debatable. On one side it seems plausible that social expenditures reduce poverty rates. On the other side high poverty rates might also increase political pressure to increase social spending. Hence, the causal relationship remains undetermined by our analysis. However, reversed causality (e.g., poverty affects social spending) seems less convincing, because poverty rates would most likely not influence social expenditures instantly but with a certain time lag. But in our analysis, the poverty rate in a given year is regressed on the social expenditure of the same year which favours the first interpretation.

Finally, our analysis finds a negative relation between short-term and long-term poverty rates. This result is surprising at first glance since one might assume that a country's long-term poverty rate is positively associated with its short-term poverty rate. However, the association we find is negative. One possible interpretation is that high short-term poverty rates exist in more dynamic

societies, in which individuals have a higher risk of falling into poverty, but also a better chance of leaving this state again. Separating the analysis into short-term and long-term periods of poverty as done in this paper makes this relation visible, whereas reporting only current spells of poverty conceals this interesting and relevant finding. Countries' welfare not only depends on the current poverty rate but also on the relationship between short-term and long-term periods of poverty. The long-term poverty rates should be small since they impact the well-being of individuals much more severely than short-term poverty.

However, the EU-SILC data also have some limitations. First of all, most countries gather the income of households via surveys (face-to-face or telephone) which are knowingly subject to social desirability. Hence, the rich might underreport and the poor might over-report their income. This would result in an underestimation of poverty rates. We do not think that this is very likely, but the data would of course be more reliable if all countries used registered data.

Furthermore, EU-SILC observes individuals only for 4 years. Therefore, individuals who report to be poor in the first or second wave, and who left poverty thereafter are classified as being short-term poor. However, since there is no information about the income situation before they participate in the survey, poverty rates are left-censored which means that we might underreport long-term poverty. The same problem occurs if a person falls into poverty during the last 2 years of his or her participation in the survey. If a respondent stays in poverty thereafter we would also underestimate long-term poverty. The short time spells of observations are a disadvantage of the EU-SILC data.

The poverty indicators we use only measure the proportion of people affected by poverty. This poverty measure does not include information about the income distribution of the poor and the depth of poverty, as done by other measures such as the Income Gap (I) (Kakwani, 1993), the Interval Measure (HI) (Atkinson, 1987), or the FGT index (Foster et al., 1984). Future research should shed light on the relationship between macro-economic drivers and these intensity measures of poverty.

Finally, the goal of this paper is to describe the development of long-term poverty and to examine possible explanations for it. Given that the estimates must be interpreted with caution it is not so obvious what the potential social policy implications are. If the effects can be interpreted causally, then an increase in social expenditures would dampen the poverty rate. Furthermore, employment reduces particularly the long-term poverty rate. But we think that further research is needed to give more precise social policy recommendations.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interests.

DATA AVAILABILITY STATEMENT

The data are available from the Statistical Office of the European Union (Eurostat): <https://doi.org/10.2907/EUSILC2004-2019V.2>.

ETHICS STATEMENT

No new data were collected for this research and the data are freely available from the Statistical Office of the European Union (Eurostat). Since this research uses freely available survey data no patient consent is required.

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