RE-InVEST
REBUILDING AN INCLUSIVE, VALUE-BASED EUROPE OF SOLIDARITY AND TRUST THROUGH SOCIAL INVESTMENTS

# Social protection, employment and poverty dynamics in the EU

## Re-assessment from a social investment perspective

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# Executive summary

This report examines effects of social protection in the EU. Part I analyses (trends in) the impact of social benefits on poverty: What differences in social protection can we observe between countries? How has social protection changed in the wake of the crisis in Europe? Our analysis emphasises some economic conditions of welfare states' fight against poverty which are too often neglected in the public and the scientific discussion. We assert that poverty rates have been rising in Europe since before the 'Great Recession', but argue that this is not exclusively caused by welfare state change. While it is true that the evolution of social protection was negative on average across European countries, there was a number of countries (13) where the effectiveness of social benefits against poverty improved. Yet, it did not always improve sufficiently to counter growing primary income inequalities. We see a detrimental legacy of the 'Great Recession' at least as much in terms of poverty challenges as in terms of welfare state institutions in Europe.

Social benefits strongly modify the income distribution and the poverty rate in some European countries, but less in others. Scandinavian social security systems generally offer the strongest social protection in Europe, though the Dutch and the Irish social security systems seem to come ahead of the Swedish most recently in terms of impact of social benefits (maybe not services in-kind). Households' poverty gaps in Northern Europe being particularly wide, the poverty-alleviating impacts of Scandinavian social benefits appear even more impressive as soon as one controls for the poverty challenge. Richer countries generally feature greater inequality before redistribution, but the poverty-alleviating impacts of their social security systems are also higher.

Countries assist the poorest households to different degrees. In all countries, households escape poverty risks through social benefits more rarely if their poverty gap is bigger. In some countries, however, the households with the lowest primary incomes are hardly ever lifted above the poverty threshold (e.g. Romania, Latvia). In contrast, social benefits are a comparatively big success against poverty also for the poorest households especially in the Netherlands, Iceland, Norway and the United Kingdom.

Part II zooms in on the effectiveness of social benefits in supporting the most vulnerable households (those faced with 'pre-transfer poverty' and those with very low work intensity) in leaving the state of poverty and/or quasi-joblessness. We examine the dynamic effects, i.e. shifts in socio-economic position following one and two years after benefit receipt. A central finding is that 'more generous' social benefits have a negative impact on households' leaving the state of dependency or of increasing work intensity. However, even though statistically significant, effects are extremely small: we estimate that if the amount of social benefits doubles, the poverty gap shrinks between one and two percentage points *less* within one year. Households that receive fewer benefits are thus a little faster in gaining financial independence from the social security system. The negative effect of social benefits is found to be stronger for households with a greater depth of poverty, respectively with lower work intensity.

Higher social benefits are also connected to a slower return to employment, but the estimated effect is even smaller. A doubling of social benefits would results in a less than one percentage point lower increase in work intensity between two consecutive years. This (negative) relationship is driven by households at high risk of poverty. This suggests that only households that find their income situation significantly improved by social benefits tend to use the additional financial leeway for staying at distance from the labour market (while an alleged 'disincentive effect' should in principle apply to all sorts of households).

An important finding is that households seek to escape the situation of benefit dependency and joblessness rather independently of whether social benefits are 'generous' or not; until they have successfully done

so, benefits grant households social protection, and possibly also improve subsequent job matching. All in all, there seems to be no genuine trade-off between 'generosity' and efficiency of social security benefits.

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# General introduction

Behind the notion of a European Social Model (ESM) is the idea of a fundamental difference between the socio-economic systems of European countries on the one hand and many of their trading partners outside Europe on the other. The difference lies in having or not having a welfare state that insures against risk like unemployment, illness and old age, and progressively also against 'new social risks' like skills obsolescence or (partial/temporary) inactivity due to family obligations. The collective good of (relative) social security generates fiscal cost, however, such that the viability of European welfare states became a more and more contested issue: in the face of various responsibilities taken on by welfare states since the 1950s, vanishing economic growth since the 1970s, and mounting fiscal pressures due to increasing global competition for markets since the 1980s at least. Some have argued that the embeddedness of welfare states in global markets forces welfare states to prioritise efficiency over equity. In this context, the added value of social policy for the economy has become a topic of discussion. The idea of 'social investment' entered European politics in the context of the Lisbon Agenda (Vandenbroucke and Vleminckx 2011). The RE-InVEST research project, in which the present report is rooted, is part of this discussion. Funded by the EU (Horizon 2020), the project proposes to review the philosophical and empirical underpinnings of the notion of social investment.

The paradigm of social investment is not thoroughly consolidated yet: some read it as an approach to maintaining the welfare state, while reorienting its means from 'passive' to 'active' measures (cp. Nikolai 2012, 91). Against this understanding of social investment, the RE-InVEST project holds that 'passive' social benefits 'allow households to continue investing in education, job search, health, mobility, social networks' (Nicaise 2016, 14). The argument goes that - as our economics transform into knowledge-based service economies - prosperity can only be generated by persons who have the possibility to develop, maintain and apply their productive potentials. In this sense, social investment is not seen as an alternative to (passive) social protection, but as one of the *functions* of social protection, beside macro-economic stabilisation and the promotion of social justice, social peace and political stability (cp. ILO 2015, 157 et seqq.). Apart from this, proponents of social investment would generally agree that social expenditure is not an outcome of, but an input to economic prosperity.[1]

In consideration of the various beneficial effects of social protection policies, the impression of Europe entering an 'age of austerity' (Schäfer & Streeck 2013) in recent years causes concern. The International Labour Office (ILO), in its World Social Protection Report, states that '[t]he achievements of the European social model, which dramatically reduced poverty and promoted prosperity in the period following the Second World War, have been eroded during and since the crisis by a series of reforms that have led to a resurgence of poverty in Europe and a loss of prosperity for the middle classes.' (ILO 2015, 137). The ILO considers that '[h]igher poverty and inequality are the results not only of the severity of the global recession, but also of specific policy decisions curtailing social transfers and limiting access to quality public services.' (ibid.). In the two decades preceding the crisis, scholars had been debating mostly the question of welfare state *change*, termed 'modernisation', 'recasting' or 'restructuring' (Ferrera 2008, 95). Currently, the debate on welfare state *retrenchment*, going strong in the 1980s, seems to be coming back.

The task of quantitative empirical research is to verify and to quantify assertions like the ones made in the above paragraphs. Opposing theoretical views on the effects of welfare state activity can be tested empirically, as can interpretations of recent developments of welfare states. Needed for such a test are an

1 The social investment idea thus clashes with the view of social expenditure as consumption and thus as a 'luxury' that one can only afford as soon and as long as economic prosperity is given (Nicaise 2016, 14).

appropriate data source and methodology. For Europe, the creation of the European Union Statistics on Income and Living Conditions (EU-SILC), more than ten years ago, has provided research with a yet imperfect, but rich source of information on conditions in EU-countries and beyond. Drawing on the EU-SILC, the analyses presented in this report are dedicated to the following questions: How has the effectiveness of social benefits in the fight against poverty evolved in recent years? How does it differ between countries? Is there a link between the 'generosity' of social benefits and households' work intensity? Do higher social benefits lead to a prolonged dependency of households on those benefits? These questions will be addressed in two separate parts of the report.

The analyses in this report use different and partly innovative research methodologies, which will also be presented and discussed. We are indebted to colleagues from the RE-InVEST network and beyond for their friendly and fruitful methodological advice. In particular, we want to thank Anna Ruelens, Tuba Bircan, Frédéric Holzwarth, Stefano Ronchi for their input on statistical modelling, as well as to Irene Becker, Jeremy Leaman and Adeline Otto for advice on welfare state analysis. We thank Stefano Ronchi also for syntax examples and hints on how to pool longitudinal EU-SILC data, and Terry Ward and Erhan Özdemir for syntax helping with the measurement of household work intensity. We also thank GESIS for their publicly available EU-SILC setup routines. The (EU-funded) InGRID project has contributed by funding a research stay.[2]

2 The research leading to these results has received support under the European Commission's 7th Framework Programme (FP7/2013-2017) under grant agreement n°312691, InGRID – Inclusive Growth Research Infrastructure Diffusion.

# Part I: Poverty risks and the impact of social protection in Europe

## 1. Introduction: Towards a 'fairer' comparison of social security systems' impacts on poverty

Assessments of the development of European welfare states during the 'Great Recession' are often on a negative note. The complexity of social security systems makes it difficult, however, to verify these assertions. While increasing poverty risks can easily be shown by established indicators, how can we capture the evolution of European social security systems' performances? One possibility is to measure system characteristics, e.g. the level and coverage of social benefits (policy output). Another possibility is to monitor the phenomena targeted by welfare state activity, e.g. the poverty rate. The drawback of both these approaches is that they do not take changing circumstances into account, to which social security systems (should) react or which co-determine policy success. Our analysis will measure policy outcomes, which result both from policy efforts and from the reality confronted by policy. In the dynamic perspective, policy changes and socioeconomic changes can offset one another, but they can also coincide. In a scenario of rising poverty challenges, more persons may become threatened by poverty, even if social security systems are becoming more effective: Social protection may just improve not fast enough, so that poverty rates rise not because, but in spite of welfare state change. Alternatively, rising poverty challenges can compound declining social protection. Our analysis will show that both cases can be found in European countries in the period between 2006 and 2014.

Isolating the evolution of social protection from the noise caused by other factors is important order to judge welfare state trends: Is social protection really getting weaker, as some argue it? In order to answer, we will develop a multivariate method that attempts a fair description of how social protection evolves, compared to mere uni- or bivariate observation. This method will also allow a comparison between social security systems that takes the different poverty challenges across countries into account. The method will be presented in sub-section 1.2, where some of its limits will also be mentioned and discussed. For example, that we focus our attention on monetary gross social benefits, thus leaving services in kind out of the analysis as well as taxes. We will also, in the present section, review the state of scientific knowledge on the evolution of social protection in Europe (1.1), and present our data and sample (1.3). Section 2 will cover the first of our two main research questions: What differences in the impact of social benefits in the fight against poverty can we observe between countries? Section 3 will take a dynamic perspective: How has this impact of social benefits changed in the wake of the crisis in Europe? Section 4 summarises the results and draws conclusions.

## 1.1 State of knowledge: Mixed evidence on changing impacts of social protection

The present sub-section provides an overview on studies of welfare states' performance in the fight against poverty.[3] Our main emphasis will be on the minority of studies (Habibov et al. 2017, 207) that 1) focus not on system characteristics (policy output) but on effectiveness (outcome) and that 2) compare not between countries at one point in time but between trends in different countries. So far, according to Habibov et al. (ibid., 208), 'there remains a conspicuous absence of longitudinal multinational studies.' A common approach to measuring welfare state effectiveness is to compare poverty risks before and after social spending and taxes. Some studies also look for differences in social spending and poverty rates between countries. Probably due to differing methodologies, but also to differences in time and place, findings remain mixed across different studies.

Historically, the take-off period of social spending in Western Europe were the years after the Second World War. Spending rose from approximately 10% of gross domestic product (GDP) to above 20% during the 20 years between the early 1950s and early 1970s (Ferrera 2008, 83). Then, there was a slowdown of growth, but no retrenchment of expenditure (ibid., 93). Rhodes and Mény, in a book from 1998, conclude that 'while adjustments to welfare programmes have occurred since the 1970s [...] these involved cuts at the margins [...] while the major programmes of health, pensions and social security were, by and large, maintained.' (p. 2). According to SCIP data for 18 OECD countries, presented by Korpi and Palme (2007, in Schmitt and Obinger 2013, 124), replacement rates in case of unemployment, sickness and retirement for an average production worker (APW) rose steeply between 1955 and 1975 (and, for retirement, continued to rise for ten more years). For unemployment after 1975 and for sickness and retirement after 1985, they started a moderate decline, but remained far above their 1955 levels.

Caminada and Goudswaard (2009, 20) point to an abundance of studies that 'have found a strong negative relationship between poverty rates and the level of social expenditure' for the period between 1985 and 2009. While we can accept this relationship as well established, only few studies analyse how it evolved over time; most studies use a cross-sectional design and limit themselves to a specific point in time (Longford and Nicodemo 2010; Scruggs and Allan 2006; Smeeding 2005; Nelson 2004; Cantillon, Marx, and Van Den Bosch 2003; Förster 1993) or leave the dynamic aspect aside (Scruggs and Allan 2006). We will review in the following some of those studies that chose a dynamic approach. Except the most recent ones, all use data from the Luxembourg Income Study (LIS).

An early study is proposed by Kim (2000) for 22 countries between the 1980s and the mid-1990s. He decomposes changes in countries' poverty rates into changes of market-generated poverty and changes of welfare state effectiveness, defined as the reduction of the poverty *gap* by net transfers (p. 112). Both the pre-tax poverty ratio and the poverty reduction effectiveness of net transfers increased in most countries during his observation period (p. 124). The increase of the latter is mainly due to what Kim calls the 'size of the welfare state', i.e. the amount of net transfers (p. 113). Still, in several countries, the increase in effectiveness is 'not large enough to offset the increase in pre-tax-transfer poverty'. A study by Sainsbury and Morissens (2002) on trends between the early 1990s and the mid-1990s confirms increasing poverty rates, but argues that welfare state effectiveness decreased in a majority of the 13 European countries analysed. Unlike above, effectiveness is measured as the difference between the pre- and the post-transfer poverty *rate*, divided by the former (p. 12). Brady (2005) presents an analysis of 18 Western nations from 1967 to 1997 (unbalanced panel). In line with his earlier works, Brady uses an index of poverty that consists in multiplying the number of persons at risk of poverty with the poverty gap. A random regression model yields that social security transfers and public health spending significantly reduce poverty, the welfare state's effects being larger than economic and demographic determinants of poverty. The evolution of effectiveness is tested by including dummies for the 1990s into the model; they turn out insignificant and thus signal that welfare state's effects on poverty have remained unchanged.

3 We do not cover here the research on *determinants* of this performance (Ferrarini, Nelson, and Palme 2016; Brady and Bostic 2015; Hölsch and Kraus 2006) or the factors that influence such determinants (Schmitt and Starke 2011; Mahler and Jesuit 2006).

Mahler and Jesuit (2006) analyse fiscal redistribution over five waves of the LIS (1980, 1985, 1990, 1995 and 2000). For each wave, they compare inequality (Gini) before and after taxes and transfers. Like Kim (see above), the authors find that private sector income inequality has grown, but that 'fiscal redistribution has also, on average, grown over the period, with the result that post-government disposable income inequality has increased less rapidly than private sector inequality' (p. 500). More specifically with regard to the population at risk of poverty, Mahler and Jesuit indicate a less positive trend of redistribution. Following Brady (see above), they multiply the poverty rate with the poverty gap. Between the 1980s and the 2000s, the degree of poverty reduction improved in two of the observed European countries (Denmark, Switzerland), stayed stable in another two (Finland, United Kingdom), and declined in four (the Netherlands, Norway, Sweden, and to a lesser degree in Germany).[4]

Habibov et al. (2017) look at poverty rate and poverty gap separately in their recent study on poverty reduction in five countries (varying periods according to data availability). Based on CNEF macro-level data, they compare the situation before and after transfers and taxes, defining effectiveness as the percentage reduction of the poverty rate resp. gap. Results are that effectiveness is stable over time in most countries. The German welfare state demonstrates the strongest poverty rate reduction performance in virtually all years observed (1983–2011; no Scandinavian country in the sample). Before the mid-2000s, the UK comes second, but after mid-2000s Switzerland. Australia is less effective in reducing poverty, while the USA range far below the other countries, staying at a constant level during 40 years (1970 to 2009) of observation. For the poverty gap, trends are very similar to those for the poverty rate.

Avram (2016) analyses the effects of social assistance in eight countries of Central and Eastern Europe (CEE), drawing on yearly EU-SILC income data on the period between 2004 and 2010. She finds that '[t]he ability of social assistance transfers to lift the poor over the poverty line is relatively low in all eight countries. In the beginning of the period, there are large differences between the Czech Republic and to a lesser extent Slovenia and the Slovak Republic and the other countries. Yet, poverty reduction drops significantly in all three countries by 2010.' (p. 434) The reduction compared to the pre-transfer poverty rate of social-assistance-receiving households is between about 6% and 40% in 2004 and between 14% and 32% in 2011. Avram's study reaches into the period after the 2008 crisis that will be covered in our own analysis below. Equally very recent is the report of the EU's Social Protection Committee (SPC) (2016). It analyses - among other things - the relationship between pre- and post-transfer AROP rates of quasi-jobless households. The authors find for the year 2014 that '[t]he impact of social transfers on poverty reduction varies greatly across Member States.' (p. 76) From 2008 to 2014, 'only 6 countries (the Baltic States of EE, LV and LT as well as CY, ES, and the UK) have strengthened the impact of social transfers in reducing poverty as opposed to five countries (CZ, HU, PL, RO and SE) where the impact has decreased.' (ibid.)

We can take home from this literature review that the dynamic effectiveness of welfare state activity against poverty has been analysed by a still manageable number of empirical studies, their observation reaching back to the 1980s. Despite the partly contradictory findings, what we can exclude for all periods is a common upward or downward trend of welfare state impacts on poverty. We find it important to note, however, that the most recent analysis (by the SPC) does not take the poverty gap into account. It thus abstracts from the growing poverty challenges (see Section 3) faced by welfare states in the course of the crisis. In our own analysis, we will try to go beyond this by tracing the effectiveness of social security systems also in function of how the 'depth of poverty' evolved.

## 1.2 Method

The purpose of the methodological part is to introduce a regression model by which we estimate the impact of a welfare state's social benefits on poverty. The reason why we *estimate* this effect instead of just observing it is that we want to take structural differences into account. We will at first review the notion of household

4 This is our own summary of TableA.4 in the bonus material provided by the authors.

income before and after social benefits, as well as the statistical definition of the risk of poverty and of the poverty gap. We will then define what we mean by impact of social benefits.

Our analysis benefits from the rich information on *household income* that is provided by the EU-SILC. Not only the total disposable household income (item HY020) is given, but also the total disposable household income before social transfers except old age and survivor' benefits (HY022). The kinds of transfers considered include, at the personal level, unemployment benefits, sickness benefits, disability benefits, and education-related allowances. At the household level, they include family/children related allowances, 'social exclusion not classified elsewhere', and housing allowances (see box). The household income *before* social benefits is usually lower than *after* social benefits and, by definition, is never higher.

According to the EU-SILC data manual (Eurostat 2017, 208 et seqq.), Total disposable household income (HY020) can be computed as: The sum for all household members of gross personal income components (Gross employee cash or near cash income (PY010G), Company car (PY021G), Gross cash benefits or losses from self-employment (including royalties) (PY050G), Pensions received from individual private plans (other than those covered under ESSPROS) (PY080G), *Unemployment benefits (PY090G)*, Old-age benefits (PY100G), Survivor' benefits (PY110G), *Sickness benefits (PY120G), Disability benefits (PY130G), Education-related allowances (PY140G)*) plus gross income components at household level (Income from rental of a property or land (HY040G), *Family/children related allowances (HY050G)*, *Social exclusion not elsewhere classified (HY060G)*, *Housing allowances (HY070G)*, Regular inter-household cash transfers received (HY080G), Interests, dividends, profit from capital investments in unincorporated business (HY090G), Income received by people aged under 16 (HY110G)), minus Regular taxes on wealth (HY120G), Regular inter-household cash transfer paid (HY130G), Tax on income and social insurance contributions (HY140G). The total disposable household income before social transfers except old age and survivors' benefits (HY022) includes all the aforementioned categories except the ones printed in *italics*.

The *at-risk-of-poverty (AROP) rate* is one of the main Laeken indicators and widely used in European statistics, e.g. in the framework of the 'social protection performance monitor' (Social Protection Committee 2012). According to the Social Protection Committee (ibid., p. 5), the AROP rate is the share of persons of all ages with an equivalised disposable household income (EDHI) below the *at-risk-of-poverty threshold*, which is set at 60% of the national median EDHI. In the present analysis, we deviate from the official definition in that we focus on households rather than on persons and that we only consider households of active age, i.e. they have at least one member in working age. We calculate poverty thresholds based on (weighted) observations in the EU-SILC data, taking all households into account (thus, not only the sample of our analysis, which includes only households in active age, see 1.3).

AROP rates and AROP thresholds are accepted conceptual tools for comparing degrees of equality and financial well-being between countries.[5] We use them for comparing *impacts of social security systems*, defined as the average success or failure to lift households at risk of poverty over the poverty threshold by way of social benefits. All European countries pay social benefits to households and individuals. Yet, there are large differences between countries and over time concerning which kinds of social problems trigger such transfers, who is covered, and which amounts of transfers are conceded. The act of freeing households from the (statistical) poverty risk by social benefits is the central phenomenon in our analysis. The poverty threshold seems to us a suitable common yardstick to compare social security systems' impact across countries and over time, even though freeing households from the risk of poverty is not the aim of social security systems *per se*.

Up to this point, our method is like the one also used in the 2016 annual report of the Social Protection Committee (2016, 76). Our analysis goes beyond this when it combines the concept of impact of social benefits with the concept of the *poverty gap*. As one of the indicators used in the context of Europe 2020,

5 We must mention that the AROP rate is a relative concept; poverty or non-poverty of a household always depends on the incomes of other households. Likewise, the AROP threshold differs between countries within the EU. When median income rises (falls), it gets relatively more difficult (easy) to reach the poverty threshold. This, however, does not limit the relevance of our results: A proportional change of the incomes of all households does not change the difficulty of reaching the poverty threshold. Only non-proportional changes of household incomes, thus changes of the income structure, alter the position of poor households vis-à-vis the poverty threshold. Such structural changes (or differences between countries) can be seen as a drawback of the commonly used statistical indicator of the risk-of-poverty.

the poverty gap is widely known as the distance between a households' EDHI and the national poverty threshold. We will use the poverty gap as a proxy for the poverty challenges faced by social security systems, because it determines the amount of social benefits necessary to lift a household above the poverty threshold. Including the poverty gap in a regression model will allow estimating country effects net of the differing distances of households from their respective national poverty thresholds. In order to do this, the concept has to be modified in two ways: Firstly, while the poverty gap is usually reported based on household income *after transfers*, it is household income *before* social benefits that is used here. Secondly, for making comparisons between countries possible, we transform the poverty gap into a relative measure, by dividing the absolute gap of each household by the national poverty threshold.

### 1.2.1 The regression model

Multivariate regression models are commonly used in order to find the 'true' relationship between an independent and a dependent variable, in the sense that they allow controlling for factors of disturbance. In the present case, the independent variable is the social security system of a country and the dependent variable is the question whether social benefits succeed in eliminating the poverty risk of a household. Our data consists of households nested in countries. Our model estimates the relationship between country dummies on the one hand and the change in poverty status of households on the other hand. If the household at risk of poverty gets above the poverty threshold by receiving social benefits, the dependent variable is coded as 1, otherwise as 0. The country dummies capture the incidence of 1s and 0s in each country (and year) respectively. Countries with a particularly large share of 1s as compared to 0s will get a relatively high coefficient. Even though social benefits are at the centre of interest for us, they do not figure among the variables of the model, but remain implicit: The country dummies capture nothing else than the impact of social benefits, because the amount of social benefits is by definition the one and only difference between household income before social benefits and household income after social benefits.[6]

While poverty alleviation is always an effect[7] of social benefits, control variables are of interest as circumstances under which social benefits succeed or do not succeed in doing this. Control variables in the model serve the one and only purpose of adjusting for differing poverty challenges faced by welfare states (and households), both between countries or over time. A regression model is necessary for our analysis precisely due to the variation in poverty challenges. The poverty gap plays a prominent role in our model, as it captures the *size* of the poverty challenge connected to each household observed. Yet, households can be poor for different (combinations of) reasons. Some additional control variables therefore cover further household features, which stand for the *nature* of poverty challenges, e.g. the time household members spend in unemployment. Some reasons to be at risk of poverty are more likely than others to trigger redistributive solidarity channelled through the welfare state. Additional explanations on our model can be found below in sub-section 2.2.2. In the following, we will discuss the limitations of our method and present the data and sample of our analysis.

6 It is also for this very reason that it would not make sense to include further policy variables or other macro-level control variables in the model. The dependent variable does not represent a value that is explained by a combination of (interrelated) factors, as it usually does, e.g., when the level of unemployment is explained by welfare state activity, labour legislation, GDP growth, etc. In our case, the only explanation for the variation of the independent variable lies in social benefits. Controls in our model are not supposed to contribute to explaining the IV, but to neutralise structural differences. Suitable as control variables are all items that capture variation in the composition of the social risks and the policy context across countries or time.

7 Even though causality (and its direction) can in principle not be captured by a model of this kind, we can speak here of an *effect* of social benefits: As mentioned, the amount of social benefits is by definition the only difference between the EDHI before and after social benefits.

### 1.2.2 Discussion: limits to our analytical method

In the following, some thoughts on possible limitations of our methodology will be noted, which can serve as an impetus for discussion and refinement of the approach.

Some limitations have to do with over- or underestimating social spending. First, we cover exclusively public, not private spending (cp. Caminada and Goudswaard 2009, 7), which leads to underestimation in countries with much private spending. Second, monetary social benefits are but a part of social security systems. Social benefits, which are in the focus of the present analysis, are but a part of welfare state activity. Equally part of it are services in-kind, which can be a functional equivalent to monetary benefits. We have no EU-SILC micro data on the value of services in-kind received by households, and values are often hard to determine due to the absence of markets for these services that would yield market prices. Yet, abstracting from services in-kind as we currently do puts social security systems at a disadvantage that pay directly for childcare, for instance, instead of reimbursing households their child-care expenses. Solving this kind of inaccuracies in a comparative analysis involving many countries would be a very time- and cost-intensive research endeavour. Whether it would significantly change our results is uncertain: It is argued in a report by the Social Protection Committee that 'in general the countries which achieve a low impact of social transfers on poverty reduction tend also to be those that spend less on in-kind services' (Social Protection Committee 2016, 77).

Third, we analyse gross social benefits, abstracting from possible interactions with taxes. There are various connections between social benefits and taxes (cp. De Deken 2013). Tax credits can replace social benefits (with important differences as far as households with low employment income are concerned). It is also possible (though not desirable) that states tax households in order to give the same money back in the form of benefits. Or that social benefits are first granted and then partly taxed, thus reducing the net social benefits granted to the household.[8] Unfortunately, the EU-SILC, like other data sources, do not permit discerning between taxes on transfers and taxes on private sector income. A counterfactual household income in the absence of social benefits can therefore not be determined. According to Mahler and Jesuit (2006, 482), our sample countries are rather transfer-based, the more tax-based systems of redistribution being the US, Australia and Canada. The literature still gives us reasons to assume that spending differences could be smaller than observed in our data,[9] and that some countries with particularly generous social benefits might look less generous from a net perspective. In particular, Scandinavia could be overestimated, while the contribution of Eastern European welfare states is downplayed.[10]

There are also non-fiscal domains of welfare state activity, namely regulation, e.g. of labour markets. Through regulation, welfare states can influence the primary distribution of income, and thus pre-empt the need for social benefits (which will be our policy recommendation, see sub-section 4). This is why speaking of household income before vs. after social benefits does not equal speaking of household income 'before vs. after government'; politics are already involved in defining the pre-benefit situation. In this sense, the situation before social benefits is a challenge faced by social security systems, but not in the same way a challenge faced by welfare states; it is not completely exogenous to the latter. The welfare state has a partial responsibility if households are in need for social benefits. Yet, there are also many influences on the primary income distribution that derive from trade or technology, or household employment behaviour.

Another issue is that pre-benefit incomes as observed in the EU-SILC cannot really be assumed to represent final outcomes in the (counter-factual) absence of social benefits paid by welfare states. A ceteris paribus assumption of no behavioural change through social benefits would be mistaken, as households may anticipate social benefits and act accordingly (cp. Avram 2016, 431; Mahler and Jesuit 2006, 498). Presumably, the poverty rate without any social security system would be lower than the *pre-benefit* poverty rate

8 The level of indirect taxes can also play a role in comparisons between countries.

9 'Adema and Ladaique (2005, 2009) have shown that while gross social spending – such as figure 3.1 displays – differs highly across welfare state regimes, *net* social spending levels are much more similar.' (Hemerijck et al 2013, 19)

10 'Differences between net and gross spending are particularly high in the Netherlands, Denmark, Sweden, Italy and Finland and lowest in the CEE countries. [...] Benefits affected the most by taxation include unemployment and old-age benefits ' (Kuitto 2016, 448).

in the presence of one. Yet, from a social investment perspective, which believes in the productive added value of social policy, a behavioural change induced by social security need not be a bad thing: Maybe people would take up jobs faster in the absence of a social security system (cp. Part II of this report below), but work less productively and earn less (and pay less taxes) in the long run. There could also be implications for health, childcare and education. Apart from the change in household behaviour without social benefits, there would also be changes in the state's behaviour: The resources not spent on social benefits would be spent for other purposes, saved, or not levied in the first place. The macro-economic and distributional effects of this would have to be modelled (e.g. with Euromod).

Looking at yearly income reference periods as a whole, the analysis smooths monthly income variations. It may thus be overlooking short-term poverty spells. (See Nicaise et al. 2004 for a possible, yet complex solution to this problem.)

National minimum income thresholds do not necessarily coincide with poverty thresholds, such that social security systems do not necessarily intervene more even if a rising number of households are at risk of poverty. There are reasons for evaluating national welfare in the light of their own ambitions, i.e. their own national minimum income thresholds (cp. Groenez and Nicaise 2004; Nicaise et al. 2004) instead of imposing a certain threshold. In the present analysis, however, this would mean to make countries seem better the lower their ambitions are in social protection. Using the national AROP rates, as it has been done here, means using a unique metric for all social security systems.

### 1.3 Data and sample

The present analysis limits itself entirely to information provided by European Union Statistics on Income and Living Conditions (EU-SILC). This data source is the best option for comparative analyses between European countries on the topics covered here. This holds in spite of some harmonisation and sampling problems, for which the EU-SILC is sometimes criticised[11]. Our data (in the present part of the report) derive from the cross-sectional files of the EU-SILC, waves 2006 through 2015.[12] In the following, we will make a few remarks on gaps in the data and transformations necessary for the analysis and then present the sample of the analysis.

(1) Monetary information in the EU-SILC refers to an income reference period that is usually one year prior to the survey year. Exceptions are the United Kingdom, where the income reference period is the very year of the survey, and Ireland, where it is the 12 months before the interview. For the analysis, the data for the latter two countries was shifted so it became historically (more) congruent with the other sample countries. (2) Following a recommendation by Mack and Lange (2015, 9), pensions received from individual private plans have been manually included in the total disposable household income for all years prior to 2011 (as of 2011, it is automatically included in the data). (3) Household income is deflated by the equivalised household size, using the revised OECD scale. The equivalence scales are derived from the household composition at the end of the income reference period. Thus, for households in which composition changed during the income reference period, the equivalised values are not absolutely correct.[13] As changes can happen either way (increase or decrease of equivalised household size), these inaccuracies should disappear by aggregating over different households.

Our sample contains households from 28 countries over an observation period reaching from the historical year 2006 to 2014 (EU-SILC income reference years). Our country-sample has a large overlap with the member countries of the European Union, but there are also some European countries without EU-membership participating in the EU-SILC and included in the analysis. As the EU-SILC is still extending its geographical coverage, not all EU-SILC countries have delivered data for all years analysed in this report.

11 E.g. the neglect of homeless people or people living in collective dwellings, which is yet shared by other surveys.

12 Distribution from 2017-03-01, or earlier for waves older than 2011.

13 The less correct the closer to end of the income reference period the change happened.

It is especially at the beginning of the observation period that gaps occur. For this reason, Croatia, Switzerland and the Republic of Serbia could not be included in our sample. In the case of Germany, data was not delivered for the most recent historical year of the analysis (2014); instead, data from the previous year (2013) was used as a proxy.

Beneath the country-level, our unit of analysis are households. The household level is the appropriate level of analysis because some social protection measures address households rather than individuals, while social benefits paid to individuals are brought to the common household economy. Households are the economic unit that pools resources (from different sources and of different kinds) and allocates them to its members. We assume an equal sharing according to the reformed OECD equivalence scale, thus individual persons are at risk of poverty exactly when their households are at risk of poverty. We focus on households in active age, defined as households with at least one member between the age of 18 and 64 years. For reasons of comparability, households excluded from the Laeken indicators' calculation are not considered in the present analysis.[14] The largest part of our analysis deals exclusively with households at risk of poverty before social benefits, because only these households are of interest with regard to the poverty-alleviating effects of the latter. When it comes to determining AROP rates at the country level, also households not at risk of poverty before social benefits are of course considered.

Table 1.1 shows the number of sample households ordered by country, as well as the share of each country in the overall sample. The overall N is 1,560,892. On the left side we have all sample households, on the right side only households at risk of poverty before social benefits (N = 378,529). All results of the analysis in this part of the report will be based on weighted calculations: Information is weighted by the probability that a household is included in the EU-SILC survey. Results thus refer not to the sample, but to the reference population of the sample, i.e. the national populations. For this reason, the number of households and countries' shares in the reference population are also included in the table.[15]

14 HX060, Household type, category „other', code 16.

15 While the number of observations strictly defines the share in the sample, it does not necessarily define the share in the observed population. A large country need not have a proportionally large share of observations in the sample. There are, however, lower boundaries as to how many interviews have to be done according to each country's population.

**Table 1.1 Numbers and shares of households in sample and reference population by country, 2006–2014 (pooled)**

| Country | All sample households | | | | Households at risk of poverty before social benefits | | | |
|---|---|---|---|---|---|---|---|---|
| | Sample | | Observed population | | Sample | | Observed population | |
| | # | % | # | % | # | % | # | % |
| AT | 43,200 | 2.77 | 25,847,081 | 1.75 | 10,681 | 2.82 | 6,771,135 | 1.73 |
| BE | 43,364 | 2.78 | 33,065,839 | 2.24 | 12,012 | 3.17 | 9,226,900 | 2.36 |
| BG | 34,438 | 2.21 | 18,743,175 | 1.27 | 7,843 | 2.07 | 4,030,394 | 1.03 |
| CY | 28,758 | 1.84 | 2,250,502 | 0.15 | 6,414 | 1.69 | 489,838 | 0.13 |
| CZ | 60,992 | 3.91 | 30,102,862 | 2.04 | 10,214 | 2.70 | 5,344,990 | 1.37 |
| DE | 88,676 | 5.68 | 270,046,336 | 18.31 | 21,890 | 5.78 | 76,865,051 | 19.64 |
| DK | 40,769 | 2.61 | 19,310,663 | 1.31 | 7,965 | 2.10 | 6,387,892 | 1.63 |
| EE | 37,585 | 2.41 | 4,114,764 | 0.28 | 9,313 | 2.46 | 943,339 | 0.24 |
| EL | 49,970 | 3.20 | 29,710,994 | 2.01 | 12,969 | 3.43 | 7,119,483 | 1.82 |
| ES | 91,588 | 5.87 | 129,801,235 | 8.80 | 25,332 | 6.69 | 36,880,446 | 9.42 |
| FI | 79,446 | 5.09 | 17,713,140 | 1.20 | 19,143 | 5.06 | 5,120,012 | 1.31 |
| FR | 76,531 | 4.90 | 189,424,990 | 12.84 | 18,087 | 4.78 | 47,410,720 | 12.11 |
| HU | 69,248 | 4.44 | 28,495,814 | 1.93 | 20,247 | 5.35 | 7,961,296 | 2.03 |
| IE | 33,695 | 2.16 | 12,228,825 | 0.83 | 12,773 | 3.37 | 4,589,426 | 1.17 |
| IS | 22,796 | 1.46 | 915,231 | 0.06 | 4,281 | 1.13 | 214,297 | 0.05 |
| IT | 134,158 | 8.59 | 170,957,435 | 11.59 | 28,120 | 7.43 | 40,257,505 | 10.28 |
| LT | 33,960 | 2.18 | 8,931,169 | 0.61 | 8,628 | 2.28 | 2,470,346 | 0.63 |
| LU | 34,210 | 2.19 | 1,490,475 | 0.10 | 10,636 | 2.81 | 416,880 | 0.11 |
| LV | 39,315 | 2.52 | 5,922,648 | 0.40 | 10,440 | 2.76 | 1,471,947 | 0.38 |
| NL | 75,215 | 4.82 | 53,255,587 | 3.61 | 10,927 | 2.89 | 13,648,835 | 3.49 |
| NO | 43,667 | 2.80 | 16,887,754 | 1.15 | 10,407 | 2.75 | 5,105,986 | 1.30 |
| PL | 94,378 | 6.05 | 95,766,809 | 6.49 | 25,710 | 6.79 | 23,203,430 | 5.93 |
| PT | 38,849 | 2.49 | 27,903,479 | 1.89 | 10,546 | 2.79 | 7,029,739 | 1.80 |
| RO | 49,379 | 3.16 | 52,525,561 | 3.56 | 13,083 | 3.46 | 14,201,995 | 3.63 |
| SE | 46,878 | 3.00 | 30,602,636 | 2.08 | 11,320 | 2.99 | 8,735,151 | 2.23 |
| SI | 69,867 | 4.48 | 5,504,168 | 0.37 | 15,080 | 3.98 | 1,343,186 | 0.34 |
| SK | 39,563 | 2.53 | 13,906,422 | 0.94 | 6,740 | 1.78 | 2,511,523 | 0.64 |
| UK | 60,397 | 3.87 | 179,285,847 | 12.16 | 17,728 | 4.68 | 51,673,303 | 13.20 |

* Working-age households only, i.e. at least one household member is at least 18 and at most 64 years old.
**Source** EU-SILC (Eurostat), own calculation

Table 1.2 resents all observed households by a typology that distinguishes households by their number of adults and dependent children. The most frequent type of 'working-age households' is composed of two adults[16] with children; it has a share of 28.3% on average across all observed years. Thereof, households with two children (12.4%) are slightly more frequent than with one child (11.9%), while three or more children (4.0%) are comparatively rare (and there is a falling trend between 2006 and 2014). The second most important household type consists of two adults without children (25.6%). Not much less frequent is the single household (24.0%), and here we see an important upward trend from 22.5% in 2006 to 24.9% in 2014. 'Other' households are households with more than two adults, e.g. three-generation households.

16 Two adults in one household does not necessarily mean that there is a couple: there can also be a parent and a grown-up child, or a middle-aged adult living together with and caring for an elderly parent, or other combinations.

Among the observed population, 'other' households have a share of 10.4% without dependent child(ren), respectively 6.5% with dependent child(ren).

**Table 1.2 Household types, shares in the observed population (%)**

| Household type | Years pooled | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 person | 24.0 | 22.5 | 23.2 | 23.6 | 23.9 | 24.1 | 24.5 | 24.6 | 24.8 | 24.9 |
| 2 adults, no children | 25.5 | 25.6 | 25.4 | 25.6 | 25.2 | 25.6 | 25.5 | 25.5 | 25.4 | 25.6 |
| 1 parent, 1+ dep. children | 5.4 | 5.3 | 5.1 | 5.0 | 5.2 | 5.3 | 5.3 | 5.6 | 5.8 | 5.7 |
| 2 adults, 1 dep. child | 11.9 | 12.1 | 12.0 | 11.9 | 11.7 | 11.8 | 11.9 | 12.0 | 11.9 | 11.8 |
| 2 adults, 2 dep. children | 12.4 | 13.0 | 12.6 | 12.5 | 12.3 | 12.5 | 12.4 | 12.1 | 12.3 | 12.2 |
| 2 adults, 3+ dep. children | 4.0 | 4.2 | 4.1 | 4.1 | 4.0 | 3.9 | 3.9 | 4.0 | 3.9 | 3.9 |
| Other w/o children | 10.4 | 10.8 | 10.7 | 10.6 | 10.7 | 10.3 | 10.3 | 10.0 | 10.0 | 10.1 |
| Other with child(ren) | 6.5 | 6.6 | 6.9 | 6.8 | 6.9 | 6.5 | 6.3 | 6.2 | 6.0 | 5.9 |

* Working-age households only. Weighted values.
**Source** EU-SILC (Eurostat), own calculation

Table 1.3 reproduces the household typology, but this time only for households at risk of poverty before social benefits. Here, the largest group by far is single households with 32.0%, and we again see a rising trend over time, even more steeply rising than among the whole population (Table 1.2). In contrast, we do not see a rising share of single parent households among households at risk of poverty before social benefits.

**Table 1.3 Household types, shares among households at risk of poverty before social benefits (%)**

| Household type | Years pooled | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 person | 32.0 | 29.3 | 30.4 | 31.1 | 32.2 | 32.7 | 32.9 | 32.7 | 32.8 | 33.5 |
| 2 adults, no children | 17.8 | 18.8 | 18.1 | 18.5 | 17.5 | 17.6 | 17.7 | 17.7 | 17.3 | 17.5 |
| 1 parent, 1+ dep. children | 10.9 | 11.2 | 11.3 | 10.9 | 10.9 | 10.7 | 10.6 | 10.9 | 11.0 | 10.8 |
| 2 adults, 1 dep. child | 8.8 | 8.9 | 8.5 | 8.6 | 8.6 | 9.0 | 9.1 | 8.9 | 9.1 | 8.7 |
| 2 adults, 2 dep. children | 11.0 | 11.4 | 11.5 | 11.3 | 11.2 | 11.2 | 10.7 | 10.4 | 10.7 | 10.4 |
| 2 adults, 3+ dep. children | 6.4 | 7.1 | 6.9 | 6.9 | 6.5 | 6.3 | 6.1 | 6.2 | 5.9 | 6.1 |
| Other w/o children | 6.4 | 6.8 | 6.5 | 6.2 | 6.3 | 5.9 | 6.5 | 6.4 | 6.5 | 6.7 |
| Other with child(ren) | 6.6 | 6.5 | 6.9 | 6.6 | 6.9 | 6.6 | 6.4 | 6.7 | 6.7 | 6.2 |

* Working-age households only. Weighted values.
**Source** EU-SILC (Eurostat), own calculation.

As described above, the information on the household type will later be used as a control in the regression analysis, together with a variable on the mean age of working-aged household members (which is at 42.3 years across all households, countries and years, and at 41.4 years for households at risk of poverty). The model further includes variables capturing household risk factors, i.e. the average number of months adult household members spend in unemployment, early retirement, or studying during one year. Across all countries and years, they amount to 2.5, 1.0 and 1.6 months on average (out of a possible maximum of 12) in households at risk of poverty before social benefits.

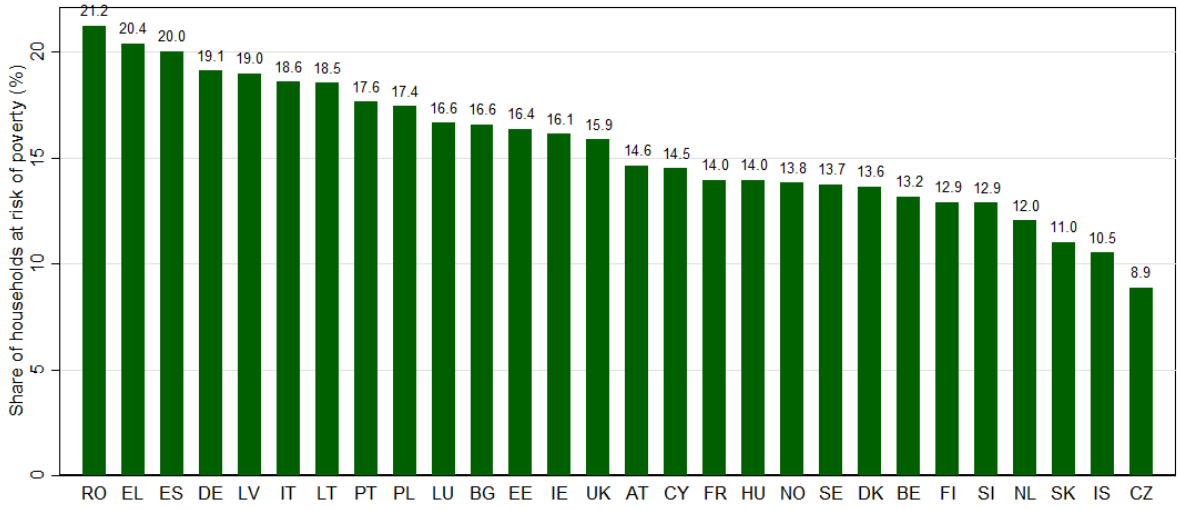
# 2. How do social security systems compare?

This section focusses on differences between countries, respectively between countries' social security systems. Developments over time will be addressed in Section 3. At present, we look at the years of our observation period (2006–2014) in a pooled way, averaging across nine historical years. In a first sub-section, differences in AROP rates before and after social benefits will be compared between countries. We will then measure the impacts of social benefits on poverty risks (2.2). In sub-section 2.3, these impacts will be compared to the AROP rates of each country. As a result, differences in poverty risks between countries will be presented as the outcome of differing poverty challenges and unequal impacts of social security systems.

## 2.1 Households at risk of poverty, before and after social benefits

This sub-section covers, in a descriptive way, the at-risk-of-poverty (AROP) rates before and after social benefits (cp. 1.1) in 28 European countries. As is widely known, poverty rates are not a measure of the living standard, but of the income distribution – they are a specific way of measuring income inequality. A households' income is always compared to the other households' incomes in the same country (and year). Figure 2.1 has the poverty rates after social benefits in each observed country, averaged over the whole period between 2006 and 2014. Romania is the country with the highest (household) AROP rate on average across the observed years: 21.2% of Romanian households have an income below the Romanian poverty threshold (after social benefits). Greece and Spain also feature AROP rates of more than 20%. Germany also has a high AROP rate of 19.1% among working-age households. The difference with AROP rates usually reported, which refer to persons and entire populations, can be attributed to the focus on working-age households in our sample: Germany has a large low-wage sector, while households of pensioners, which are doing well in international comparison, are not considered in our figures. The United Kingdom, as a liberal country, features an average poverty rate, while low poverty rates are found for Scandinavian countries. At the bottom, the Czech Republic shows a quite equal income distribution with only 8.9% at risk of poverty, followed by Iceland and Slovakia.

**Figure 2.1 Poverty risks after social benefits, by country, 2006–2014 (pooled)**

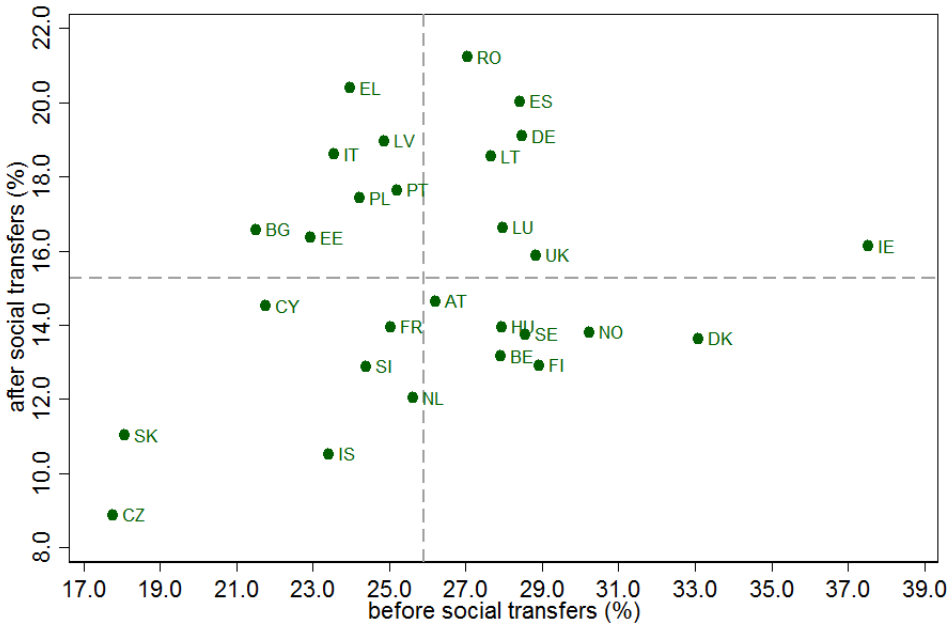



* Working-age households only. Weighted values.
Source EU-SILC (Eurostat), own calculation.

A countries' AROP rate is determined by the interplay of a whole range of factors. A very important one - and at the centre of interest in this report - is the social security system. This is why the main distinction made here is between 'final' AROP rates after social benefits and AROP rates before social benefits. The social security system, by its social benefits, is the (sole) author of the difference between both. Besides providing a first impression of how social security systems transform poverty, adding pre-benefit AROP rates to the picture also provides us with an idea about the caseload faced by social security systems.

To get an impression of the link between AROP rates before and after social benefits, we can look at Figure 2.2, which shows the observed countries in a scatter plot. We see a cloud of dots that hints at a certain correlation between pre- and post-benefit AROP rates ($\varrho = 0.233$), but not at a close association. The vast majority of observed countries have initial AROP rates of between 22% and 31%, while their final AROP rates are somewhere between 12% and 23%, with no visible linkage. While a country's final AROP rate certainly has *something* to do with the distribution of household income before social benefits, the pre-benefit distribution does not seem the only or even the most important predictor. Obviously, countries with similar pre-benefit poverty situations end up with very different AROP rates after benefits, e.g. Belgium, Sweden, Hungary, Luxembourg, Lithuania, Germany and Spain, which all feature AROP rates before social benefits of between 27.5% and 28.5%, achieve final – and thus practically relevant – AROP rates as different as 13.2% (Belgium) and 20.0% (Spain). The graph shows that half of countries (14) either have pre-benefit AROP rates above the median and post-benefit AROP rates below the median of countries, or vice versa. Redistribution through social benefits obviously has considerable impact on the income distribution in many European countries.

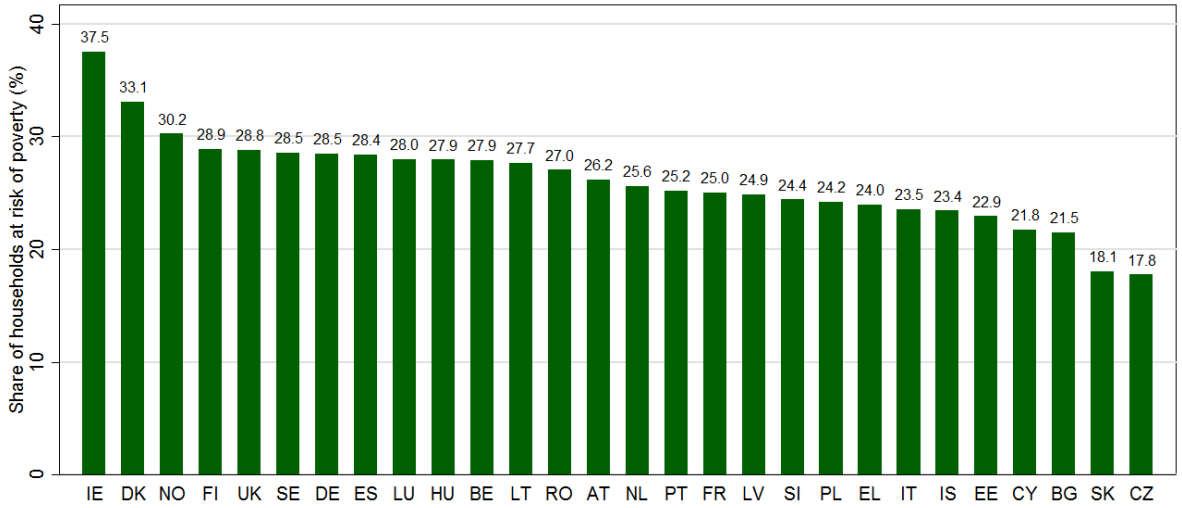
**Figure 2.2 Poverty risks before and *after* social benefits, by country, 2006–2014 (pooled)**




* Working-age households only. Values weighted. Dashed lines indicate the median, which is not depicted as identical with any country because of the even number of countries.
Source EU-SILC (Eurostat), own calculation

Given the loose connection between pre- and post-benefit AROP rates, it is evident that the countries with the highest post-benefit AROP (Figure 2.1) rates are not the same as those with the highest pre-benefit AROP rates. In Figure 2.3, we see countries ranked by initial AROP rates: Ireland, Denmark and Norway feature pre-benefit household AROP rates of more than 30%. Also before social benefits, the Czech Republic is the country with the lowest AROP rate, though with 17.8% a considerably higher one than after benefits, as we could see above. Except these 'outliers', the pre-benefit AROP rates of our sample countries are contained in a range between 21.5% and 29.0%.

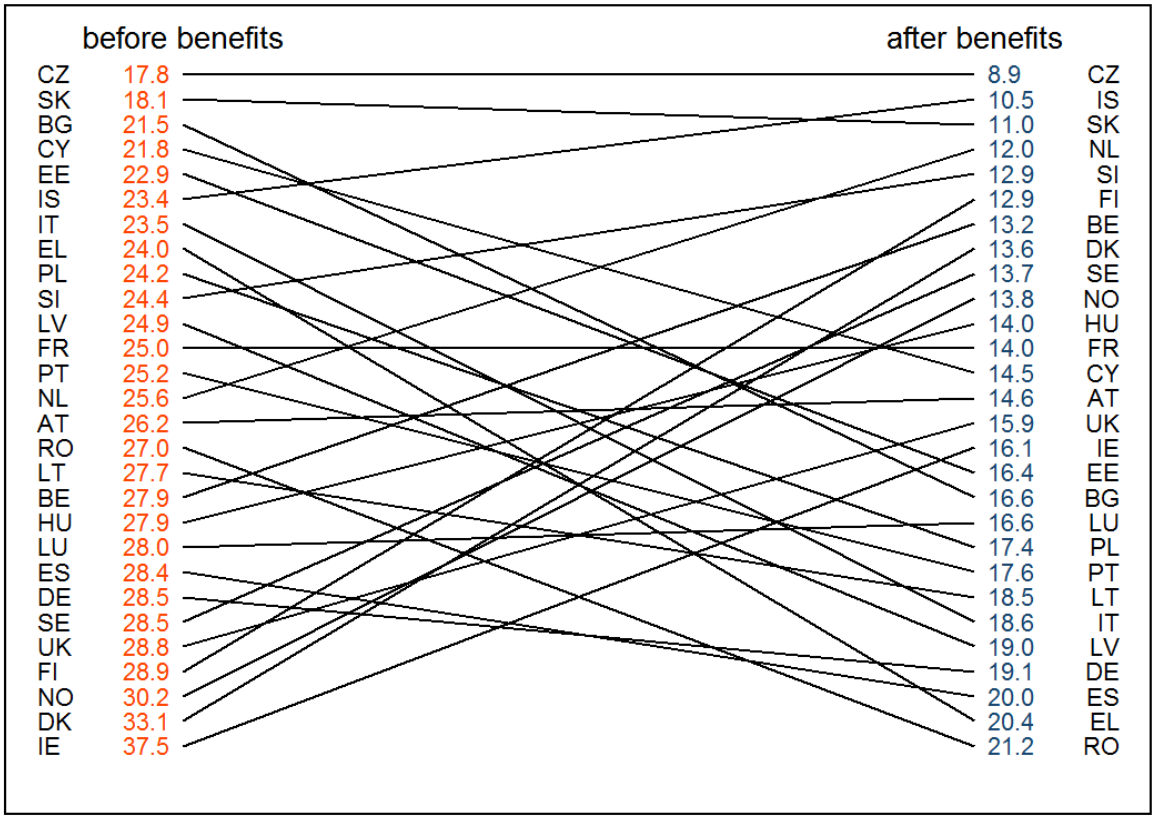
**Figure 2.3 Poverty risks *before* social benefits, by country, 2006–2014 (pooled)**




* Working-age households only. Values weighted.
Source EU-SILC (Eurostat), own calculation.

When ranked by their AROP rates, countries thus switch places by redistribution, as illustrated by Figure 2.4. On average across 2006 to 2014, none of the six countries with the highest AROP rates before transfers is among the highest six after transfers. While the Czech Republic and Slovakia remain far on top of the equality scale both before and after social benefits, countries like Bulgaria, Cyprus and Estonia, which also start out with comparably low inequalities, seem to do much less to compensate for these initial inequalities, and thus lose many places in the ranking order. In contrast, the Netherlands pass from a middle position of pre-benefit inequality to one of the lowest post-benefit AROP rates (12%). Countries like Ireland or the Scandinavian countries start out with the highest pre-benefit AROP rates of all countries, but rise to middle (Ireland) or even below-average AROP rates through redistribution. For the Scandinavian countries, the large role of the state in the socioeconomic system is reflected here (the other side of the medal being, necessarily, high taxes).

**Figure 2.4 Countries ranked by AROP rates before and after social benefits, 2006–2014 (pooled) (%)**




* Working-age households only. Values weighted.
Source EU-SILC (Eurostat), own calculation

The slopes of the connecting lines in Figure 2.4 hint at the different extent to which AROP rates are modified by social benefits, very inclined slopes pointing to either strong gains (positive slopes) or strong losses (negative slopes) in the ranking order. The slopes are a way of visualising what we will call, in the following sub-section, the *impact* of social benefits on the poverty risk.

## 2.2 Impacts of social benefits in the fight against poverty

How can we quantify the impact of social benefits on poverty? We will use in this sub-section the notion of impact of social benefits, which was introduced above in the method part (1.1): the percentage of households at risk of poverty before social benefits that are lifted over the poverty threshold by social benefits. We distinguish between observed impacts (2.2.1) and adjusted impacts (2.2.2). The former are determined in bivariate, the latter in multivariate analysis, controlling among other things for the distance of households' income from the poverty threshold. We compare both versions in 2.2.3. For obvious reasons, only the subsample of households at risk of poverty before social benefits are considered in this sub-section.

### 2.2.1 Observed impacts: a bivariate analysis

Table 2.1 shows the impact of social benefits as the percentage of households at risk of poverty *before* social benefits which are not at risk of poverty *after* social benefits.[17] As we use the same poverty thresholds before and after benefits, there is no social security system with a negative impact. All countries *reduce* their AROP rates by means of social benefits, in other words, the share of households living under the poverty threshold is systematically higher before social benefits than after social benefits.[18] The extent of the reduction differs widely, as was already hinted by Figure 2.2. In Greece, the reduction of AROP rates by social benefits is only 14.9%, in Italy (!) and Bulgaria only 21.0% resp. 22.9%. In contrast, we see a tremendous reduction by 58.8% in Denmark, by 57.0% in Ireland, and by 54.3% in Norway. Redistribution thus makes that primary and secondary household income is more loosely linked in some countries than in others.

**Table 2.1 Share of persons at risk of poverty before and after social benefits, and reduction of the AROP rate through social benefits, by country, 2006–2014 (pooled) (%)**

| Country | AROP before social benefits | AROP after social benefits | Impact of social benefits | Country | AROP before social benefits | AROP after social benefits | Impact of social benefits |
|---|---|---|---|---|---|---|---|
| AT | 26.2 | 14.6 | 44.1 | IS | 23.4 | 10.5 | 55.1 |
| BE | 27.9 | 13.2 | 52.8 | IT | 23.5 | 18.6 | 21.0 |
| BG | 21.5 | 16.6 | 22.9 | LT | 27.7 | 18.5 | 33.0 |
| CY | 21.8 | 14.5 | 33.3 | LU | 28.0 | 16.6 | 40.5 |
| CZ | 17.8 | 8.9 | 50.0 | LV | 24.9 | 19.0 | 23.7 |
| DE | 28.5 | 19.1 | 32.9 | NL | 25.6 | 12.0 | 53.0 |
| DK | 33.1 | 13.6 | 58.8 | NO | 30.2 | 13.8 | 54.3 |
| EE | 22.9 | 16.4 | 28.7 | PL | 24.2 | 17.4 | 28.1 |
| EL | 24.0 | 20.4 | 14.9 | PT | 25.2 | 17.6 | 30.0 |
| ES | 28.4 | 20.0 | 29.5 | RO | 27.0 | 21.2 | 21.5 |
| FI | 28.9 | 12.9 | 55.3 | SE | 28.5 | 13.7 | 51.9 |
| FR | 25.0 | 14.0 | 44.2 | SI | 24.4 | 12.9 | 47.2 |
| HU | 27.9 | 14.0 | 50.1 | SK | 18.1 | 11.0 | 38.9 |
| IE | 37.5 | 16.1 | 57.0 | UK | 28.8 | 15.9 | 44.9 |

* Working-age households only. Weighted values.
**Source** EU-SILC (Eurostat), own calculation

17 Instead of the percentage, the table could also show the number of percentage points by which the AROP rate is reduced through social benefits. From the perspective of the individual household at risk of poverty, however, the chance of being lifted out of poverty by social benefits corresponds to the percentage value: the share of poor households which are non-poor after social benefits. We therefore define impact as percent, not as percentage points.

18 This cannot be otherwise because social benefits are by definition positive, thus household disposable income cannot shrink by their receipt.

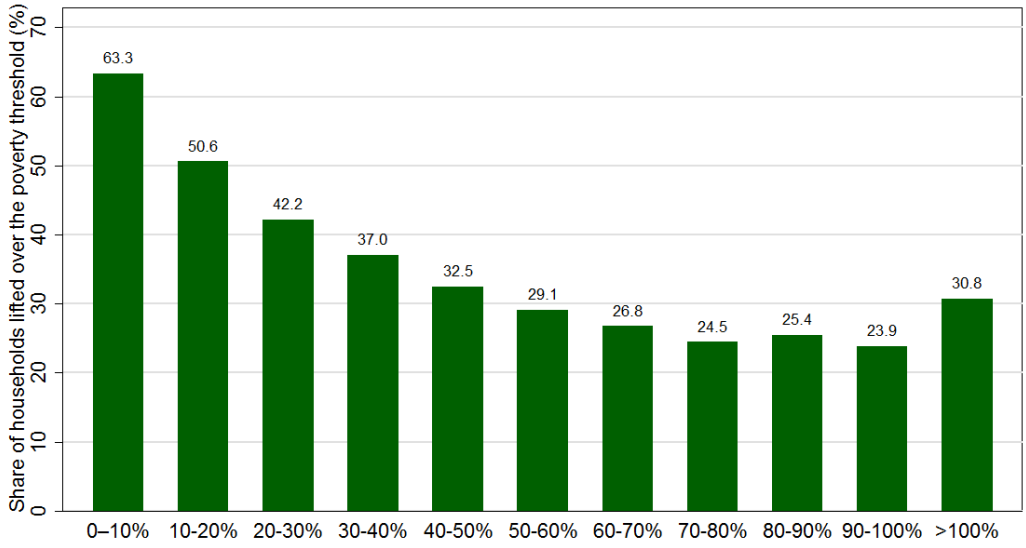
We will argue in the following that Table 2.1 is still just at the surface of the issue. Why is the impact of different countries' social benefits so different in size, and is there a pattern? The immediate explanation is that the extent of welfare provision, the 'generosity' of social security systems, differs. Indeed, social security systems are not the same regarding which issues trigger social benefits, and the amounts and durations of disbursement also differ. There has been and still is a productive strand of research on 'worlds of welfare capitalism' (Esping-Andersen 1990) that classifies welfare states according to their characteristics in terms of decommodification and stratification. Comparative welfare state research of this tradition analyses institutions, e.g. the duration of unemployment payments, the replacement rate, etc. (cp. Social Protection Committee 2015).

The point we want to make in the present analysis is different: While it is evident that the extent of welfare provision differs between countries (and over time) e.g. due to political struggles, the unequal challenges that welfare states face receive far fewer attention in research. We can conceptualise these challenges as the *number* of households at risk of poverty (Figure 2.3), so to say the breadth of poverty, as well as the *depth* of poverty which these households suffer: A household at risk of poverty before social benefits is lifted above the poverty line if and only if the sum of benefits received is larger than the gap between the household's own income and the poverty threshold. What Table 2.1 above does not consider is the depth of poverty as a factor that determines the difficulty of lifting households above the poverty threshold. We will turn to this factor in the following.

#### 2.2.1.1 Considering the depth of poverty

Different countries' welfare states do not just have unequal numbers of cases to treat in the fight against poverty (cp. the pre-benefit AROP rate, Figure 2.3), but also *more or less difficult* cases. The difficulty is conceptualised as the depth of poverty here, thus the average size of households' poverty gap. The wider the gap between household income and the poverty threshold, the more benefits are necessary to lift the household over the poverty threshold. Accordingly, it can be shown empirically that households with a wider poverty gap escape poverty risks through social benefits more rarely than do households with a smaller poverty gap (Figure 2.5). 63.3% of households with a pre-benefit poverty gap between just over 0% and 10% of the national poverty threshold escape poverty through social benefits. This share can also be interpreted as a probability: For households with a poverty gap 10 p.p. points larger, the chance of being lifted over the poverty threshold is only at about 50.6%. Among households with a poverty gap of between 90% the national poverty threshold down to zero income, only 23.9% escape the at-risk-of-poverty status. A surprising exception are households with a negative own income (e.g. losses from self-employment) which have a poverty gap greater than 100%: 30.8% of those households are carried over the poverty threshold by social benefits.

**Figure 2.5 Observed share of households lifted over the poverty threshold by social benefits, by size of prior poverty gap, 2006–2014 (%)**




* Only working-age households at risk of poverty before social benefits. Weighted values. Reading example: In the period between 2006 and 2014, the share of households lifted over the poverty threshold by social benefits was 63.3% in the group of households with a poverty gap before social benefits between 0 and 10% of the poverty threshold applying to country and year.

Source EU-SILC (Eurostat), own calculation

Table 2.2 shows that the observed phenomenon is found in virtually all observed countries. No matter where, we can see that the smaller a household's income before social benefits, the higher will be the odds of remaining at risk of poverty also after social benefits. What differs between countries is how much the impact of social protection falls as the poverty gap widens. In some countries, social benefits are a comparatively big success against poverty risks in basically all income strata. This applies to Belgium, the Czech Republic, Denmark, Finland, Ireland, Iceland, the Netherlands, and Norway. Looking particularly at the stratum of households with an income between zero and ten percent of the poverty threshold, still more than 40% are lifted over the poverty threshold in Iceland, the Netherlands, Norway (and the United Kingdom). In contrast, the situation is very difficult except for the easiest cases in Bulgaria, Cyprus, Italy, Latvia, Poland, Portugal, Romania and Slovakia. In Greece, more than 74% even of those directly below the poverty threshold do not cross it by means of social benefits; poorer households have even lower chances.

**Table 2.2** **Observed share of households lifted over the poverty threshold through social benefits, by size of poverty gap before social benefits and by country, 2006–2014 (pooled) (%)**

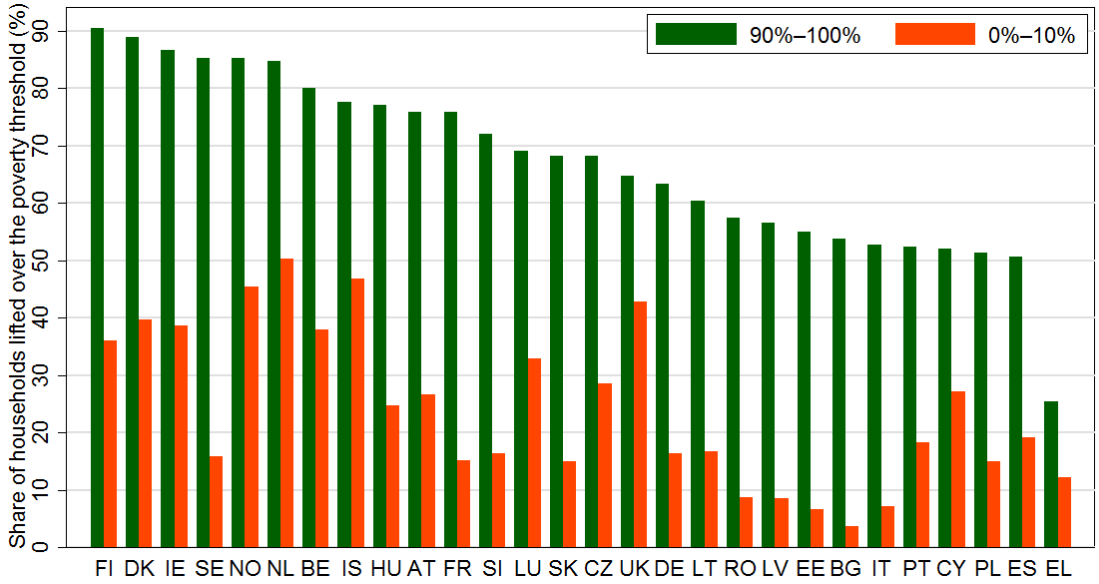
| Country | 0%-10% | 10%-20% | 20%-30% | 30%-40% | 40%-50% | 50%-60% | 60%-70% | 70%-80% | 80%-90% | 90%-100% | >100% |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AT | 75.9 | 62.4 | 52.5 | 48.4 | 36.4 | 30.6 | 28.3 | 26.5 | 27.2 | 26.7 | 32.3 |
| BE | 80.1 | 73.9 | 65.2 | 58.5 | 47.8 | 53.7 | 44.9 | 54.7 | 52.3 | 37.9 | 47.4 |
| BG | 53.8 | 35.2 | 27.5 | 20.3 | 14.6 | 11.7 | 8.2 | 4.8 | 5.0 | 3.7 | 11.5 |
| CY | 52.0 | 39.5 | 26.1 | 23.7 | 25.0 | 26.4 | 24.9 | 22.9 | 29.9 | 27.1 | 40.5 |
| CZ | 68.2 | 60.0 | 63.2 | 56.0 | 45.8 | 38.1 | 30.2 | 33.0 | 24.3 | 28.6 | 42.3 |
| DE | 63.4 | 52.4 | 39.4 | 35.9 | 33.1 | 34.3 | 31.9 | 29.4 | 28.0 | 16.3 | 23.1 |
| DK | 88.9 | 78.0 | 66.7 | 61.1 | 57.7 | 43.5 | 39.1 | 41.1 | 42.1 | 39.7 | 64.3 |
| EE | 55.0 | 43.9 | 40.1 | 33.8 | 27.3 | 24.2 | 16.3 | 16.5 | 9.8 | 6.6 | 5.4 |
| EL | 25.4 | 21.2 | 15.1 | 13.2 | 10.2 | 7.6 | 8.2 | 5.7 | 6.8 | 12.3 | 11.7 |
| ES | 50.7 | 43.0 | 36.3 | 30.7 | 25.8 | 22.5 | 18.7 | 15.6 | 17.6 | 19.2 | 17.2 |
| FI | 90.5 | 84.7 | 79.8 | 67.9 | 54.9 | 42.1 | 44.3 | 37.4 | 36.8 | 36.0 | 47.1 |
| FR | 75.9 | 66.2 | 54.8 | 50.0 | 39.5 | 32.4 | 27.2 | 21.6 | 16.9 | 15.2 | 25.7 |
| HU | 77.1 | 75.2 | 63.8 | 56.3 | 46.8 | 36.8 | 31.7 | 23.0 | 21.9 | 24.7 | 29.5 |
| IE | 86.8 | 77.7 | 71.1 | 73.0 | 74.1 | 66.3 | 63.0 | 58.9 | 50.0 | 38.7 | 25.4 |
| IS | 77.6 | 62.6 | 48.0 | 45.7 | 42.6 | 44.7 | 41.5 | 44.2 | 46.8 | 46.8 | 64.0 |
| IT | 52.7 | 30.3 | 21.1 | 15.0 | 13.5 | 8.6 | 6.1 | 4.8 | 5.7 | 7.1 | 7.4 |
| LT | 60.4 | 44.7 | 43.0 | 33.9 | 32.3 | 27.0 | 27.1 | 20.4 | 19.2 | 16.6 | 30.6 |
| LU | 69.2 | 58.5 | 44.0 | 36.7 | 24.6 | 21.2 | 20.8 | 26.8 | 31.9 | 32.9 | 26.6 |
| LV | 56.5 | 37.3 | 27.5 | 22.6 | 15.1 | 16.4 | 10.9 | 13.5 | 8.2 | 8.6 | 11.5 |
| NL | 84.8 | 64.4 | 56.3 | 44.9 | 48.2 | 44.2 | 41.4 | 44.0 | 52.6 | 50.3 | 36.4 |
| NO | 85.3 | 69.9 | 59.1 | 56.6 | 42.9 | 42.8 | 45.5 | 40.8 | 46.1 | 45.5 | 57.1 |
| PL | 51.4 | 38.7 | 31.8 | 26.5 | 20.1 | 17.3 | 13.9 | 9.3 | 8.1 | 14.9 | 22.1 |
| PT | 52.3 | 35.3 | 32.9 | 29.2 | 24.7 | 21.3 | 20.8 | 16.0 | 8.8 | 18.3 | 34.4 |
| RO | 57.5 | 26.7 | 22.0 | 14.3 | 13.5 | 9.6 | 6.2 | 5.7 | 6.4 | 8.7 | 29.7 |
| SE | 85.4 | 76.5 | 69.7 | 61.4 | 54.6 | 50.9 | 48.1 | 36.5 | 25.7 | 15.9 | 47.0 |
| SI | 72.1 | 65.9 | 56.1 | 53.9 | 44.4 | 36.5 | 29.5 | 26.0 | 23.8 | 16.4 | 27.7 |
| SK | 68.3 | 51.3 | 51.0 | 41.7 | 28.4 | 21.4 | 20.2 | 25.3 | 9.3 | 15.0 | 15.6 |
| UK | 64.8 | 59.1 | 54.3 | 47.0 | 48.1 | 42.0 | 41.1 | 35.8 | 32.5 | 42.9 | 31.1 |

* Only working-age households at risk of poverty before social benefits. Weighted values. Cells are coloured according to their value, with a high (low) rate of households escaping the poverty risk coloured in green (red).

**Source** EU-SILC (Eurostat), own calculation

Figure 2.6 again emphasises the difference in impact between the higher and the lower strata of pre-benefit household incomes by taking up two columns of the above table. Countries are sorted by the share of households relieved from poverty by social benefits, among households with a particularly small poverty gap (0%–10%). The second row represents shares for households with a poverty gap of 90%–100% of the poverty threshold. One observation to make is that the correlation between both rows is rather limited: sorting countries by the second row would yield a wholly different ranking. The political priority of progressively assisting households with almost no income seems high in the Netherlands, Iceland, Norway, and the United Kingdom (and also in Ireland, Belgium, and in Scandinavian countries except Sweden). In contrast, there seems to be a particular lack of efficient assistance schemes for the poorest households in countries like Romania, Latvia, Estonia and Bulgaria.

**Figure 2.6 Observed impact of social benefits, for small and large poverty gaps before social benefits, by country, 2006–2014 (pooled) (%)**

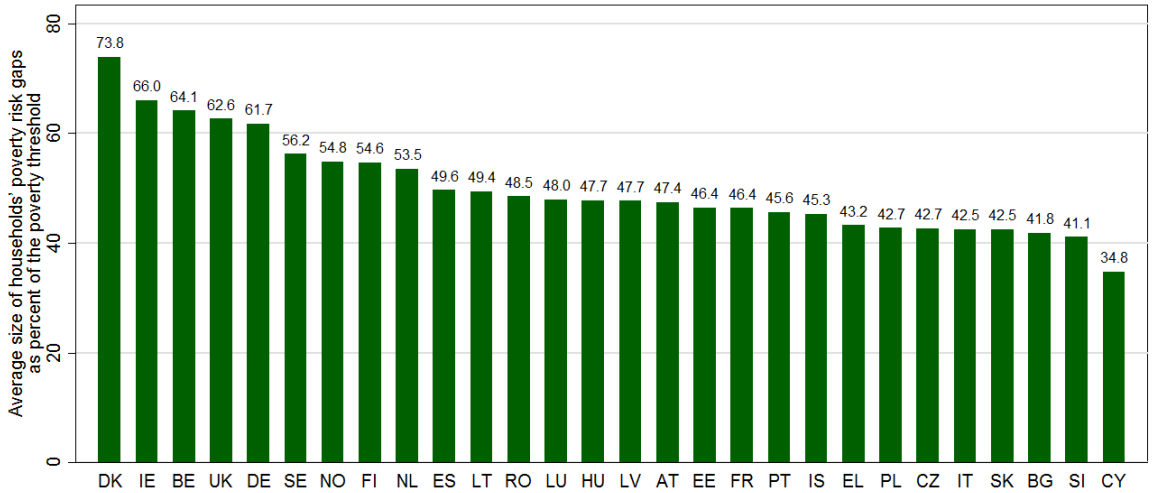



* Only working-age households at risk of poverty before social benefits. Weighted values. The columns show, for each country, the share of households lifted over the poverty threshold. Green bars stand for households with an income before social benefits that is not less than 10% below the poverty threshold. Red bars stand for an income of zero or at most 10% the poverty threshold.

Source EU-SILC (Eurostat), own calculation

We have seen in this sub-section that the depth of poverty plays a crucial role as a marginal condition for our indicator of social security-effectiveness, i.e. the impact of social benefits on poverty. A lesson to draw from this is that for judging the impact of social benefits in a comparative way (or also its evolution in one country over time), differences in circumstances must be heeded. Such differences exist, as Figure 2.7 shows: average poverty gaps range from 34.8% in Cyprus to 73.8% in Denmark, on average across our observation period. We expect social protection to be less effective (in terms of poverty-relief) in countries (or periods) with a large pre-benefit poverty gap.

**Figure 2.7 Depth of poverty, by country, 2006–2014 (pooled) (%)**




* Only working-age households at risk of poverty before social benefits. Weighted values.

Source EU-SILC (Eurostat), own calculation

In the following, we will turn to multivariate analysis, as this permits controlling for the poverty gap at any time when comparing between countries.

### 2.2.2 Adjusted impacts: controlling for the poverty challenge to social security systems

In this sub-section, we estimate an adjusted impact of different welfare states' social benefits. Technically, this will be implemented using a logistic regression model, where the dependent variable is the success or failure of lifting households over the poverty threshold. The main independent variables are country dummies, complemented by indicators for the poverty challenge as control variables (see 1.1). They will allow us to compare social security systems in the fictitious situation where all confront the same poverty challenges. While the size of the challenge is captured by the households' poverty gap, the nature of the challenge is proxied by variables for possible reasons why households remain below the poverty threshold: the average number of months spent by household members in activity statuses that suggest an increased poverty risk. Alongside these risk factors, the model includes information on the mean age and type of households. We will thus learn what national social security systems would achieve if confronted with households spending a similar share of their time in unemployment, (early) retirement, or studies, and which have a similar structure.

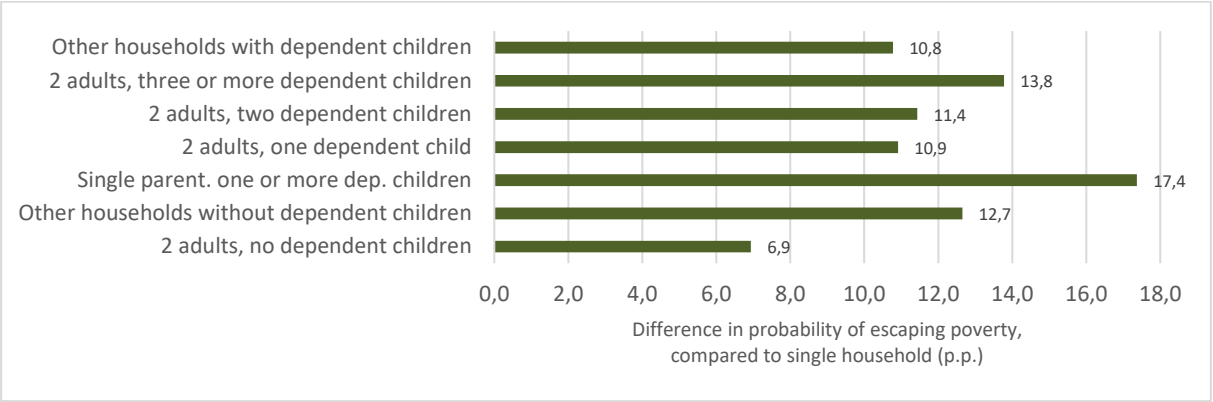
The regression output is shown in the appendix, Table a1.1.[19] The poverty gap is attributed a highly significant coefficient, which is not surprising, given the descriptive results shown above (Figure 2.5). The sign is of course negative: The larger the poverty gap, the smaller the probability of the dependent variable to equal one (household is poor before but not after social benefits), and the larger the probability of the dependent variable to be zero (household is poor before as well as after social benefits).

Most household features in the model have a highly significant relationship with the dependent variable. Studying *decreases* the probability of leaving poverty by way of social benefits: The more time household members spend for studying, the smaller the households' chance of being lifted over the poverty threshold. An explanation is that this status represents a risk poorly insured against by welfare states (which is critical from a social investment perspective). In contrast, the time household members spend in (pre-)retirement is positively associated with the chance of being lifted over the poverty threshold. We find no significant coefficient for the time household members spend in unemployment. The variable holding the mean age of working-aged household members is positively signed.

Coefficients estimated for household types show that all kinds of households have far bigger chances than single households to get above the poverty threshold by social benefits. Figure 2.8 presents predictive margins (Jann 2013). It is especially the presence of dependent children that makes for a marked difference between income before and after social benefits. Compared to a single person without dependent children, a single parent with one or several children has a 17.4 p.p. bigger chance of being lifted above the poverty threshold. Two adults without children have a 6.9 p.p. higher chance than a single household of escaping poverty, but it is 10.9% if there is one dependent child, 11.4 p.p. for two children and 13.8 p.p. if there are three or more children in the household.

19 We use Stata 14.2 with its estimation command xtlogit.

**Figure 2.8 Average predictive margins of household type, all observed social security systems and years pooled**




* Only working-age households at risk of poverty before social benefits. Weighted values.
Source EU-SILC (Eurostat), own calculation

Even though the impact of household features can be instructive, their purpose in the model is mainly to control for structural variation between countries. What we are finally interested in is contained in the country intercepts. The country intercepts - the coefficients of each country dummy variable - reflect the degree to which the performance of each country's social benefits in the fight against poverty deviates from a base value.[20] To make these results more comprehensible, we use the estimated coefficients (and in particular, the differing country intercepts) to predict for each social security system the share of households which would be lifted above the poverty line (of the respective country and year).[21] As this cannot be done for each national population individually (results would not be comparable between social security systems), we apply the estimated effect of each social security system to all households at risk of poverty in the whole sample.[22] We thus get the share of households in Europe that are at risk of poverty before transfers and that would not be poor if they received the social benefits granted by the Italian social security system, the Danish social security system, etc. In the following, we thus do not compare countries, but (countries') social security systems.

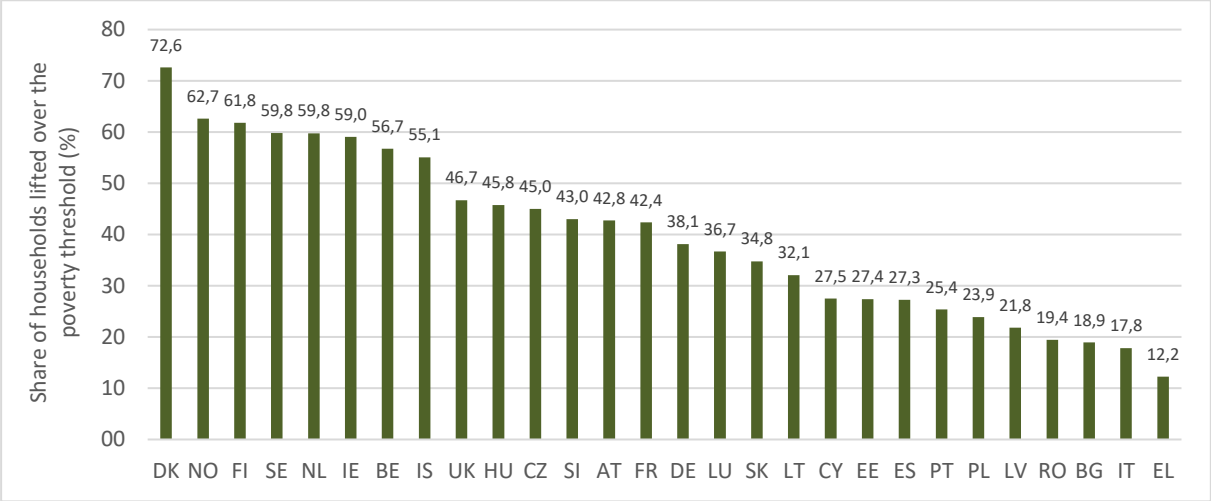
Figure 2.9 shows the predictions for each welfare state. By far the largest share (72.6%) of households would escape poverty through benefit receipt if the 'Denmark-effect' applied to all observed households at risk of poverty. The Norwegian social security system follows with 62.7%, followed in turn by the Finnish, the Swedish and the Dutch. At the end of the list, we have the Greek social security system: controlling for the poverty gap and for household-level structural differences as we did, the Greek system would lift only 12.2% of observed households out of the risk of poverty. A little better, but still surprisingly small, is the share of households that would escape the risk of poverty under the conditions of the Italian welfare state: 17.8%. It is striking that the twelve lowest ranks are all occupied by Southern and Eastern European welfare states (right side of Figure 2.9).

20 The base value is represented by one of the countries: Austria, for alphabetical reasons. All other countries are thus compared to Austria.

21 Covariates beside the country effect are not fixed but vary freely. The structure of households used for the prediction is not an ideal-typical one, but the structure found in the sample.

22 An alternative would be to compare predictive margins, like above for household types. The disadvantage would be that all effects are expressed with regard to a base country, which make results less intelligible.

**Figure 2.9 Adjusted impact of social benefits, poverty gap and household risk factors controlled for, by social security system, 2006–2014 (pooled)**



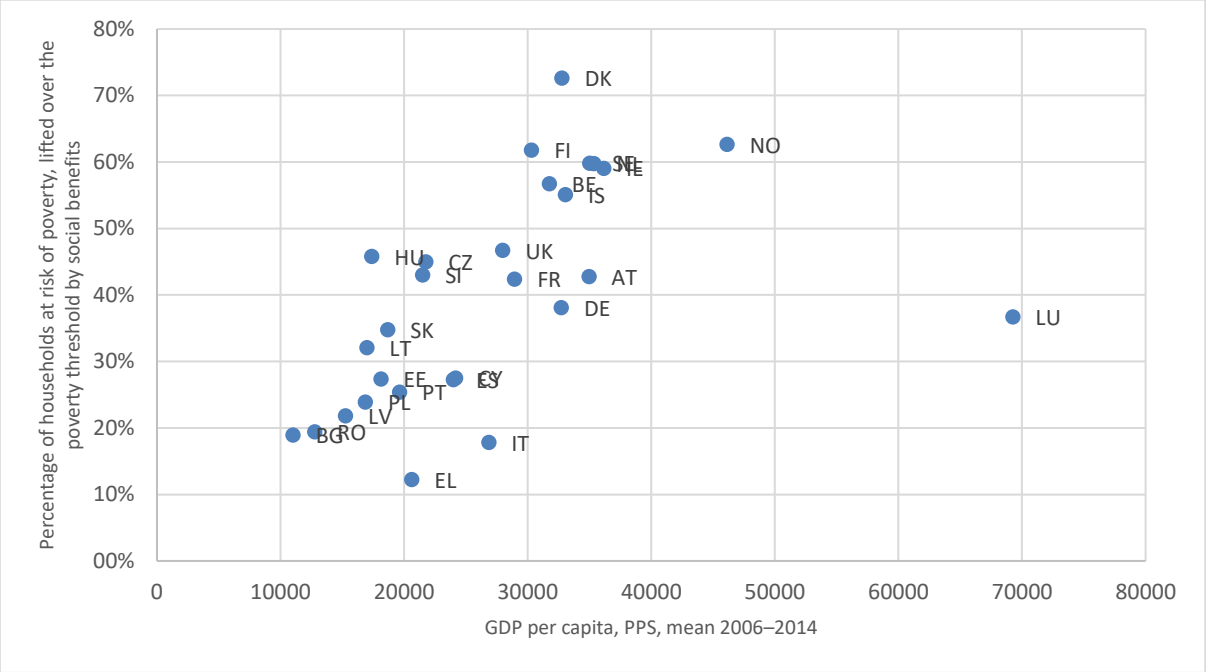

* Only working-age households at risk of poverty before social benefits. Weighted values. Estimated shares of households (across all observation countries) at risk of poverty that would be lifted over the poverty line by the social benefits of each particular social security system.

Source EU-SILC (Eurostat), own calculation

In its World Social Protection Report already cited above, the ILO (2015, 139) analyses the 'effective poverty prevention and reduction capacity of national transfers and tax systems in OECD countries. It shows quite significant differences between countries, even for those at a similar level of economic development and potential fiscal resources, illustrating the point that it is the political will of each society that sets the framework for its social protection system.' We can confirm this finding when we compare our adjusted effectiveness of social benefits with countries' wealth. Figure 2.10 shows quite different impacts of social benefits for countries with similar levels of GDP per capita (in inflation-adjusted Purchasing Power Standard (PPS)), e.g. Denmark and Germany, or Hungary and Latvia. What the figure shows more generally and in spite of the former, however, is a rather close link between impact of social benefits and GDP per capita. Social security systems in richer countries have a more effective social protection, presumably not only due to a greater political will of 'social equalising', but also due to a better resourcing of social security systems.[23]

23 Note that in many of the Eastern European countries, both the tax base and the tax rates are smaller. Both the capacity and the political will to raise taxes play a role.

**Figure 2.10 Adjusted impact of social benefits and GDP, by social security system, 2006–2014 (pooled)**




* Only working-age households at risk of poverty before social benefits. Yearly GDP was HICP-deflated to the base-year 2011 and transformed into PPS by 2011's purchasing power parity (PPP).
Source EU-SILC (Eurostat), own calculation

Extensions of the model would be possible in order to capture the poverty challenge even better. Further characteristics of households could be included which are connected to social security system' willingness to grant social benefits. Extensions are limited both by the item spectrum of the EU-SILC and by missings in the existing variables. It was tried here to keep the set of observations the same between the observed and the adjusted perspective on social benefits impacts. We will in the following use the predictions from our model to contrast the impacts of social benefits that are purely observed.

### 2.2.3 Observed and adjusted impacts in comparison

The intention of our analysis is to deliver a fairer account of social security systems' relative performance than can be given by descriptive means. How do adjusted impacts compare to observed impacts? In Table 2.3, we find stunning differences between the observed and the adjusted values for some countries, reaching up to 13.9 percentage points in the case of Denmark. While the share of households lifted over the poverty threshold is by 18.9 p.p. higher in Denmark than on average across countries, which is already extremely effective, the *predicted* impact of social benefits is even 32.7 p.p. higher. The strong correction by the predicted value is explained by the relative poverty gap – the challenge the welfare state faces – which is especially large in Denmark (cp. Figure3.1).[24] While social benefits of all Scandinavian and of the Dutch social security systems appear far better in the adjusted perspective (because these countries all feature a great depth of poverty), the impacts of Southern and Eastern European social security systems tend to be corrected downwards. Structural effects seem to put the latter in a relatively easier position in the fight against poverty.[25] Without this, the social security systems of countries like Cyprus, the Czech Republic or Portugal would lift (even) fewer households above the poverty threshold. What we take home is that those

24 Note that the observed impact refers to the national population only, the adjusted impact to whole sample. We can compare social security systems only if we predict their effects on an identical population. The surprisingly strong effect of the Danish system on the whole sample of households is due to all countries having a smaller poverty gap than Denmark.

25 In the CEE countries possibly a structural heritage of socialist times, e.g. small differences in wages and property income.

countries that are already known for their strong social security systems emerge as the ones with an even higher performance in the challenge-adjusted perspective.

**Table 2.3 Observed and adjusted impacts of social benefits on households' poverty status, by welfare state: difference from the average impact, years 2006–2014 (pooled)**

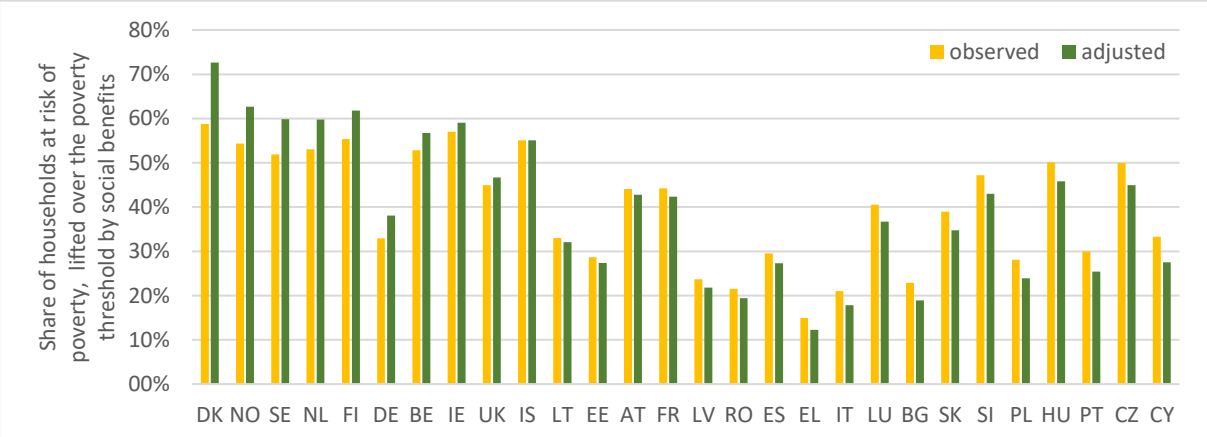
| Country | Observed (%) | Adjusted (%) | Gap (p.p.) | Country | Observed (%) | Adjusted (%) | Gap (p.p.) |
|---|---|---|---|---|---|---|---|
| DK | 58.8 | 72.6 | 13.9 | LV | 23.7 | 21.8 | -1.9 |
| NO | 54.3 | 62.7 | 8.3 | RO | 21.5 | 19.4 | -2.1 |
| SE | 51.9 | 59.8 | 8.0 | ES | 29.5 | 27.3 | -2.3 |
| NL | 53.1 | 59.8 | 6.7 | EL | 14.9 | 12.2 | -2.6 |
| FI | 55.4 | 61.8 | 6.4 | IT | 21.0 | 17.8 | -3.2 |
| DE | 32.9 | 38.1 | 5.2 | LU | 40.5 | 36.7 | -3.8 |
| BE | 52.8 | 56.7 | 3.9 | BG | 22.9 | 18.9 | -4.0 |
| IE | 57.0 | 59.0 | 2.0 | SK | 38.9 | 34.8 | -4.1 |
| UK | 44.9 | 46.7 | 1.8 | SI | 47.2 | 43.0 | -4.2 |
| IS | 55.1 | 55.1 | 0.0 | PL | 28.1 | 23.9 | -4.2 |
| LT | 33.0 | 32.1 | -0.9 | HU | 50.1 | 45.8 | -4.3 |
| EE | 28.7 | 27.4 | -1.3 | PT | 30.0 | 25.4 | -4.6 |
| AT | 44.1 | 42.8 | -1.3 | CZ | 50.0 | 45.0 | -5.0 |
| FR | 44.2 | 42.4 | -1.9 | CY | 33.3 | 27.5 | -5.8 |

* Only working-age households at risk of poverty before social benefits. Weighted values. Difference from the average refers to the difference between a social security systems' (observed or predicted) impact and the mean probability of a sample household (no matter in which country) to be lifted over the poverty threshold by social benefits. Sorted by difference between observed and predicted value.

**Source** EU-SILC (Eurostat), own calculation

Figure 2.11 orders countries by the absolute difference between observed and predicted value, so that the countries where the descriptive impression is the most inaccurate (Scandinavian countries) are on the left side of the graph. The only country where the observed impact happens to match the predicted impact is Iceland.

**Figure 2.11 Observed and adjusted impacts of social benefits, by welfare state, 2006–2014 (pooled)**




* Only working-age households at risk of poverty before social benefits. Weighted values. Sorted by absolute difference between observed and predicted value.

Source EU-SILC (Eurostat), own calculation

We had started our analysis with the assertion that poverty rates are not a sufficient indicator if the question is about social security systems' effectiveness. We then developed an indicator that is supposed to allow a comparison of social security systems. In the next sub-section, we will come back to our starting point, post-benefit AROP rates, and compare them with what we found out about ('real') impacts of social benefits.

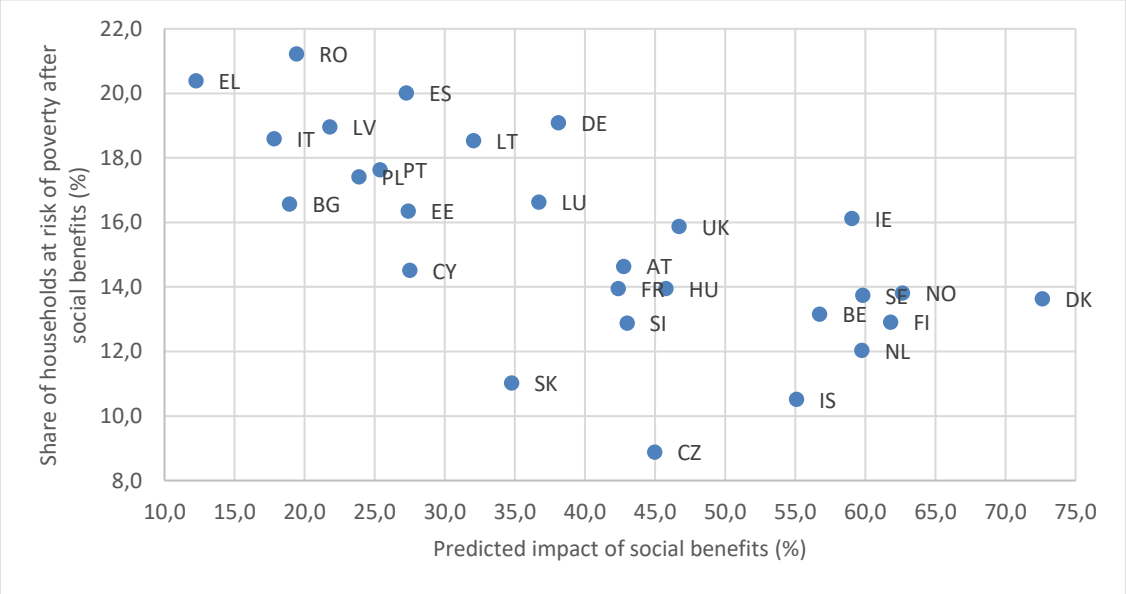
## 2.3 Final AROP rates and the impact of social benefits

What is the link between our measure of the impact of social benefits and final household AROP rates? Figure 2.12 is again a scatterplot, with the predicted impact on the horizontal and the household AROP rate (after benefits) on the vertical axis. First of all, the dots in the graph suggest that there is a link: above average predicted impacts (right hand-side of the graph) go together with below-average final AROP rates (bottom part). Correspondingly, countries for which below-average impacts of social benefits are predicted (left side) tend to show higher rates of households at risk of poverty. The correlation is $\varrho = -0.678$.

The graph also documents the fuzziness of the mentioned link: many social security systems feature a similar impact of social benefits (similar position on the horizontal axis), but the final AROP rates of the respective countries differ sharply. Take for example, Cyprus, Estonia and Spain, all with a predicted impact of social benefits of around 27%. Cyprus has an AROP rate of 14.5% on average across our observation period, Estonia of 16.4% and Spain of 20.0%. Reading the graph from the perspective of the vertical axis, we can also see that Bulgaria, Estonia, Luxembourg and Ireland all feature AROP rates after benefits of just over 16%, while the impact of their social benefits ranges from 18.9% (Bulgaria) to 59.0% (Ireland). Moreover, there are many examples of countries that both have a higher impact of social benefits but also a higher AROP rate than other countries. Take again Ireland as an example: Seen from the perspective of Ireland, there are numerous countries that achieve less in terms of social benefits, but which nevertheless do better in terms of AROP rates: Austria, France, Hungary, Slovenia, Slovakia, the Czech Republic, and others.

In sum, the impact of social benefits is thus linked to a countries' final AROP rate (because the former is one of the *causes* of the latter), but is still a substantially different thing (as it is just *one* of its causes).

**Figure 2.12 Predicted impact of social benefits and AROP rate after social benefits, by country, 2006–2014 (pooled)**




* Working-age households only. Weighted values. The predicted impact of each social security systems' social benefits is expressed as the difference from the overall mean probability of leaving poverty by social benefits.

Source EU-SILC (Eurostat), own calculation

Figure 2.12 complements Figure 2.2 in that both present a part of the explanation of final AROP rates: the initial income distribution (Figure 2.2) and the way social benefits alter this initial distribution (Figure 2.12). Tentatively, we can include both as independent variables in a regression on the final AROP rate (DV). Each country is one (unweighted) observation. Figure a1.2 in the appendix shows that both regressors are jointly significant in explaining the mean AROP rate after social benefits between 2006 and 2014. An estimation of effect size shows that the mean pre-benefit AROP rate (over time) and the mean impact of social benefits have similar explanatory power: the former can explain 88.1%, the latter 93.1% of the residual variance (partial $\eta^2$).[26] This can be taken as a sign that in the between-country perspective (all years pooled), the impact of social security systems is slightly more important in explaining the final AROP rate than the primary income distribution.[27]

In the next section, we will switch to the dynamic perspective. While above, our aim was to compare social security systems in the context of their differing poverty challenges, we will in the following use the same conceptual tools to examine the evolution of social security systems after the 'Great Recession'.

26 The residual variance is the unexplained variance of the DV once the other regressors are already in the model.

27 For interest, it shall be added that both are statistically linked at $\rho = 0.521$: There is thus a tendency of countries with higher pre-benefit AROP levels to feature higher impacts of social benefits (most importantly the Scandinavian countries and Ireland). This may be more than a coincidence, in the sense that advanced economies produce more marked-induced poverty risks, but allow also for a stronger social security system that compensates these risks. An alternative explanation is stronger political pressure in favour of a welfare state in European countries where inequality is larger. At a statistical level, the correlation implies possible multicollinearity in our country-level regression model.

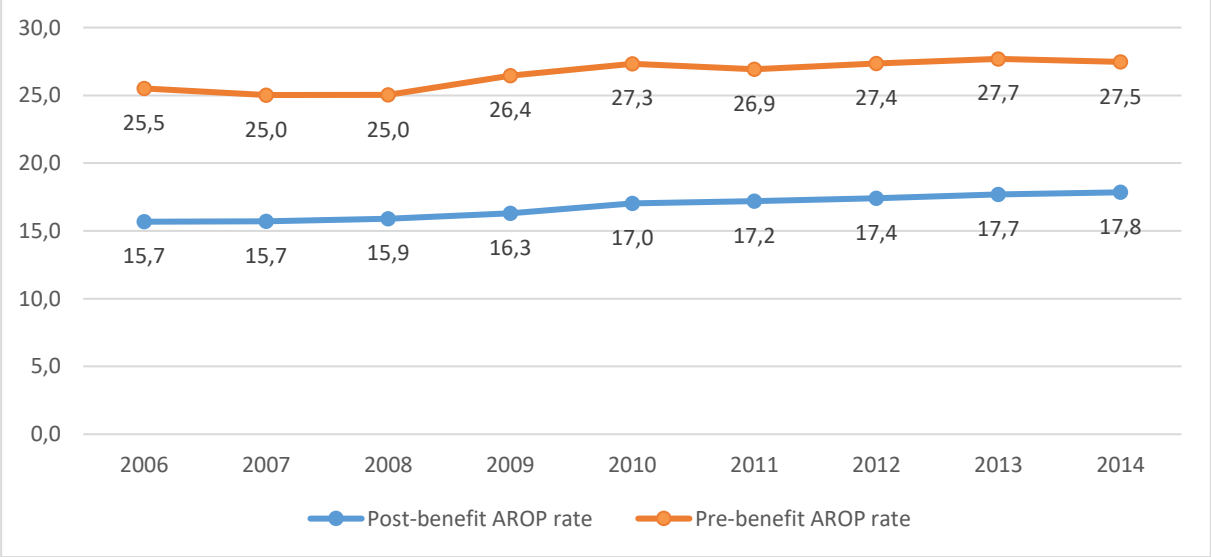
# 3. What are social security trends over time?

In this section, we will shed light on developments in the period between 2006 and 2014. We will mostly focus on differences between the first and the last year of this period. The central question we seek to answer is how social security systems developed during that period, but we also look at the link with changes of households' poverty risks. In a first sub-section (3.1), the changes of AROP rates among households before and after social benefits are analysed and compared. We then (3.2) turn to the impacts of social benefits on poverty, analyse them in observed and adjusted form and compare both. Finally (3.3), we hold changes in final AROP rates against the evolution of adjusted impacts.

## 3.1 Changes in pre- and post-benefit AROP rates

Figure 3.1 shows how AROP rates evolved among working-age households on average across our whole sample between 2006 and 2014 (micro-level averages). The lower curve indicates AROP rates after social benefits. There clearly is a steadily rising share of households with incomes below the poverty threshold: 15.7% in 2006, 17.0% in 2010, and 17.8% in 2014. Inequality is on the rise, not only during Europe's way into the 'Great Recession', but also during its way out of it. A less steady, but also rising trend applies to the AROP rate before social benefits. Starting at 25.5% of observed households in 2006, it peaks for a first time in 2010 and then again in 2013. In 2014, it is at 27.5%, thus two p.p. higher than in 2006. It has thus risen almost as much as the final AROP rate.

**Figure 3.1 Pre- and post-benefit AROP rates between 2006 and 2014, households of all observed countries pooled (%)**



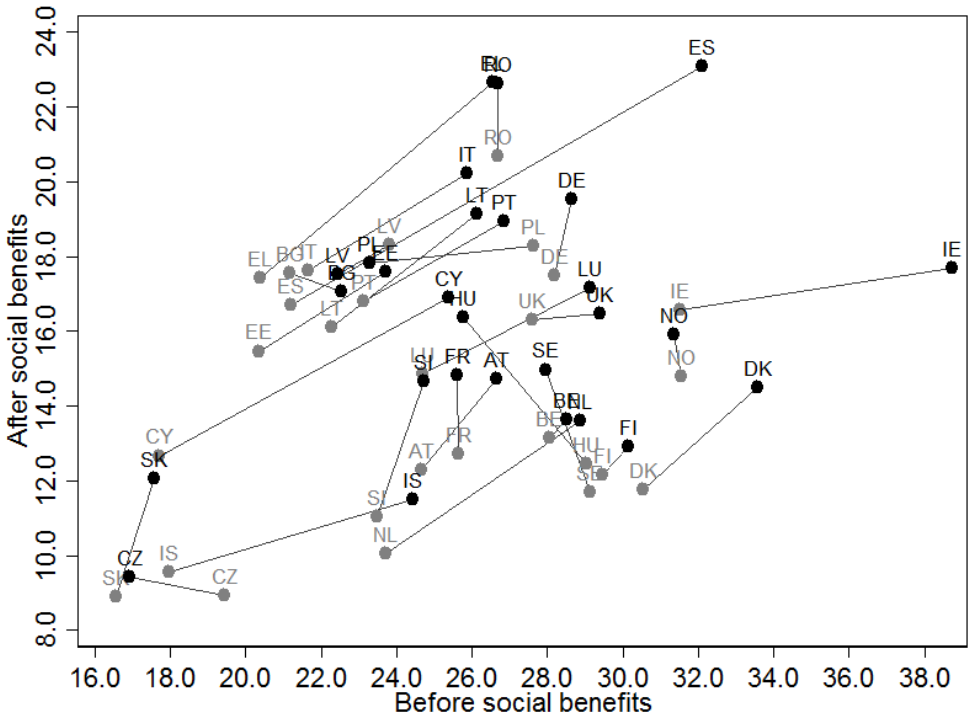

* Working-age households only. Weighted values.
Source EU-SILC (Eurostat), own calculation

If we look at the country level, however, we can see that changes in post-transfer AROP rates are not determined by changes in pre-transfer AROP rates. This relative independence is shown by Figure 3.2: It presents the 2006 and 2014 AROP rates before and after social benefits for each sample country. Grey dots mark the 2006, black dots the 2014 positions. The trend of rising poverty risks concerns virtually all countries.

Looking first at the vertical axis, we hardly see any country where the post-transfer AROP rate has decreased by the end of the observed period (it became slightly lower in Bulgaria, Latvia, and Poland). Especially in Spain (6.4 p.p.) and Greece (5.3 p.p.), there have been rises of more than five percentage points, and of more than three p.p. in Cyprus, Hungary, Slovenia, the Netherlands, Sweden, Slovakia and Lithuania.

Changes in *pre*-transfer AROP rate levels are more drastic, however. We see them on the horizontal axis. In Spain, the rate rises by 10.9 p.p., by more than seven p.p. in Cyprus, Ireland, and by more than six in Iceland and Greece. Interestingly, there are some countries featuring a lower pre-benefit AROP rate in 2006 than in 2014, in particular the Czech Republic, Hungary and Poland. These improvements do not translate, however, into an improved final AROP rate (almost no change in the Czech Republic and Poland, and a steep rise in Hungary in spite of the improved starting position).

**Figure 3.2 Pre- and post-benefit AROP rates in 2006 and 2014, by country (%)**



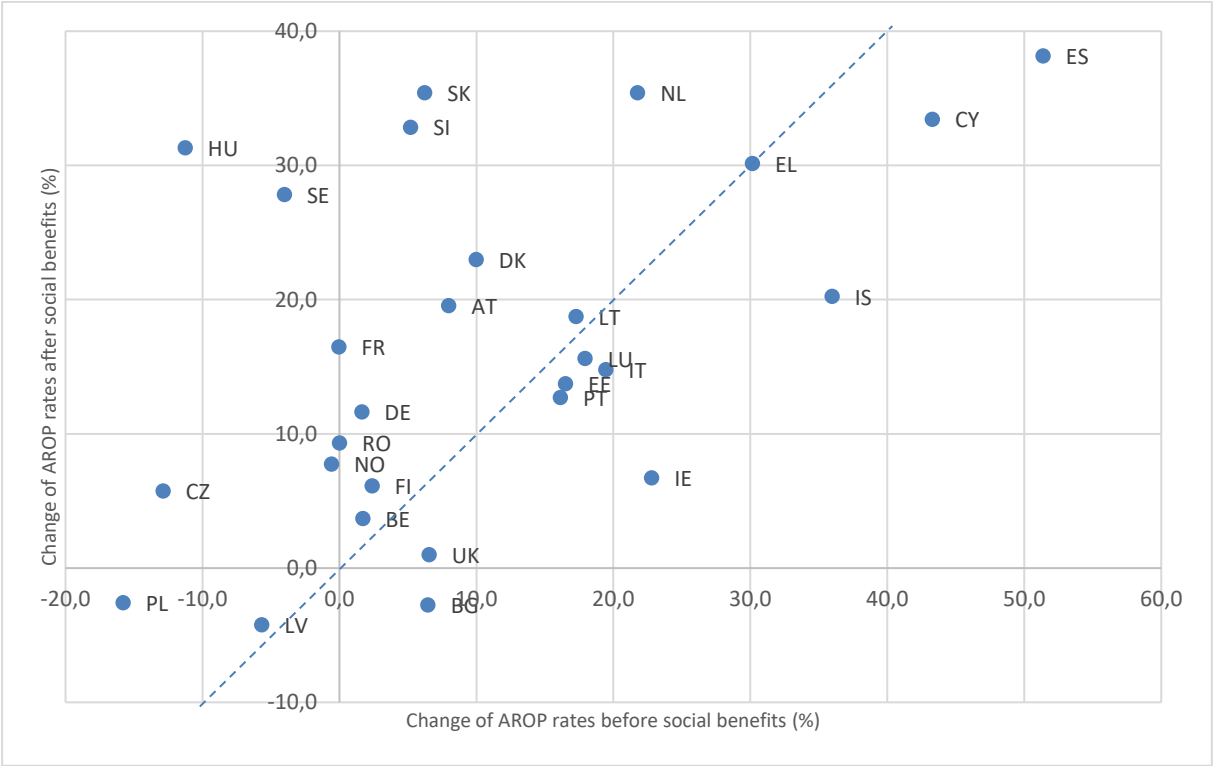

* Working-age households only. Weighted values. Legend: Grey dots = 2006, black dots = 2014.
Source EU-SILC (Eurostat), own calculation

The partly diverging changes of pre- and post-benefit AROP rates suggest that the impact of social benefits on poverty has changed in some countries. In fact, all the slopes in Figure 3.2 which are not on a line that goes through the origin indicate a changed impact, because the ratio between percentage of households poor before and after social benefits changes. A steeper slope indicates a rising, a flatter slope a declining observed impact of social benefits. Changed impacts of social benefits are the one any only reason why changes in final AROP rates are not a mere result of changing pre-benefit AROP rates.

To show more clearly which social security system decreases and which increases its (observed) impact on poverty, Figure 3.3 has changes in pre-benefit AROP rates on the horizontal and changes in post-benefit AROP rates on the vertical axis, both expressed as percentage changes (not p.p.). The statistical correlation of both dimensions is $\varrho = 0.504$ (for p.p. changes: $\varrho = 0.567$). If there were an exact match, i.e. if post-benefit changes were exactly proportional to pre-benefit changes, all countries would be situated on a diagonal line through the origin. This would mean constant impacts of social benefits over time. The only country for which this is observed is Greece (indeed surprisingly), which we find exactly on the diagonal.

Most countries deviate from the diagonal more or less clearly, either upwards or downwards. All countries below the diagonal increase the impact of social benefits between 2006 and 2014, so that the deterioration of the pre-transfers poverty situation is partly cushioned. In turn, all countries above the diagonal feature decreasing poverty-alleviating impacts of social benefits, most of all the countries far above the diagonal (Hungary!). In some of these countries, there is a decrease in pre-benefit AROP rates, but it does not lead to a proportional decline in AROP rates after social benefits.

**Figure 3.3 Changes in pre- and post-benefit AROP rates of households from 2006 to 2014, by country**




* Working-age households only. Weighted values. For DE, values of 2013.
Source EU-SILC (Eurostat), own calculation

As we know from Section 2, a change of observed impact can be caused both by a changing extent of welfare provision and by changing challenges in terms of depth of poverty. This will be analysed in the following sub-section.

## 3.2 Changes in the impact of social protection

How did the impact of social benefits on poverty evolve between 2006 and 2014? As explained above, this impact is defined here as the share of households at risk of poverty before social benefits which are lifted over the poverty threshold by social benefits. We look both at the 'real' impact in the sense of observed

values and at a different 'real' impact in the sense that we adjust for changing circumstances and thus isolate social security system change.

In order to estimate adjusted changes, we again use the model explained above in sub-sections 1.1 and 2.2.2, yet in a slightly modified way, in order to trace dynamic trends. We still run one single regression for all historical years, but we include dummies not for each country (28 dummies), but for each country year (thus 252 dummies). Based on the resulting coefficients, we predict for each household at risk of poverty *in 2006* the probability of being lifted out of poverty by the social security systems of its country in 2006 and in each of the following years. For example, having estimated the impact of the Belgian social security system for the years 2006, 2007, ..., 2014, we apply these impacts to each Belgian household at risk of poverty in 2006. This method reveals how the (dynamically changing) Belgian social security system would perform if confronted each year with the same poverty challenge (captured by the variables that describe the situation of the sample households). We can then compare the Belgian case to the estimated evolution of other countries' social security systems (3.2.3). We can also calculate a joint prediction for all social security systems at once, building the mean share of households lifted over the poverty threshold by the social security system of their respective country in 2006, 2007,..., 2014 (3.2.1). Finally, we can compare observed trends of social security systems (3.2.2) with our estimated trends (3.2.4).

### 3.2.1 The evolution of observed and adjusted impacts in comparison, across all countries

Figure 3.4 shows how the mean impact of social benefits in the fight against poverty evolves between 2006 and 2014, aggregating across all sample countries.[28] One curve stands for the *observed* share of households lifted above the poverty threshold by social benefits, the other curve presents the adjusted share, as predicted based on our regression model. The prediction refers to what would have happened if households' situations had stayed the same as in the year 2006.[29]

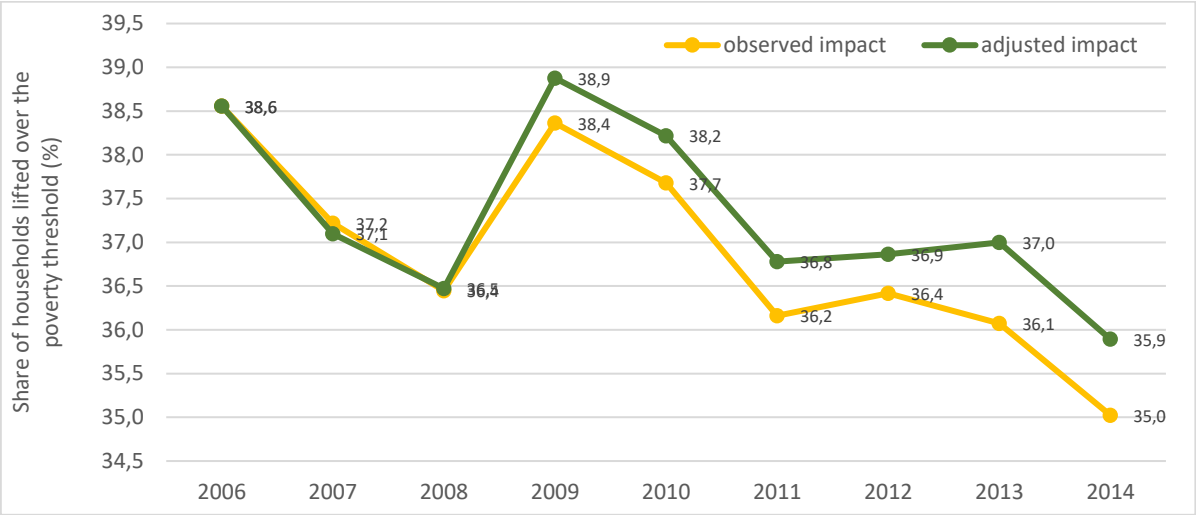
The observed trend is clearly downward: while there are 38.6% of households at risk of poverty before social benefits that have a post-benefit income above the poverty threshold in 2006, this share is just at 35.0% in 2014. The downward trend of observed impact is interrupted by a bulge in the years 2009 and 2010. In these two years, there seems to be an increased 'generosity' of social benefits to counter the crisis, which is then taken back again.

Looking at the adjusted trend, the evolution is less negative in all years after 2007. The bulge in the midst of the crisis is even stronger, and for the middle of the observation period the development is rather stable or even slightly upward. Yet, this does not compensate the marked drop in effectiveness in the first and the last year observed. From 2006 to 2007, the adjusted impact shrinks from 38.6% to 37.2% and from 2013 to 2014 from 37.0% to 35.9%. Thus, if we compare both ends of our observation period, we get a downward trend on average across all countries also in the adjusted perspective. There is thus a degradation of the average performance of social security systems in our country sample. At the same time, and on top of this, poverty challenges grew in the observed period. The grown challenges are the reason why the observed trend is more negative than the adjusted trend.

28 Impacts are weighted by the sample households' selection probability, captured by the EU-SILC weights; country size is thus included in the weighting.

29 The prediction for the year 2006 is therefore identical to the observed value for 2006.

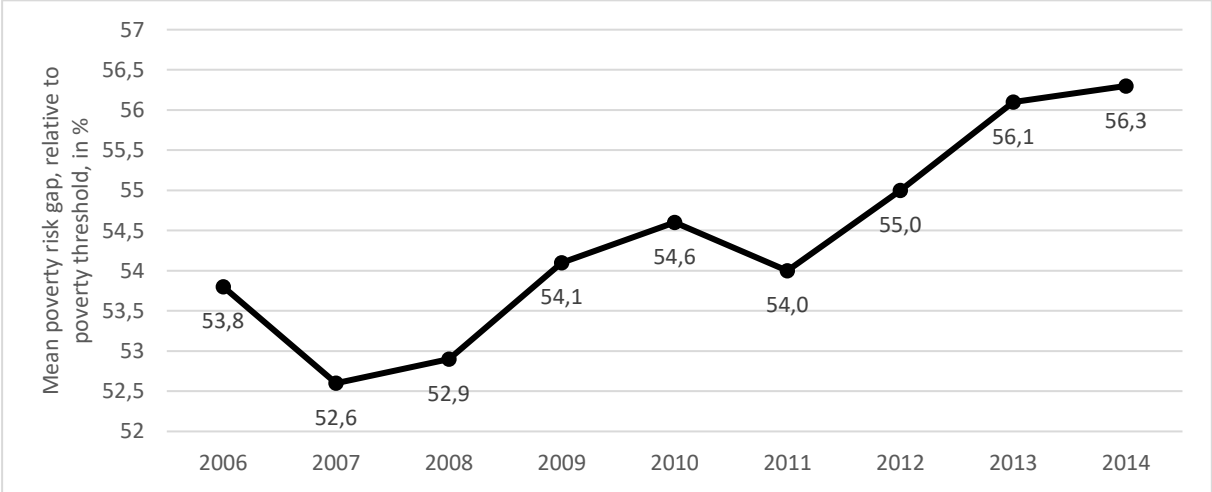
**Figure 3.4 Observed and adjusted trends of social benefits' impact, households of all observed countries pooled**




* Only working-age households at risk of poverty before social benefits. Weighted at household level.
Source EU-SILC (Eurostat), own calculation

Part of the evolution of poverty challenges is illustrated in Figure 3.5 by the rise of the average poverty gap. After an initial drop from 53.8% to 52.6%, it increases up to 56.3% in 2014. This means that in 2014, the average household at risk of poverty is 2.5 p.p. further below the poverty threshold compared to 2006. That in itself is a cause for concern from the perspective of equality. Apart from this, it is also an explanation why (in Figure 3.4) the adjusted impact of social benefits has deteriorated less than the observed impact.[30]

**Figure 3.5 Evolution of the poverty gap on average across households in observed countries**




* Only working-age households at risk of poverty before social benefits. Weighted at household level.
Source EU-SILC (Eurostat), own calculation

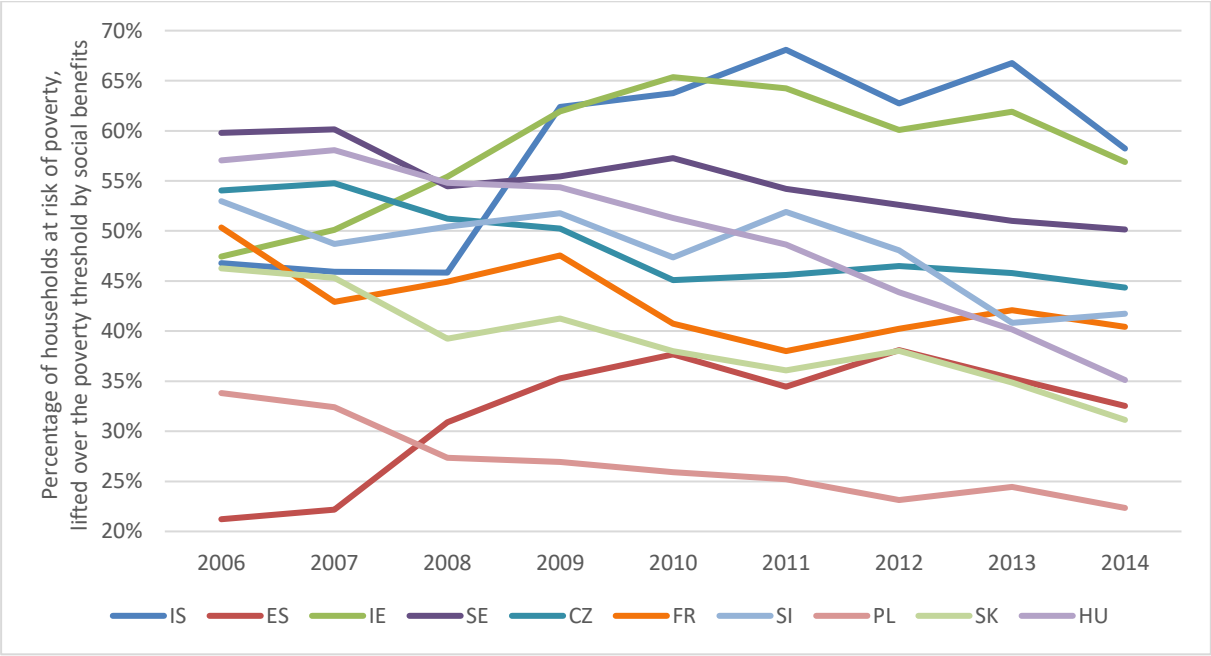
A grown poverty challenge in terms of number of households at risk of poverty without social benefits (Figure 3.1) and in terms of the poverty gap (Figure 3.5) seems to be a particular legacy of the 'Great Recession'. Concerning the downward trend of social protection, the link with the crisis does not seem so clear.

30 Note that the adjusted trend tends to be better/worse than the observed trend when the average poverty gap increases/decreases. The relationship is not exactly proportional, however. The other factors in the model also play a role.

The crisis clearly reflects in a bulge in the impact of social benefits (Figure 3.4) in 2009/2010, documenting the successes of short-term anti-crises policies. Intervention was then scaled back again for fiscal reasons.[31] In the course of the observed decade, Figure 3.4 makes the 2008 crisis look like a short-term interruption of a more long-standing downward trend of social protection, which could also have occured without the crisis.

It is important to look at the marked differences between countries, however. Figure 3.6 shows the (estimated) trajectories of countries whose social security systems feature particularly strong changes of impacts (>|9| p.p.) between 2006 and 2014. In Iceland, but also in Spain (starting from a low level) and Ireland, we even see impressive hikes of social benefits' impacts on poverty. But we also see how the adjusted effectiveness of the Hungarian social security system declines, from a very decent level, 57.1% in 2006, to merely 35.1% in 2014. A marked decline is also observed in Slovakia, Slovenia, Poland, France and Sweden.

**Figure 3.6 Adjusted trends of social benefits' impact, selected countries**




* Only working-age households at risk of poverty before social benefits. Weighted values.
Source EU-SILC (Eurostat), own calculation

In the following, we look in more detail at developments in individual countries; first observed and then adjusted developments, after which both will be compared.

31 The 2014/2015 world social protection report of the ILO acknowledges for the first phase of the global crisis an 'expansion and fiscal stimulus' (ILO 2015, 128), even though smaller in Europe than in other high income countries (ibid.). In the second phase, the years 2010 and after, 'a 180-degree shift in governments' public expenditure policy' (ibid.) followed, towards 'fiscal consolidation' (ibid.). According to the ILO report, 'the European social model was [then] depicted as unaffordable and burdensome, which ultimately reduced competitiveness and discouraged growth' (ibid.). Similarly, a publication by Eurofound states that 'European welfare states have prevented a greater increase in inequalities by cushioning growing market income inequalities, especially in some of the countries that were hardest hit by the crisis in the European periphery (the Mediterranean and Anglo-Saxon countries and the Baltics to a lower extent). The strong pressures and growing strain on public finances as the crisis continued (especially after 2011, and especially in the periphery) further underline the significance of European welfare states in cushioning the effect of economic turbulence on the distribution of income and the life chances of Europeans.' (Eurofound 2017, 55) The Social protection committee states that 'in some Member States income support levels of last resort schemes worsened significantly at the same time as the number of people counting on them increased.' (Social Protection Committee 2016, 76)

### 3.2.2 Observed changes, by country

Table 3.1 presents for each country the impacts of social benefits for the years 2006 and 2014, thus two years with unequal overall impacts, as we saw in Figure 3.4. In 2006, the impact of social protection, as it is measured here, ranges from 14.6% (of households lifted above the poverty threshold) in Greece to 61.4% in Denmark. In 2014, the range goes from again 14.6% in Greece up to 57.2% in Finland, Danish social benefits having lost some of their impact (4.6 p.p.). If we abstract from changes of less than one percentage point, we see an improvement of the observed impact in 10 out of 28 countries between 2006 and 2014, and a deterioration in a majority of 15 countries. The worst deteriorations with more than 10 p.p. occur in Hungary, Slovakia, Sweden, Slovenia and Poland, thus mostly Eastern Europe (one could add the Czech Republic with 9.8 p.p.). The country with the biggest improvement is equally in this region, Bulgaria with a 7.2 p.p. higher impact in 2014, followed by Ireland and Spain (+6.9 p.p. each), plus Iceland and two more Southern European countries (Cyprus, Italy).[32]

**Table 3.1 Observed share of households lifted over the poverty threshold, by country, 2006 and 2014**

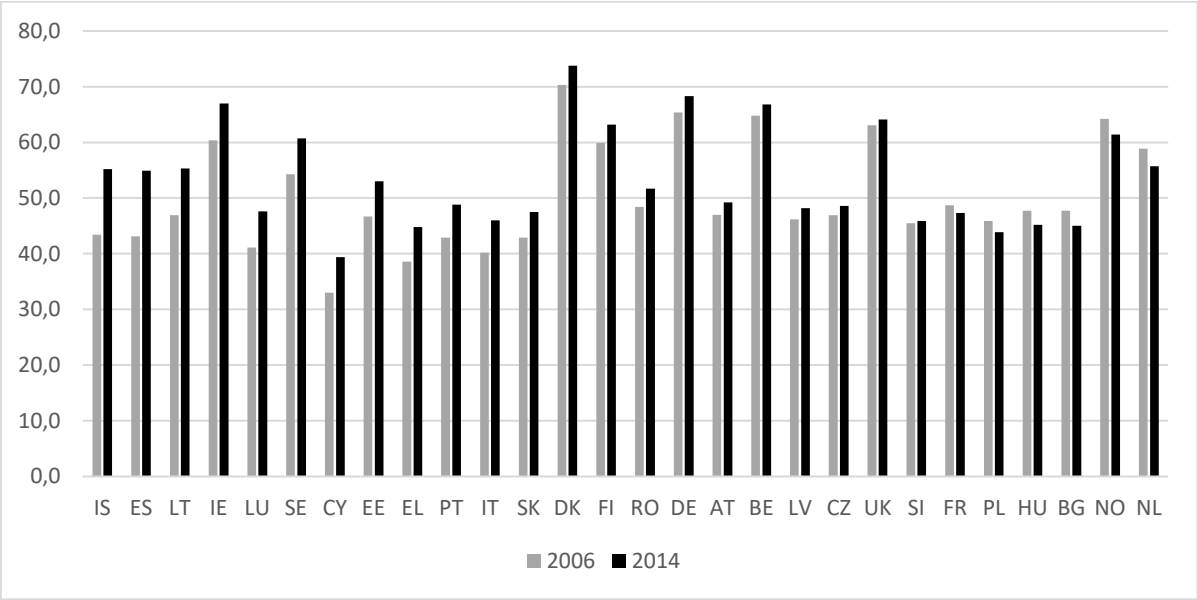
| Country | 2006 (%) | 2014 (%) | Δ (p.p.) | Country | 2006 (%) | 2014 (%) | Δ (p.p.) |
|---|---|---|---|---|---|---|---|
| AT | 50.1 | 44.8 | -5.3 | IS | 46.8 | 52.9 | 6.2 |
| BE | 53.1 | 52.2 | -0.9 | IT | 18.7 | 21.9 | 3.2 |
| BG | 17.1 | 24.3 | 7.2 | LT | 27.7 | 26.7 | -0.9 |
| CY | 28.4 | 33.4 | 4.9 | LU | 39.9 | 41.0 | 1.2 |
| CZ | 54.0 | 44.2 | -9.8 | LV | 23.1 | 21.9 | -1.2 |
| DE | 37.9 | 31.8 | -6.1 | NL | 57.7 | 52.9 | -4.7 |
| DK | 61.4 | 56.9 | -4.6 | NO | 53.1 | 49.2 | -3.9 |
| EE | 24.0 | 25.9 | 1.8 | PL | 33.8 | 23.4 | -10.4 |
| EL | 14.6 | 14.6 | 0.0 | PT | 27.3 | 29.4 | 2.1 |
| ES | 21.2 | 28.1 | 6.9 | RO | 22.5 | 15.2 | -7.2 |
| FI | 58.7 | 57.2 | -1.5 | SE | 59.8 | 46.5 | -13.3 |
| FR | 50.3 | 42.1 | -8.2 | SI | 53.0 | 40.6 | -12.4 |
| HU | 57.1 | 36.5 | -20.6 | SK | 46.3 | 31.5 | -14.8 |
| IE | 47.4 | 54.3 | 6.9 | UK | 40.9 | 44.0 | 3.1 |

* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013.
**Source** EU-SILC (Eurostat), own calculation

We have noted above the importance the poverty challenge as a context for our analysis. Figure 3.7 shows that the general rise in depth of poverty (Figure 3.5) applies also to most countries individually. It is only in six countries, France, Poland, Hungary, Bulgaria, Norway and the Netherlands, that the average poverty gap has narrowed from 2006 to 2014. In these few cases, the incomes of households at risk of poverty have grown over-proportionally (or shrunk under-proportionally) compared to richer households. In Iceland and Spain, in contrast, the poverty gap has widened by as much as 11.8 p.p., which means a tremendously increased challenge to welfare states if the aim is fighting poverty in the sense of the definition used here.

32 These results can be compared with those in the annual report of the Social Protection Committee (2016, 76), except that the latter compare *2008* to 2014 and focus on quasi-jobless households. The authors find a mixed result across countries and thus no common trend of the effectiveness of social benefits.

**Figure 3.7 Average relative poverty gap, by country, years 2006 and 2014 (%)**




* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013. Sorted by percentage-point change.
Source EU-SILC (Eurostat), own calculation

In the following, we will again look at impacts of social benefits, yet adjusted for the changes in poverty gaps and other household features. We saw above that single households have a particularly low chance of being lifted over the poverty threshold by social benefits Figure 2.8). It is therefore appropriate to control not only for the depth of poverty, but also for household types in order to account for the rise in single households (see table 1.2 in the first section), which might otherwise be confounded with a declining impact of social benefits.

### 3.2.3 Adjusted changes, by country

We now turn to what the adjusted perspective tells us about social security systems in the course of the observation period. In 2006, the adjusted impacts of social benefits are within a range of 14.6% for the Greek and 61.4 for the Danish social security system Table 3.2). In 2014, the Danish system still marks the top of the distribution, with an estimated share of 61.0% of households at risk of poverty that would be lifted over the poverty threshold by social transfers, if their conditions had not changed since 2006. It is now the Romanian social security system that comes last with an estimated effectiveness of 15.7%, while the Greek system has improved by one rank with an effectiveness of 16.4% in 2014. Interestingly, this happens even though Greece has suffered from strong pressures in the context of the crisis and the subsequent policy constraints imposed in exchange for financial support, just like Portugal, which also features an improvement in the observed period.

Looking only at changes of more than one percentage point, 13 social security systems gain in effectiveness between 2006 and 2014, while the same number lose some of their effectiveness. (Belgium and Denmark stay almost unchanged.) Losses are more important in size than gains, however: -8.7 p.p. on average across the 13 social security systems which lose effectiveness (-7.6 if we include Belgium and Denmark), compared to gains of 5.4 p.p. on average across the 13 social security systems with an improved performance. We see some particularly large losses (more than 10 p.p.) of social benefits' impacts of some Eastern European social security systems, namely the Hungarian, Slovakian, Polish and Slovenian. Impact losses of the French, the Czech and the Swedish social security system are also close to -10 p.p. Improvements of impacts of 11.4 and 11.3 p.p. are calculated for the Icelandic and the Spanish social security system.

**Table 3.2 Adjusted share of persons lifted over the poverty threshold, by social security system, 2006 and 2014**

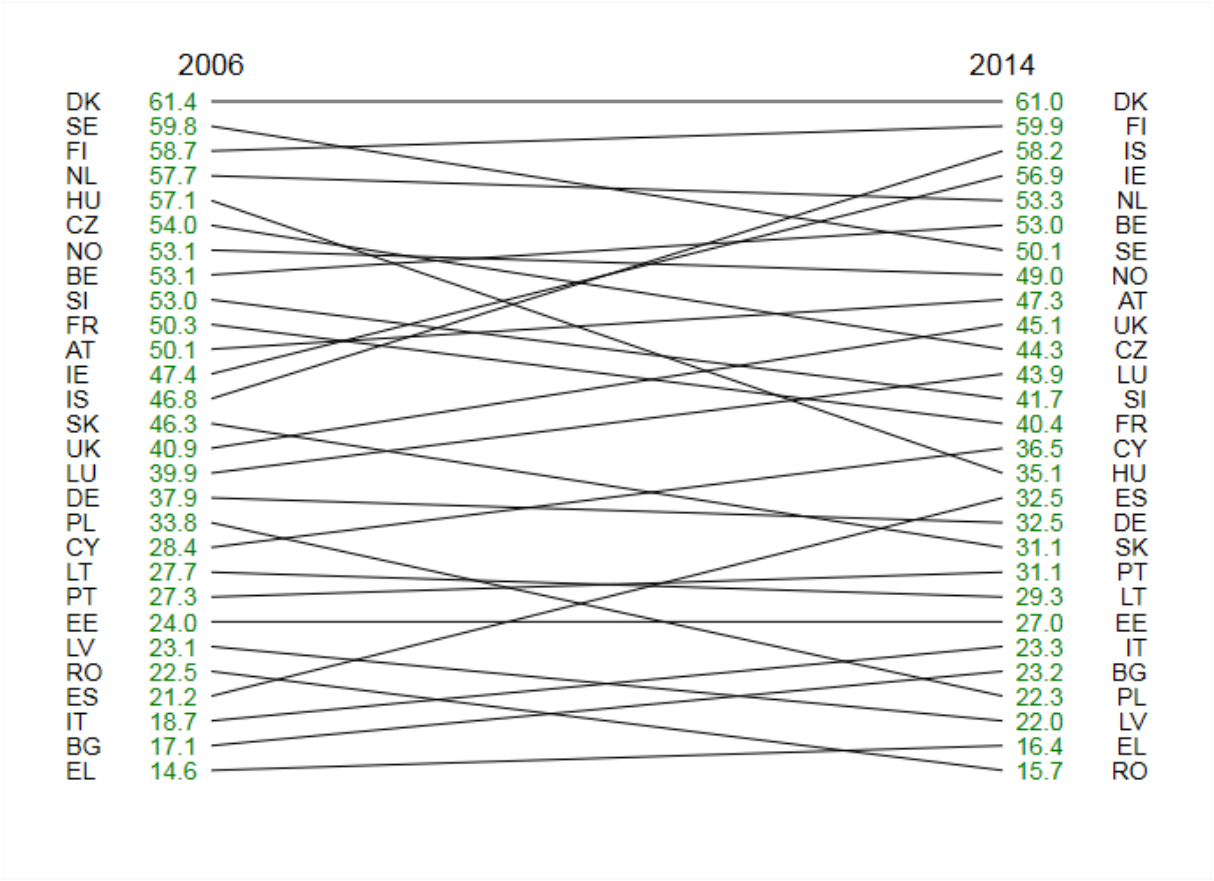
| Country | 2006 (%) | 2014 (%) | Δ (p.p.) | Country | 2006 (%) | 2014 (%) | Δ (p.p.) |
|---|---|---|---|---|---|---|---|
| AT | 50.1 | 47.3 | -2.8 | IS | 46.8 | 58.2 | 11.4 |
| BE | 53.1 | 53.0 | -0.1 | IT | 18.7 | 23.3 | 4.6 |
| BG | 17.1 | 23.2 | 6.1 | LT | 27.7 | 29.3 | 1.7 |
| CY | 28.4 | 36.5 | 8.1 | LU | 39.9 | 43.9 | 4.0 |
| CZ | 54.0 | 44.3 | -9.7 | LV | 23.1 | 22.0 | -1.1 |
| DE | 37.9 | 32.5 | -5.4 | NL | 57.7 | 53.3 | -4.4 |
| DK | 61.4 | 61.0 | -0.4 | NO | 53.1 | 49.0 | -4.1 |
| EE | 24.0 | 27.0 | 3.0 | PL | 33.8 | 22.3 | -11.5 |
| EL | 14.6 | 16.4 | 1.8 | PT | 27.3 | 31.1 | 3.8 |
| ES | 21.2 | 32.5 | 11.3 | RO | 22.5 | 15.7 | -6.8 |
| FI | 58.7 | 59.9 | 1.2 | SE | 59.8 | 50.1 | -9.7 |
| FR | 50.3 | 40.4 | -9.9 | SI | 53.0 | 41.7 | -11.3 |
| HU | 57.1 | 35.1 | -21.9 | SK | 46.3 | 31.1 | -15.1 |
| IE | 47.4 | 56.9 | 9.4 | UK | 40.9 | 45.1 | 4.2 |

* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013. Estimated shares of households (across all observation countries) at risk of poverty that would be lifted over the poverty line by the social benefits of each particular social security system.

**Source** EU-SILC (Eurostat), own calculation

Changes in impact of social benefits result in an altered ranking order of social security systems: Figure 3.7 shows marked drops e.g. for the Hungarian (5 to 16), but also for many other social security systems in Eastern Europe. In turn, the Irish moves from rank 12 to rank 4, the Icelandic from 13 to 3, and the Spanish from 25 to 17. At the bottom of the ranking order, both in 2006 and 2014 there is a mix of Eastern and Southern European social security systems. At the top, Scandinavian social security systems are next to individual representatives of other welfare regimes.

**Figure 3.8 Social security systems of sample countries ranked by their adjusted impact, years 2006 and 2014 (%)**




* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013. Estimated shares of households (across all observation countries) at risk of poverty that would be lifted over the poverty line by the social benefits of each particular social security system.

Source EU-SILC (Eurostat), own calculation

The estimated impacts of social security systems are more similar between countries in 2014 than in 2006, if we look at their variation coefficient (see Figure a1.1 in the appendix). The trend of convergence is not linear, however; we see a W-shaped development: from 36.9% in 2006 to a minimum of 30.6% in 2009 and again up to 34.5% in 2011 and again in 2014. Whether or not the inequality in effectiveness between social security systems is heading back towards its 2006 level remains to be seen in the coming years.

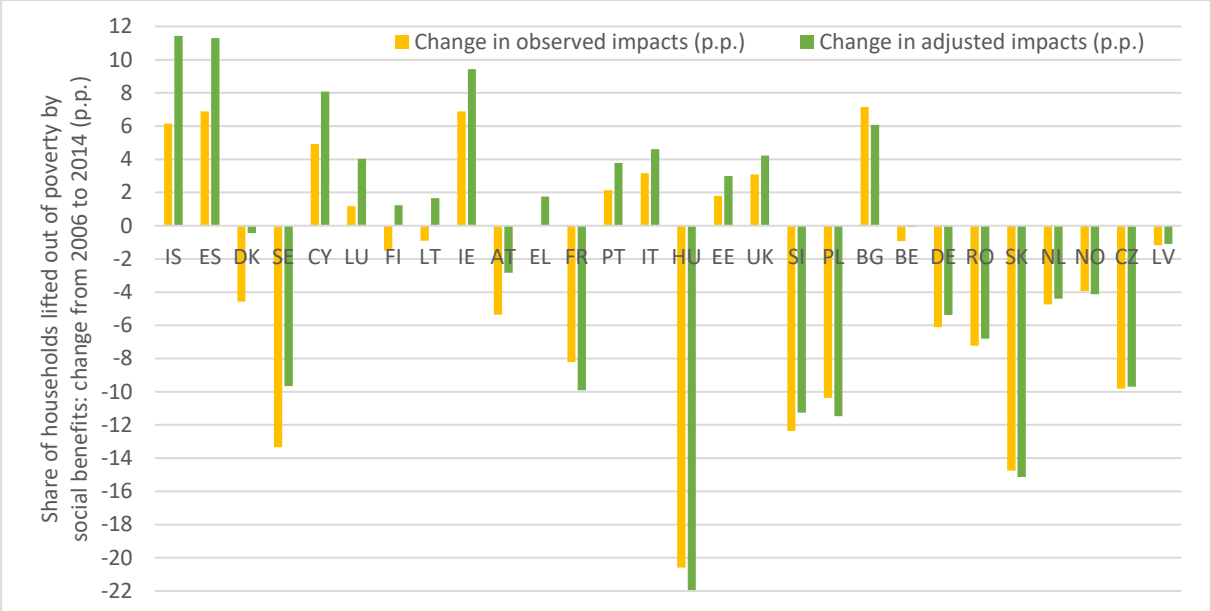
### 3.2.4 Observed and adjusted changes in comparison

We saw already in 3.2.1 that observed impacts of social security systems declined more strongly than adjusted impacts when looking at the average across countries. Having analysed at the country-level both the observed (3.2.2) and the adjusted (3.2.3) impacts, we will in the following compare them for each sample country: Are there countries where the observed trend is a good approximation of how social security systems evolved? In which countries does it make a major difference to look at the adjusted instead of the observed trend?

The most flagrant cases of disagreement between observed and adjusted impact change gather on the left side of Figure 3.9. The gap is widest in Iceland. While both perspectives indicate a rising effectiveness of its social security system, the adjusted change (11.4 p.p.) exceeds the observed change (6.2 p.p.) by 5.2 p.p. Quite similar is the case of Spain. In Denmark, while we observe a -4.6 p.p. smaller share of households freed from poverty risks by social benefits in 2014 than in 2006, this change seems to be for the largest part

accounted for by adverse changes of circumstances. In the adjusted perspective, we see hardly any change of impact of Danish social benefits (-0.4 p.p.). In Sweden, where we observe a strong reduction of impact, our estimated results equally point to a decreased effectiveness of social benefits, yet the reduction is smaller. In virtually all countries with a marked difference between observed and adjusted trend, the adjusted trend is the more positive one (though it can be negative in itself). The most important exception is France (-8.2 p.p. observed, -9.9 p.p. predicted), but also Hungary, Poland and Bulgaria.

**Figure 3.9 Change of impact between 2006 and 2014: observed and adjusted results, by social security system**




* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013. Sorted by absolute p.p. difference between observed and adjusted change.

Source EU-SILC (Eurostat), own calculation

In all the countries where the adjusted is superior to the observed trend, a mere observation of social benefits' success in the fight against poverty would understate the true efforts of the social security system. In countries with rising policy efforts, we would have seen a smaller increase (or sometimes even a drop) of the AROP rate if policy efforts had not been accompanied by rising poverty challenges. It is these rising poverty challenges in most countries, reflected in a growing depth of poverty of households before social benefits, which either offset improvements of the social security system or compound its deterioration.

**Table 3.3** **Change in share of households lifted out of poverty by social benefits from 2006 to 2014: Comparison of observed and adjusted results, by social security system (p.p.)**

| Country | Observed change | Adjusted change | Country | Observed change | Adjusted change |
|---|---|---|---|---|---|
| AT | -5.3 | -2.8 | IS | 6.2 | 11.4 |
| BE | -0.9 | -0.1 | IT | 3.2 | 4.6 |
| BG | 7.2 | 6.1 | LT | -0.9 | 1.7 |
| CY | 4.9 | 8.1 | LU | 1.2 | 4.0 |
| CZ | -9.8 | -9.7 | LV | -1.2 | -1.1 |
| DE | -6.1 | -5.4 | NL | -4.7 | -4.4 |
| DK | -4.6 | -0.4 | NO | -3.9 | -4.1 |
| EE | 1.8 | 3.0 | PL | -10.4 | -11.5 |
| EL | 0.0 | 1.8 | PT | 2.1 | 3.8 |
| ES | 6.9 | 11.3 | RO | -7.2 | -6.8 |
| FI | -1.5 | 1.2 | SE | -13.3 | -9.7 |
| FR | -8.2 | -9.9 | SI | -12.4 | -11.3 |
| HU | -20.6 | -21.9 | SK | -14.8 | -15.1 |
| IE | 6.9 | 9.4 | UK | 3.1 | 4.2 |

* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013.
**Source** EU-SILC (Eurostat), own calculation

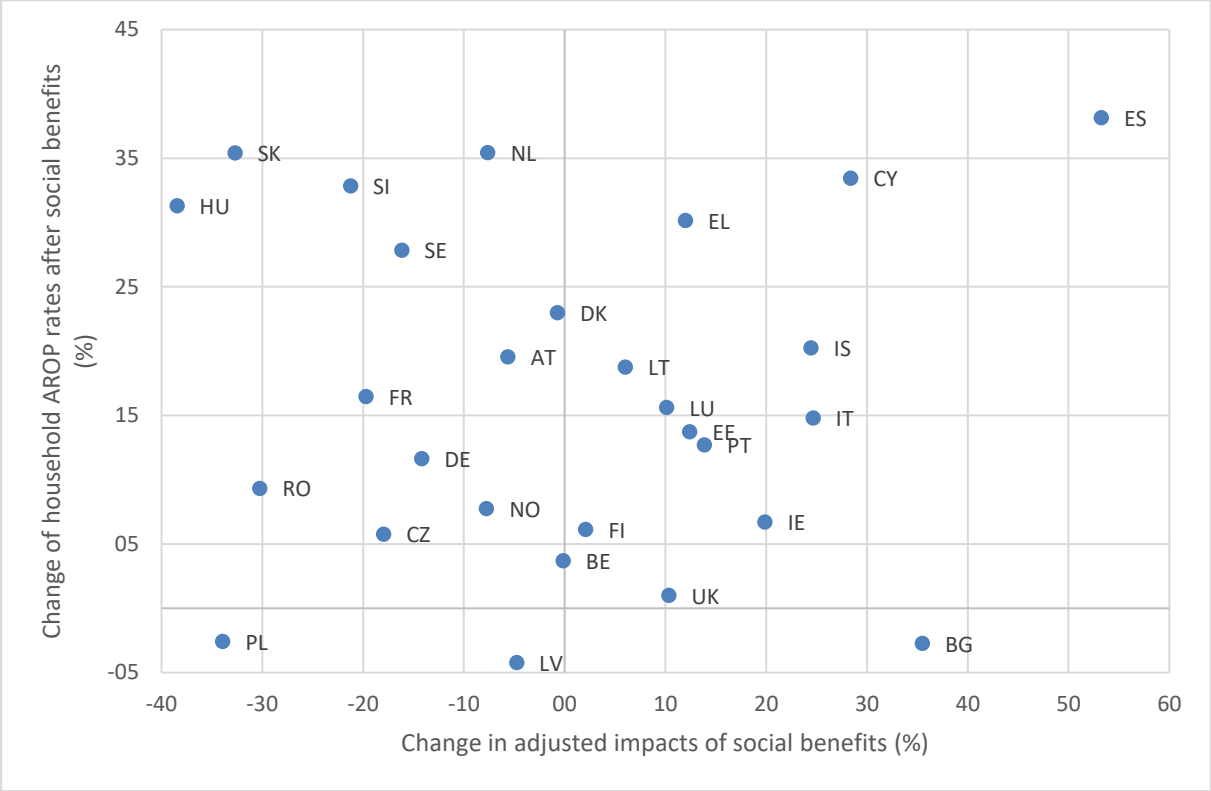
For convenience, Table 3.3 again lists the values contained in Figure 3.9. As mentioned already, we find 13 countries with positive and 13 countries with negative adjusted trends (if we abstract from the almost unchanged cases of Belgium and Denmark). This is much more balanced than the observed trends with 10 improving and 15 declining impacts of social security systems (cp. 3.2.2). Our results suggests that it can indeed be worthwhile to control for the depth of poverty and households structures if one is interested in separating social security-effects from structural changes.

## 3.3 Changes in the impact of social benefits and in final AROP rates

At the beginning of this section, we saw that the evolution of post-benefit AROP rates has been negative in a great majority of observed countries. On average across the observed population, the share of households at risk of poverty in 2014 exceeds the 2006 share by 2.0 p.p. Is this deterioration caused by a decline in social benefits' poverty-reducing impact?

If we compare changes in post-transfer AROP rates to the adjusted impact changes that we estimated with our model, we find almost complete independence at first glance. Whereas the correlation between AROP rate changes (in %) and observed impact changes (in %) is already negligible ($\varrho$ = -0.121), the correlation with adjusted impact changes (in %) is only $\varrho$ = -0.015, thus inexistent. Figure 3.10 illustrates this, plotting changes in adjusted policy impact (horizontal axis) against the evolution of post-benefit AROP rates (vertical axis). There is no pattern: AROP rates grew in most countries, but independently of whether the adjusted impact of social benefits shrunk, stayed constant, or grew.

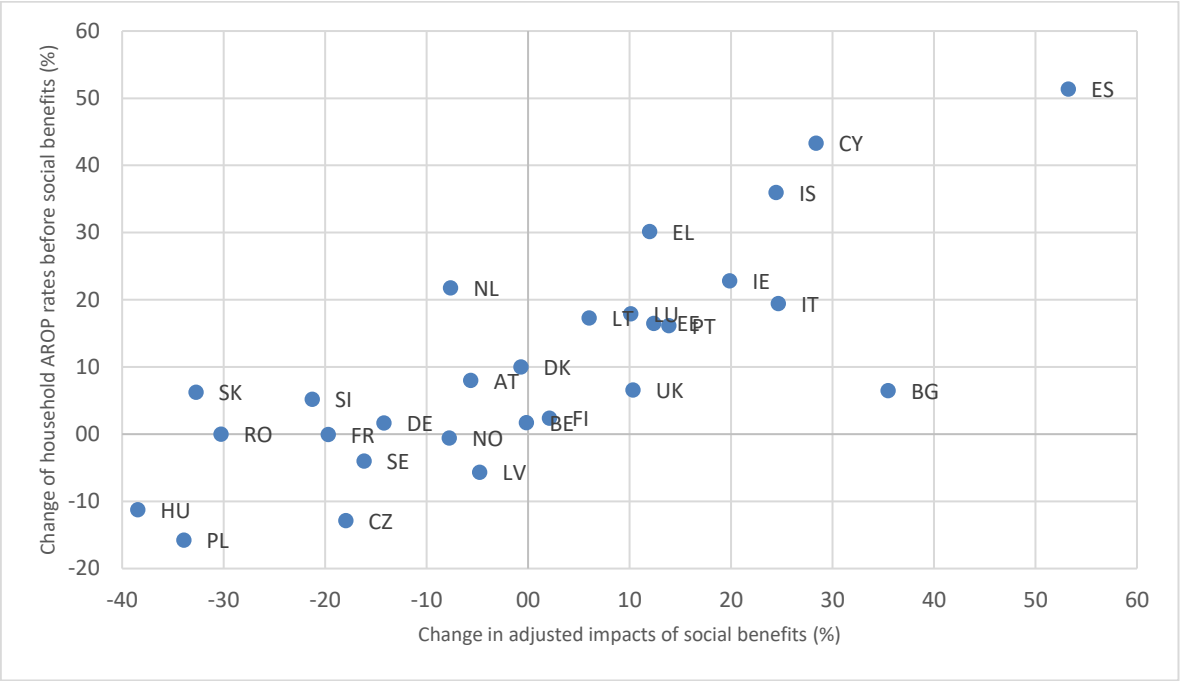
**Figure 3.10 Change in final AROP rates of households and change in (adjusted) effectiveness of social benefits from 2006 to 2014**




* Working-age households only. Weighted values. For DE, values of 2013.
Source EU-SILC (Eurostat), own calculation

The above perspective is only bivariate, however. We need to take account of the simultaneous change in pre- benefit AROP rates, because this change obscures the link between changes of impact and changes of post- benefit AROP rates. This is possible because the change in pre-benefit AROP rates is strongly correlated with the change in adjusted impacts ($\varrho$ = 0.798), see also Figure 3.11 below: social protection has decreased less where challenges have grown more strongly; possibly there has been a 'compensatory evolution' of social policy. When looking at Figure 3.10, we thus have to keep in mind that the more positive the evolution of adjusted impacts (right hand-side), the more negative the evolution of pre-benefit AROP rates. Both factors partly cancel each other out.

**Figure 3.11 Link between evolution of pre-benefit AROP rates and evolution of impact, from 2006 to 2014**




* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013.
Source EU-SILC (Eurostat), own calculation

A multivariate regression at country-level indeed shows that pre-benefit AROP rate changes and social security system impact changes are jointly significant in explaining the evolution of the final AROP rate (Table a1.13). Estimating effect sizes yields that pre-benefit AROP rate changes explain 66.6% of the residual variance, while social security system impact changes explain 55.2% of the residual variance (partial $\eta^2$). The regression results are only of limited reliability, however, as the model suffers from strong multicollinearity (high correlation between the two regressors, see above). What we can take home is that the changing impact of social benefits and the growth of the poverty challenge faced by European societies jointly explain the trend of rising AROP rates in Europe.

# 4. Summary and conclusions: Increased poverty challenges for households and social security systems

Our analysis of social benefits and poverty risks confirms that poverty rates have been on the rise in Europe in the wake of the 'Great Recession'. With regard to households in active age, they rose from 15.7% in 2006 to 17.8% in 2014 on average across our 28-country sample (Figure 3.1). We also confirm - to some extent - the general impression of a decline in social security systems' impact. On average across households of the observed countries, the share of households at risk of poverty that are helped out by social benefits drops between 2006 and 2014 (Figure 3.4). Both phenomena are also linked, as the decrease in social benefits' poverty-alleviating power appears as one reason for rising AROP rates. Our results underline, however, the role that a rising poverty challenge to households and social security systems has played as a causal factor for rising AROP rates during and since the 'Great Recession'.

It is a twofold challenge: On the one hand, the share of households at risk of poverty *before* social benefits rises by 2.0 p.p. or 7.8% across our sample in the period between 2006 and 2014 (from 25.5% to 27.5%). On the other hand, the mean poverty gap increases by 2.5 p.p. or 4.6% (from 53.8% to 56.3%). This means that social security systems faced both an increasing caseload ('breadth of poverty') and a greater difficulty of the average case ('depth of poverty'). The increase of poverty challenges is more pronounced in some countries than in others. The share of households that are at risk of poverty before transfers increased most strongly in Spain, Cyprus, Iceland and Greece in the course of the observed period - by 30% or more (Figure 3.3) - while it declined in Poland, Czech Republic and Hungary. The poverty gap increased most strongly in Iceland, Spain, Lithuania and Ireland, while there is also a minority of countries where it decreased between 2006 and 2014 (Figure 3.7).

A widening of the poverty gaps suffered by households makes the observed trend of social protection partly misleading. If the underlying poverty challenges grow, efforts of social security systems risk being underrated. Increased efforts in social protection can be absorbed or even appear as their contrary in a context of a(n) (over-)proportional deterioration of circumstances. Figure 3.9 showed that - against the backdrop of mostly rising poverty challenges - the adjusted evolution of social security systems is most of the time better than it appears at first glance. It is a difference by degree, however, not a qualitative difference, except in Finland and Lithuania, where the observed change of impact is slightly negative while the adjusted change is slightly positive. Among the countries with substantial (more than one p.p.) changes of their social security systems' effectiveness, 'only' 13 of our 26 show a clear weakening from the challenge-adjusted perspective, while an equal number of 13 feature increased effectiveness. (In contrast, from the non-adjusted perspective, 15 out of 25 changes are for the worse and only 10 for the better.) The diagnosis of a general decline of social protection in European countries is therefore not supported by our adjusted results.

What we can say is that deteriorations of impacts, where they are occur, weigh heavier than improvements. This is why, at a weighted country-average, there is a net worsening of the impact of social benefits on poverty between 2006 and 2014: among all households at risk of poverty, fewer would be lifted over the poverty threshold in 2014 than in 2006 if socioeconomic circumstances had remained the same (which they have not: an increased poverty challenge to households and social security systems appears as the legacy of the 'Great Recession'). Figure 3.4 shows that while in 2006, 38.6 in each 100 households at risk of poverty are lifted over the poverty threshold, it would *ceteris paribus* only be 35.9 in 2014. It remains a question for

more country-specific research whether decreases in anti-poverty effectiveness of social protection are connected to reforms in the context of the 2008 crisis or to more long-standing policy developments.[33]

As mentioned, the evolution of social benefits' impacts, thus of social security system change, did not translate into proportional changes of households poverty statuses. We found that this is due to a negative link between the evolution of social protection and the evolution of pre-benefit AROP rates: Social protection worsened less where the number of households at risk of poverty (before social benefits) increased more, and vice versa. In consequence, AROP rates grew in most countries, either because of an increasing lack of primary income or because of weakening social benefits, in some cases Figure 3.11) also due to a combination of both.

### 4.1.1 Poverty-differences between countries depend strongly on social security systems

While in the dynamic perspective, changes in pre-benefit AROP rates are a relevant predictor of changes in post-benefit AROP rates, *levels* of pre-benefit AROP rates do not seem to determine *levels* of post-benefit AROP rates at the same extent (2.1). For example, Belgium, Sweden, Hungary, Luxembourg, Lithuania, Germany and Spain all feature AROP rates before social benefits of between 27.5% and 28.5%, but end up with post-transfer AROP rates as different as 13.2% (Belgium) and 20.0% (Spain). This is so because social security systems intervene between pre- and post-benefit AROP rates, and they do so at very different degrees. Differences between social security systems appear as an important driver of European countries' unequal poverty rates (2.3).[34]

It has proven useful also in the between-country comparison to adjust for poverty challenges. Yet, while the adjusted perspective on differences between social security systems sheds a new light on developments in countries over time, in the comparison between countries it rather reinforced what we already knew: Social security systems known as the strongest emerge as those with an even higher performance as soon as we control for the poverty challenge. Most strikingly, the Danish social security system, which lifts 58.8% of households over the poverty threshold, has a still much higher impact, 72.6%, from the adjusted perspective. This is explained the important poverty gap in Denmark,[35] encountered also in other Scandinavian countries, as well as in Ireland, Belgium, the UK and Germany (Figure 2.7). In other words, part of the impact of the social security systems of these countries is reduced by the comparatively great depth of poverty. In turn, social security systems of some countries with flat primary income distributions seem better than they really are, just because they have a relatively 'easier job', in the sense of our method. This applies to many social security systems of Eastern and Southern Europe.[36] The lowest social security system impacts were found in Greece Figure 2.9), where only 12.2 out of each hundred households below the poverty threshold before social benefits are lifted above the poverty threshold by social benefits (non-adjusted value: 14.9, see Table 2.1). Also in Italy, the adjusted impact is extremely low with 17.8% (non-adjusted 21.0%),

33 A report by Bouget et al. (2015, 37) mentions 'cuts in the amount and/or duration of [unemployment] benefits (e.g. BE, CZ, DK, EL, ES, IE, HU, PT, RO). Furthermore, in many cases eligibility conditions have been tightened and benefits have been made more conditional. Importantly, while these developments have often been the consequence of fiscal consolidation measures implemented in the context of the economic crisis, it should be noted that, on the one hand, they do not only concern the countries hardest hit by the crisis and, on the other hand, that they have sometimes been part of a longer trend, which began well before the crisis.'

34 Less than our results on developments within countries, our results on differences between countries suffer from one important drawback: Using gross data on social benefits, we abstract from differences in taxation which exist between countries. Caused by the lack of net spending data for many countries in the datasource, this blind spot potentially leads us to overestimate the effectiveness of social security systems in countries with high tax rates for money which households receive through social transfers. This concerns in particular some countries that stand out for the high effectiveness of their social security systems: 'Differences between net and gross spending are particularly high in the Netherlands, Denmark, Sweden, Italy and Finland and lowest in the CEE countries.' (Kuitto 2016, 448). Therefore, the effectiveness of social security systems in the former group of countries could be overestimated here, while the contribution of Eastern European welfare states is downplayed.

35 In Denmark, the average poverty gap is 73.8%: the average household at risk of poverty has an income of only 26.2% of the poverty threshold.

36 There are exceptions, e.g. Romania has a larger poverty gap than Luxembourg (48.5% vs. 48.0%,).

even though Italy is one of the 'rich' countries of Europe. Bulgaria and Romania follow in third and fourth last place.

Notwithstanding the importance of social security systems, final AROP rates remain also a product of pre-transfer inequality (of households' market incomes). Social security systems use their leeway to change the income structure, but they do not turn it upside down. With some exceptions, a geographical grouping can provide some overview here (see Figure 2.2 and Figure 2.9): Eastern and Southern European countries (except Spain, Hungary and Romania) feature relatively low AROP-rate levels before benefits, but many of them also achieve only a limited reduction of poverty risks by social benefits (exceptions: Hungary, the Czech Republic and Slovenia). A considerable number among them therefore come out with above-average poverty risks. Scandinavian countries tend to start with significantly above-average pre-benefit AROP rates, but reduce them very strongly by redistribution. Continental - or, in 'worlds of welfare'-terms, conservative - countries are rather in the middle for pre-benefit AROP rates and also around the average for the impact of social benefits (except Belgium which is above average).

The correlation between high pre-benefit inequality and high redistribution makes that social security-activity entails a certain convergence of poverty risks in Europe: pre-benefit AROP rates are more unequal between countries than post-benefit AROP rates. On average across 2016 to 2014, poverty rates before benefits range from 17.8% in the Czech Republic to 37.5% in Ireland, a span of 19.8 p.p., while the span after benefits is only 12.3 p.p. (between 8.9% in the Czech Republic to 21.2% in Romania).

Countries assist the poorest households to differing degrees. It can be shown for all countries that households with a wider poverty gap escape poverty risks through social benefits more rarely than households with a smaller poverty gap (Figure 2.5). In some countries, however, the households with the lowest primary incomes are hardly ever lifted above the poverty threshold. There seems to be a particular lack of support to the poorest households in Romania, Latvia, Estonia und Bulgaria. In contrast, social benefits are a comparatively big success against poverty risks also of the poorest households in Belgium, the Czech Republic, Denmark, Finland, Ireland, Iceland, the Netherlands, Norway and the United Kingdom.

It was shown that the degree of redistribution is connected to countries' GDP (Figure 2.10). It is not a one-on-one relationship, as for each level of country wealth there are smaller and bigger spenders. Still, social benefits clearly tend to have a higher impact in wealthier countries. Countries with a higher GDP are also countries with a higher pre-benefit AROP rate. The greater inequality of primary household income in wealthier countries is thus partly compensated by their more redistributive social security systems. It is indeed an interesting question whether this link is rather a pointer to the past or to the future: The correlation between prosperity and redistribution could both be seen as 1) a heritage from the *trente glorieuses*, the period after WW2 – where fast-growing economies and expanding welfare states characterised Western and Northern European societies, and as 2) the way ahead for all poorer countries in the sense that high inequality of market incomes and strong social security systems are a trait of modernisation.

# Part II: Dynamic effects of social protection on employment and poverty

## 1. Introduction: Three competing paradigms of social protection

The sustainability of generous social security systems and the productivity of the European Social Model have been questioned in public debates from both a neo-liberal and a conservative perspective. Some of the arguments point at a presumed behavioural change of transfer recipients: The neo-liberal view highlights the threat of 'moral hazard' in the face of decommodification by social security systems: due to a presumed preference of individuals for economic inactivity ('leisure'), social benefits are suspected to encourage free riding and discourage job search. The conservative argument is similar, though more sociological: as a by-product of benefit receipt, the emergence of a self-re-enforcing 'dependency culture' is postulated, i.e. an acquired lack of preparedness to take personal responsibility and action. This is transmitted to the children of recipients, thus shaping the life-style of the next generation. While 'moral hazard' stands for a deliberate rational decision of actors to free ride on the efforts of others, the 'welfare dependency' hypothesis conjectures an acquired inaptitude to respond to the demands of the labour market that cannot easily be reversed. However, as argued by Nicaise (2016, 2.1), these reflections build on assumptions about human behaviour which are themselves questionable.

The RE-InVEST project's capability- and human rights-oriented view stands in the tradition of a welfare resources perspective, 'concerned with how collective resources and services stimulate and enable social participation.' (van der Wel and Halvorsen 2015, 101) This perspective is a theoretical alternative to the neo-liberal and the conservative views. It suggests positive effects of generous social benefits in terms of employment and a prospective financial independence of households. It considers that persons generally want to leave the state of unemployment/poverty and wish to take part in society by economic activity. It further considers that they are sometimes hindered from doing so, by a lack of human capital or other resources, or also by a lack of adequate conversion factors. Against this backdrop, social benefits can be seen as a form of investment in persons' capabilities, with pay-offs for both recipients and society at large (in terms of social justice and social cohesion, but also in macro-economic terms, allowing to re-finance social benefits).

In order to contribute to the body of empirical knowledge, the present section deals with intertemporal effects of social benefits. Firstly, looking at households at risk of poverty, it will be tested whether a high extent of public welfare provision (measured by the level of social benefits) leads to a reduced need for social benefits in the future. Secondly, we will test for quasi-jobless households whether 'generous' social benefits foster increases in work intensity. Our approach is described in sub-section 2, while sub-section 3 presents results and sub-section 4 summarises and draws conclusions.

# 2. State of knowledge on welfare state impacts

It is almost impossible to review the vast number of existing studies on the effects of labour market and social policy. These effects have been researched since the 1970s, in order to find remedies against poverty and unemployment, but also to explore a potential trade-off between equity and efficiency (Okun 1975) of welfare state intervention: On the one hand the aim to grant social protection, on the other hand the necessity to maintain sufficient financial incentives for people to take up work (cp. Savage, Callan, and Walsh 2015, 124). While it is clear that welfare states can immediately ease hardship by granting social benefits,[37] monetary or in-kind, the short-run and the long-run impacts of welfare state activity on employment (and, ultimately, on poverty) remain a matter of debate.

According to neo-classical search theory, 'an increase in UI benefit generosity increases the duration of unemployment' (Tatsiramos 2009, 1227)[38] because if replacement income is higher, job-seekers have less to gain from employment. Of course, the comparison between the alternative states of unemployment and employment is done plainly in monetary terms, assuming a certain monetarised value of leisure time. Many studies take this behavioural model as a basis and thus analyse welfare state impacts from the perspective of incentives. Studies drawing on micro-level data often use the individual net replacement rate (NRR) as the factor that explains transitions between employment statuses.[39] In this manner, Guzi (2014, 411) 'demonstrates the existence of a welfare trap [in the Czech Republic], finding a negative influence of the high NRR on the probability of transitioning from unemployment to employment.' Similar findings are reported for Germany by Schneider and Uhlendorff (2005). In contrast, Savage et al. (2015, 136) 'found evidence that strong disincentives to take up employment were infrequent, for those who are currently unemployed.' Determining the NRR is methodologically complex and requires assumptions concerning the (counter-factual) earnings of the observed job seekers. Equally observing transitions, other studies exploit variations of the maximum possible duration of benefit receipt caused by policy reform. For Portugal in the 1990s, Portugal (sic!) and Addison (2008) identify 'strong disincentive effects' (ibid., 393) of unemployment benefits on the exit rate from unemployment. For Slovenia, Van Ours and Vodopivec (2006) confirm that in 1998, a shortening of the entitlement period increased transition rates into employment (only) for the job-seekers concerned by the benefit reform.

Studies using macro-level data cannot observe transitions at the micro-level, but they can compare (un)employment rates over time or between countries. In his often-cited study, Nickell (1997) takes a critical stance toward passive labour market policy (PLMP): he argues that '[t]he impact of a high benefit replacement ratio on unemployment is well documented [...] The other important feature of the benefit system is the duration of entitlement. Long-term benefits generate long-term unemployment' (ibid., 67). Nickell, Nunziata, and Ochel (2005) summarise existing studies on the link between benefit levels and unemployment: 'The average of their results indicates a 1.11 percentage point rise in equilibrium unemployment for every 10 percentage point rise in the benefit replacement ratio.' (ibid., 4). Their own analysis confirms that 'benefit levels have an important impact on unemployment as does benefit duration and their interaction' (ibid., 18). Beyond level and duration, the same observations can be made for the coverage of PLMP and the strictness of benefit conditions (ibid., 4 et seq.). On the opposite, thus the 'optimist' side of the spectrum,

37 Though there can be and is a discussion on the distributive effects of the welfare state: does social protection benefit rather high- or low-wage earners (Jahn 2017), rather the old than the young (Rovny 2014), etc.

38 UI = unemployment insurance.

39 The NRR is the net income difference between a scenario of continued (partial) unemployment and a scenario of (additional hours of) employment.

there are Howell and Rehm (2009) arguing that the existing empirical evidence on detrimental effects of PLMP has been largely overstated (ibid., 66) and that counter-evidence has not been taken into account (ibid., 62 and 80). They also stress that the credibility of virtually all macro-level analyses so far is undermined by their using a *gross* measure of replacement rates.[40] Based on *net* replacement rates (made available by the OECD as of 2001), Howell and Rehm find that 'more generous after-tax benefits [are] associated with lower unemployment' (p. 17) in 2002 and that in 2001, 'higher levels of benefit duration are actually associated with lower unemployment' (p. 85). Bruno and Rovelli (2010, 680) confirm that need-adjusted PLMP expenditure relative to GDP is significantly positively associated with the employment rate. More ambivalent are the results of Bradley and Stephens (2007), who distinguish between short- and long-term replacement rates. They find positive impacts on the employment rate of generous transfers during one year, and negative impacts of generous transfers during five years (ibid., 1502). Our own cross-sectional analysis (Lehwess-Litzmann and Nicaise 2008) yields no significant connection between the need-adjusted level of PLMP spending and employment one and two years later. Yet, there seems to be a positive link between total need-adjusted LMP spending and employment, due to a slight positive influence of active labour market policy (ALMP).[41] It seems is hard to isolate impacts of active and passive LMP, however, due to their high empirical correlation across countries. Moreover, there is reason to assume interactions: Bassanini and Duval (2006, 9) observe that 'the impact of generous unemployment benefits on unemployment appears to be mitigated by high public spending on ALMPs, perhaps because high spending on ALMPs is often accompanied with a strong emphasis on 'activation".

Not from a cross-sectional, but from a dynamic perspective, Howell and Rehm (2009) find changes in replacement rates to be negatively correlated with unemployment, particularly for changes of long-term (5-year) replacement rates. As for employment rates, their analysis yields positive effects of extending PLMP: 'countries with increasingly generous replacement rates and benefit durations appear to be associated with increasing employment rates.' (p. 86) Accordingly, 'increasing access to benefits by the unemployed, at least as measured by the OECD's recipiency rate, is not associated with increasing unemployment over the last two decades.' (p. 88). These unconventional macroeconomic findings do not preclude more generous PLMP from leading to longer individual unemployment spells. Even Howell and Rehm confirm that a longer compensation of unemployment raises the mean unemployment duration (p. 66). However, this increase is quite modest, and it concerns just one single group in the labour market (the unemployed), which allows for a divergence between micro-level and macro-level (aggregate) effects: In fact, a possible disincentive effect of generous PLMP on job-seekers can be offset by an 'entitlement effect' (Hamermesh 1979), attracting job-seekers to employment because this creates new benefit entitlements for them, and equally attracting inactive persons in working age to participating in the labour market.

Howell and Rehm (2009, 61) therefore see 'an ambiguous theoretical relationship between benefit 'generosity' and the incidence and duration of unemployment, resulting in a variety of possible empirical predictions.' Our impression of the existing *empirical* literature on the link between social benefits and (un)employment is indeed mixed. In 2009, Tatsiramos (2009, 1225) concluded: 'That unemployment insurance (UI) has disincentive effects on job-seeking behaviour and on unemployment duration is the conventional wisdom in modern labour economics.' Part of the recent literature seems to challenge this 'wisdom', though the majority of studies is probably still on the welfare-pessimist side.

Yet, even if the evidence pointed more unanimously to a connection between generous social benefits and unemployment – would this be good evidence in favour of the neo-liberal hypothesis? There are some theoretical reasons to doubt the predominance of the disincentive effects that informed policy reforms

40 'The macro literature has relied almost exclusively on a single OECD-based maximum gross replacement rate (GRR) [...] The GRR measure does not include social or housing assistance, which can make up a substantial proportion of non-wage income, and is measured against the average productionworkerwage, an increasingly inappropriate wage measure since the vast majority of wage earners in all developed countries work outside manual occupations in the manufacturing sector.' (61 et seq.)

41 Concerning not employment but economic activity, we observe that generous PLMP spending keeps working-age persons closer to the labour market ('entitlement effect'), while more expenditure on ALMP drives some of them into inactivity. The latter may be a consequence of the way active LMP is currently designed and experienced by job-seekers.

('making work pay') in the past (cp. Savage, Callan, and Walsh 2015, 124). Firstly, momentary net replacement rates have to be weighed against the long-term monetary implications of abstaining from employment. Scarring effects of longer unemployment spells have been amply shown by research (Nilsen and Reiso 2011), and job-seekers are presumably aware of this issue. Secondly, it has become a consensus that non-monetary benefits from employment play a major role in modern 'working societies'. People go to work also to receive recognition, to structure their day, to socialise, etc. (cp. van der Wel and Halvorsen 2015, 100–101). If more generous social benefits still seem to prolong unemployment spells, there can be an alternative explanation radically different from the neo-classical monetary incentive approach: The welfare resource approach stipulates that persons use social benefits not in order to free-ride on the efforts of others, but to wait for a suitable job: A job that matches their qualification, needs and preferences (working time, etc.) will benefit both themselves (stable jobs, better pay) and others (higher productivity).[42] Longer job search and longer unemployment benefit receipt are thus in principle compatible with a welfare-optimistic view on social benefits. Paradoxically, while the welfare resource approach opposes the neo-classical paradigm at the level of how individuals are conceptualised, it can explain the very evidence that is presented in favour of the latter and yields similar predictions concerning unemployment duration.

The same holds for some empirical results that have been used to back the welfare dependency hypothesis. Most studies find a peak in individual exits from unemployment just before the expiration of entitlements (Katz and Meyer 1990). The welfare resource hypothesis would suggest just this and therefore disadvise short entitlement durations in order to prevent precipitated return to (inadequate) work. The welfare resource and the welfare dependency hypotheses diverge, of course, on the consequences of long-term benefit receipt: While the former posits a return of job-seekers into suitable jobs after some time, the latter expects an erosion of the work norm and an entrenchment and diffusion of unemployment (Michau 2013; cp. also van der Wel and Halvorsen 2015, 100).

## 2.1 Our own empirical study

Given the theoretical doubts about the relevance of the incentive effect, we do not use the NRR in our analysis below. For us, the crucial aspect is not the short-term monetary difference between not working and working, but whether the resources available to the unemployed permit them to carefully choose their next job. We consider that dynamic studies at the micro level (thus using longitudinal data on individual actors) are best suited for testing the effects of social benefits: The dynamic method is less encumbered by unobserved differences (composition effects) between the treated and the non-treated (or those receiving less generous social benefits). Micro-level data provide a large number of observations and sufficient variance of the independent variable. In our study, we will look at the relationship between the level of social benefits granted to households and the behavioural change of households from one year to the next. We look at households because employment participation is a collective decision at household level: When a person engages in paid employment, this tends to require exchange relationships internal to the household (Brose, Diewald, and Goedicke 2004, 287) – unless it is a single household. The more work becomes commodified, the less time is left for unpaid work. The decision for paid employment depends on the (employment) preferences of all working-aged members of the household (cp. Goedicke 2012). Successfully activating one member of a household can therefore reduce the availability of other members (usually the partner) for the labour market. The following section will explain our sample and approach more in detail.

42 Few studies test the welfare resource hypothesis, but there is evidence that welfare state generosity improves post-unemployment job stability. Tatsiramos (2009) compares two groups of unemployed, benefit recipients and non-recipients. In his cross-country study, he finds a higher subsequent duration of employment for the former benefit recipients, which would underline the "a matching effect of unemployment insurance" (ibid., 1225). Similar findings are presented by Wulfgramm and Fervers (2013). Greater job stability should go hand in hand with higher productivity and higher wages, though there are mixed findings (Addison and Blackburn 2000).

# 3. Method and data

Our analysis seeks to determine the link between the level of social benefits received by households at risk of poverty, respectively with low work intensity, at a specific point in time and the change of households' situations in terms of poverty and employment in the transition to the next period. It is a multilevel regression analysis, where the first level are households and the second level are countries. We use EU-SILC longitudinal data of the historical (income reference) years between 2006 and 2014. This section will review the elements of our analytical model: the phenomena to be explained (DV), our measure of social benefits (IV), control variables, and the sample of the analysis.

## 3.1 Household poverty as sampling criterion and dependent variable

The analysis observes and tries to explain for households at risk of poverty (before social benefits) the evolution of the poverty situation between one year and the next. This requires an indicator that identifies poor households at time t, and it further requires an indicator that compares the depth of poverty at time t and at time t+1. The indicators are constructed as follows, close to the usual conventions of poverty research: In a first step, the household income before social benefits is calculated for each sample household. We divide the total income before benefits (HY022) by a household equivalence scale (HX050), thus generating an equivalised household income before benefits. In a second step, we calculate a poverty threshold for each country and year. We draw on the cross-sectional files of EU-SILC data to get the (equalised disposable) median income across all household types for each country and historical year and define the poverty threshold as 60% of this median income. In a third step, we check whether the income before social transfers calculated for each household lies above or below the poverty threshold. On that basis, we classify part of the sample households as at risk of poverty before transfers. In the poverty-oriented part of the analysis, we keep these households as our sample. A fourth step serves to obtain a continuous measure of households' depth of poverty. We divide the distance between the household's income and the poverty threshold of the given country and year by the value of this poverty threshold. Our indicator thus captures the share of the poverty threshold that would have to be added to a household's equivalised income before social transfers to make the household a household not at risk of poverty. This measure is similar to the official Europe 2020 poverty gap indicator, just that it measures the poverty gap *before* transfers.

Table 3.1 provides an overview of households' poverty gap in the first year observed. Our analysis works with two samples (see below). The improvement of the poverty gap will be analysed using what we call the 'poverty gap sample'. The improvement of household work intensity will be studied with a sample of households of low work intensity, called the 'work intensity sample'. For a better overview, the continuous variable for the poverty gap is divided into ranges in Table 3.1. By definition, the poverty gap sample cannot have observations with a zero or even negative poverty gap (the household would not count as at risk of poverty and could thus not reduce this risk in the observation period). 32.3% of observations of this sample have a 'small' poverty gap of between 0 and 25% of the poverty threshold. 28.1% have a large poverty gap of between 75% and 100% of the poverty threshold (or, potentially, more: households with a negative income have been put into this category). In the work intensity sample, the share of households with a poverty gap of zero (thus an income above the poverty threshold) is of 42.7%. There is, however, also a big group of households with a large poverty gap: 29.7%.

**Table 3.1 Distribution of households' poverty gap before social benefits in first year of observation**

| Poverty gap (% of poverty threshold) | Poverty gap sample | | Work intensity sample | |
|---|---|---|---|---|
| | N | % | N | % |
| 0% | 0 | 0 | 18,999 | 42.7 |
| )0% – 25%) | 21,228 | 32.3 | 4,472 | 10.0 |
| )25% – 50%) | 15,834 | 24.1 | 4,370 | 9.8 |
| )50% – 75%) | 10,272 | 15.6 | 3,468 | 7.8 |
| )75% – 100%) | 18,458 | 28.1 | 13,216 | 29.7 |

**Source** EU-SILC (Eurostat), own calculation

A fifth step is necessary to create the dependent variable of our analysis: It consists in simply subtracting the poverty gap of the first year (continuous scaling) from the poverty gap of the second year (continuous). The resulting variable reflects the evolution of the household's poverty gap (change as p.p.), which will be described below (4.1).

## 3.2 Household work intensity as sampling criterion and dependent variable

An increasing employment participation of 'quasi-jobless households' has a high political priority (see Social Protection Committee 2014, 98). Household work intensity is a relevant indicator in the context of Europe 2020 and officially calculated with data of the EU-SILC. The Europe 2020 definition of 'quasi-jobless households' refers to households 'where working-aged adults (18–59) worked less than 20% of their total work potential during the past year'.[43] We use low work intensity both as a sampling criterion and as a dependent variable: Only households with low work intensity at the beginning of the observation period are included in the part of the analysis that looks at the development of household work intensity over time. The possibility to determine the work intensity in both observed years is a necessary condition for households accessing the sample.

To calculate the work intensity, we do not use the item HX020 provided with the EU-SILC data. Firstly, it does not offer the 0%–20% category needed to identify quasi-jobless households. Secondly, as pointed out by Ward and Ozdemir (2013), it does not take due account of part-time working hours. We use a syntax that was kindly made available by the latter authors. Some modifications and additional assumptions were necessary in order to apply it to the longitudinal files of the EU-SILC: only the primary job of a worker can be considered, as the item PL100 (further jobs) is only provided in the cross-sectional files. In addition, our measure of household work intensity excludes from the denominator not just student months for persons 18–24 years old, but also months in retirement (PL085). This is in order to avoid that household work intensity drops sharply when a household member retires. Rather, the total number of workable months (in the denominator) also drops in that case. An important assumption lies in the imputation of working hours.[44] Following Ward and Ozdemir, we calculate the weighted mean working hours (of either full- or part-time employed persons) for subgroups of the sample population at the time of the interview, discerning by country, year, sex and age group. The calculated mean is then assumed as the working time during the income reference period, according to the socio-demographic group of the sample person. An exception is

43 http://ec.europa.eu/social/BlobServlet?docId=10421&langId=en, last accessed 2018-09-03.

44 Employment participation of household members is calculated for the income reference period of each EU-SILC wave (PL210A-PL210L), while information on working hours (PL060) refers to the time of the interview. Also, a person's employment status at the time of the interview is not necessarily the same as during each of the 12 months of the income reference period. He may for example be employed in full-time at the time of the interview and work during 35 hours a week. In the income reference period, the same person may have worked in full-time for six months and in part-time for six months. In the EU-SILC, there is no information on weekly working hours in either part of the income reference period, but while we may assume that working time is the same in the current full-time job as in last year's full-time job, there is no way of knowing the working hours during in the six months of part-time work in the income reference period. This problem in particular makes imputation necessary.

made in the (frequent) case that at the time of the interview, the sample person features an employment status that he or she has also been in during one or several (or all) months in the income reference period. If the information on working hours at the time of the interview is given (PL060 is not missing), and if there has been no change of job since last year (PL160), then we substitute the imputed working hours by the information taken from the individual sample person. Individual work intensities of household members are aggregated to obtain the household's work intensity.

Table 3.2 provides on overview on the distribution of household work intensity in the two samples of our analysis. Just as the poverty gap sample could not have observations with zero or negative poverty gaps, we find by definition no households with a work intensity above 0.2 (or 20%) in the work intensity sample, as it concentrates on quasi-jobless households. Most households, 92.8% in the work intensity sample and 39.2% in the poverty gap sample, show a work intensity of zero in the first year of observation.

**Table 3.2 Distribution of household work intensity in first year of observation**

| Household work intensity | Poverty gap sample | | Work intensity sample | |
|---|---|---|---|---|
| | N | % | N | % |
| 0 | 24,580 | 39.2 | 41,368 | 92.8 |
| )0 – 0.2) | 2,473 | 3.9 | 3,236 | 7.3 |
| )0.2 – 0.5( | 8,128 | 13.0 | 0 | 0.0 |
| 0.5 | 10,762 | 17.2 | 0 | 0.0 |
| )0.5 – 1( | 8,485 | 13.5 | 0 | 0.0 |
| 1 | 8,294 | 13.2 | 0 | 0.0 |

**Source** EU-SILC (Eurostat), own calculation

In the poverty gap analysis, a low work intensity is not a sample criterion, we therefore find all possible values of work intensity (as the sample criterion is being at risk of poverty, see above, low work intensity is dominant, however, because poverty and low work intensity are correlated). 13.2% of that sample are households with a work intensity of 1, which means that all persons in working age (who are not studying or already retired) work in full time. Household work intensity itself is not exactly the dependent variable of our later regression analysis, but the evolution of work intensity between year one and year two, which is constructed simply by subtracting the former value from the latter. This will be described below (4.2).

## 3.3 Social benefits as our independent variable

The independent variable of interest in our analysis are the social benefits granted to households. We analyse in the relationship between these benefits and households' prospective employment and poverty (gap) status. Our focus is on social benefits that address households with members in working age. They include, first of all, decommodifying benefits like unemployment benefits and possible functional equivalents, like sickness or disability benefits (cp. Erlinghagen and Zink 2008). Payments designed to fight poverty are also included (see below).

We primarily use micro-level measures of the extent of welfare provision, which have several important advantages. Studies which draw on institutional features (at the macro level) lose some of the variance of social benefits between households; social benefits figure as a feature of the country, not of the individual household. Micro-level measures of social benefits, instead, can contain different values for different households, which is more realistic: households, by their employment histories and legally acknowledged situations, have unequal access to social benefits. In addition, even if these differences in eligibility and entitlement were taken into account while using institutional data, the 'legislative 'paper reality' does not necessarily translate into actual 'benefit reality' due to issues such as deviating policy implementation, administrative

discretion, and non-take-up of benefits.' (Otto 2017). A further drawback of the macro-level approach is statistical: the number of independent cases remains limited to the number of cases that are institutionally distinguished. In the worst case, that is the number countries in the sample.[45] This can put serious strain on the reliability of policy impact analyses. The reason why policy evaluations with a comparative (cross-country) design often use institutional data is that the relevant policy variables are frequently not available at the micro level. In contrast, macro-level databases have been thriving during recent years, provided e.g. by Eurostat, the OECD, the World Bank, and many smaller institutions. They cannot easily be replaced by micro data. Also in the present case, where EU-SILC data is exploited to construct an independent variable at the micro level, not all the relevant data is contained in our dataset. Assumptions are therefore necessary – which may or may not hold – as a price to pay for using micro data. We will thus compare the results of two imperfect approaches, the micro- and the macro-level approach to measuring social policy (cp. Otto 2017).

Our macro-level information on the extent of welfare provision is drawn from Eurostat (database item spr_net_ben). We aggregate benefits of the following categories to one total sum: unemployment, sickness, disability, family, exclusion, and housing. The sum is expressed in two ways, either as Purchasing Power Standard (PPS), adjusting for price level difference between countries, or deflated by the country-year's poverty threshold, adjusting both for price levels and for wealth differences. We also use some data on labour-market policy expenditure, which is also provided by Eurostat.[46]

As for our micro-level regressors, built directly from the EU-SILC data, we equally include unemployment benefits (PY090G), sickness (PY120G) and disability benefits (PY130G). As for social benefits at the household level, we include family- and children-related allowances (HY050G), other benefits addressing social exclusion (HY060G), and housing allowances (HY070G). We use the gross amounts because they are regularly provided as of 2007, while net amounts are lacking for some countries and years. Negative amounts of social benefits are set to zero. According to a recommendation by Mack and Lange (2015, 9), pensions received from individual private plans have been manually included in the total disposable household income for all years prior to 2011 (as of 2011, it is automatically included in the data. 2007 is an exception, see EU-SILC data documentation). The amounts of benefits of the mentioned categories are summed up for each household and year, equivalised by household size (new OECD scale), and then deflated by the level of the poverty threshold in the respective country and year. Deflation allows a comparison over time and between countries.

#### Deflating yearly social benefits by household entitlement and need

A specificity of the EU-SILC's structure suggests a further step of adjusting the micro-level spending-data: all information on social benefits (no matter whether disaggregated by spending categories or not) is given as sums across a whole year (i.e. the income reference period). In other words, we do not know for how many months during a year social benefits have been received. The issue about this lies in unobserved heterogeneity between households, which can be correlated with the dependent and independent variables. Røed and Zhang (2003, 190) point out: 'The overriding problem in the whole literature is a lack of independent variation in benefit payments or replacement ratios. Variation in benefit entitlements is typically correlated to previous income, which again is likely to be correlated with unobserved characteristics that affect unemployment duration in their own right.' Similarly, level of benefit receipt and future employment prospects/future poverty status may not vary independently. Presumably, households that receive more social benefits in a given year are households that experience more socio-economic problems in that year. These problems make that they cannot increase their work intensity as strongly as other households can in the following period. Thus, if we want to determine effects according to the extent of social benefits received, we need to look at amounts received by different households in the light of the entitlement or

45 Even if a longitudinal observation covers several years, these years are still nested in countries and are thus not statistically independent.

46 This data is described in detail in Lehwess-Litzmann and Nicaise (2008).

neediness of these households, e.g. the number of months in unemployment. Otherwise, (the yearly sum of) benefits would automatically seem smaller – less 'generous' – for households with greater need, e.g. compared to households which needed and received benefits for just a few months.

The challenge is thus to quantify a household's benefit entitlement or need for benefits during the income reference period in order to deflate the amount of social benefits received during one year. In principle, this should be feasible with regard to the ample information on households' situations provided by the EU-SILC. The problem is that most of the information refers to the year of the survey, more precisely the moment of the interview. In contrast, as mentioned, the relevant data on employment and income refers to the *whole* income reference period, which is usually one year *prior* to survey year.[47] Pieces of information on the moment of the interview thus neither belong to the same period as our main variables of interest, nor cover the diversity of situations that may have occurred to the household during this period. We thus have to make do with the information the EU-SILC offers on the income reference period if we want to contextualise the amount of social benefits received by a household.

It is at this point that our analysis includes a methodological experiment. Knowing that there are different reasons for receiving benefits, which may only jointly explain the total amount, we refer to an *index* to approximate the entitlement or neediness of each household. It builds on two indicators that have also been involved in constructing the independent variables: the household work intensity and the depth of poverty before benefits (expressed as percent of the poverty threshold, capped at 100%). Both these variables attain values between 0 and 1. The entitlement-and-need-index (ENI) is formed in a way that it reaches its maximum (minimum) if the work intensity of a household is zero (one) and the income is also zero (equal to or above one), i.e. the poverty gap is 100% (0%). Both components count into the index with equal weight. The ENI thus becomes zero if the work intensity of the household is 1 and the equivalised household income before social benefits reaches the level of the poverty threshold.

The sum of benefits received by each household are deflated by the household's score on the ENI index. The formula is determined empirically, with the following guiding idea: We can assume and also verify that households with a lower work intensity and a greater poverty gap before benefits receive higher amounts of social benefits (the ENI correlates with yearly social benefits by approximately $\varrho = 0.4$). This is so because the latter two variables are proxies for the household's entitlement to and need for social benefits. Our approach is to modify the observed benefit amount until there is no correlation left with the ENI.[48] The assumption is that for each given situation of household benefit entitlement/neediness, there are cases with more generous and cases with less generous social benefits in our sample. For each point on the entitlement/neediness-scale, each value of the ENI, we thus assume a similar distribution of 'generosity'. Therefore, if we modify the benefit amount in a way that it is not correlated any more with the ENI, we have transformed the variable containing social benefits into a variable that approximates the benefit 'generosity', but is independent of entitlement and need.

The main methodological limitation of our study dwells in its independent variables. Beside the drawback of using gross data on social benefits, it is clear that the ENI or any other way of quantifying household entitlement and neediness in the income reference year are just approximations. Other possible ways of deflating social benefits could be conceived. We have to keep in mind the difficulties of deflating social benefits when interpreting our results. As a validation, non-deflated social benefit amounts will also be tested. As we are not going for a descriptive analysis of benefits received, but seek to use social benefits as an independent variable in a regression analysis, the use of adequate control variables, which reflect households' situations, seems an alternative solution to deflating benefits by the ENI.

47 Exceptions are the United Kingdom, where the income reference period is the very year of the survey, and Ireland, it is the 12 months before the interview.

48 The formula is: adjusted social benefits (PPS) = social benefits / (1 + ENI * 0.0625), and adjusted social benefits (% of the poverty threshold) = social benefits / (1 + ENI * 0.042).

## 3.4 Sample(s)

In this sub-section, the sample(s) of the analysis will be explained. Our unit of observation are not individual persons, but households. There are several points which speak for this choice: Concerning poverty, it is not the individual who is at risk of poverty or not, but the household. Some kinds of benefits are also received by the household, not by its individual members. Disaggregating the total benefits received by a household and allocating them precisely to each individual member is hardly feasible without a lot of context knowledge on each household. Concerning employment, while it is the individual who is employed or not, the decision on the degree of employment participation can be conceived as a collective decision against the backdrop of the household's resources and needs, informed by the preferences of all working-aged members (see above). As mentioned above, work intensity at household level is an established indicator in the European context.

The sample(s) of the analysis consist of households that have been observed over two consecutive years. As mentioned, the analysis refers to the *historical* years between 2006 and 2014. In terms of EU-SILC waves used, we draw on the waves between 2008 and 2015. In each longitudinal wave, there is data on households that reaches back up to three years into the past, according to which of the four rotating panels the household belongs to (the maximum time to stay in the EU-SILC survey is four years). We keep from each wave only those households that were observed during the two most recent years, because one single transition is sufficient for our purpose and grants the largest possible sample size. The earliest EU-SILC-year of which we use data is thus the year 2007, contained in wave 2008. Considering that for most countries (except the UK and Ireland), the income reference period is the year prior to the survey, the earlier of the two years (2007), taken from our earliest wave (2008), thus draws some of its data from the historical year 2006.

As mentioned, there are two samples according to which phenomenon is being analysed as the dependent variable: the change in households' depth of poverty or the change in households' work intensity. In the former case, all households at risk of poverty before social benefits (their income is less than 60% of the median equivalised disposable household income) in the first year of observation are looked at, in the latter case, all households with low work intensity (less than 20%) in the first year of observation. In both samples, only households featuring at least one working-age member (18–64 years old) during both years are observed. In addition, the number of working-age members in each sample household is required to not change from one year to the next. What is more, only households with a constant composition are considered; all members are part of the household in both years observed. The poverty gap sample consists of 65,792 observations, the work intensity sample consists of 44,604 observations. Table a1.6 and a1.7 in the appendix inform about the distributions across countries and years.[49]

It is important to note that all results in this analysis are calculated without weights for a precise reason: The pooling of different waves of the EU-SILC is technically feasible, but not supported by Eurostat. While there are weights provided for each individual wave, there is no single weight item that can be applied to all waves simultaneously. As the main approach of the present analysis is multivariate regression, the lack of weighting is not a major problem. We will be restrained concerning descriptive results, however, because these need weighting in order to get statistically representative for the population. The descriptive results in this chapter (Table 3.1, Table 3.2) apply only to our sample.

## 3.5 Modelling

We use multilevel regression models of two levels to account for the fact that households are nested in countries. In principle, time could be modelled as an additional level, either as years nested in households, or as years nested in countries. This is not implemented here for several reasons; next to the increase in

49 The historical year 2014 is not visible in these tables. It does however figure in the data, because the change of the dependent variable after 2013 requires the information on the household's status in 2014.

complexity, it is mainly because changes in social benefits from one year to the next are empirically not relevant enough to justify an additional level.[50]

Table 3.3 gives an overview on the variables used in the regression models. The models are very similar for the two alternative dependent variables change in poverty gap and change in work intensity. The dependent variables are in continuous format, which has the advantage of accelerating computation. Social benefits, as the independent variable, are measured either at micro- or at macro-level. In both cases, we use different versions to increase the robustness of our results. Mostly, these versions differ in the way amounts have been deflated (3.3). Independent variables enter the model one at a time, in the case of labour-market policy expenditure mostly two at a time (we distinguish ALMP and PLMP).

50 Notwithstanding, small changes can accumulate over several years, see part I of this report.

**Table 3.3 Variables used in the regression models**

| Category | Variable | Scale |
|---|---|---|
| Dependent variable | Change in poverty gap | metric |
| | Change in work intensity | metric |
| *Fixed effects* | | |
| Independent variable: social benefits measured at household level | Non-adjusted, measured as PPS | metric |
| | Non-adjusted, measured as % of poverty threshold | metric |
| | ENI-adjusted, measured as PPS | metric |
| | ENI-adjusted, measured as % of poverty threshold | metric |
| Independent variable: social benefits measured at country level | Sum of benefits per inhabitant on average (in country-year), in PPS | metric |
| | Sum of benefits per inhabitant, as % of poverty threshold (of country-year) | metric |
| Independent variable: labour-market policy expenditure, measured at country level | Expenditure on labour-market policy, as % of GDP, per % of persons wanting to work in the population | metric |
| | Expenditure on labour-market policy, in PPS per person wanting to work | metric |
| | Measures, as % of GDP, per % of persons wanting to work in the population | metric |
| | Supports, as % of GDP, per % of persons wanting to work in the population | metric |
| | Measures, in PPS per person wanting to work | metric |
| | Supports, in PPS per person wanting to work | metric |
| | Measures, in PPS per person wanting to work, deflated by hourly wages | metric |
| | Supports, in PPS per person wanting to work, deflated by hourly wages | metric |
| | Measures, PPS per participant in LMP programmes | metric |
| | Supports, in PPS per beneficiary | metric |
| | Access to ALMP | metric |
| | Access to PLMP | metric |
| Macro-level controls | Gini coefficient | metric |
| | Change of unemployment rate as % of population (only in 4.2) | metric |
| Household situation | Equivalised income before transfers as % of poverty threshold | metric |
| | Work intensity, part-time adjusted | metric |
| Household composition | # of working-aged members below 30 | metric |
| | # of working-aged members above 55 | metric |
| | # of members with low education | metric |
| | # of members with low education | metric |
| | # of members with limited activity due to health | metric |
| | Partner household | dummy |
| | # of children aged 0–2 | metric |
| | # of children aged 3–6 | metric |
| | # of children aged 7–17 | metric |
| Historical time | Year | dummy |
| *Random effects* | | |
| | Country | dummy |

As for macro-level controls, the number of possible items in the model is extremely limited due to the small number of second level units (30) and the corresponding lack of degrees of freedom. For the analysis of the poverty gap, we use just the Gini coefficient of countries' income inequality at time t in our main model. In

the part analysis on work intensity, we add the change of the unemployment rate as a second macro-level control variable. It is meant to proxy the change of absorptive capacity of the national labour markets.

There are more degrees of freedom at the micro level, which lead us to include a wide range of controls documenting the household situation (couple status, disposable income and work intensity) and composition (household members, their age, education and health). This helps to neutralise structural difference of households both between and within countries, which influence the probability of households taking on employment and reducing their benefit receipt. Some social security systems may have a more difficult situation to deal with than others. Historical time enters the model as a dummy variable. The model includes country random intercepts, but no other random terms. Computation is done using Stata 14.2 with its estimation command 'mixed'.

All variables pertain to the income reference period of the respective EU-SILC wave except the partner household variable, which applies to the moment of the interview, and is thus just an approximation of the household's partner status in the income reference period. A further exception is partly the work intensity, which uses some pieces of information from the moment of the interview (3.2).

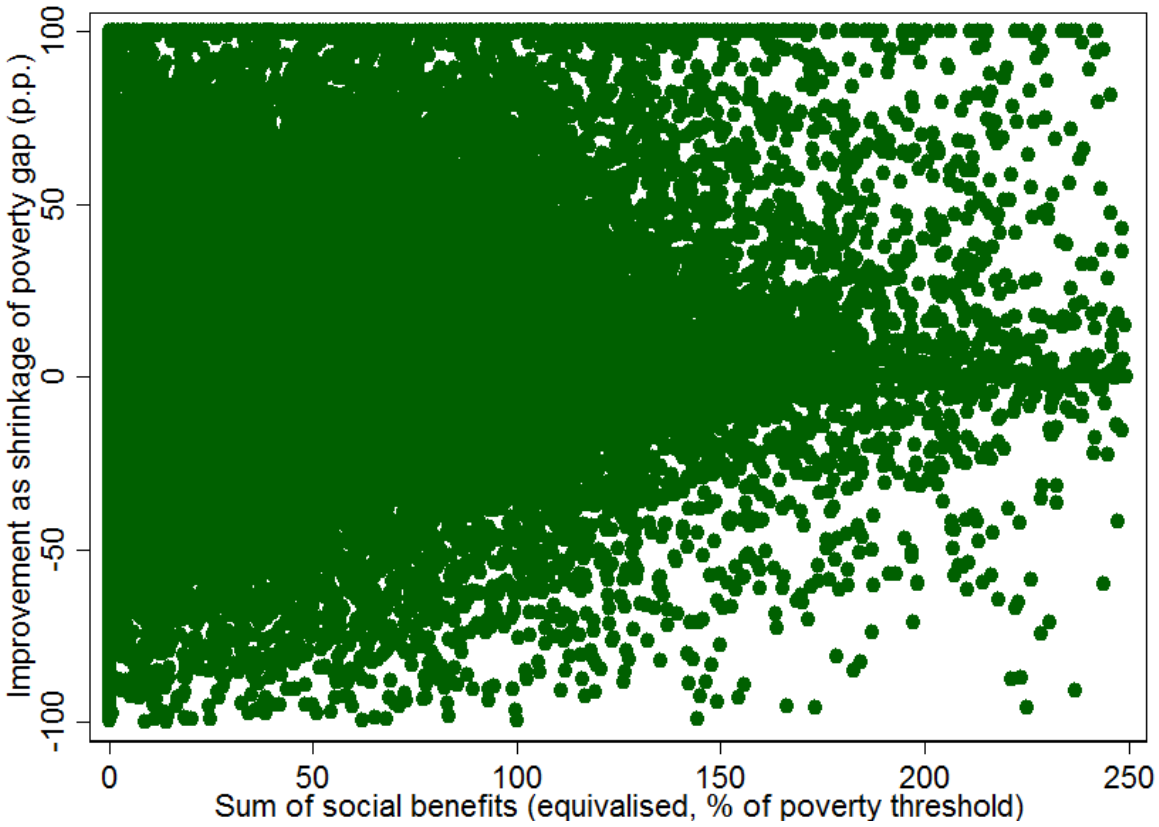
# 4. Results

This section presents the results of our regression estimations based on the data and method described above. It consists of two parts, the first covering the poverty gap (4.1), the second the work intensity of households (4.2).

## 4.1 Social benefits and reduction of households' poverty gap

The following will shed light on the link between social benefits received by households at risk of poverty and the subsequent change of those households' poverty gaps. It is important to note that we are speaking about the poverty gap measured before social benefits. The financial situation of households after social benefits is more relevant for the real social participation of households, but it is not as relevant with regard to the question of welfare dependency. Figure 4.1 gives an impression of the binary distribution of our main variables of interest: level of social benefits at time t and change of the poverty gap from t to t+1. We can see that for each level of social benefits (horizontal axis), households with positive and households with negative evolutions of the poverty gap can be observed. It is not immediately clear if for higher social benefit levels (expressed here as % of the poverty threshold) a shrinking of the poverty gap is more frequent than for lower level of social benefits. The correlation of both variables is minor: $\varrho$ = 1.89% in the poverty gap sample. If we adjust social benefits by our index for entitlement and need, in order to control for the household's situation in which the social benefits have been received, we get a correlation of $\varrho$ = -5.93%. It is thus not evident whether social benefits are linked in one way or the other to improvements of the poverty gap from one year to the next.

**Figure 4.1 Scatter plot: social benefits and subsequent improvements of the poverty gap**

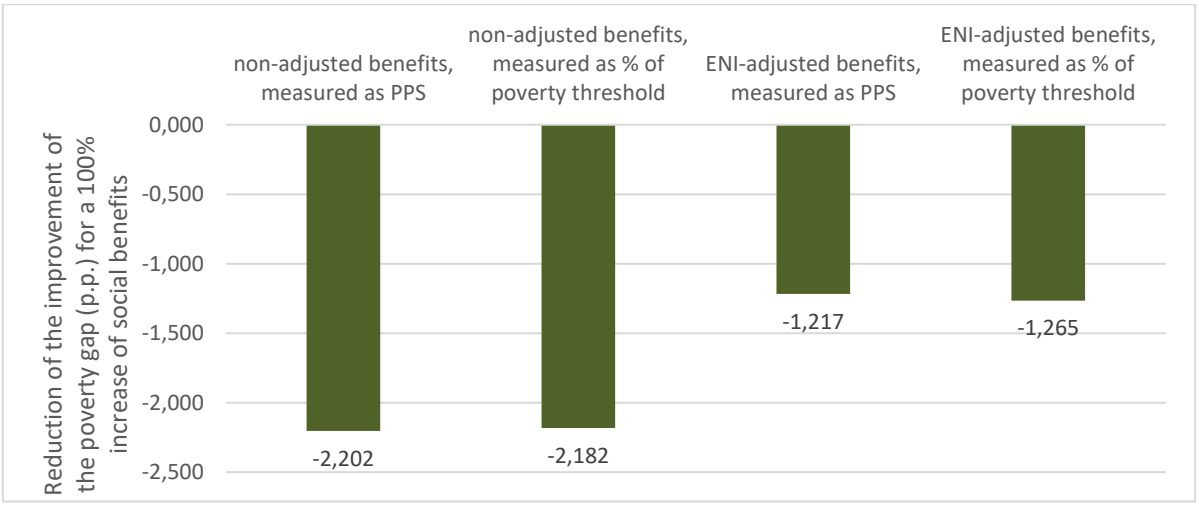



* Dots represent households observed in one year. Horizontal axis capped, outliers not shown.
Source EU-SILC (Eurostat), own calculation

Our next step is to use multivariate regression models, so that relationships between our main variables can be tested while holding other features, e.g. household features, constant. We use the model presented above (3.5), including at this time only the independent variables that are measured at household level (not at macro level). The regression output is shown in Table a1.8 in the appendix. It turns out that in the multivariate perspective, social benefits are significantly negatively associated with households' gaining financial independence from the social security system. Households receiving smaller amounts of social benefits in year t are found to reduce the gap between their income (without social benefits) and the poverty threshold more strongly than households with higher social benefit amounts in year t. It is important to emphasise, however, that the measured effect is extremely small (see below).

The negative relationship holds for different alternative ways of measuring social benefits, as shown by Figure 4.2 (compare also bold coefficients in Table a1.8 in the appendix): no matter whether we measure the amount of benefits as PPS or as share of the poverty threshold, take the sum of social benefits received in year t as such or adjust it by our entitlement-and-need-index which approximates households' socio-economic problems: higher benefits remain associated to a smaller, respectively slower improvement of households' poverty situation (or, in case of very high benefits, even a worsening). They thus foster a higher, respectively longer dependency of households on social benefits.

**Figure 4.2 Estimated effect of social benefits on improvements of the poverty gap, shown for different ways of measuring social benefits**




* Average partial effects. Bars represent derivatives of the dependent variable (reduction of the poverty gap) for proportional changes of social benefits received by households. All estimates significant at p=0.001.

Source EU-SILC (Eurostat), own calculation

Figure 4.2 also gives an impression of the strength of effects.[51] It depicts by how many percentage points the improvement of the poverty gap between one year and the next is predicted smaller if social benefits are 100% higher. Taking the yearly amounts of social benefits as registered in the EU-SILC data (and further deflated), households at risk of poverty tend to remain just above two percentage points deeper below the poverty threshold if they received double the amount of social benefits the year before (no matter whether social benefits are measured as PPS or as % of the poverty threshold). If social benefits received by households are adjusted to the household situation (thus deflated by the ENI), 100% more social benefits reduce the predicted improvement of the poverty situation by only around 1.22% (benefits in PPS metric) or 1.27% (benefits in % of poverty threshold metric).

While for all ways of measuring social benefits, we see a negative impact of higher benefits, this negative impact is clearly smaller for adjusted benefits. An explanation could be that part of the 'effect' predicted for non-adjusted amounts of social benefits is in reality due to households in more difficult situations receiving greater amounts of social benefits, for reasons that may *also* hinder an improvement of their income situation within one year. Yet, the model contains control variables supposed to capture (some of) these reasons: low education or health problems of working-aged household members, and the presence of children in the household. These variables turn out highly significant in the expected sense. In addition, the initial work intensity and the initial poverty gap are part of the model. Still, the problem remains that the social benefit amounts received by households with greater socioeconomic problem are measured as systematically too low (as compared to better-off households) if they are not adjusted to household entitlements and needs. In this sense, the coefficients of the ENI-adjusted benefit amounts may be closer to the true value than the estimates for the non-adjusted benefit amounts. We should therefore look more to the smaller estimates.[52] In addition, the example of a 100% increase of average social benefits was chosen here for the sake of simplicity. If we consider that an increase of that size is not realistic, the potential 'damage' done by a possible benefit reform is even smaller.

51 The prediction is based on only the fixed part of the multilevel model. This is adequate, as the random part just serves to filter out idiosyncratic country effects.

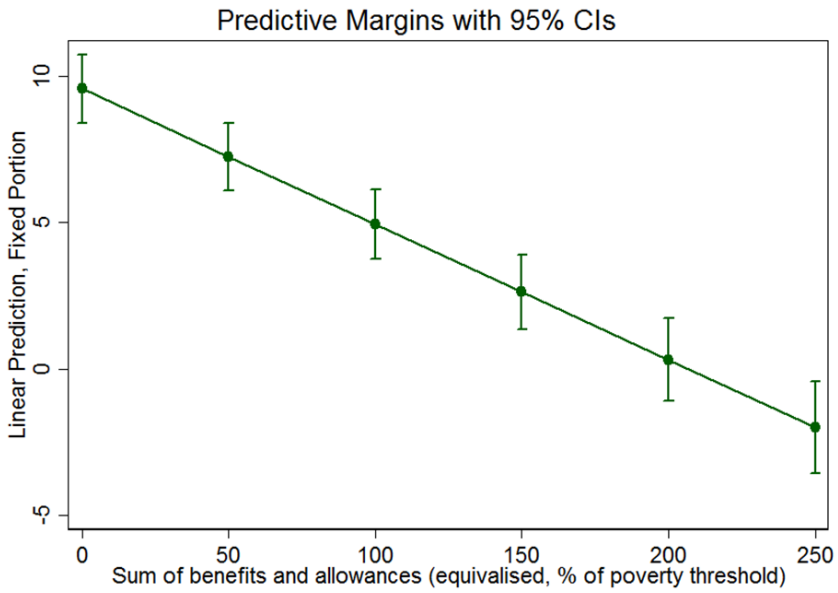
52 Given the methodologically experimental way of adjustment, we will yet continue to consider both measures of social benefits.

A different way of illustrating our results is plotting the predicted change of the poverty gap against the amount of social benefits received. On the horizontal axis in Figure 4.3 and Figure 4.4, we have the sum of benefits and on the vertical axis the number of percentage points by which the poverty gap is predicted to change from year t to year t+1. The sum of benefits is expressed as percentage of the poverty threshold in the respective country and year. The axis scale covers the range of benefits that is observed in the data, abstracting from outliers. In Figure 4.3, the amount received by the household in the given year is taken as such, in Figure 4.4 it is adjusted to the household's situation in terms of employment and income in that year. In both graphs, it is again clearly visible that the predicted improvement of the poverty situation declines when the sum of social benefits and allowances increases, even though they differ on the extent to which this is the case.[53] The same can be shown for spending items in terms of PPS, which is not done here to avoid redundancy.

Let us illustrate by the example of Figure 4.3: there is an estimated improvement of the pre-transfer poverty gap of 5 p.p. from year t to year t+1 if social benefits cover 100% of the pre-transfer poverty gap of a household. That means, if a household with an equivalised market income of 40% the poverty threshold in the year 2010 receives social benefits that lift its income up to the poverty threshold (thus social benefits amounting to 60% of the poverty threshold), the household will have a pre-transfer income of 45% of the poverty threshold in 2011 (thus 5 p.p. more than 40%). If the same household had received in 2010 social benefits not at 100% but 0% of the poverty gap (thus nothing at all), it would have a market income of 50% the poverty threshold in 2011. If, in turn, it had received 200% of the poverty gap, its market income in 2011 would remain the same as in 2010. As mentioned above, however, the need-adjusted estimation is probably the more relevant one, we should therefore look at Figure 4.4, even though the unit of the horizontal axis is rather unintelligible due to deflation of social benefits by the ENI. What we can see is that for all the need-adjusted levels of social benefits that are empirically observed, even the highest ones, the predicted change of the poverty gap is positive – households thus become less dependent on social benefits over time. The yearly improvement of the poverty gap ranges between just over 3 p.p. for the most generous level of social benefits and just under 9 p.p. for no social benefits at all.

53 Graphs also show different confidence intervals: estimates based on non-adjusted social benefits are statistically more precise.

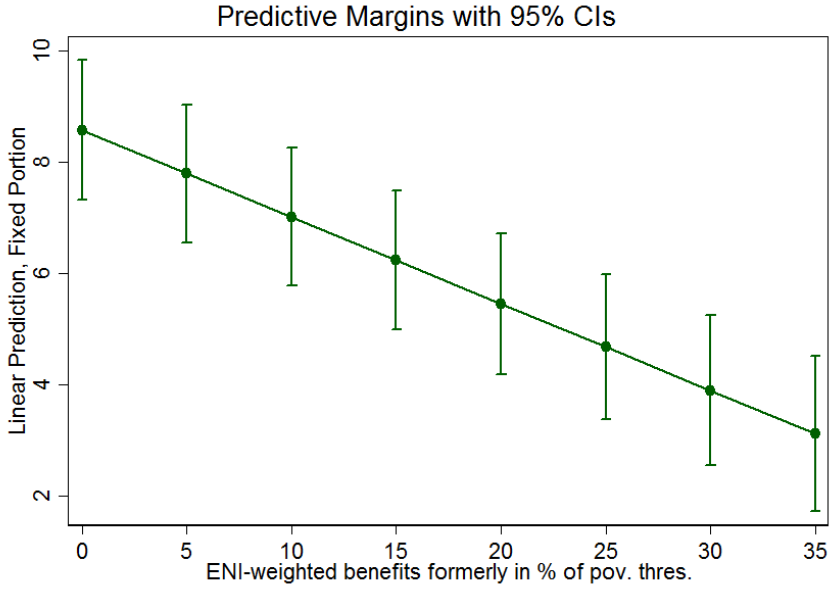
**Figure 4.3 Predicted improvement of poverty situation (in % of pre-transfer poverty gap), by amounts of social benefits (as % of poverty threshold, non-adjusted)**




* Average partial effects. The improvement of the poverty situation is expressed on the vertical axis as the reduction of the poverty gap in percentage points. Horizontal axis capped, outliers not shown. The graph shows mean estimates and confidence intervals.

Source EU-SILC (Eurostat), own calculation

**Figure 4.4 Predicted improvement of poverty situation (in % of pre-transfer poverty gap), by level of social benefits (as % of poverty threshold, ENI-adjusted)**




* Average partial effects. The improvement of the poverty situation is expressed on the vertical axis as the reduction of the poverty gap in percentage points. Horizontal axis capped, outliers not shown. Unit not intelligible due to adjustment by an index. The graph shows mean estimates and confidence intervals.

Source EU-SILC (Eurostat), own calculation

The identified negative relationship between social benefits and change of poverty risks can be shown for separate subgroups of our sample, discerning by households' initial depth of poverty and work intensity. However, the strength of effects (represented by the slope in the above graphs) differs. We find that the negative effect is stronger for poorer households in comparison to households with an equivalised disposable income closer to (but still below) the poverty threshold.[54] The same holds for households with a lower work intensity, which show a more negative relationship between social benefits and reductions of the poverty gap than households with higher work intensity. The differences are quantified in Table 4.1. In the case of households with an income far below the poverty threshold, or with very low work intensity, the improvement of the poverty gap is by 2.1-2.8 percentage points smaller on average if social benefits double. For households that are less poor, or have a higher work intensity, the reduction is predicted smaller by only between 0.4 and 1.1 percentage points.

**Table 4.1 Reduction of the improvement of the poverty gap (p.p.) for a hypothetical 100% increase of social benefits, by initial poverty gap and work intensity**

| Social benefits | Whole sample | Subsamples by poverty gap | | Subsamples by work intensity | |
|---|---|---|---|---|---|
| | | More than 50% of threshold | Less than 50% of threshold | Less than 50% | More than 50% |
| Non-adjusted, measured as PPS | -2.202 | -2.621 | -1.084 | -2.600 | -0.882 |
| Non-adjusted, measured as % of poverty threshold | -2.182 | -2.309 | -0.657 | -2.802 | -0.632 |
| ENI-adjusted, measured as PPS | -1.217 | -2.576 | -1.025 | -2.248 | -0.462** |
| ENI-adjusted, measured as % of poverty threshold | -1.265 | -2.154 | -0.700 | -2.417 | -0.414** |

* Average partial effects. All values significant at p=0.001 if not otherwise noted (** p=0.01).
**Source** EU-SILC (Eurostat), own calculation

We have included only one macro-level control in our main model: the Gini coefficient (of the respective country) at time t. It is significantly negatively connected to the reduction of the poverty gap (Table a1.8): The more unequal household incomes are in a country, the more difficult it seems to reduce the poverty gap for households at risk of poverty. Poverty is thus more persistent in countries that are more unequal. (Causality could be inverse here: some countries are more unequal *because* it is more difficult for poor households to leave the state of poverty.) Other possible macro controls that have been tested are not significantly connected to our DV, e.g. the unemployment rate and its annual change, or GDP and GDP growth. The choice of macro-level control variables in the model does not affect the negative significance of the IVs' coefficients.

Given the high number of level-one units of our multilevel regression analysis, there is ample leeway for micro-level control variables.[55] Besides avoiding distortions by structural effects (caused by household differences between countries and over time), these variables also convey interesting information on the determinants of the evolution of household incomes. A greater improvement of the income situation during one year is found for households with a larger initial poverty gap (thus with a smaller EDHI in year t) (Table a1.8). This comforting finding is plausible, as for these households, the room for improvement (measured as p.p.) is obviously bigger. In addition, a higher initial work intensity is positively connected to

54 This result is confirmed by regression with interaction variables: If social benefits regressor is interacted with household EDHI in year t, the main effects of social benefits remain negatively significant, while interaction variables turn out positively significant. The higher the household income before social benefits (thus the smaller the poverty gap), the less higher social benefits stand against an improvement of the poverty situation. Positive significant interaction terms are also found using the initial work intensity.

55 Even more would have been used if the data source had provided more information on households' situations and earnings potentials.

reductions of the poverty gap.[56] Surprisingly, positive effects are also exerted by higher shares of household members in working age who are either at an early or at a late stage of their working lives. Positive are also the fact of having higher shares of highly educated members in working age and of being a partner household. A smaller improvement of the poverty situation during one year is found for households with a higher share of low-educated members in working age or whose activities are limited due to health issues. Households with children (of all age groups) are also shown to experience smaller improvements of their poverty gap.

All results presented in this sub-section were based on *micro*-level measures of social benefits received by households, thus measures based on the EU-SILC dataset. Macro-level independent variables on social benefits (see 3.3), which can alternatively be used, do not lead to significant results in most cases (see Table a1.9 in the appendix).[57] Alternatively, variables on labour-market policy spending also yield very few significant coefficients, and significance remains at the p=0.05 error level (output not shown). *If* a significant impact of social benefits is estimated, it is again a *negative* impact. We do not consider the (lack of) results for macro-indicators as in contradiction with our results based on micro-level independent variables (presented above). Given the small number of independent observations at the country level (30 cases), the predominant lack of significance of macro-level IVs is explained first of all by statistical reasons. Macro-level IVs seem to underline the finding that impacts of social benefits on the financial autonomy of households tend to be negative, but overall negligible.

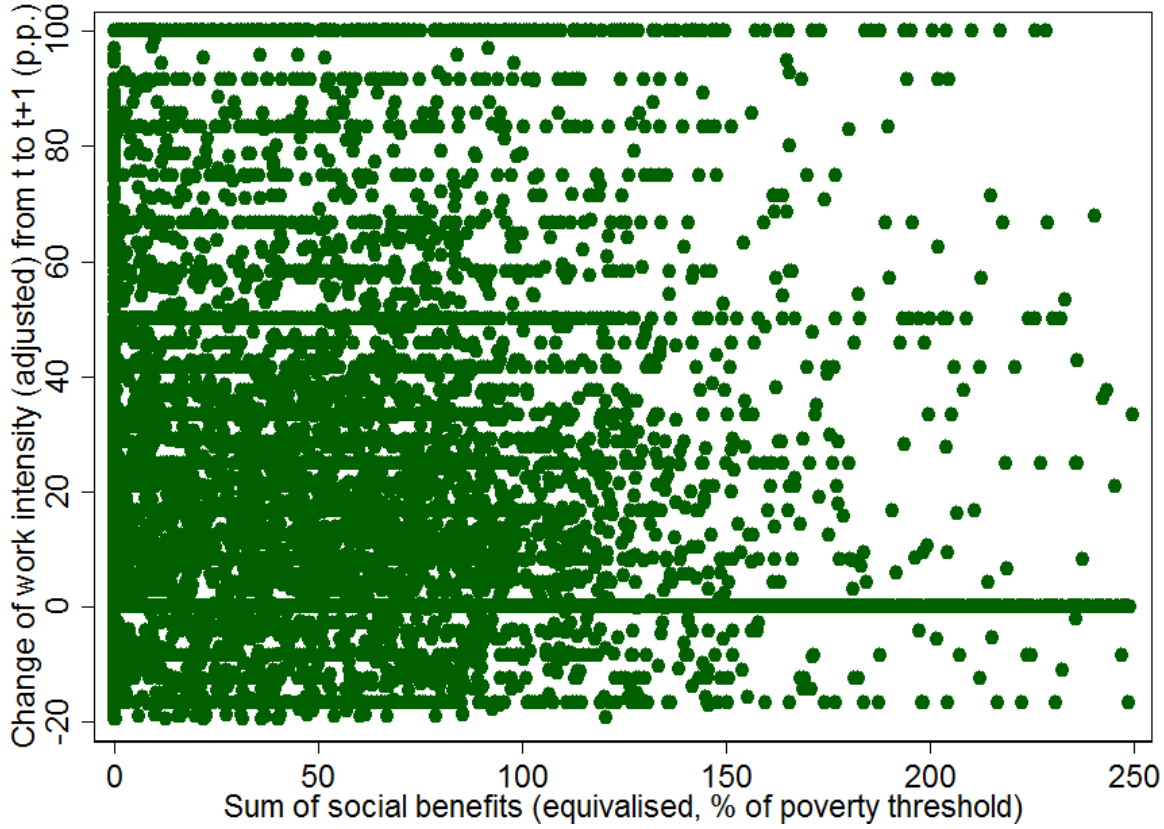
## 4.2 Social benefits and increases of households' work intensity

The second part of our analysis asks: what kind of policy makes it more probable that quasi-jobless households increase their work intensity? In fact, the majority of households in our sample does not change their work intensity over the two consecutive years observed. Among the 44,604 households observed, there are 36,783 or 82.5% that remain with the same work intensity. 6,540 households, thus 14.7% increase their work intensity from the first to the second year they are observed, while 1,281 households or 2.87% decrease it. The most frequent case in our sample is the household that has a work intensity of zero in the first year observed and maintains this zero work intensity in the second year. Figure 4.5 shows a scatter plot of changes in work intensity for different levels of social benefits (measured at household level). The many cases of unchanged work intensity crystallise as a solid horizontal line at Y=0. All dots above (below) it stand for increases (decreases) in work intensity. For all levels of social benefits received, both cases can be observed. A scatter plot does not give more than a first impression about the bivariate distribution. A correlation test shows that social benefits amounts are slightly negatively correlated with changes in work intensity ($\varrho$ = -1.41% for unadjusted amounts, -0.96% for ENI-adjusted amounts of social benefits). The bivariate finding is thus that quasi-jobless households with smaller benefits increase their work intensity faster.

56 The *change* in work intensity is not included in the model even tough tests have shown that it would be highly positively significant: It is not a control, but a mechanism by which the effect of social benefits may operate (a test shows that the latter would still stay negative significant).

57 The exception is the IV 'Expenditure on labour-market policy, as % of GDP, per % of persons wanting to work in the population', which is negatively significant, but only at the p=0.05 level.

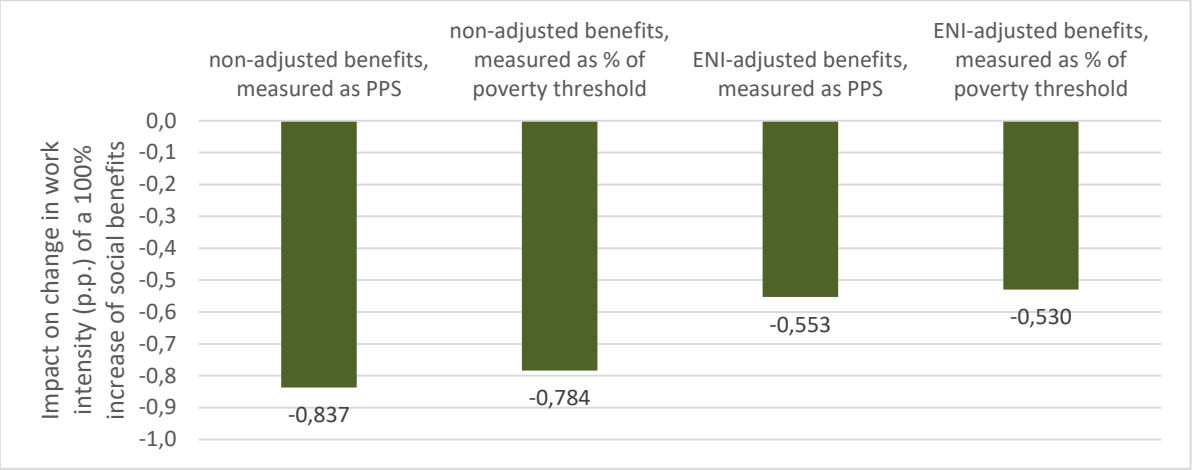
**Figure 4.5 Scatter plot: social benefits and subsequent change in work intensity**




* Dots represent households observed in one year. Horizontal axis capped, outliers not shown.
Source EU-SILC (Eurostat), own calculation

Multivariate regression, using the model presented above (3.5), confirms that higher social benefits are connected to a slower return to employment. Partial effects for different measures of social benefits are shown in Figure 4.5. Like above, where the dependent variable was the change of the poverty situation, we see stronger effects for the non-adjusted measures of social benefits. Overall, the estimated effect is again extremely small. With changes in work intensity ranging from -0.2 to 1 in our sample, a *doubling* of social benefits would lead to a less than 1 percentage point lower increase in work intensity between two consecutive years. If we stick to the need-adjusted measure of social benefits (right half of the graph), the difference is just above half a percentage point.

**Figure 4.6 Estimated effect of social benefits on change in work intensity, shown for different ways of measuring social benefits**




* Average partial effects. All values significant at p=0.001.
Source EU-SILC (Eurostat), own calculation

A separate analysis by household poverty status reveals that the relationship shown above is mostly driven by the subsample of households at high risk of poverty. For households with an income above the poverty threshold already before social benefits (rightmost column), the amount of social benefits received is only weakly connected to subsequent changes of work intensity. For households that are at risk of poverty, we hardly get any significant effects if we only look at those with a poverty gap not bigger than 50% of the poverty threshold (Table a1.8), thus with an income (before social benefits) of at least 30% the median equivalised disposable household income. For households with a poverty gap of 50% or more, however, we get highly significant coefficients.

**Table 4.2 Reduction of the change of work intensity for a hypothetical 100% increase of social benefits, by initial poverty gap**

| Social benefits | Whole sample | Subsamples by size of poverty gap | | |
|---|---|---|---|---|
| | | More than 50% of threshold | 50% – 1% of threshold | No poverty gap |
| Non-adjusted benefits, measured as PPS | -0.008*** | -0.024*** | not sig. | not sig. |
| Non-adjusted benefits, measured as % of poverty threshold | -0.008*** | -0.027*** | not sig. | -0.001* |
| ENI-adjusted benefits, measured as PPS | -0.006*** | -0.023*** | not sig. | not sig. |
| ENI-adjusted benefits, measured as % of poverty threshold | -0.005*** | -0.026*** | not sig. | -0.001* |
| N | 35,091 | 14,390 | 6,108 | 13,581 |

* Average partial effects. Legend: * p<.05; ** p<.01; *** p<.001.
**Source** EU-SILC (Eurostat), own calculation

Our findings thus suggest that households which find their income situation significantly improved by social benefits - households at high risk of poverty before transfers - tend to use the additional financial leeway provided by social benefits partly for staying at distance from the labour market. Increased monetary strain would translate into a higher preparedness of very poor households to take on employment. This finding seems to back the welfare resource hypothesis rather than the disincentive hypothesis (see above), as dis-incentives should also change the behaviour of the less poor households. From a social investment point of

view, one can only hope that the (slightly) prolonged non-employment of better-protected households allows job seekers to find better matching and higher-quality jobs – or those in prolonged work incapacity to avoid premature returns to work and recover more durably. Unfortunately, the EU-SILC data are not detailed enough to test these hypotheses. Note also that a slightly smaller labour supply from our observed population (households with work intensity <= 20%) does not necessarily mean a smaller total labour supply in the economy: substitution effects between socio-economic groups have not been examined here.

There is a range of factors apart from social benefits that affect observed households' propensity and/or opportunities to change their degree of work intensity. These factors are captured by control variables in the model. The regression output for our main model can be found in the appendix, Table a1.10. It turns out that work intensity increases more from one observed year to the next in households with a *higher* initial work intensity and with higher initial household income.[58] (The *link* between social benefits and increases in work intensity is not affected by initial work intensity, as an analysis of the interaction shows.) Increases are also positively (negatively) affected by a higher (lower) education and a lower (higher) age of working-aged household members. Limitations of household members' activities because of health problems have a negative effect on the further evolution of the household's work intensity. Being a partner household negatively influences the increase of work intensity; it seems that quasi-jobless households consisting of persons without partners make a bigger effort to gain ground again in the working world. This effect is weaker when looking only at households at risk of poverty. The number of children in the household is not significantly connected to the evolution of work intensity of quasi-jobless households. Only the number of children between 3 and 6 years of age has a weakly significant effect, yet a positive one.[59]

Looking at the macro-level control variables in our model, increases in household work intensity are higher if unemployment decreases in the labour market, and they are also higher in a context of lower initial income inequality between households (a higher Gini coefficient at time t is negatively correlated with increases in work intensity). Other possible macro-level control variables include GDP, GDP growth, the unemployment rate, the job vacancy rate, the prevalence of long-term unemployment, and changes in income inequality (Δ Gini). For GDP, no significant connection to work intensity changes is found, while GDP growth is positively linked. The latter link vanishes as soon as the evolution of unemployment changes is also included in the model, which indicates that GDP growth proxies unemployment rate changes (we thus opted for keeping the latter). The unemployment rate as a control variable is significant, yet less strong than the *change* of the unemployment rate that was taken for our main model. We can still take home that a higher share of unemployed in the population at time t is positively associated with subsequent increases in work intensity. In contrast, the rate of job vacancies is not significantly correlated to households' changes in work intensity. Two rather counter-intuitive results are that the prevalence of long-term unemployment in total unemployment at time t turns out positively connected to increases in work intensity to t+1, and that an increase in income inequality (delta Gini) is also positively connected to increases in work intensity.

Returning to the identified link between social benefits and work intensity increases, it is largely stable across different labour-market conditions: it holds independently of the level and changes of unemployment. For households which are not at risk of poverty (also without social benefits), there is some evidence that higher benefits go along with larger increases in household work intensity in a situation where there are many job vacancies (share of vacancies in total jobs), conversely that higher social benefits can lead to smaller increases in work intensity in a context of few vacancies for this group of households. For households at risk of poverty before benefits, interacting social benefits with the job vacancy rate does not make any difference. In contrast, there is some evidence that if long-term unemployment is more severe a problem in the labour market (higher share of LTU in total unemployment), the negative link between social benefits and taking up work is less strong for households at risk of poverty. (In turn, the *change* in the long-term

58 While above in the poverty gap analysis, we saw that households with lower EDHI were *faster* at closing the poverty gap (in terms of p.p.).

59 The number of elderly persons above 80 years is not significantly connected to changes of household work intensity. The latter variable has been eliminated from our model. Without any doubt, effects of household composition on *levels* of work intensity would be more significant than on the *changes* of work intensity which are in the present focus.

unemployment share from t to t+1 does not seem to play a role.) Again, as far as households at risk of poverty are concerned, the negative link between social benefits and increases in work intensity seems stronger in sample countries with a high GDP.

#### Using macro-level measures as independent variables

Like the improvement of the poverty situation analysed above, the change in household work intensity cannot be explained by social benefits measured at the macro level: If we take the sum of social benefits per inhabitant on average (either in PPS or as % of the poverty threshold), thus as a country-feature regardless of what the individual household receives, our regression model does not indicate a statistically significant link between social benefits and changes in work intensity (Table a.11 in the appendix, first two columns).

What we do find is significant coefficients for labour-market policy (LMP) spending items. These variables are based on data provided by Eurostat and DG EMPL of the European Commission. They reflect the cost of public intervention in the labour market, addressed at unemployed persons, persons employed at risk, and inactive persons who would like to work. Interventions consist of services, measures and supports, thus both active and passive labour-market policy, and its administration. To increase the robustness of our results, we try out several ways of expressing the amounts spent on LMP: spending as percentage of GDP or as PPS, the latter optionally deflated by hourly wages[60]. Spending is further deflated either by the number of persons wanting to work in a country and year, or by the actual number of recipients. For further explanations see Lehwess-Litzmann and Nicaise (2008).

Overall expenditure on LMP in year t is positively connected to the evolution of work intensity from year t to t+1 (Table a.11, third and fourth columns). If we decompose spending into active and passive spending (a distinction which can be criticised) and put both in the model, it turns out that it is only the passive, not the active spending that is positively linked to increases in household work intensity. We get a (highly) significant positive effect for spending on PLMP, but a (highly) significant negative effect for spending on ALMP. We find this for different ways of measuring expenditure (Table a1.12 in the appendix). The contrast between ALMP- and PLMP effects also shows if we consider not spending of year t, but of the preceding year (t-1), thus if we lag the spending variable by one year (Table a1.13 in the appendix). However, models containing both ALMP and PLMP probably suffer from multicollinearity: macro-level spending on ALMP and PLMP are correlated by up to $\varrho = 0.8$, depending on how we deflate. If we include either ALMP or PLMP separately, we tend to get positive significant coefficients each time, weakly significant ones for ALMP and more highly significant ones for PLMP. As a result, we cannot be sure about the effect of ALMP expenditure in particular, which might still be negative: the positive sign may come from its correlation with PLMP expenditure, which is not controlled for if PLMP is not also in the model. A negative effect of ALMP spending on yearly transitions into employment can result from short-term lock-in effects of programmes like training or public works.

As for PLMP spending, the positive result is obviously at odds with what we found using micro-level indicators. A possible explanation is that there is a difference between general social policy spending and LMP expenditure. The latter could be more favourable in promoting employment, respectively less prone to prevent employment. LMP supports differ from general social spending somewhat in content (housing benefits not included) and addressees (only persons close to the labour market are targeted).[61] A different, and more plausible, explanation is that our micro-level indicators measure effects of social benefits on household behaviour, while – due to a lack of adequate controls at the macro level – our macro-level independent variables just illustrate differences between countries, not necessarily caused by spending policies: it is perfectly possible to have a slightly negative influence of social benefits on the work intensity of the individual household, but to have higher increases of work intensity in countries with higher social benefits.

60 To adjust for the purchasing power of LMP expenditure also in terms of the living standard, not just price levels.

61 Unlike for general social policy, we have no possibility of comparing results for LMP between micro-level and macro-level spending measures, as LMP information is not contained in the EU-SILC.

# 5. Summary and conclusion: Households strive to leave poverty and joblessness behind

The analysis in this second part of the report sought to explain shifts in households' *poverty gap* and *work intensity* by social benefits by the 'generosity' of social benefits. Most of our analysis used information on social benefits factually received by sample households, drawing on micro-level information in the EU-SILC. For households at risk of poverty before social benefits, we found the amount of social benefits received to be *negatively* associated with the reduction of households' *poverty gaps* before transfers during the year following benefit receipt. We estimated with a multivariate model that if the amount of social benefits doubles, the poverty gap shrinks between one and two percentage points *less* within one year. Households that receive fewer benefits are thus faster in gaining financial independence from the social security system. The negative effect of 'generous' social benefits is found to be stronger for households with a greater depth of poverty, respectively with lower work intensity. Higher social benefits are also significantly connected to a slower return to *employment*. However, the estimated effect is extremely small. According to our model, even a doubling of social benefits would result in a less than one percentage point lower increase in work intensity between two consecutive years. The negative link is driven by the poorest among observed households at risk of poverty.

Connecting this finding with our analysis in the first part of the report, it may thus seem that lifting households over the poverty threshold by social benefits - our indicator of social security effectiveness - is at odds with setting work incentives to quasi-jobless households. It may also seem that social protection, seeking to mitigate hardship, leads to households' remaining dependent on the welfare state. However, there are some important points that speak against these interpretations. *First*, the households we observe - all of which experience quasi-joblessness and/or poverty risks - on average have a clear tendency of increasing their employment participation and their market incomes over time. Generous social benefits, unless they are really very high, slow down the yearly improvements, but do not bring them to a halt. *Second*, the degree of this slowdown by social benefits is small concerning the closing of the poverty gap, and extremely small concerning the increase of work intensity. We could even speak of a quasi-independence between 'generosity' of social benefits and work intensity. *Third*, it is interesting to see that the negative relationship between social benefits and employment is driven by households at high risk of poverty. For 'richer' households (among the poor), we hardly get any indication that generous social benefits slow down transitions into employment. This suggests that only households that find their income situation significantly improved by social benefits use the additional financial leeway to stay at distance from employment. In our view, this speaks rather for the welfare resource hypothesis than for the moral hazard hypothesis: if disincentives were relevant, they would influence 'rational actors' in all sorts of households.

From a social investment point of view, our findings on the link between benefits and employment can be read as a confirmation of social policy as a public resource that grants troubled households additional time to 'sort things out'. This may have positive returns in the future, as households may allocate their labour power to more stable and productive jobs if they have more time to train and search (cp. footnote 42). Yet, such an effect of benefit 'generosity' should not be overstated on the basis of our results, which point to a very limited impact on employment behaviour of households. Given that not only the welfare resource approach, but also other theoretical perspectives (moral hazard, welfare dependency) predict prolonged unemployment spells as a consequence of more 'generous' social benefits, the small effects measured in our

analysis are rather surprising. It thus seems that most households take on employment or stay un-employed/inactive independently of benefit 'generosity': After all, getting a job always requires not just the desire to work, but also adequate training, healthcare, childcare arrangements etc. and not least a job vacancy.

By the same token, it seems plausible that benefit "generosity" does not overly impact the evolution of pre-benefit household income. The effect that we have measured gives reason to assume that financial hardship in the face of parsimonious social security systems makes households explore channels for survival more desperately than their counterparts receiving more-generous social protection. Yet, the full extent of this does not necessarily reflect in the data: One of the radical life-choices households may be forced to - beside acceptance of low-paid jobs - is the recourse to the shadow economy.

# appendix 1 Additional tables and figures

**Table a1.1 Regression output on the impact of social benefits, by country**

| Variable | Coef. | Std. Err. | z | P>z | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| Dependent variable: success (1) or non-succes (0) of social benefits in lifting the equivalised disposable income of a household over the poverty threshold (binary). | | | | | | |
| Poverty gap | -0.01664 | 0.00022 | -76.88 | 0.000 | -0.01706 | -0.01621 |
| Time spent unemployed (%) | -0.00061 | 0.00180 | -0.34 | 0.735 | -0.00413 | 0.00291 |
| Time spent as pensioner (%) | 0.01435 | 0.00228 | 6.30 | 0.000 | 0.00988 | 0.01882 |
| Time spent studying (%) | -0.07906 | 0.00210 | -37.71 | 0.000 | -0.08317 | -0.07495 |
| Household type (base: single household) | | | | | | |
| 2 adults, no dependent children | 0.37873 | 0.01895 | 19.98 | 0.000 | 0.34159 | 0.41588 |
| Other households without dependent children | 0.56261 | 0.02586 | 21.76 | 0.000 | 0.51193 | 0.61329 |
| Single parent household, one or more dependent children | 0.76916 | 0.02200 | 34.96 | 0.000 | 0.72604 | 0.81228 |
| 2 adults, one dependent child | 0.44159 | 0.02342 | 18.86 | 0.000 | 0.39569 | 0.48749 |
| 2 adults, two dependent children | 0.47337 | 0.02169 | 21.83 | 0.000 | 0.43087 | 0.51587 |
| 2 adults, three or more dependent children | 0.59985 | 0.02509 | 23.90 | 0.000 | 0.55066 | 0.64903 |
| Other households with dependent children | 0.43207 | 0.02507 | 17.23 | 0.000 | 0.38293 | 0.48121 |
| Year (base: 2006) | | | | | | |
| 2007 | -0.07195 | 0.02469 | -2.91 | 0.004 | -0.12034 | -0.02355 |
| 2008 | -0.09537 | 0.02460 | -3.88 | 0.000 | -0.14358 | -0.04716 |
| 2009 | 0.02640 | 0.02437 | 1.08 | 0.279 | -0.02137 | 0.07417 |
| 2010 | 0.00333 | 0.02444 | 0.14 | 0.892 | -0.04457 | 0.05124 |
| 2011 | -0.06490 | 0.02495 | -2.60 | 0.009 | -0.11381 | -0.01600 |
| 2012 | -0.05041 | 0.02493 | -2.02 | 0.043 | -0.09928 | -0.00154 |
| 2013 | -0.04736 | 0.02447 | -1.94 | 0.053 | -0.09532 | 0.00060 |
| 2014 | -0.10086 | 0.02481 | -4.07 | 0.000 | -0.14948 | -0.05223 |
| Country (base: Austria) | | | | | | |
| BE | 0.70622 | 0.03326 | 21.23 | 0.000 | 0.64103 | 0.77141 |
| BG | -1.24857 | 0.03908 | -31.95 | 0.000 | -1.32517 | -1.17197 |
| CY | -0.74955 | 0.04041 | -18.55 | 0.000 | -0.82875 | -0.67035 |
| CZ | 0.14312 | 0.03301 | 4.34 | 0.000 | 0.07842 | 0.20781 |
| DE | -0.17028 | 0.02816 | -6.05 | 0.000 | -0.22548 | -0.11508 |
| DK | 1.44496 | 0.04285 | 33.72 | 0.000 | 1.36098 | 1.52894 |
| EE | -0.71980 | 0.03646 | -19.74 | 0.000 | -0.79125 | -0.64835 |
| EL | -1.77368 | 0.04090 | -43.36 | 0.000 | -1.85385 | -1.69351 |

| Variable | Coef. | Std. Err. | z | P>z | [95% Conf. Interval] | |
|---|---|---|---|---|---|---|
| ES | -0.71462 | 0.03052 | -23.42 | 0.000 | -0.77443 | -0.65480 |
| FI | 0.88563 | 0.03045 | 29.09 | 0.000 | 0.82595 | 0.94531 |
| FR | -0.00532 | 0.02980 | -0.18 | 0.858 | -0.06372 | 0.05308 |
| HU | 0.18315 | 0.02855 | 6.42 | 0.000 | 0.12720 | 0.23910 |
| IE | 0.81444 | 0.03491 | 23.33 | 0.000 | 0.74602 | 0.88286 |
| IS | 0.55684 | 0.04786 | 11.63 | 0.000 | 0.46304 | 0.65065 |
| IT | -1.30532 | 0.02954 | -44.20 | 0.000 | -1.36321 | -1.24743 |
| LT | -0.47406 | 0.04207 | -11.27 | 0.000 | -0.55652 | -0.39161 |
| LU | -0.23832 | 0.03934 | -6.06 | 0.000 | -0.31542 | -0.16121 |
| LV | -1.05445 | 0.03608 | -29.22 | 0.000 | -1.12518 | -0.98373 |
| NL | 0.82543 | 0.03970 | 20.79 | 0.000 | 0.74762 | 0.90324 |
| NO | 0.89305 | 0.03446 | 25.92 | 0.000 | 0.82551 | 0.96060 |
| PL | -0.90127 | 0.02906 | -31.01 | 0.000 | -0.95823 | -0.84430 |
| PT | -0.80631 | 0.03568 | -22.60 | 0.000 | -0.87624 | -0.73638 |
| RO | -1.22807 | 0.03481 | -35.28 | 0.000 | -1.29630 | -1.15984 |
| SE | 0.74546 | 0.03309 | 22.53 | 0.000 | 0.68061 | 0.81031 |
| SI | 0.04015 | 0.03090 | 1.30 | 0.194 | -0.02042 | 0.10072 |
| SK | -0.33441 | 0.03542 | -9.44 | 0.000 | -0.40383 | -0.26498 |
| UK | 0.21267 | 0.03032 | 7.01 | 0.000 | 0.15324 | 0.27209 |
| Intercept | 0.32647 | 0.03300 | 9.89 | 0.000 | 0.26178 | 0.39116 |

* Only working-age households at risk of poverty before social benefits. Weighted values. N= 378,506.
**Source** EU-SILC (Eurostat), own calculation

**Table a1.2 Share of persons at risk of poverty after social benefits (reference: all persons)**

| Country | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| AT | 12.3 | 14.8 | 13.8 | 15.3 | 14.9 | 15.7 | 15.0 | 15.2 | 14.7 |
| BE | 13.2 | 12.7 | 12.6 | 12.2 | 12.9 | 13.2 | 13.8 | 14.1 | 13.6 |
| BG | 17.5 | 15.6 | 14.9 | 15.9 | 17.1 | 17.1 | 16.2 | 17.7 | 17.1 |
| CY | 12.7 | 12.9 | 13.3 | 14.2 | 14.0 | 14.8 | 15.8 | 15.3 | 16.9 |
| CZ | 8.9 | 8.4 | 8.1 | 8.5 | 9.5 | 9.3 | 8.6 | 9.1 | 9.4 |
| DE | 17.5 | 18.0 | 18.8 | 19.1 | 19.8 | 20.0 | 19.6 | 19.5 | 19.5 |
| DK | 11.8 | 12.1 | 13.3 | 14.4 | 13.1 | 13.6 | 14.4 | 15.5 | 14.5 |
| EE | 15.5 | 15.3 | 15.1 | 15.4 | 16.2 | 16.7 | 16.8 | 18.7 | 17.6 |
| EL | 17.4 | 18.6 | 18.7 | 18.3 | 18.8 | 22.9 | 23.6 | 22.7 | 22.7 |
| ES | 16.7 | 17.6 | 17.9 | 19.1 | 20.0 | 20.9 | 20.9 | 23.4 | 23.1 |
| FI | 12.2 | 12.6 | 13.0 | 12.9 | 13.3 | 13.6 | 12.5 | 13.2 | 12.9 |
| FR | 12.7 | 12.7 | 12.5 | 13.6 | 14.9 | 15.1 | 14.9 | 14.3 | 14.8 |
| HU | 12.5 | 12.9 | 12.4 | 12.3 | 14.1 | 14.0 | 15.5 | 15.3 | 16.4 |
| IE | 16.6 | 15.8 | 14.9 | 14.5 | 15.2 | 15.7 | 17.7 | 17.0 | 17.7 |
| IS | 9.6 | 10.4 | 11.3 | 11.1 | 11.5 | 9.7 | 10.7 | 8.8 | 11.5 |
| IT | 17.6 | 16.9 | 16.8 | 17.4 | 19.3 | 19.4 | 19.6 | 20.2 | 20.2 |
| LT | 16.1 | 17.4 | 18.1 | 22.5 | 20.2 | 16.9 | 18.8 | 17.8 | 19.1 |
| LU | 14.9 | 14.7 | 15.8 | 16.9 | 15.8 | 17.1 | 18.5 | 18.4 | 17.2 |
| LV | 18.3 | 19.1 | 20.0 | 20.0 | 20.4 | 19.3 | 18.4 | 17.6 | 17.5 |
| NL | 10.0 | 11.3 | 11.9 | 11.6 | 11.8 | 12.0 | 12.3 | 13.8 | 13.6 |
| NO | 14.8 | 13.4 | 13.7 | 13.1 | 12.7 | 12.7 | 13.3 | 14.5 | 15.9 |
| PL | 18.3 | 16.9 | 17.0 | 17.6 | 17.5 | 17.0 | 17.5 | 17.0 | 17.8 |
| PT | 16.8 | 17.5 | 16.9 | 16.7 | 16.4 | 17.6 | 18.6 | 19.3 | 18.9 |
| RO | 20.7 | 20.5 | 20.5 | 20.0 | 21.0 | 21.4 | 21.3 | 23.2 | 22.6 |
| SE | 11.7 | 12.2 | 13.5 | 13.3 | 13.0 | 13.7 | 15.1 | 16.0 | 15.0 |
| SI | 11.0 | 12.0 | 10.8 | 12.1 | 13.4 | 13.1 | 13.7 | 14.8 | 14.7 |
| SK | 8.9 | 8.7 | 9.5 | 11.3 | 12.2 | 12.3 | 12.0 | 12.4 | 12.0 |
| UK | 16.3 | 15.8 | 16.0 | 15.6 | 15.9 | 14.9 | 16.3 | 15.6 | 16.5 |

* Only working-age households.

**Source** EU-SILC (Eurostat), own calculation

**Table a1.3 Share of persons at risk of poverty before social benefits (reference: all persons)**

| Country | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| AT | 24.7 | 25.5 | 25.2 | 26.6 | 27.1 | 27.0 | 26.4 | 26.6 | 26.6 |
| BE | 28.0 | 27.2 | 27.3 | 27.2 | 27.8 | 28.4 | 27.6 | 29.1 | 28.5 |
| BG | 21.2 | 21.2 | 19.4 | 21.7 | 21.9 | 21.2 | 21.4 | 22.9 | 22.5 |
| CY | 17.7 | 18.7 | 19.4 | 21.1 | 21.2 | 22.5 | 24.0 | 24.4 | 25.4 |
| CZ | 19.4 | 19.0 | 17.2 | 17.7 | 18.0 | 17.7 | 16.8 | 17.1 | 16.9 |
| DE | 28.2 | 28.1 | 27.6 | 28.5 | 29.7 | 28.5 | 28.3 | 28.6 | 28.6 |
| DK | 30.5 | 31.9 | 33.0 | 33.0 | 33.1 | 33.3 | 34.9 | 34.4 | 33.6 |
| EE | 20.4 | 19.7 | 21.3 | 23.5 | 24.1 | 24.0 | 23.6 | 26.0 | 23.7 |
| EL | 20.4 | 21.8 | 21.5 | 21.8 | 22.0 | 26.9 | 28.1 | 26.6 | 26.5 |
| ES | 21.2 | 22.5 | 25.4 | 28.1 | 30.3 | 30.0 | 31.5 | 33.5 | 32.1 |
| FI | 29.4 | 28.3 | 27.1 | 28.4 | 29.1 | 28.8 | 29.1 | 29.7 | 30.2 |
| FR | 25.6 | 23.0 | 23.5 | 25.7 | 25.6 | 24.8 | 25.8 | 25.4 | 25.6 |
| HU | 29.0 | 30.5 | 28.5 | 28.0 | 28.8 | 27.3 | 27.6 | 26.1 | 25.8 |
| IE | 31.5 | 32.1 | 33.8 | 36.9 | 41.1 | 40.7 | 40.9 | 40.8 | 38.7 |
| IS | 18.0 | 18.7 | 20.3 | 26.1 | 27.5 | 26.4 | 25.8 | 23.5 | 24.4 |
| IT | 21.7 | 21.4 | 21.5 | 22.4 | 24.3 | 24.5 | 24.8 | 25.4 | 25.9 |
| LT | 22.3 | 24.9 | 26.4 | 33.0 | 32.5 | 27.6 | 29.3 | 27.1 | 26.1 |
| LU | 24.7 | 24.3 | 26.3 | 29.7 | 28.2 | 29.0 | 30.7 | 28.8 | 29.1 |
| LV | 23.8 | 23.0 | 24.4 | 27.5 | 28.3 | 25.5 | 24.8 | 23.8 | 22.5 |
| NL | 23.7 | 23.4 | 23.8 | 25.2 | 25.5 | 26.2 | 26.7 | 27.2 | 28.9 |
| NO | 31.5 | 28.5 | 28.7 | 30.3 | 33.5 | 29.8 | 29.2 | 29.0 | 31.4 |
| PL | 27.6 | 25.4 | 23.9 | 24.6 | 24.0 | 23.1 | 23.2 | 23.1 | 23.3 |
| PT | 23.1 | 23.7 | 23.4 | 25.4 | 24.7 | 25.9 | 26.3 | 27.2 | 26.8 |
| RO | 26.7 | 27.4 | 27.2 | 26.5 | 27.9 | 27.1 | 26.5 | 27.3 | 26.7 |
| SE | 29.1 | 29.3 | 27.5 | 27.6 | 28.3 | 28.0 | 29.2 | 29.9 | 28.0 |
| SI | 23.5 | 23.3 | 22.2 | 24.7 | 24.4 | 26.4 | 25.6 | 24.4 | 24.7 |
| SK | 16.6 | 16.2 | 15.7 | 19.0 | 19.4 | 19.4 | 19.5 | 19.2 | 17.6 |
| UK | 27.6 | 26.5 | 26.5 | 28.8 | 29.8 | 29.4 | 30.5 | 30.6 | 29.4 |

* Values weighted. Only working-age households.
**Source** EU-SILC (Eurostat), own calculation

**Table a1.4 Shares of households lifted over the poverty threshold by social benefits: observed (reference: households poor before social benefits)**

| Country | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| AT | 50.1 | 42.0 | 45.0 | 42.5 | 45.0 | 41.8 | 43.1 | 43.1 | 44.8 |
| BE | 53.1 | 53.5 | 53.7 | 55.0 | 53.5 | 53.4 | 49.8 | 51.4 | 52.2 |
| BG | 17.1 | 26.5 | 23.2 | 26.9 | 21.9 | 19.2 | 24.1 | 22.6 | 24.3 |
| CY | 28.4 | 30.9 | 31.3 | 32.6 | 34.0 | 34.5 | 34.1 | 37.3 | 33.4 |
| CZ | 54.0 | 55.8 | 52.7 | 52.1 | 47.0 | 47.6 | 48.5 | 46.7 | 44.2 |
| DE | 37.9 | 35.9 | 31.9 | 33.0 | 33.3 | 29.9 | 30.8 | 31.8 | 31.8 |
| DK | 61.4 | 62.2 | 59.7 | 56.4 | 60.5 | 59.0 | 58.6 | 54.8 | 56.9 |
| EE | 24.0 | 22.7 | 29.0 | 34.8 | 32.6 | 30.2 | 28.9 | 28.2 | 25.9 |
| EL | 14.6 | 14.6 | 13.3 | 16.2 | 14.7 | 15.1 | 16.2 | 14.5 | 14.6 |
| ES | 21.2 | 21.6 | 29.4 | 32.0 | 34.0 | 30.3 | 33.7 | 30.2 | 28.1 |
| FI | 58.7 | 55.5 | 52.1 | 54.6 | 54.3 | 52.6 | 57.1 | 55.7 | 57.2 |
| FR | 50.3 | 45.0 | 46.7 | 47.2 | 41.7 | 39.1 | 42.2 | 43.8 | 42.1 |
| HU | 57.1 | 57.8 | 56.7 | 55.9 | 51.0 | 48.6 | 44.0 | 41.5 | 36.5 |
| IE | 47.4 | 50.8 | 55.9 | 60.6 | 63.0 | 61.5 | 56.8 | 58.4 | 54.3 |
| IS | 46.8 | 44.3 | 44.6 | 57.4 | 58.0 | 63.2 | 58.6 | 62.5 | 52.9 |
| IT | 18.7 | 21.2 | 22.0 | 22.3 | 20.7 | 21.0 | 21.0 | 20.5 | 21.9 |
| LT | 27.7 | 30.3 | 31.5 | 31.8 | 37.9 | 38.9 | 35.7 | 34.1 | 26.7 |
| LU | 39.9 | 39.6 | 39.8 | 43.2 | 44.1 | 40.8 | 39.7 | 36.3 | 41.0 |
| LV | 23.1 | 17.2 | 18.0 | 27.3 | 28.1 | 24.1 | 25.9 | 26.0 | 21.9 |
| NL | 57.7 | 51.8 | 50.3 | 53.9 | 53.8 | 54.3 | 53.9 | 49.2 | 52.9 |
| NO | 53.1 | 53.0 | 52.4 | 56.7 | 62.0 | 57.3 | 54.3 | 50.1 | 49.2 |
| PL | 33.8 | 33.3 | 28.6 | 28.3 | 27.0 | 26.5 | 24.3 | 26.1 | 23.4 |
| PT | 27.3 | 26.2 | 27.8 | 34.2 | 33.6 | 32.2 | 29.3 | 29.3 | 29.4 |
| RO | 22.5 | 25.3 | 24.5 | 24.7 | 24.8 | 21.3 | 19.9 | 14.7 | 15.2 |
| SE | 59.8 | 58.4 | 50.9 | 51.7 | 54.0 | 51.1 | 48.4 | 46.6 | 46.5 |
| SI | 53.0 | 48.6 | 51.6 | 51.1 | 45.3 | 50.3 | 46.6 | 39.3 | 40.6 |
| SK | 46.3 | 46.6 | 39.4 | 40.5 | 37.0 | 36.6 | 38.4 | 35.5 | 31.5 |
| UK | 40.9 | 40.4 | 39.5 | 46.0 | 46.6 | 49.2 | 46.6 | 48.8 | 44.0 |

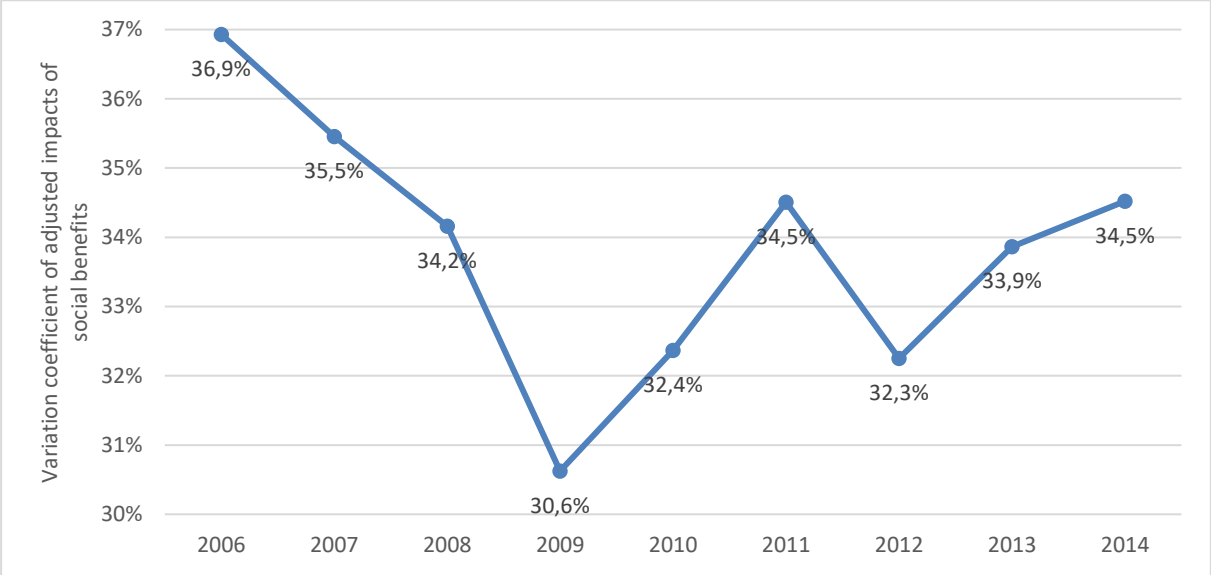
* Values weighted. Only working-age households at risk of poverty before social benefits.
**Source** EU-SILC (Eurostat), own calculation

**Table a1.5 Shares of households lifted over the poverty threshold by social benefits: predicted (reference: households poor before social benefits)**

| Country | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|
| AT | 50.1 | 42.5 | 46.2 | 45.2 | 47.2 | 44.1 | 44.7 | 45.8 | 47.3 |
| BE | 53.1 | 53.3 | 52.5 | 54.2 | 54.0 | 54.4 | 51.9 | 52.2 | 53.0 |
| BG | 17.1 | 24.7 | 20.9 | 24.1 | 20.0 | 18.2 | 22.3 | 21.2 | 23.2 |
| CY | 28.4 | 32.1 | 31.6 | 34.7 | 36.3 | 36.6 | 35.5 | 39.8 | 36.5 |
| CZ | 54.0 | 54.8 | 51.2 | 50.3 | 45.1 | 45.6 | 46.5 | 45.8 | 44.3 |
| DE | 37.9 | 36.3 | 32.1 | 33.3 | 33.6 | 29.6 | 30.2 | 32.5 | 32.5 |
| DK | 61.4 | 63.2 | 65.7 | 59.2 | 62.9 | 61.3 | 60.6 | 58.9 | 61.0 |
| EE | 24.0 | 22.5 | 28.1 | 35.4 | 35.2 | 32.4 | 30.7 | 29.7 | 27.0 |
| EL | 14.6 | 14.8 | 13.6 | 16.5 | 15.8 | 16.2 | 18.1 | 16.1 | 16.4 |
| ES | 21.2 | 22.2 | 30.9 | 35.3 | 37.7 | 34.4 | 38.1 | 35.3 | 32.5 |
| FI | 58.7 | 55.6 | 52.3 | 55.0 | 55.2 | 53.7 | 57.5 | 57.3 | 59.9 |
| FR | 50.3 | 42.9 | 44.9 | 47.6 | 40.7 | 38.0 | 40.2 | 42.1 | 40.4 |
| HU | 57.1 | 58.1 | 54.8 | 54.4 | 51.3 | 48.6 | 43.9 | 40.2 | 35.1 |
| IE | 47.4 | 50.1 | 55.4 | 61.9 | 65.4 | 64.2 | 60.1 | 61.9 | 56.9 |
| IS | 46.8 | 45.9 | 45.8 | 62.4 | 63.7 | 68.1 | 62.7 | 66.8 | 58.2 |
| IT | 18.7 | 21.1 | 21.9 | 22.6 | 21.7 | 22.0 | 22.5 | 21.9 | 23.3 |
| LT | 27.7 | 30.1 | 32.2 | 34.7 | 42.4 | 42.5 | 37.6 | 35.6 | 29.3 |
| LU | 39.9 | 39.8 | 40.4 | 44.5 | 46.6 | 43.3 | 44.0 | 40.0 | 43.9 |
| LV | 23.1 | 17.3 | 18.2 | 28.7 | 29.4 | 25.4 | 26.6 | 26.3 | 22.0 |
| NL | 57.7 | 52.4 | 52.6 | 55.1 | 55.8 | 57.8 | 56.5 | 51.1 | 53.3 |
| NO | 53.1 | 51.8 | 49.6 | 55.2 | 61.6 | 56.2 | 51.6 | 48.7 | 49.0 |
| PL | 33.8 | 32.4 | 27.4 | 26.9 | 25.9 | 25.2 | 23.1 | 24.4 | 22.3 |
| PT | 27.3 | 25.3 | 27.3 | 34.5 | 33.8 | 32.3 | 30.5 | 31.3 | 31.1 |
| RO | 22.5 | 24.5 | 24.1 | 23.7 | 24.0 | 21.1 | 19.9 | 14.9 | 15.7 |
| SE | 59.8 | 60.1 | 54.5 | 55.5 | 57.3 | 54.2 | 52.6 | 51.0 | 50.1 |
| SI | 53.0 | 48.7 | 50.4 | 51.8 | 47.4 | 51.9 | 48.1 | 40.8 | 41.7 |
| SK | 46.3 | 45.3 | 39.2 | 41.3 | 38.0 | 36.1 | 38.0 | 34.8 | 31.1 |
| UK | 40.9 | 39.4 | 38.6 | 46.4 | 46.9 | 49.9 | 48.7 | 50.1 | 45.1 |

* Values weighted. Only working-age households at risk of poverty before social benefits.
**Source** EU-SILC (Eurostat), own calculation

**Figure a1.1 Convergence and divergence of adjusted impacts between social security systems (variation coefficient), 2006–2014**




* Only working-age households at risk of poverty before social benefits. Weighted values. For DE, values of 2013.
**Source** EU-SILC (Eurostat), own calculation

**Figure a1.2 Linear regression on between-country differences: Post-benefit AROP rates explained by pre-benefit AROP rates and impact of social benefits**

```
. reg arop_post_mean06till04 arop_pre_mean06till04 adj_impact_pct_mean06till04
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| | | | | Number of obs | = 28 |
| | | | | F(2, 25) | = 180.02 |
| Model | 250.87658 | 2 | 125.43829 | Prob > F | = 0.0000 |
| Residual | 17.4204863 | 25 | .696819452 | R-squared | = 0.9351 |
| | | | | Adj R-squared | = 0.9299 |
| Total | 268.297066 | 27 | 9.93692837 | Root MSE | = .83476 |

| arop_post_mean06till04 | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| arop_pre_mean06till04 | .6249376 | .0460359 | 13.57 | 0.000 | .5301248 | .7197504 |
| adj_impact_pct_mean06till04 | -.2138072 | .0116091 | -18.42 | 0.000 | -.2377166 | -.1898978 |
| _cons | 7.641677 | 1.04816 | 7.29 | 0.000 | 5.482952 | 9.800402 |

```
. estat esize

Effect sizes for linear models
```

| Source | Eta-Squared | df | [95% Conf. | Interval] |
|---|---|---|---|---|
| Model | .9350702 | 2 | .8638541 | .95546 |
| arop_pre_mean06till04 | .8805431 | 1 | .7629077 | .9211951 |
| adj_impact_pct_mean06ti~04 | .931355 | 1 | .8613496 | .9546037 |

**Figure a1.3 Linear regression on changes over time: Change of post-benefit AROP rates explained by change of pre-benefit AROP rates and change of impact of social benefits**

```
. reg change_post_AROP_pct change_pre_AROP_pct change_adj_impact_pct
```

| Source | SS | df | MS | Number of obs | = | 28 |
|---|---|---|---|---|---|---|
| | | | | F(2, 25) | = | 24.88 |
| Model | 2933.38365 | 2 | 1466.69183 | Prob > F | = | 0.0000 |
| Residual | 1473.60813 | 25 | 58.9443251 | R-squared | = | 0.6656 |
| | | | | Adj R-squared | = | 0.6389 |
| Total | 4406.99178 | 27 | 163.221918 | Root MSE | = | 7.6775 |

| change_post_AROP_pct | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| change_pre_AROP_pct | 1.062729 | .1506721 | 7.05 | 0.000 | .7524143 | 1.373044 |
| change_adj_impact_pct | -.6044592 | .1089537 | -5.55 | 0.000 | -.8288535 | -.3800649 |
| _cons | 5.507697 | 2.12909 | 2.59 | 0.016 | 1.122754 | 9.892639 |

```
. estat esize

Effect sizes for linear models
```

| Source | Eta-Squared | df | [95% Conf. | Interval] |
|---|---|---|---|---|
| Model | .6656204 | 2 | .3812294 | .7715233 |
| change_pre_AROP_pct | .6655449 | 1 | .4015358 | .7797795 |
| change_adj_impact_~t | .5518003 | 1 | .253353 | .7032536 |

Note: Eta-Squared values for individual model terms are partial.

**Table a1.6 Poverty gap sample, by country and historical year**

| Country | Historical year | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| AT | 274 | 254 | 248 | 309 | 272 | 269 | 259 | 277 |
| BE | 330 | 238 | 279 | 297 | 256 | 243 | 318 | 336 |
| BG | 116 | 232 | 271 | 194 | 228 | 201 | 189 | 228 |
| CY | 113 | 111 | 112 | 224 | 141 | 197 | 157 | 169 |
| CZ | 328 | 274 | 282 | 278 | 273 | 223 | 208 | 214 |
| DK | 167 | 173 | 175 | 147 | 155 | 191 | 220 | 191 |
| EE | 210 | 177 | 193 | 209 | 242 | 256 | 246 | 273 |
| EL | 236 | 290 | 370 | 257 | 267 | 339 | 528 | 533 |
| ES | 490 | 545 | 685 | 503 | 501 | 506 | 573 | 608 |
| FI | 273 | 267 | 281 | 526 | 467 | 352 | 150 | 156 |
| FR | 283 | 254 | 286 | 269 | 290 | 263 | 253 | 315 |
| HR | | | | 618 | 593 | 316 | | 283 |
| HU | 510 | 457 | 635 | 554 | 1,008 | 421 | 434 | 361 |
| IE | | 293 | 341 | | | 312 | 334 | 337 |
| IS | 54 | 54 | 64 | 86 | 96 | 82 | 92 | 79 |
| IT | 713 | 725 | 711 | 548 | 744 | 712 | 700 | 737 |
| LT | 193 | 184 | 188 | 249 | 167 | 154 | 97 | 102 |
| LU | 118 | 97 | 195 | 242 | 216 | 198 | 204 | 188 |
| LV | 213 | 251 | 266 | 342 | 307 | 223 | 250 | 214 |
| MT | | 158 | 202 | 157 | 195 | 184 | 162 | |
| NL | 311 | 302 | 277 | 291 | 326 | 309 | 279 | 330 |
| NO | | | 96 | 78 | 77 | 217 | 219 | 204 |
| PL | 784 | 686 | 615 | 659 | 630 | 652 | 640 | 656 |
| PT | | 141 | 56 | 54 | 67 | 22 | 6 | 15 |
| RO | 998 | 274 | 338 | 368 | 337 | 239 | 209 | 209 |
| RS | | | | | | | 1,055 | 357 |
| SE | 250 | 230 | 215 | 212 | 183 | 163 | 172 | 162 |
| SI | 337 | 381 | 284 | 235 | 258 | 287 | 378 | 325 |
| SK | 115 | 90 | 97 | 207 | 162 | 3 | 60 | 66 |
| UK | | 379 | 385 | 353 | 368 | 375 | 678 | 516 |

**Source** EU-SILC (Eurostat), own calculation

**Table a1.7 Work intensity sample, by country and historical year**

| Country | Historical year | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
| AT | 186 | 175 | 186 | 195 | 196 | 160 | 161 | 197 |
| BE | 262 | 201 | 238 | 264 | 216 | 222 | 266 | 267 |
| BG | 130 | 186 | 204 | 178 | 176 | 164 | 138 | 156 |
| CY | 78 | 71 | 66 | 133 | 86 | 119 | 77 | 131 |
| CZ | 297 | 232 | 297 | 290 | 259 | 198 | 224 | 222 |
| DK | 55 | 28 | 50 | 38 | 55 | 48 | 58 | 54 |
| EE | 112 | 90 | 108 | 109 | 140 | 155 | 122 | 127 |
| EL | | 221 | 236 | 164 | 207 | 261 | 536 | 482 |
| ES | 297 | 315 | 294 | 307 | 358 | 303 | 302 | 387 |
| FI | 83 | 75 | 80 | 172 | 136 | 107 | 42 | 59 |
| FR | 191 | 185 | 228 | 239 | 210 | 213 | 165 | 234 |
| HR | | | | 532 | 602 | 291 | | 283 |
| HU | 428 | 338 | 479 | 444 | 699 | 337 | 296 | 285 |
| IE | | 197 | 240 | | | 299 | 220 | 247 |
| IS | 12 | 13 | 16 | 29 | 31 | 24 | 19 | 16 |
| IT | 636 | 633 | 559 | 489 | 653 | 560 | 549 | 561 |
| LT | 122 | 101 | 107 | 162 | 131 | 130 | 75 | 70 |
| LU | 24 | 12 | 111 | 148 | 136 | 146 | 102 | 93 |
| LV | 125 | 135 | 150 | 228 | 240 | 151 | 169 | 141 |
| MT | | 156 | 176 | 178 | 184 | 163 | 140 | |
| NL | 174 | 186 | 118 | 130 | 195 | 128 | 125 | 155 |
| NO | | | 31 | 28 | 38 | 68 | 48 | 69 |
| PL | 475 | 446 | 396 | 439 | 425 | 436 | 387 | 427 |
| PT | | 75 | 39 | 35 | 30 | 11 | 3 | 5 |
| RO | 829 | 206 | 334 | 327 | 310 | 217 | 198 | 199 |
| RS | | | | | | | 764 | 296 |
| SE | 60 | 49 | 40 | 47 | 43 | 33 | 38 | 25 |
| SI | 230 | 265 | 219 | 220 | 243 | 275 | 265 | 266 |
| SK | 86 | 64 | 86 | 171 | 135 | 5 | 55 | 57 |
| UK | | 205 | 210 | 205 | 243 | 248 | 432 | 317 |

**Source** EU-SILC (Eurostat), own calculation

**Table a1.8 Regression output on poverty gap improvements, main model, by method of measuring social benefits**

| Category | Variable | Non-adjusted amounts | | ENI-adjusted amounts | |
|---|---|---|---|---|---|
| **Dependent variable: improvement of poverty gap (p.p.)** | | **PPS** | **PTH** | **PPS** | **PTH** |
| Macro-level control | Gini coefficient | -0.264*** | -0.221** | -0.244** | -0.221* |
| Household situation | EDHI as % of poverty threshold | -39.122*** | -39.112*** | -37.124*** | -37.227*** |
| | work intensity, part-time adjusted | 9.687*** | 9.772*** | 11.217*** | 11.178*** |
| Household composition | # of working-aged members below 30 | 0.027*** | 0.029*** | 0.031*** | 0.032*** |
| | # of working-aged members above 55 | 0.057*** | 0.057*** | 0.056*** | 0.056*** |
| | # of members with low education | -4.457*** | -4.503*** | -4.371*** | -4.415*** |
| | # of members with high education | 5.494*** | 5.596*** | 5.518*** | 5.582*** |
| | # of members with limited activity due to health | -9.406*** | -9.469*** | -10.003*** | -9.996*** |
| | partner household | 4.983*** | 4.980*** | 4.855*** | 4.873*** |
| | # of children aged 0–2 | -2.325*** | -1.994*** | -2.333*** | -2.063*** |
| | # of children aged 3–6 | -1.397*** | -1.318*** | -1.380*** | -1.345*** |
| | # of children aged 7–17 | -1.797*** | -1.715*** | -1.728*** | -1.685*** |
| Historical time | Historical year (base 2006) | | | | |
| | 2007 | -2.112*** | -2.298*** | -2.146*** | -2.256*** |
| | 2008 | -3.413*** | -3.704*** | -3.481*** | -3.653*** |
| | 2009 | -3.613*** | -3.814*** | -3.703*** | -3.818*** |
| | 2010 | -2.748*** | -2.988*** | -2.804*** | -2.946*** |
| | 2011 | -3.559*** | -3.859*** | -3.670*** | -3.851*** |
| | 2012 | -3.021*** | -3.422*** | -3.134*** | -3.397*** |
| | 2013 | -3.614*** | -3.998*** | -3.741*** | -3.973*** |
| Social benefits | Non-adjusted, measured as PPS | **-0.001*** ** | | | |
| | Non-adjusted, measured as % of poverty threshold | | **-0.046*** ** | | |
| | ENI-adjusted, measured as PPS | | | **-0.003*** ** | |
| | ENI-adjusted, measured as % of poverty threshold | | | | **-0.156*** ** |
| | Intercept | 36.563*** | 35.132*** | 33.475*** | 32.824*** |
| Level 2 estimates | Random intercept variance | 0.954*** | 1.119*** | 1.112*** | 1.204*** |
| | Within-group error variance | 3.290*** | 3.290*** | 3.292*** | 3.292*** |
| | **N** | **47,738** | **47,738** | **47,738** | **47,738** |

* Legend: * p<.05; ** p<.01; *** p<.001.

**Source** EU-SILC (Eurostat), own calculation

**Table a1.9 Regression output on poverty gap improvements, alternative model: social benefits measured at the macro-level**

| Category | Variable | Mod 1 | Mod 2 | Mod 3 | Mod 4 |
|---|---|---|---|---|---|
| **Dependent variable: improvement of poverty gap (p.p.)** | | | | | |
| Macro-level controls | Gini coefficient | 0.128 | 0.149 | -0.221* | -0.226* |
| Household situation | EDHI as % of poverty threshold | -36.365*** | -36.366*** | -36.710*** | -36.707*** |
| | work intensity, part-time adjusted | 10.688*** | 10.681*** | 10.288*** | 10.287*** |
| Household composition | # of working-aged members below 30 | 0.033*** | 0.033*** | 0.036*** | 0.036*** |
| | # of working-aged members above 55 | 0.057*** | 0.057*** | 0.052*** | 0.052*** |
| | # of members with low education | -4.240*** | -4.246*** | -4.488*** | -4.487*** |
| | # of members with high education | 5.451*** | 5.446*** | 5.067*** | 5.068*** |
| | # of members with limited activity due to health | -10.369*** | -10.373*** | -10.361*** | -10.361*** |
| | partner household | 4.859*** | 4.859*** | 4.552*** | 4.551*** |
| | # of children aged 0–2 | -2.588*** | -2.590*** | -2.502*** | -2.499*** |
| | # of children aged 3–6 | -1.537*** | -1.536*** | -1.454*** | -1.453*** |
| | # of children aged 7–17 | -1.677*** | -1.679*** | -1.747*** | -1.748*** |
| Historical time | 2006 | | | (base) | (base) |
| | 2007 | (base) | (base) | -1.926*** | -1.903*** |
| | 2008 | -1.176* | -1.213* | -3.288*** | -3.303*** |
| | 2009 | -1.534** | -1.645*** | -3.587*** | -3.720*** |
| | 2010 | -0.305 | -0.327 | -2.619*** | -2.731*** |
| | 2011 | -1.274* | -1.315* | -4.173*** | -4.218*** |
| | 2012 | -0.861 | -0.949 | -3.735*** | -3.783*** |
| | 2013 | -1.452** | -1.528** | -3.806*** | -3.836*** |
| Social and labour-market policy expenditure | Sum of benefits per inhabitant on average (in country-year), in PPS | **0.000** | | | |
| | Sum of benefits per inhabitant, as % of poverty threshold (of country-year) | | **-0.034** | | |
| | Expenditure on labour-market policy, as % of GDP, per % of persons wanting to work in the population | | | **-5.696*** | |
| | Expenditure on labour-market policy, in PPS per person wanting to work | | | | **0.000** |
| | Intercept | 19.554*** | 19.206*** | 33.069*** | 32.876*** |
| Level 2 estimates | Random intercept variance | 1.053*** | 1.081*** | 1.139*** | 1.150*** |
| | Within-group error variance | 3.291*** | 3.291*** | 3.287*** | 3.287*** |
| | **N** | **43,064** | **43,064** | **44,305** | **44,305** |

* Data on social benefits only available as of 2007. Legend: * p<.05; ** p<.01; *** p<.001

**Source** EU-SILC (Eurostat), own calculation

**Table a1.10 Regression output on work intensity changes, main model, by method of measuring social benefits**

| Category | Variable | Non-adjusted amounts | | ENI-adjusted amounts | |
|---|---|---|---|---|---|
| **Dependent variable: change in work intensity** | | **PPS** | **PTH** | **PPS** | **PTH** |
| Macro-level controls | Change of unemployment rate as % of population | -0.006*** | -0.006*** | -0.006*** | -0.006*** |
| | Gini coefficient | -0.004*** | -0.004*** | -0.004*** | -0.004*** |
| Household situation | EDHI as % of poverty threshold | 0.004*** | 0.004*** | 0.005*** | 0.005*** |
| | Work intensity, part-time adjusted | 0.167*** | 0.167*** | 0.175*** | 0.175*** |
| Household composition | # of working-aged members below 30 | 0.001*** | 0.001*** | 0.001*** | 0.001*** |
| | # of working-aged members above 55 | -0.001*** | -0.001*** | -0.001*** | -0.001*** |
| | # of members with low education | -0.013*** | -0.013*** | -0.013*** | -0.013*** |
| | # of members with high education | 0.030*** | 0.030*** | 0.030*** | 0.030*** |
| | # of members with limited activity due to health | -0.052*** | -0.053*** | -0.054*** | -0.055*** |
| | partner household | -0.009*** | -0.009*** | -0.009*** | -0.009*** |
| | # of children aged 0–2 | 0.009* | 0.010* | 0.009 | 0.009* |
| | # of children aged 3–6 | 0.009* | 0.009* | 0.009* | 0.009* |
| | # of children aged 7–17 | 0.001 | 0.001 | 0.001 | 0.001 |
| Historical time | Historical year (base 2006) | | | | |
| | 2007 | -0.018*** | -0.019*** | -0.018*** | -0.018*** |
| | 2008 | -0.026*** | -0.026*** | -0.026*** | -0.026*** |
| | 2009 | -0.019*** | -0.020*** | -0.019*** | -0.020*** |
| | 2010 | -0.020*** | -0.021*** | -0.021*** | -0.021*** |
| | 2011 | -0.003 | -0.004 | -0.003 | -0.004 |
| | 2012 | -0.030*** | -0.031*** | -0.031*** | -0.032*** |
| | 2013 | -0.031*** | -0.032*** | -0.031*** | -0.032*** |
| Social benefits | Non-adjusted, measured as PPS | **-0.000*** ** | | | |
| | Non-adjusted, measured as % of poverty threshold | | **-0.000*** ** | | |
| | ENI-adjusted, measured as PPS | | | **-0.000*** ** | |
| | ENI-adjusted, measured as % of poverty threshold | | | | **-0.001*** ** |
| | Intercept | 0.272*** | 0.265*** | 0.263*** | 0.259*** |
| Level 2 estimates | Random intercept variance | -3.322*** | -3.380*** | -3.365*** | -3.397*** |
| | Within-group error variance | -1.681*** | -1.681*** | -1.680*** | -1.680*** |
| | **N** | **34,081** | **34,081** | **34,081** | **34,081** |

* * p<.05; ** p<.01; *** p<.001.

**Source** EU-SILC (Eurostat), own calculation

**Table a1.11 Regression output on work intensity changes, alternative model: social benefits and LMP expenditure measured at the macro-level**

| Category | Variable | Mod 1 | Mod 2 | Mod 3 | Mod 4 |
|---|---|---|---|---|---|
| Dependent variable: change in work intensity | | | | | |
| Macro-level controls | Change of unemployment rate as % of population | -0.005*** | -0.005*** | -0.006*** | -0.005*** |
| | Gini coefficient | -0.002 | -0.002 | -0.001 | -0.001 |
| Household situation | EDHI as % of poverty threshold | 0.007*** | 0.007*** | 0.006*** | 0.006*** |
| | Work intensity, part-time adjusted | 0.139*** | 0.139*** | 0.155*** | 0.155*** |
| Household composition | # of working-aged members below 30 | 0.001*** | 0.001*** | 0.001*** | 0.001*** |
| | # of working-aged members above 55 | -0.001*** | -0.001*** | -0.001*** | -0.001*** |
| | # of members with low education | -0.011*** | -0.011*** | -0.013*** | -0.013*** |
| | # of members with high education | 0.029*** | 0.029*** | 0.028*** | 0.028*** |
| | # of members with limited activity due to health | -0.055*** | -0.055*** | -0.056*** | -0.056*** |
| | partner household | -0.008*** | -0.008*** | -0.010*** | -0.010*** |
| | # of children aged 0–2 | 0.008 | 0.008 | 0.008 | 0.008 |
| | # of children aged 3–6 | 0.008 | 0.008 | 0.011* | 0.011* |
| | # of children aged 7–17 | 0.000 | 0.000 | 0.000 | 0.000 |
| Historical time | 2006 | | | (base) | (base) |
| | 2007 | (base) | (base) | -0.010* | -0.011* |
| | 2008 | -0.008 | -0.008 | -0.020*** | -0.020*** |
| | 2009 | -0.001 | -0.001 | -0.016*** | -0.014** |
| | 2010 | -0.002 | -0.001 | -0.016*** | -0.014** |
| | 2011 | 0.014** | 0.015*** | 0.007 | 0.008 |
| | 2012 | -0.013** | -0.013** | -0.025*** | -0.024*** |
| | 2013 | -0.014** | -0.013** | -0.024*** | -0.024*** |
| Social and labour-market policy expenditure | Sum of social benefits per inhabitant on average (in country-year), in PPS | **0.000** | | | |
| | Sum of social benefits per inhabitant, as % of poverty threshold (of country-year) | | **0.000** | | |
| | Expenditure on labour-market policy, as % of GDP, per % of persons wanting to work in the population | | | **0.130*** ** | |
| | Expenditure on labour-market policy, in PPS per person wanting to work | | | | **0.000*** ** |
| | Intercept | 0.162*** | 0.166*** | 0.145*** | 0.151*** |
| Level 2 estimates | Random intercept variance | 3.521*** | -3.512*** | -3.414*** | -3.463*** |
| | Within-group error variance | -1.695*** | -1.695*** | -1.686*** | -1.686*** |
| | **N** | **30,790** | **30,790** | **31,690** | **31,690** |

* Data on social benefits only available as of 2007. Legend: * p<.05; ** p<.01; *** p<.001

**Source** EU-SILC (Eurostat), own calculation

**Table a1.12 Regression output on work intensity changes, alternative model: active and passive LMP measured at the macro-level**

| Category | Variable | Mod 1 | Mod 2 | Mod 3 | Mod 4 |
|---|---|---|---|---|---|
| Dependent variable: change in work intensity | | | | | |
| Macro-level controls | Change of unemployment rate as % of population | -0.005*** | -0.005*** | -0.005*** | -0.006*** |
| | Gini coefficient | -0.003*** | -0.003*** | -0.003*** | -0.003** |
| Household situation | EDHI as % of poverty threshold | 0.007*** | 0.007*** | 0.007*** | 0.007*** |
| | Work intensity, part-time adjusted | 0.162*** | 0.162*** | 0.162*** | 0.155*** |
| Household composition | # of working-aged members below 30 | 0.001*** | 0.001*** | 0.001*** | 0.001*** |
| | # of working-aged members above 55 | -0.001*** | -0.001*** | -0.001*** | -0.001*** |
| | # of members with low education | -0.013*** | -0.013*** | -0.013*** | -0.013*** |
| | # of members with high education | 0.028*** | 0.028*** | 0.028*** | 0.028*** |
| | # of members with limited activity due to health | -0.056*** | -0.056*** | -0.056*** | -0.055*** |
| | partner household | -0.010*** | -0.010*** | -0.010*** | -0.009*** |
| | # of children aged 0–2 | 0.009 | 0.009 | 0.009 | 0.007 |
| | # of children aged 3–6 | 0.011* | 0.011* | 0.011* | 0.012** |
| | # of children aged 7–17 | 0.001 | 0.001 | 0.001 | 0.000 |
| Historical time | Historical year (base 2006) | | | | |
| | 2007 | -0.015** | -0.014** | -0.016*** | -0.016*** |
| | 2008 | -0.023*** | -0.022*** | -0.024*** | -0.026*** |
| | 2009 | -0.017*** | -0.017*** | -0.018*** | -0.017*** |
| | 2010 | -0.025*** | -0.024*** | -0.024*** | -0.018*** |
| | 2011 | -0.006 | -0.005 | -0.005 | 0.001 |
| | 2012 | -0.033*** | -0.031*** | -0.033*** | -0.032*** |
| | 2013 | -0.032*** | -0.031*** | -0.032*** | -0.031*** |
| Labour-market policy expenditure | Measures, as % of GDP, per % of persons wanting to work in the population | **-0.218**** | | | |
| | Supports, as % of GDP, per % of persons wanting to work in the population | **0.264***** | | | |
| | Measures, in PPS per person wanting to work | | **-0.000***** | | |
| | Supports, in PPS per person wanting to work | | **0.000***** | | |
| | Measures, in PPS per person wanting to work, deflated by hourly wages | | | **-0.000**** | |
| | Supports, in PPS per person wanting to work, deflated by hourly wages | | | **0.000***** | |
| | Measures, PPS per participant in LMP programmes | | | | **0.000** |
| | Supports, in PPS per beneficiary | | | | **0.000*** |
| | Intercept | 0.212*** | 0.212*** | 0.221*** | 0.205*** |
| Level 2 estimates | Random intercept variance | -3.224*** | -3.099*** | -3.362*** | -3.472*** |
| | Within-group error variance | -1.684*** | -1.684*** | -1.684*** | -1.685*** |
| | **N** | **31,858** | **31,858** | **31,858** | **30,258** |

* * p<.05; ** p<.01; *** p<.001. Measures = ALMP, supports = PLMP.

**Source** EU-SILC (Eurostat), own calculation

**Table a1.13 Regression output on work intensity changes, alternative model: active and passive LMP measured at the macro-level, lagged by one year**

| Category | Variable | Mod 1 | Mod 2 | Mod 3 | Mod 4 |
|---|---|---|---|---|---|
| Dependent variable: change in work intensity | | | | | |
| Macro-level controls | change of unemployment rate as % of population | -0.005*** | -0.005*** | -0.005*** | -0.006*** |
| | Gini coefficient | -0.003*** | -0.003*** | -0.003*** | -0.003** |
| Household situation | EDHI as % of poverty threshold | 0.007*** | 0.007*** | 0.007*** | 0.007*** |
| | work intensity, part-time adjusted | 0.162*** | 0.162*** | 0.162*** | 0.155*** |
| Household composition | # of working-aged members below 30 | 0.001*** | 0.001*** | 0.001*** | 0.001*** |
| | # of working-aged members above 55 | -0.001*** | -0.001*** | -0.001*** | -0.001*** |
| | # of members with low education | -0.013*** | -0.013*** | -0.013*** | -0.013*** |
| | # of members with high education | 0.028*** | 0.028*** | 0.028*** | 0.028*** |
| | # of members with limited activity due to health | -0.056*** | -0.056*** | -0.056*** | -0.055*** |
| | partner household | -0.010*** | -0.010*** | -0.010*** | -0.009*** |
| | # of children aged 0–2 | 0.009 | 0.009 | 0.009 | 0.007 |
| | # of children aged 3–6 | 0.011* | 0.011* | 0.011* | 0.012** |
| | # of children aged 7–17 | 0.001 | 0.001 | 0.001 | 0.000 |
| Historical time | Historical year (base 2006) | | | | |
| | 2007 | -0.015** | -0.014** | -0.016*** | -0.016*** |
| | 2008 | -0.023*** | -0.022*** | -0.024*** | -0.026*** |
| | 2009 | -0.017*** | -0.017*** | -0.018*** | -0.017*** |
| | 2010 | -0.025*** | -0.024*** | -0.024*** | -0.018*** |
| | 2011 | -0.006 | -0.005 | -0.005 | 0.001 |
| | 2012 | -0.033*** | -0.031*** | -0.033*** | -0.032*** |
| | 2013 | -0.032*** | -0.031*** | -0.032*** | -0.031*** |
| Labour-market policy expenditure , lagged by one year | Measures, as % of GDP, per % of persons wanting to work in the population | **-0.218**** | | | |
| | Supports, as % of GDP, per % of persons wanting to work in the population | **0.264***** | | | |
| | Measures, in PPS per person wanting to work | | **-0.000***** | | |
| | Supports, in PPS per person wanting to work | | **0.000***** | | |
| | Measures, in PPS per person wanting to work, deflated by hourly wages | | | **-0.000**** | |
| | Supports, in PPS per person wanting to work, deflated by hourly wages | | | **0.000***** | |
| | Measures, PPS per participant in LMP programmes | | | | **0.000** |
| | Supports, in PPS per beneficiary | | | | **0.000*** |
| | Intercept | 0.212*** | 0.212*** | 0.221*** | 0.205*** |
| Level 2 estimates | Random intercept variance | 3.224*** | -3.099*** | -3.362*** | -3.472*** |
| | Within-group error variance | -1.684*** | -1.684*** | -1.684*** | -1.685*** |
| | **N** | **31,858** | **31,858** | **31,858** | **30,258** |

* Legend: * p<.05; ** p<.01; *** p<.001. Measures = ALMP, supports = PLMP.
**Source** EU-SILC (Eurostat), own calculation

# Abbreviations

| | |
|---|---|
| ALMP | active labour market policy |
| APW | average production worker |
| AROP rate | at-risk-of-poverty rate |
| CEE | Central and Eastern Europe |
| CNEF data | Cross-National Equivalent Files |
| DG EMPL | European Commission: Directorate-General for Employment, Social Affairs and Inclusion |
| DV | dependent variable |
| EDHI | equivalised disposable household income |
| ENI | entitlement-and-need index |
| ESM | European Social Model |
| EU | European Union |
| EU-SILC | European Union Statistics on Income and Living Conditions |
| GDP | gross domestic product |
| ILO | International Labour Office |
| IV | independent variable |
| LIS | Luxembourg Income Study |
| LMP | labour market policy |
| NRR | net replacement rate |
| OECD | Organisation for Economic Co-operation and Development |
| PLMP | passive labour market policy |
| PPP | Purchasing Power Parity |
| PPS | Purchasing Power Standard |
| SCIP data | Social Citizenship Indicator Program |
| SPC | Social Protection Committee |
| UI | unemployment insurance |

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## RE-InVEST - Rebuilding an Inclusive, Value-based Europe of Solidarity and Trust through Social Investments

In 2013, as a response to rising inequalities, poverty and distrust in the EU, the Commission launched a major endeavour to rebalance economic and social policies with the Social Investment Package (SIP). RE-InVEST aims to strengthen the philosophical, institutional and empirical underpinnings of the SIP, based on social investment in human rights and capabilities. Our consortium is embedded in the 'Alliances to Fight Poverty'. We will actively involve European citizens severely affected by the crisis in the co-construction of a more powerful and effective social investment agenda with policy recommendations.

**http://www.re-invest.eu/**

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HIVA-KU Leuven • HIVA-Research Institute for Work and Society, Katholieke Universiteit Leuven • Belgium
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IFZ • Internationales Forschungszentrum für Soziale und Ethische Fragen • Austria
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