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Lean and Just?

Social Protection Spending and Inequality Outcomes across Europe

Alex Pienkowski, Valentina Semenova, Ian Charles Stuart, Yuntian Lu

WP/26/78

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European Department

Lean and Just: Social Protection Spending and Inequality Outcomes across Europe

Prepared by Alex Pienkowski, Valentina Semenova, Ian Charles Stuart, Yuntian Lu *

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ABSTRACT: European governments face tight fiscal constraints amid rising debt and mounting demands from aging, health, defense, and climate spending, while scope to raise taxes is limited. This paper benchmarks the distributional efficiency of non-old-age social protection across Europe using harmonized EU-SILC microdata: defining efficiency as the reduction in the Gini coefficient per euro of transfers. We estimate an efficiency frontier and document large cross-country dispersion: countries with similar spending levels achieve markedly different inequality outcomes. Moving toward the frontier implies potential savings of about 0.7 percent of GDP on average. Complementing this cross-sectional lens, we examine how inequality reduction changes with each additional euro of transfers as coverage extends beyond poorer households. We show that marginal gains typically decline and can eventually turn negative, helping to identify spending components with limited distributional payoff. While social protection serves many important objectives beyond redistribution, our metric provides a transparent, comparable benchmark for assessing where fiscal space may be created with minimal impact on inequality and poverty.

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WORKING PAPERS

Lean and Just?

Measuring the Efficiency of Social Protection Expenditure Across Europe

Prepared by Alex Pienkowski, Valentina Semenova, Ian Charles Stuart, Yuntian Lu[1]

[1] The authors would like to thank Helge Berger, Luc Eyraud, Céline Thévenot, Javier Kapsoli, and Magali Pinat for their helpful comments.

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1. Introduction

Many European countries are running up against fiscal constraints resulting from rising debt and growing spending pressures. However, options for fiscal consolidation are limited: lower spending is both politically and socially challenging, particularly given the large share of spending going towards social protection. This is set against rising pressures from defense, climate, and demographic-related spending. In Europe, taxes are already high by international standards, limiting the space for raising additional revenue. One potential solution is greater *spending efficiency*, which could allow governments to spend less while achieving similar outcomes – an often elusive "free lunch".

This paper considers the *efficiency* of social protection in reducing inequality. Social protection spending is typically assessed according to its adequacy, fiscal sustainability and efficiency.[2] 'Adequacy' considers whether the aggregate level of social protection spending is sufficient to meet the government's policy objectives, while 'fiscal sustainability' refers to a government's capacity to finance social protection spending needs without undermining macroeconomic stability. 'Efficiency' considers whether policy objectives are achieved in a cost-effective manner. Our analysis focuses on the last of these—efficiency—without prejudicing the importance of the other metrics of success.

Rather than delving into country specific issues, we aim to provide a high-level cross-country comparison of countries' efficiency at reducing inequality through social protection spending using individual-level data from the Eurostat statistics on income and living conditions (SILC) database.[3] We measure distributional efficiency as the change in inequality (measured using the Gini coefficient), relative to per capita distributions (our spending metric) on non-old-age social benefits.

It is important to note that governments allocate social protection spending to meet multiple objectives, of which poverty and inequality reduction are only one dimension. Social protection benefits can also provide insurance, support social inclusion and human capital formation, encourage labor-market participation, and target demographic objectives. Furthermore, the willingness of citizens to contribute to the financing of the social contract is an important consideration. Accordingly, our efficiency metric offers a transparent, comparable benchmark, but it need not coincide with each country's welfare weights or policy priorities. Therefore, differences in measured "efficiency" within this analysis can be indicative of inefficiencies, but also can be driven by the extent to which spending is oriented toward distributional objectives rather than other legitimate aims. Finally, inequality reduction is not solely achieved through cash transfers but also in-kind public spending, broader structural policies and tax credits. Therefore, the efficiency measures presented here should not be interpreted as capturing the full set of policy instruments for inequality reduction, but rather one important component.

Section 2 provides an overview of expenditure trends in Europe. Section 3 estimates an efficiency ranking of European countries (in terms of inequality reduction) and calculates how far countries are from the "efficiency frontier". Our analysis suggests that significant savings are possible: we estimate that average potential savings of 0.7 percent of GDP can be achieved across countries. Section 4 complements this cross-sectional

[2] IMF 2022. Technical Notes and Manuals: IMF Engagement on Social Safety Net Issues in Surveillance and Program Work

[3] Given the reliance of this analysis on EU SILC data, the results are subject to the same caveats that apply to the use of EU SILC in other empirical work.

benchmarking by adding a marginal perspective: we trace, within each country, how inequality-reduction evolves as additional euros of non-pension benefits are distributed—starting with the poorest households and progressively expanding coverage. Our analysis shows that marginal gains typically decline and can even turn negative at higher disbursement levels. This helps distinguish redistributive from non-redistributive components of social transfers when assessing potential savings under fiscal pressure. Section 5 considers the implications of our analysis and concludes that some countries may be able to make substantial savings on non-pension social benefits without substantially impacting inequality and poverty.

We contribute to the well-established fiscal incidence literature which assesses the redistributive impact of a fiscal system as a whole or of specific fiscal instruments. This literature provides robust frameworks for evaluating how taxes and transfers alter the distribution of income, most commonly through measures such as the Gini coefficient or other inequality indices (Lustig et al., 2025; Wang et al., 2025, Lustig, 2019; Coady et al., 2019; Kenworthy, 1998). Recent global studies confirm that fiscal systems reduce inequality in all countries, though the magnitude and mechanisms vary widely. Notably, transfers account for the majority of redistribution, while taxes play a smaller but still significant role (Fisher-Post & Gethin, 2025). Our work contributes to the literature examining the redistributive impact of fiscal policy in several ways: (i) we study a relatively under-explored dataset (we use Eurostat SILC data, whereas many studies leverage Luxembourg Income Study's microdatabase), (ii) we complement existing papers studying the efficiency of spending by focusing on inequality and non-pension social spending (Antonelli & De Bonis, 2018), and (iii) we propose a new method for evaluating the marginal impact of social spending.

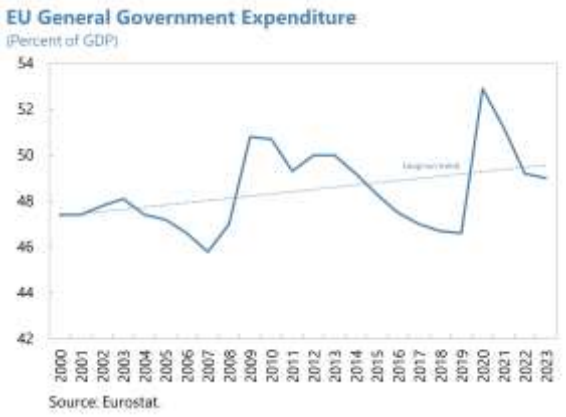
2. Expenditure Trends in Europe

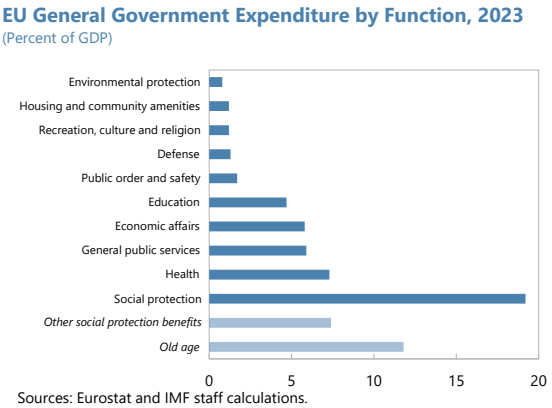
The EU's general government expenditure-to-GDP ratio has trended upwards over the past two decades, driven mainly by higher social benefits and health spending.

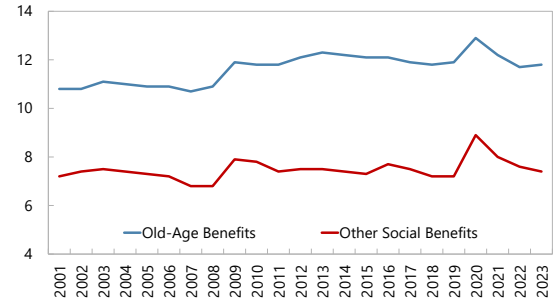
From 47.4 percent in 2000, total expenditure stood at 49.4 percent of GDP in 2024. Social protection, which includes pensions, is the largest spending item in the EU and a major driver of rising aggregate expenditure. By 2030 advanced economies could face spending needs amounting to an additional 6.0 to 7.4 percentage points of GDP (IMF 2024a). Spending needs on pensions, health care and long-term care, defense, climate, and public borrowing costs are estimated to increase from 2.5 percent of GDP across Europe in 2025 to more than double by 2050, reaching 6.8 percent of GDP (Eble et al., 2025). Much of the increase is due to higher old-age benefits, driven by aging populations (European Commission, 2024).

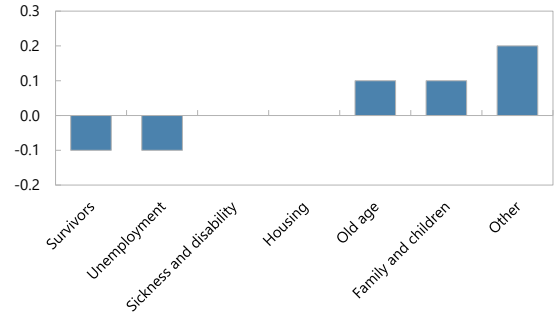
Across the EU, non-pension social benefits account for roughly 45 percent of total social benefits spending. Although increases have been less steep than for pensions, other social benefits have also increased over the past two decades. The fastest growing items include 'family and children' benefits, and 'other' benefits (which include measures to reduce social exclusion). In aggregate, unemployment benefits have declined as a share of GDP. Current non-old-age spending is concentrated in sickness/disability and family/child benefits. The degree of means-testing varies sharply across categories and is highest in the residual "other" benefits, which are typically targeted at addressing social exclusion and protection (Figure 1).

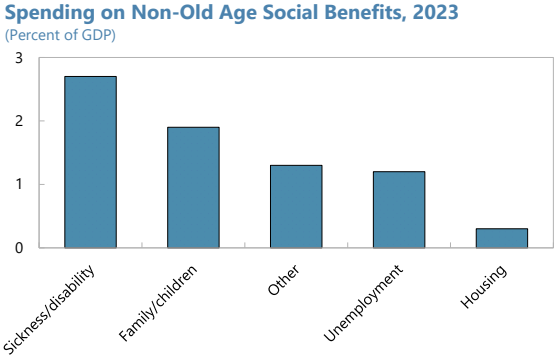
Figure 1: The Magnitude and Trajectory of Social Spending

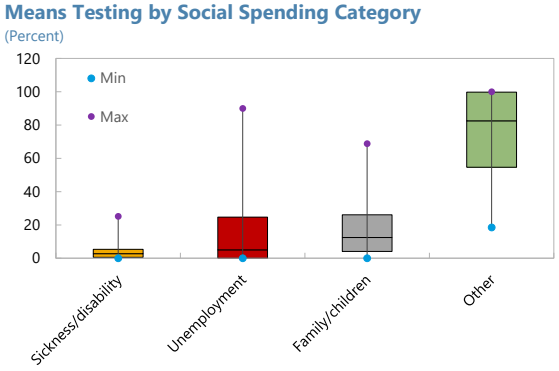










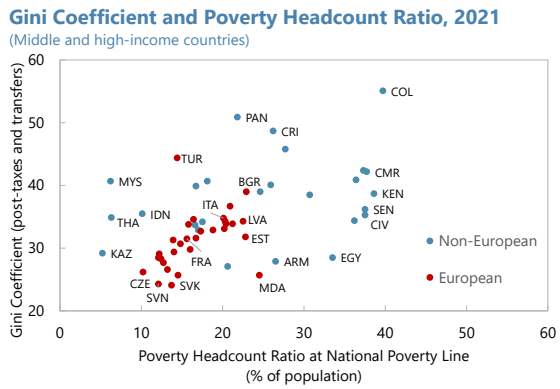


3. The Efficiency of Non-Old-Age Social Protection Transfers at Reducing Inequality

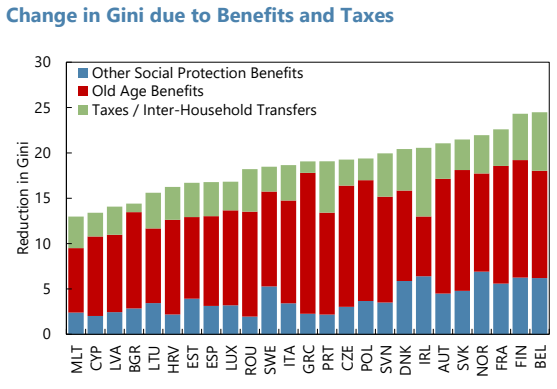
Different countries demonstrate distinct redistributive preferences. In broad terms, European societies tend to be more equal and to experience less poverty, reflecting both a more equal pre-transfer income distributions and a more progressive tax-and-transfer systems (Figure 2). A combination of taxes, pensions, and transfers reduce the market income Gini coefficient in Europe by as much as 0.24 for some countries (e.g. Belgium), and

by as little as 0.13 for others (e.g. Malta, Cyprus) (Figure 2). Cross-country heterogeneity is reflective of different policy and expenditure decisions. For example, the low contribution of taxes to inequality reduction in Bulgaria is determined by the flat 10 percent personal income tax. Romania's relatively small benefit-driven reduction is consistent with overall low social spending and means-testing. Ireland's muted pension effect reflects a comparatively modest public pension (with heavier reliance on occupational and private pensions).

Figure 2: Inequality and Poverty in Europe[4]



Source: World Bank.



Sources: EU-SILC User Database and IMF staff calculations.

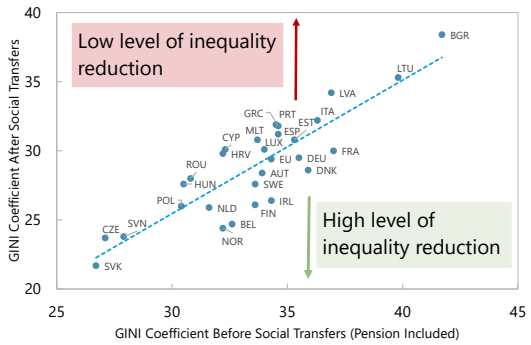
Non-pension social protection transfers[5] meaningfully reduce inequality on average, but their redistributive impact varies substantially between countries (we discuss which specific transfers are included and data selection in the Appendix). On average, these benefits lower the Gini coefficient by about 4.5 percentage points, yet the impact ranges from roughly 7.9 points in Belgium and Ireland to only about 1.5 points in Türkiye, pointing to sharp cross-country differences in the generosity, targeting, and take-up of non-pension programs. The regression of the post-benefit Gini on the pre-transfer Gini demonstrates this dispersion: among countries starting from similar pre-benefit inequality, those below the fitted line achieve larger inequality reductions from non-pension benefits (Figure 3). Figure 3 also demonstrates that there is no systematic relationship between pre-transfer Gini coefficient and the amount the Gini is reduced due to transfers.

[4] We calculate the pre-tax market income Gini (gross) and recompute the Gini after recalculating individual incomes in the following order: adding gross old age benefits (red bar), adding gross non-pension social protection benefits (blue bar), calculating the difference in inequality between gross and net income to estimate the impact of taxes (green bar). Negative income values (which are infrequent) are replaced with zeros, due to constraints for the validity of the Gini calculation.

[5] We group pensions (PY100) and survivor benefits (PY110) together under the broad category of "old age" or "pension" transfers.

We calculate the spending efficiency frontier across different countries' social transfers (excluding old age benefits), using reduction in inequality as the key objective for policy evaluation (Figure 4).[6,7] We consider the Gini coefficient pre- and post- social benefits (net of taxes to equivalize across tax systems and after old age benefits). As our spending metric, we calculate the average disbursements per capita, as observed from individual-level EU SILC microdata.[8] Countries that are most efficient are those with the greatest reduction in inequality for a given level of spending per capita (PPP-adjusted).

Figure 3: Inequality Reduction from Social Transfers (excl. Old-Age Benefits)

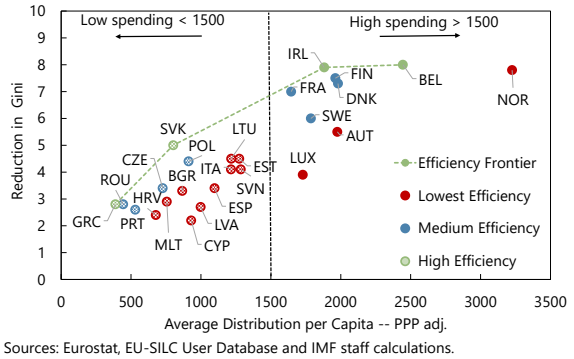


Source: Eurostat.

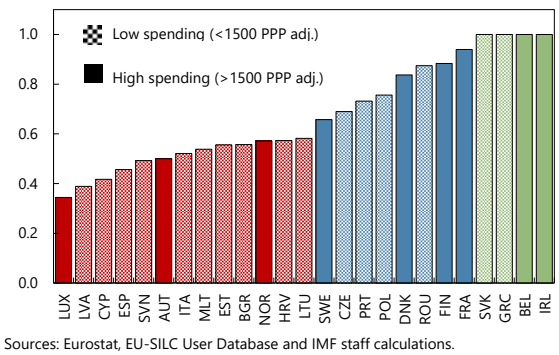
We use Data Envelopment Analysis (DEA) to estimate our efficiency frontier (Figure 4). The efficiency frontier is estimated by drawing a curve through the upper-most points: the points which have the highest level of "output" at each level of input. This curve *envelops* all other points on the plot. DEA is a common approach used to analyze public services (see Antonelli & De Bonis, 2018 for a recent example using DEA to evaluate the efficiency of welfare policies in Europe, as well as a comprehensive literature review): it allows for multiple definitions of efficiency and can compare "decision making units" that may favor different combinations of inputs and outputs (in our case, distinct spending and redistributive preferences).

The piecewise-linear interpolation between frontier countries is consistent with DEA's standard assumption of convexity (i.e., that feasible outcomes include mixtures of observed policies). Beyond the highest observed spending level, we extend the frontier linearly: as long as inequality remains (the Gini is above zero), additional resources can be directed toward households below the equality line through more generous or more tightly targeted transfers, thereby mechanically reducing dispersion in disposable incomes. This is a conservative, transparent extrapolation of the attainable set when data are sparse at very high spending levels.

Figure 4: The Efficiency of Non-Pension Social Protection Spending



Sources: Eurostat, EU-SILC User Database and IMF staff calculations.



Sources: Eurostat, EU-SILC User Database and IMF staff calculations.

[6] Implications for poverty and the transferability of insights from inequality to poverty are discussed in the Appendix.

[7] We use the difference between Eurostat's estimated Gini coefficient before social transfers (pensions excluded from trasnfers) and Eurostat's estimated Gini coefficient after social transfers.

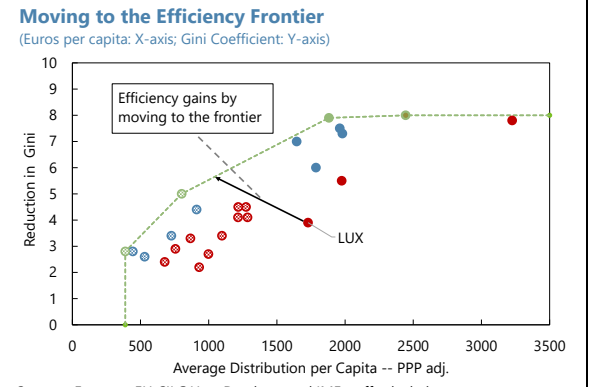
[8] EU SILC data description: EU statistics on income and living conditions - Microdata - Eurostat.

We then calculate each countries' spending efficiency and split countries into three distinct spending efficiency categories[9] - these are highlighted in red (low-efficiency), blue (medium-efficiency) and green (high-efficiency). We perform this separation as we observe a meaningful jump in efficiency scores between the different categories. Additionally, we observe that countries separate into two broad spending buckets clustering either below or above €1500 (PPP-adjusted). To further differentiate between countries, we label countries spending less that €1500 as "low-spend" and those with higher spending levels are "high-spend".

Countries with different positions relative to the efficiency frontier and with differing disbursement amounts (PPP-adjusted) may face distinct policy options. Efficient countries with low distribution amounts may consider broadening their non-pension social benefits, while increasing their fiscal space by removing distortionary measures in their tax systems (if currently in place). Countries with low levels of efficiency may examine the level of targeting within their social protection system, as well as their distribution mix (i.e. which types of disbursements are being made).

Our analysis suggests that significant savings can be achieved by moving towards the efficiency frontier. We observe an average potential saving of 0.7 percent of GDP across countries not currently on the frontier or potential significant reductions in inequality. Savings / inequality reduction are estimated by moving each country diagonally to the efficiency frontier: simultaneously reducing spending and improving equality (Figure 5). Potential savings are highly heterogenous – medium-efficiency countries (highlighted in blue) only have the potential to save 0.4 percent of GDP on average by moving to the efficiency frontier; low-efficiency countries (highlighted in red), on the other hand, have the potential to save 1.0 percent of GDP on average (Figure 6). Similarly, countries differ markedly in their scope to achieve larger inequality reductions at unchanged – or even lower – levels of distributions (Figure 6). Our Appendix demonstrates the close link between inequality reduction and poverty reduction.[10]

Figure 5: Moving to the Efficiency Frontier

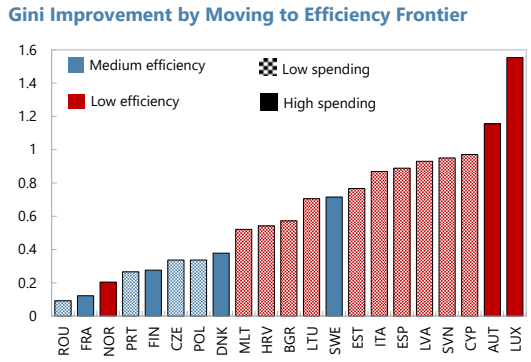


Sources: Eurostat, EU-SILC User Database and IMF staff calculations.

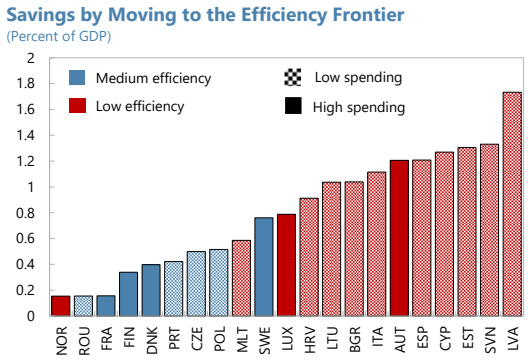
[9] Efficiency is calculated using Data Envelopment Analysis (DEA) - we use the benchmarking package in R to preform our analysis.

[10] Poverty reduction and inequality reduction due to social transfers (excluding old age) appear to be closely correlated, with an Pearson correlation coefficient of 0.79.

Figure 6: Savings and Gini Improvement from Moving to the Efficiency Frontier



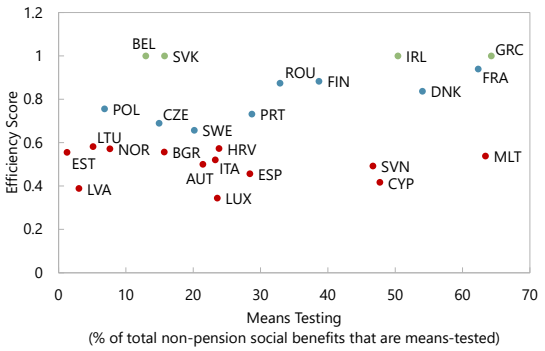
Sources: Eurostat, EU-SILC User Database and IMF staff calculations.



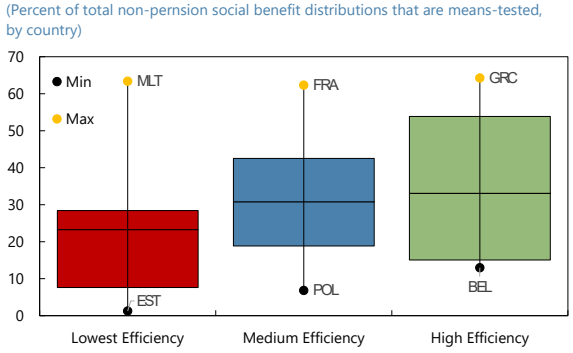
Sources: Eurostat, EU-SILC User Database and IMF staff calculations.

Means-tested benefits are more prevalent in countries closer to the efficiency frontier – an intuitive result given that programs explicitly targeted at lower-income households will generally appear more efficient when the outcome metric is inequality reduction. While means-testing can be administratively demanding and achieve imperfect results, our analysis suggests that, when implemented well, greater reliance on means-testing is associated with more efficient non-pension social spending (Figure 7). We calculate the fraction of gross benefits that are means-tested by country: the average means-tested gross distributions per capita and divide this by the average gross distributions (across all non-old age distributions). Nonetheless, the distributional gains from means-testing are contingent on implementation capacity and program design; in practice, administrative complexity, imperfect information, and low take-up can generate sizable exclusion and inclusion errors (Coady, Grosh, & Hoddinott, 2004).

Figure 7: Means-Testing



Sources: Eurostat, EU-SILC User Database and IMF staff calculations.



Sources: Eurostat, EU-SILC User Database and IMF staff calculations.

4. The Marginal Impact of Non-Old-Age Social Protection Transfers on Inequality

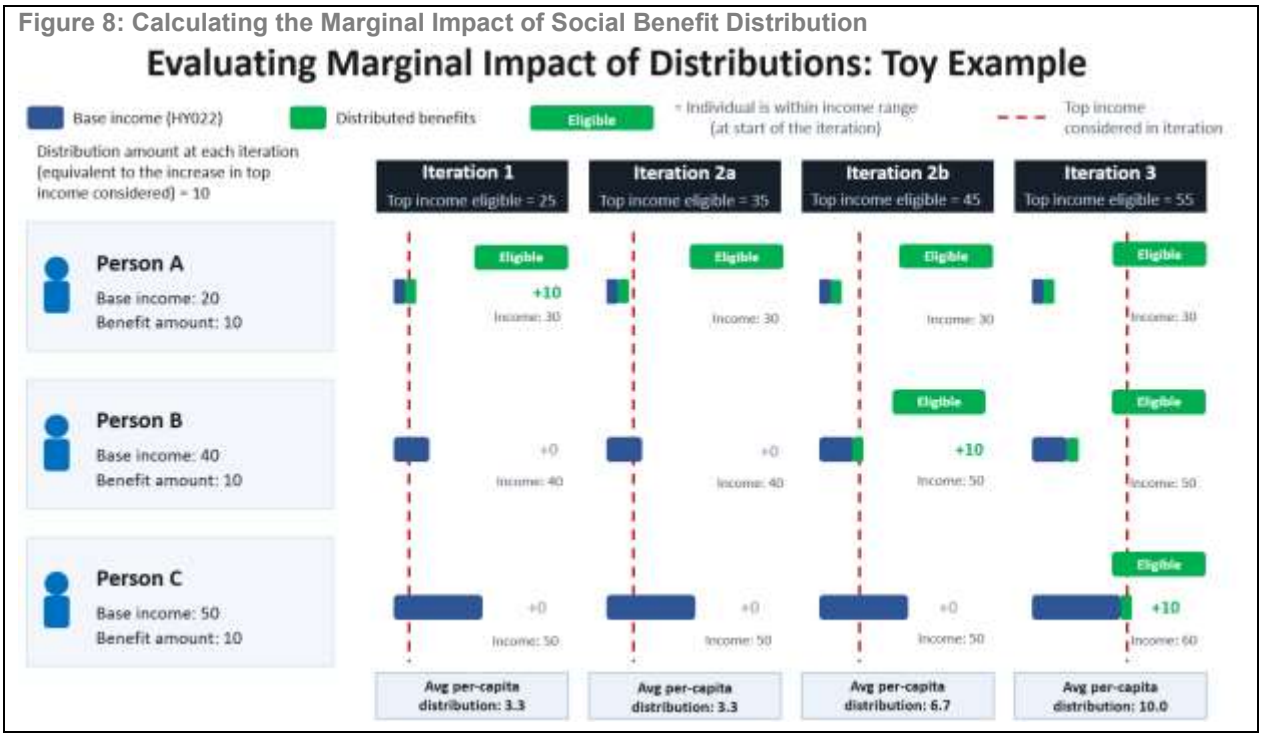
Section 3 benchmarks countries against one another showing that similar social benefit distributions per capita can have very different inequality outcomes. In this section we add a marginal perspective: we study the impact to inequality with each additional euro distributed to individuals receiving non-pension social benefits. Our

analysis shows that even in systems that appear efficient on average, the inequality-reducing impact of additional transfers weakens as distributions expand beyond lower-income households and can eventually turn negative. This is not inherently problematic, since social spending serves objectives beyond redistribution (as discussed in our introduction). However, in an environment of fiscal pressure, a marginal analysis can help identify where savings might be achieved with minimal impacts to the structure of society.

The fiscal incidence literature provides methodological tools to isolate and analyze the marginal contribution of specific fiscal instruments to inequality. Most studies classify their work within the "marginal incidence" space—calculating the difference in inequality indicators with and without a given tax or transfer (Lustig, 2019; Coady et al., 2019). Our analysis may be better described as a "marginal contribution" analysis: we propose a novel methodology to evaluate the marginal improvement in the Gini from each additional distributed euro.

We start by looking at inequality within a country inclusive of old age benefits. Subsequently, we incrementally distribute non-pension benefits to individuals until we reach the total they receive in benefits. We begin by distributing social benefits to the poorest households and subsequently increase the range of households receiving disbursements. We recompute the average distribution per capita, as well as the Gini, after every incremental distribution is made. Figure 8 presents a simplified example. Further implementation details are discussed in the Appendix.

Figure 8: Calculating the Marginal Impact of Social Benefit Distribution



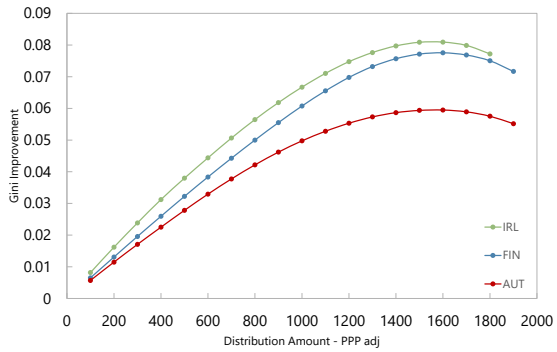
We plot the incremental change in the Gini improvement versus distribution amount in Figure 9. We plot countries that spend less than €1500 (PPP-adjusted) on the right and those spending more than €1500 (PPP-adjusted) on the left. The €1500 (PPP-adjusted) delineation is chosen in accordance with our previous section. We select three countries with similar spending levels, but different positions relative to the spending efficiency frontier from our previous analysis (Figure 4) – those plotted in red are categorized as "low-efficiency", blue are "medium-efficiency" and green are "high-efficiency".

Inequality declines in a broadly linear fashion with additional incremental transfer payments (distributions are made to lowest-income households first), before leveling off and declining towards the upper end of disbursements (Figure 9). Using our observations of how inequality declines as distribution amounts increase, we compute the marginal efficiency of spending. Perhaps not surprisingly, we observe that the marginal efficiency of non-pension social spend is highest for initial disbursements – the payments made to poorest households. Marginal efficiency declines and ultimately becomes negative across all economies.

A country's position relative to the social spending efficiency frontier (Figure 4) is closely linked to its marginal efficiency of social spending (Figure 9). Countries that initially have high marginal impact of their distributions (consider Slovakia) and cut off spending soon after the marginal impact becomes negative (Ireland, Finland) are generally more efficient. We observe that a mixture of means-testing and distribution types determines the marginal distributional efficiency profile of a country.

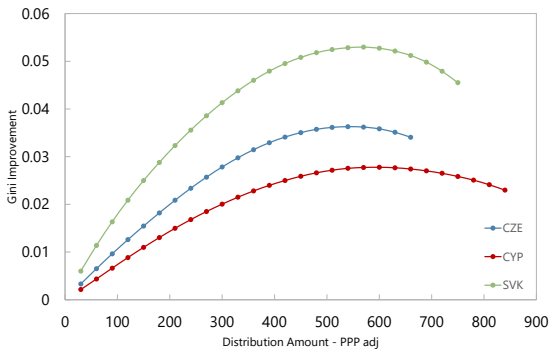
Figure 9: The Marginal Efficiency of Social Spending

Gini Improvement vs Distribution Amount By Country



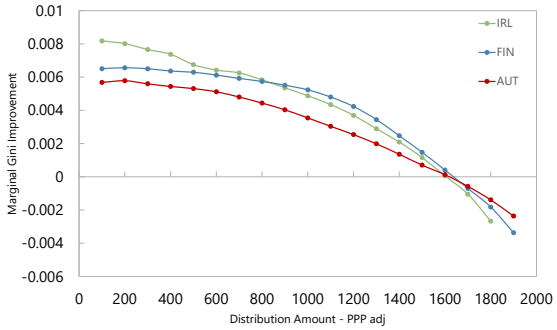
Sources: EU-SILC User Database and IMF staff calculations.

Gini Improvement vs Distribution Amount By Country



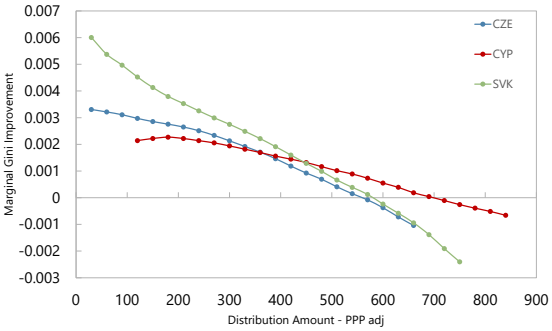
Sources: EU-SILC User Database and IMF staff calculations.

Marginal Gini Improvement vs Distribution Amount By Country



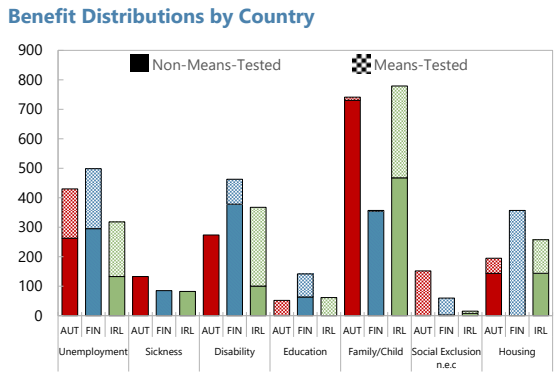
Sources: EU-SILC User Database and IMF staff calculations.

Marginal Gini Improvement vs Distribution Amount By Country

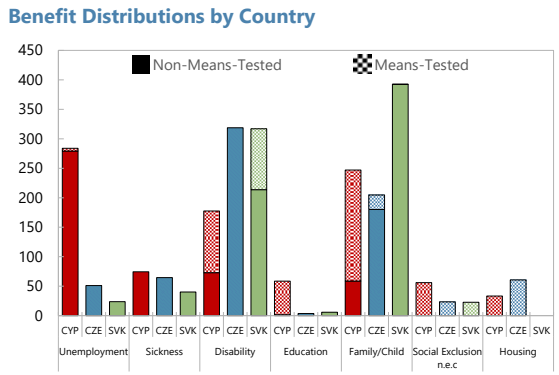


Sources: EU-SILC User Database and IMF staff calculations.

Figure 9: The Marginal Efficiency of Social Spending (Concluded)



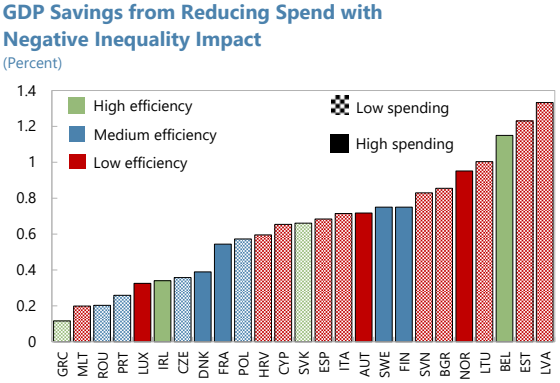
Sources: EU-SILC User Database and IMF staff calculations.



Sources: EU-SILC User Database and IMF staff calculations.

By calculating what fraction of social distributions are not redistributive (i.e. the fraction of distributions with a negative marginal Gini impact in Figure 9), we can estimate how much countries can potentially save without worsening inequality (Figure 10).[11] On average, we estimate potential savings of 0.65 percent of GDP across countries within our sample. This approach complements our previous savings estimate, which considers how much countries can save by moving to the efficiency frontier (Figure 6).

Figure 10: Savings from Reducing Non-Redistributive Benefits



Sources: EU-SILC User Database and IMF Staff Calculations.

The two approaches yield results with certain similarities, but also noteworthy differences. Latvia, for example, is assessed to have high potential for savings across both methodologies. Greece and Ireland are both on the efficiency frontier and have a relatively low fraction of distributions with negative marginal impact to inequality – therefore, for these countries we estimate limited opportunities for reducing distributions without simultaneously increasing inequality. Belgium and Slovakia, on the other hand, can both achieve considerable savings by reducing non-redistributive expenditure, despite both being on the efficiency frontier relative to peers (Figure 4). This can be achieved, for example, by raising both countries' relatively low level of means testing: our estimates from SILC data indicate that approximately 13 percent of non-pension social cash transfers are means-tested in Belgium and only 16 percent in Slovakia. Slovakia's distributions are initially highly effective at reducing inequality, however, the marginal impact drops off quickly (Figure 9). Similarly, Estonia and Latvia are countries with very low levels of means testing (less than 10 percent) – they can potentially achieve high savings without a significant increase in inequality, or greater inequality reduction through better targeting. In addition to means-testing, countries can also re-examine their respective distribution mix: Norway, for example, is an outlier both in terms of low levels of means-testing (8 percent), as

[11] Our total distributions amounts differ slight in this methodology from those in Section 3 for two reasons: (1) we eliminate individuals with negative HY022N, (2) we terminate our estimation technique when we do not observe a significant change in the Gini after several rounds of distributions are made (as we progress to higher income categories). Therefore, in practice, our method is conservative in estimating potential savings.

well as its disproportionately high expenditure on sickness and disability (Norway's relation to the frontier is discussed in greater detail in the Appendix).

Combining our analysis of how far countries are from the efficiency frontier (Section 3) with marginal distributional diagnostics (Section 4) provides different perspectives: the first highlights system-wide efficiency differences, while the second pinpoints where composition and targeting can unlock savings without eroding equity.

5. Conclusion

This paper highlights substantial cross-country variation in the efficiency of non-pension social protection spending across Europe: while social benefits remain central to reducing poverty and inequality, our results show that countries achieve markedly different redistributive outcomes for similar levels of expenditure. By leveraging harmonized EU SILC microdata and constructing an efficiency frontier for non-old-age social protection benefits, we identify clear groupings of high-, medium-, and low-efficiency countries. These differences are not driven by spending levels alone: countries with similar fiscal effort often achieve very different distributional outcomes, pointing to the central role of program design, targeting, and implementation capacity. Countries below the efficiency frontier—particularly those in the low-efficiency group—could reduce spending by over one percent of GDP (on average) if they improved targeting and delivery systems to match the performance of efficient peers. Our analysis suggests that fiscal space can be created without compromising distributional objectives. The marginal contribution analysis shows that additional spending yields diminishing or even negative returns to inequality reduction.

Social protection systems are not designed solely to minimize income inequality; they also pursue insurance and stabilization objectives—such as protection against idiosyncratic and aggregate shocks, support for labor-market attachment, as well as other objectives discussed in our introduction. Accordingly, transfers may exhibit weak or even negative marginal effects on the Gini coefficient without implying that they fail to meet other important objectives. Nevertheless, as population aging, health pressures, and competing fiscal demands intensify across Europe, the capacity to deliver strong social outcomes with limited resources will become increasingly important.

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Appendix

Data and Methods

For this study, we leverage EU SILC microdata.[12] We leverage several variables to identify the types of transfers individuals and households receive, as well as to properly weight individuals for aggregate calculations. Specific SILC variables are used to identify the amounts of social transfers at the household level (HY050, HY060, HY070) and at the individual level (PY090, PY100, PY110, PY120, PY130, PY140). Transfers PY100 (old-age benefits) and PY110 (survivor's benefits) are classified under the umbrella of "old-age benefits" or "pension benefits" within this study, consistent with SILC's methodological approach of grouping these benefits together when considering transfers related to old-age. For all transfers listed above, we observe both net and gross transfer amounts, as well as a breakdown by contributory / non-contributory and means-tested / non-means-tested (gross).

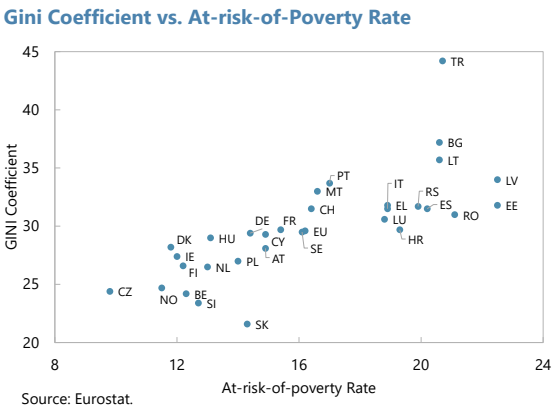
We use the following aggregate variables for our calculations: HY010, HY020, HY022, HY023. We use the variable HX050 as the equivalized household size, HB030 as the unique household identifier, RB050 as the individual weight (for weighted mean calculations / Gini calculation), HB120 to identify household size – the number of individuals living together in the household.

Gini vs. Poverty Rate

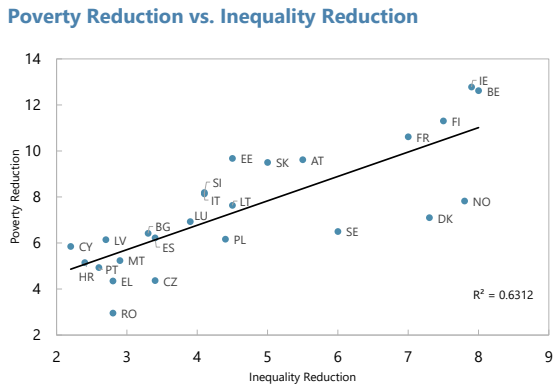
We observe a clear association between inequality and poverty across countries. In Figure A1, the left-hand chart shows that higher at-risk-of-poverty rates tend to coincide with higher Gini coefficients, even though there is cross-country dispersion. The right-hand chart shows that social benefits (excluding pensions) reduce poverty and inequality in tandem, with larger poverty reductions strongly aligned with larger declines in the Gini coefficient. The tight fit of the regression line – and the high R^2 – shows that benefit-driven reductions in poverty and in the Gini move so closely together across countries that, in practice, analyzing one is largely equivalent to analyzing the other. Furthermore, the Pearson's correlation between poverty and inequality reduction is at 0.79. We focus our analysis on the Gini because it is a continuous metric, however, the patterns we document have direct implications for poverty outcomes as well.

[12] Details on EU SILC methodological guidelines are available from Circabc.

Figure A1: Robustness Checks of Inequality vs. Poverty



Source: Eurostat.



Sources: Eurostat and IMF staff calculations.

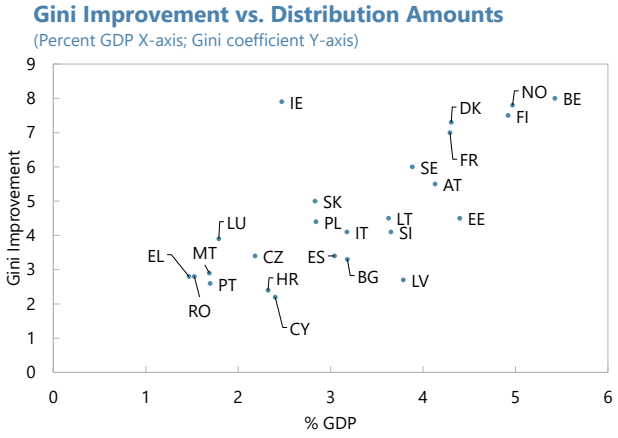
Efficiency Frontier – Variable Selection and Robustness Checks

We make several methodological choices in our variable selection. We consider net, rather than gross, benefits and incomes in order to abstract away from cross-country differences driven by taxation. Net measures capture the amount households actually receive and therefore more closely reflect the direct contribution of benefits to alleviating inequality. This choice is also conceptually consistent when relating spending to distributional outcomes, since net benefits exclude the share of transfers that governments subsequently recover through taxation.

We perform several robustness checks to our efficiency frontier analysis below and highlight key differences to our main findings.

Percent of GDP expenditure metric: As a robustness check, we re-estimate the distributions amount – Gini reduction relationship using social-transfer outlays expressed as a share of GDP (rather than PPP-adjusted disbursements per capita). Specifically, we convert the EU SILC–implied average disbursement per capita into an aggregate spending measure by multiplying by population and dividing by nominal GDP. We then reassess the association between this spending metric and the reduction in the Gini coefficient (Figure A2). The qualitative message is unchanged: there remains substantial cross-country dispersion in redistributive performance for a given fiscal effort. However, the "percent of GDP" scaling induces meaningful re-rankings in some instances. Ireland, for example, appears even more efficient under the GDP metric because measured spending effort is mechanically lower relative to an inflated GDP denominator associated with multinational activity. We observe a similar shift for Luxembourg. Norway similarly shifts toward the main

Figure A2: Gini Improvement vs. Distributions (% GDP)

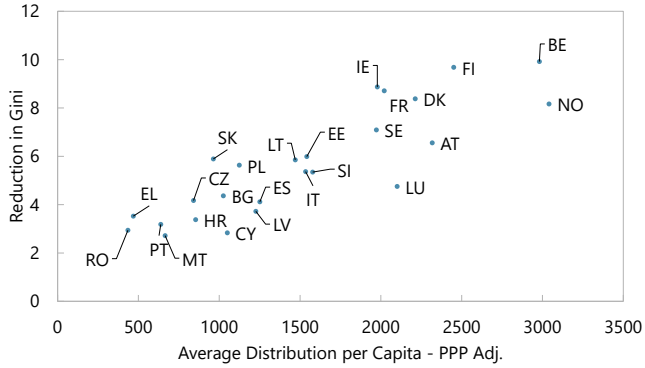


Sources: EU SILC User Database and IMF Staff calculations.

high-spending cluster when spending is scaled by GDP, potentially reflecting a larger GDP base linked to resource rents; as a result, it no longer stands out as an outlier on the cost side. More generally, this exercise demonstrates that frontier positions are partly sensitive to the choice of denominator.

Working Age Population: As a second robustness check, we recompute the relationship between Gini reduction and per-capita disbursements after excluding any households that contain pensioners – defined as households with at least one member reporting positive pension income (PY100N > 0). This restriction isolates redistribution among non-pensioner households and recalculates both inequality reduction and average non-pension transfer disbursements per capita on the restricted sample. Comparing the baseline frontier to the non-pensioner-household specification (Figure A3), the results are broadly unchanged for most countries, suggesting that our main comparisons are not primarily driven by demographics. Norway is a notable exception: while it does not become efficient, its measured per-capita non-pension spending falls markedly – this would be consistent with a non-trivial share of non-old-age benefits accruing to pensioners in the full sample, thereby inflating baseline per-capita disbursements without commensurate gains in inequality reduction.

Figure A3: Gini Improvement vs. Distributions (Households without Pensioners)



Sources: EU SILC user database and IMF staff calculatios.

Analyzing the Marginal Impact of Social Spending

We construct a marginal-incidence exercise – the goal of which is to evaluate the incremental effect on inequality of each additional euro of non-pension social spending, when spending is allocated starting from the poorest households. The starting point is a post-pension baseline income (HY022N). Because standard Gini computations assume non-negative welfare aggregates, we restrict attention to non-negative HY022 values by dropping entries with negative HY022N (these are relatively infrequent in the data).

The core method is an iterative, expanding-coverage distribution rule, illustrated conceptually in Figure 8. At each iteration, we define an eligibility set consisting of individuals (and hence their households) whose current equivalized income lies below a moving income threshold. Eligible individuals receive an additional fixed "distribution increment", while ineligible individuals receive no additional amount in that iteration. This process is designed to emulate the idea that the marginal euro is first directed toward the bottom of the distribution; as the threshold expands (by the same amount as the proposed distribution within an iteration), progressively higher-income households enter the set, allowing the analysis to recover how the marginal redistributive return changes as spending scales up and coverage broadens.

Implementation requires respecting a budget constraint at the individual level: no one can receive more than their observed total non-pension benefit entitlement. Each iteration therefore proposes an incremented benefit level for eligible individuals and then applies a cap: if the proposed cumulative amount exceeds the person's observed total distribution entitlement, it is truncated at the entitlement amount; if the person is already at their

entitlement, they remain unchanged. In parallel, individual increments are aggregated to the household level (HB030) and then assigned back to household members so that the income concept remains internally consistent with household sharing: the household's total incremented benefits are added to baseline HY022 to generate an updated household income level for that iteration.

After each increment, we recompute (i) average per-capita spending and (ii) inequality. Average spending is calculated as a survey-weighted mean of incremented benefits (RB050), ensuring that results reflect population representativeness rather than sample counts. Inequality is recalculated on the updated equivalized income distribution using a weighted Gini. Repeating this sequence produces two aligned series: cumulative spending (per capita) and the associated Gini levels, which together define the marginal redistributive schedule—i.e., the incremental change in inequality per additional euro spent as the distribution expands from the poorest upward.

Finally, we adapt the increment size to maintain computational efficiency. The algorithm begins with a relatively fine increment (20 euros). As iterations progress into higher income ranges, marginal changes in the Gini can become extremely small and slow-moving—partly because benefit entitlements are lower or already exhausted for many individuals, and partly because heavy-tailed income distributions require expanding the eligibility threshold substantially to bring in new recipients at the right tail of incomes. When successive iterations yield negligible changes in cumulative spending and inequality over long stretches, the increment is increased (by 10 euros). The loop terminates when observed entitlements are exhausted (everyone has reached their personal total benefits).



PUBLICATIONS

Lean and Just? Social Protection Spending and Inequality Outcomes across Europe

Working Paper No. WP/2026/078