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CONTENTS

EXECUTIVE SUMMARY

The adverse consequences of inequality—social, economic, and political—have been increasingly recognized and under scrutiny. While global inequality has declined significantly over the past three decades, the evolution of inequality within countries is mixed. During the last decade, overall income inequality in the European Union (EU) has remained stable, but a closer look reveals that this reflected opposing developments between the real incomes of the young and the elderly. Before the global financial crisis, the young and the elderly had broadly similar risk of relative poverty in the EU. More recently, the risk of poverty increased significantly for the young and, to a lesser extent, for the rest of the working age population, while it declined sharply for the elderly.

Labor market developments as well as the design of both social protection and fiscal consolidation likely contributed to this outcome. The crisis exacerbated preexisting high youth unemployment and a trend toward less stable jobs. High youth unemployment is associated with lower youth incomes and greater risk of youth poverty. Social protection systems are ill-equipped to address rising youth poverty. They shield the elderly's real incomes from the impact of the crisis but offer only limited assistance to young unemployed individuals. Moreover, the latest fiscal consolidation efforts were more focused on programs helping the working age population rather than the elderly.

High and prolonged youth unemployment and poverty have long-lasting effects on young people's productivity and incomes, as well as their social prospects. The problems of youth unemployment and poverty are reaching macroeconomic proportions in several European economies. While the ongoing cyclical upturn improves job opportunities for the young, policymakers need to do more to ensure that today's young do not fall further behind the rest of the population.

To lower the chances of young people becoming poor and suffering lifetime income losses, facilitating their integration into the labor market is essential. To that effect, employers could be given incentives to hire young people, including through targeted reductions in the labor tax wedge or tax credits at the lower end of the wage scale. A better integration of the young into the labor market also requires improving and adapting their skills. Thus, spending on education and training needs to be protected from fiscal consolidation and its efficiency needs to be raised, including through better cooperation on the delivery of programs among employers, employee representatives, and governments.

Better access to social protection systems for workers in less stable jobs could help preserve labor market flexibility, while significantly reducing youth poverty and income inequality. Policymakers could achieve this goal with reforms of unemployment and non-pension benefits. For example, eligibility requirements could be reviewed as well as the design, age targeting, and efficiency of transfers. A more uniform approach to indexation across benefits could also help along with, more generally, better consideration of the distributional impact across age groups of public expenditure policy. Finally, tax reform could rebalance the tax burden across generations and increase the redistributive impact of taxation, by increasing progressivity on income taxes and by giving a greater redistributive role to taxes on capital income and wealth.

INTRODUCTION

1. There is growing recognition of the adverse economic, social, and political consequences of inequality. Both efficient market mechanisms as well as market failures can lead to inequality. While rewards for innovation, entrepreneurial activity, and job creation in competitive markets exacerbate inequality, they can also have a positive impact. Conversely, rent seeking, abuse of market power, and inequality of opportunity can negatively impact overall welfare. There is a growing body of empirical evidence that highlights the detrimental effects of market failures and, accordingly, findings suggest that lower net income inequality can be associated with faster and more sustained growth (Berg and Ostry, 2011; Ostry, Berg, and Tsangarides, 2014).

2. Over the last decade, overall income inequality has remained stable in the EU, but a closer look reveals that inequality across generations has increased markedly. Income convergence between advanced and developing countries has contributed to a decline in inequality across countries, even as the evolution of inequality within countries, including some advanced countries, is mixed (IMF, 2017). In Europe, the increase has been driven by growing inequality across generations. This reflects higher poverty and joblessness among the young, which have adverse and long-lasting consequences for today's youth, as well as for tomorrow's economic prospects. Inequality across generations also erodes social cohesion and polarizes political preferences, and may ultimately undermine confidence in political institutions.

3. This Staff Discussion Note (SDN) analyzes poverty and inequality across generations in Europe and discusses policy implications. During the last decade, the relative poverty rate of the working age population, especially the young, rose while that of the elderly declined markedly. The crisis has exacerbated preexisting high youth unemployment and a structural trend toward less stable jobs. This outcome has hurt real incomes of the working age population, especially the young. Social protection systems are ill-equipped to mitigate the impact of the crisis on the working age population, notably the young. Reversing the trend toward youth poverty requires, in addition to macro-economic policies that avoid large shocks, concerted labor market and fiscal policies, including social protection and fiscal redistribution.

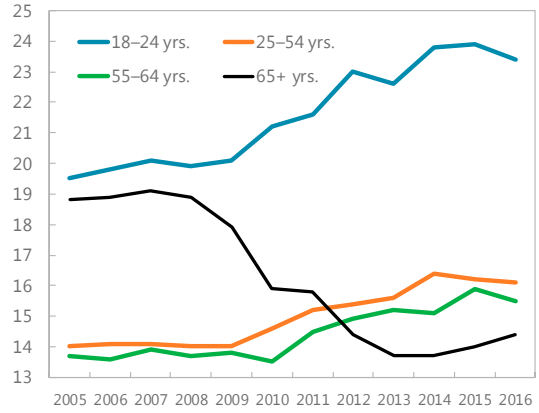
4. This SDN paper is organized as follows. The first section takes stock of recent trends in inequality and poverty across generations in Europe. The second section quantifies the importance of labor market developments and fiscal redistribution for income inequality and poverty across generations. The following two sections discuss how labor market policies and fiscal redistribution affect inequality and poverty across age groups. The SDN concludes with policy implications.

RECENT TRENDS IN POVERTY AND INEQUALITY ACROSS GENERATIONS IN THE EU

Over the past decade, poverty and inequality across generations increased. Today, the young are the age group most at risk of poverty. This generation has been adversely affected by economic stagnation and labor market developments, as well as by gaps in the social safety net.

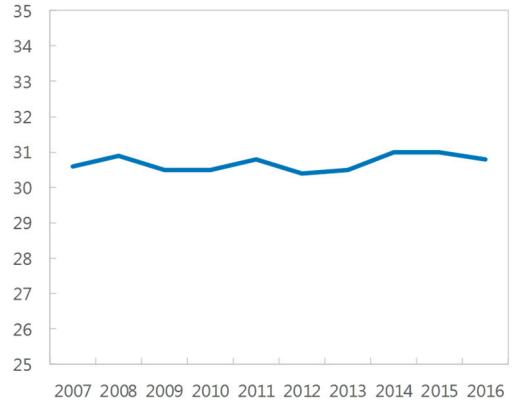
5. The risk of youth poverty is on the rise in Europe.[1] In the years leading up to the global financial crisis, the relative poverty of the young (those 18 to 24 years old) and elderly (those older than 65) was broadly similar.[2] With the financial crisis came a significant rise in the risk of relative poverty for the young because they suffered disproportionately from unemployment. Meanwhile, the risk for the rest of the working age population increased only modestly, and the risk for the elderly declined precipitously since their incomes, particularly pensions, were better protected than those of workers. Today, the young are the age group most likely to be poor—in both relative and absolute terms (Figure 1).[3]

EU27: At-Risk-of-Poverty Rate
(Percent of total)



Source: Eurostat.

EU27: Gini Coefficient of Disposable Income
(Index, 0–100)



Sources: Eurostat and IMF staff calculations.
[1] Or latest available.

6. Income inequality in Europe has remained stable at the aggregate level but income developments have diverged across generations and countries. Some of the countries hardest hit by the global financial crisis also experienced sharp increases in the Gini coefficient of market income between 2007 and 2016, driving some of the differences across European regions; however, this topic is not the focus of this SDN (Appendix I). Rather, the focus here is on measures of income inequality by age groups, which are available for the period since the mid-2000s. We find that income inequality across generations increased markedly (Figure 2). The median equivalized net income of the working age population—after accounting for taxes and transfers, including pension benefits—stagnated following the crisis, while it grew for the elderly by nearly 10 percent. Notably, the ratio of median net income

[1] We use the Eurostat definition for the at-risk-of-poverty rate: the share of people with equivalized disposable income (after taxes and social transfers) below the at-risk-of-poverty threshold, which is set at 60 percent of the national median equivalized disposable income. The median equivalized disposable income is the total income of a household that is available for spending or saving, divided by the number of household members weighted by age. If the main breadwinners in a household are over age 25, measures of youth poverty (18–24) based on equivalized household income would likely underestimate youth poverty; if the young are the main breadwinners, then youth poverty would be overestimated. EU-aggregated estimates are calculated as the population-weighted arithmetic average of individual national figures. See Appendix III for data sources and definitions.

[2] The time series for poverty and inequality data disaggregated by age group begins only in 2005, which limits the analysis of longer-term structural trends. The young are defined as those aged 18 to 24 years old and the elderly as those older than 65.

[3] The persistent at-risk-of poverty rate is the share of the population living in households in which the equivalized disposable income was below the at-risk-of-poverty threshold (60 percent of the national median equivalized disposable income) for the current year and for at least two out of the three preceding years.

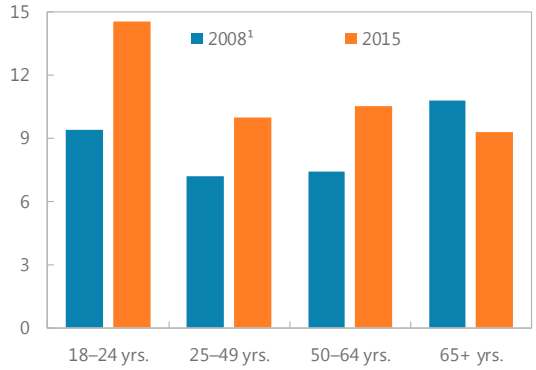
of the elderly to the youth rose in most countries. In Germany, the ratio has been stable but income inequality within young cohorts is higher than it was when their parents were young (Box 1).

7. The stagnation of workers' incomes fundamentally changed the profile of inequality across generations, and left the youth with the lowest median income of any age group. Inequality within age cohorts is also markedly different; the ratio of the top and lower quintiles is much lower among those aged 65 and older than in the working age population. Further, the concentration of income tilted markedly in favor of the elderly in the years since the crisis (Figure 2).

Figure 1. EU: Risk of Poverty Across Generations

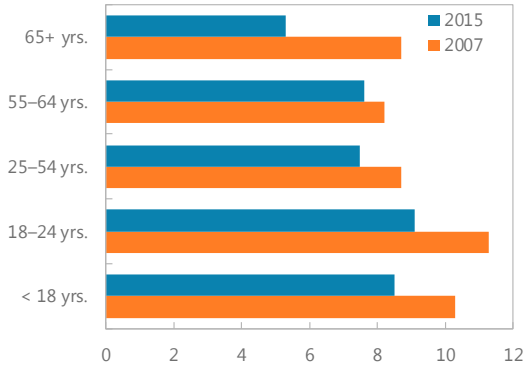
The young now have the highest persistent at-risk-of poverty rate among all age groups.

1. EU27: Persistent at-Risk-of-Poverty Rate
(Percent of total)



The share of youth experiencing absolute poverty (as measured by severe material deprivation) is almost twice as high as the share of elderly.

2. EU27: Severe Material Deprivation
(Percent of total)



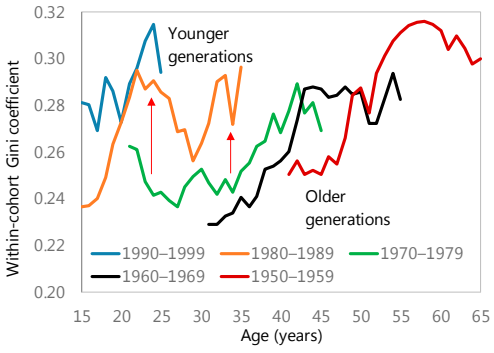
Sources: Eurostat and IMF staff estimates.

[1] 2008 used due to lack of data in 2007.

Box 1. Germany: A Within-Cohort Perspective on Inequality

The median net income and the poverty rate of different age groups have been evolving rather uniformly in Germany over the past decade, suggesting a broadly stable picture in terms of intergenerational inequality. This perspective can be usefully complemented by an analysis of the evolution of within-cohort income inequality for various age groups. Such an analysis show that younger cohorts are facing a more unequal within-cohort distribution of income than older cohorts when they were young.

Germany: Within-Cohort Gini Coefficient of Disposable Income, 1991-2014 (Index between 0 and 1)



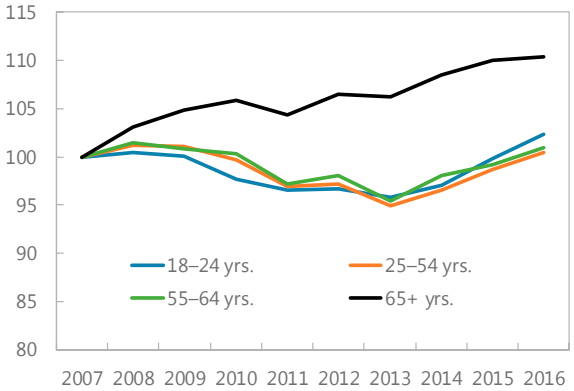
Sources: Socio-Economic Panel v32; and IMF staff calculations.
Note: Each line represents the evolution of the within-cohort Gini index as a function of the age of the cohort's oldest member. Cohorts are tagged by birth years.

The within-cohort Gini index of disposable income of individuals born in the same decade displays a clear upward drift at any given age. The drift is particularly pronounced for the income received during the time individuals are 15–35 years old. For example, whereas the Gini index of those born in the 1970s when their oldest member was 25 years old was 0.24, it was close to 0.30 for those born in the 1980s and the 1990s at the same age. This finding is reminiscent of the results of Bönke and others (2015), who identified a secular increase in lifetime earnings inequality among men born in West Germany between 1935 and 1969, a pattern which they attributed for the most part to the evolution of the cohort-specific wage structure.

Figure 2. Income Inequality Across Generations in Europe

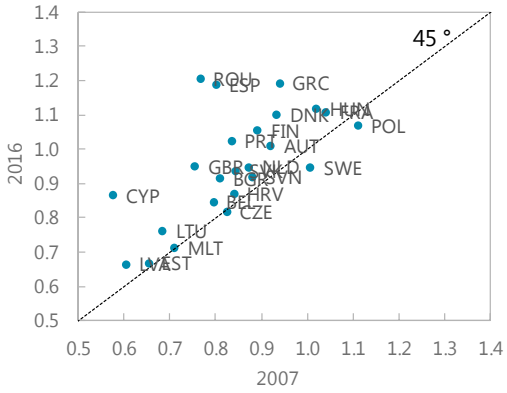
The median income of the elderly diverged sharply…

1. Real Median Equivalized Net Income in the European Union (Index, 2007 = 100)



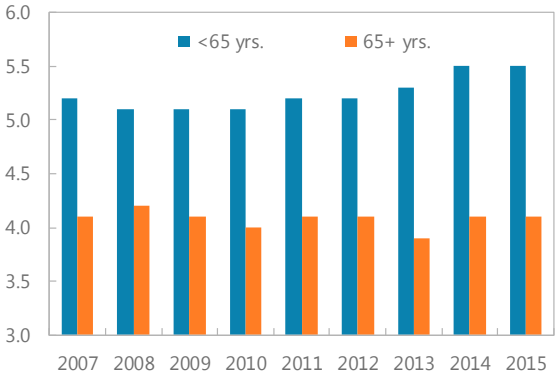
…especially compared to the young.

2. Median Net Income Ratio
(Ratio, 65+ / 18–24)



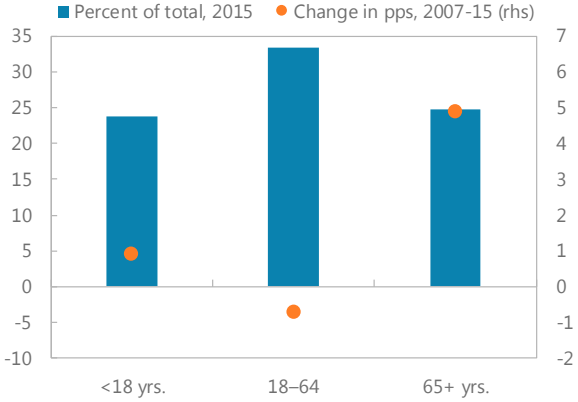
The population aged 65 and over faces lower income inequality…

3. EU27: Inequality of Income Distribution
(Share of top to lower quintile, ratio)



…and a growing share of those over 65 have relatively high income.

4. EU27: Concentration of Income (Population having 130% or more of national median net income)



Sources: Eurostat; IMF World Economic Outlook; and IMF staff calculations.

Note: Data labels use International Organization for Standardization (ISO) country codes. pps = percentage points; rhs = right-hand scale.

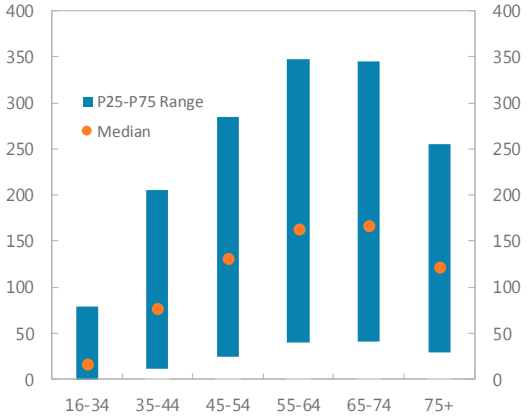
8. The young are more likely to fall into poverty in the event of an income shock in part because they typically lack asset wealth that acts as a buffer. As the accumulation of assets is gradual over the life cycle, younger generations (measured here as 16–34 years old) hold less than 5 percent of net wealth in Europe, and their median wealth is one-tenth of the median for 65-year-olds. They also have the highest debt-to-assets ratio (49 percent) across age groups and are most likely to form part of a credit-constrained household (12.4 percent) (Household Finance and Consumption Survey, 2016).[4] Intergenerational transfers and gifts within families are important for household wealth accumulation and could be an important source for mitigating intergenerational inequality, but matter to a smaller extent in reducing overall inequality (Mathä and others, 2014).[5]

[4] The Household Finance and Consumption Survey data covers Euro Area countries only.

[5] While these transfers could play an important role in reducing inequality across generations, data is not available.

9. Income inequality and poverty across generations are closely related to developments in the labor market. Youth employment prospects were especially hard hit by the global financial crisis. Although labor force participation among the young has fallen, youth unemployment remains well above overall unemployment rates across EU countries (despite a modest decline since 2013) and is correlated with higher poverty rates. Moreover, the prevalence of in-work poverty, involuntarily part-time employment, and temporary work contracts has risen over the last decade and most among the young (Figure 3). One important exception is Germany, where youth unemployment, temporary contracts, and part-time work have declined, and the increase in youth in-work poverty has been more limited than for older age groups (Box 2).

Net Wealth Distribution by Age Group, EA-17
(Thousands of euros)

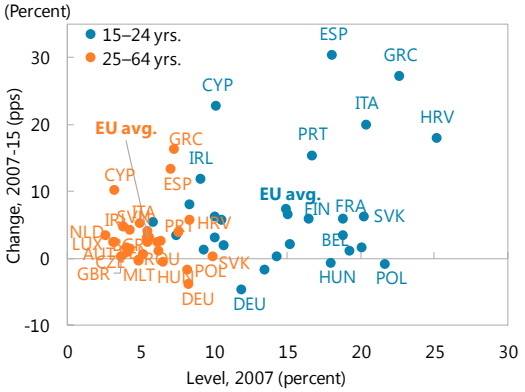


Source: ECB HFCS wave 2.
Note: P25 and P75 refer to the 25th and 75th percentile ranges.

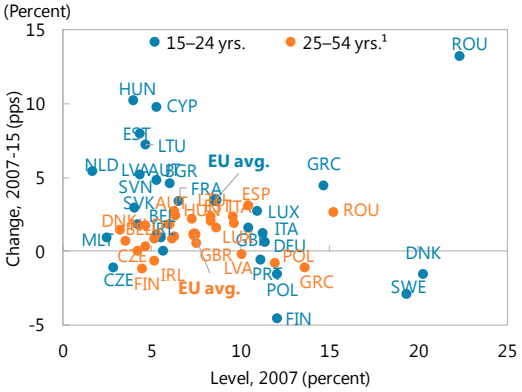
Figure 3. The Young and the Labor Market

The young not only face higher unemployment than other age groups (Chart 1), but even when in work, poverty has increased most for them (Chart 2), they are more often involuntarily employed part-time (Chart 3), and they face lower job security (Chart 4).

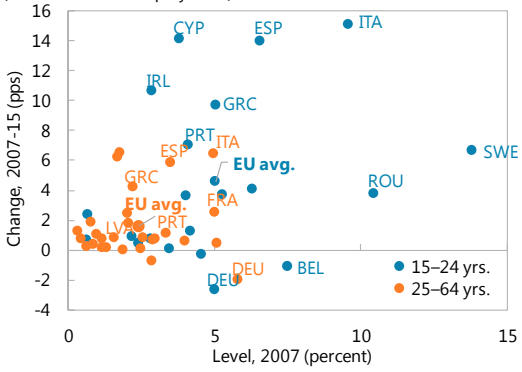
1. Unemployment Rate
(Percent)



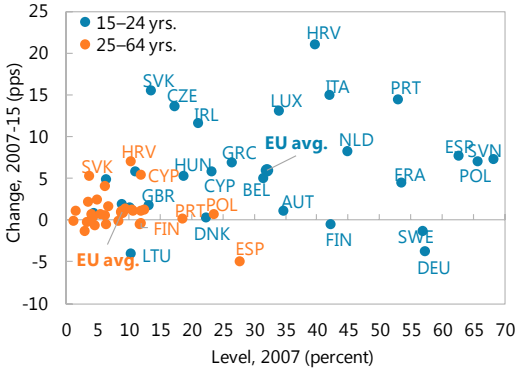
2. In-Work At-Risk-of-Poverty Rate
(Percent)



3. Involuntary Part-Time Employment
(Percent of total employment)



4. Temporary Employees
(Percent of total employment)



Sources: Eurostat and IMF staff calculations.
[1] Data for age group 25–64 is unavailable.

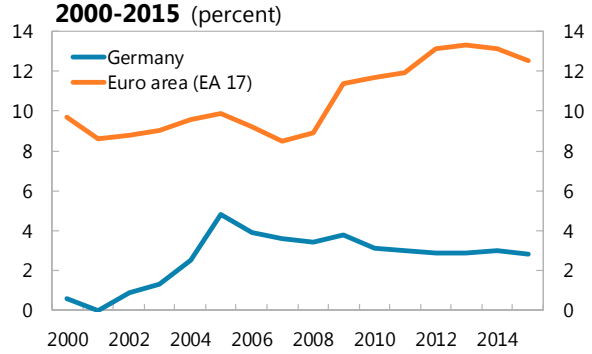
Box 2. Labor Market Institutions, Youth Unemployment, and Income Inequality in Germany

The German labor market has become more flexible over the past 20 years. Starting in the mid-1990s, and in the context of greater offshoring opportunities in neighboring Central, Eastern, and Southern European countries after the fall of the iron curtain (Dustmann and others, 2014), wage-setting became gradually more decentralized. Through the Hartz reforms implemented in 2003–05, employment protection legislation (EPL) for fixed-term contracts and regulation of temporary agency work were loosened, and unemployment benefits became less generous, while active labor market policies were expanded and targeting improved, and job placement services restructured (Engbom and others, 2015).1 The reforms boosted labor demand as well as supply, and matching efficiency (Weber, 2015). Other policy measures have further encouraged higher female labor force participation, including a reform of parental leave legislation in 2007, and an increase of subsidized child care (Geyer and others, 2014). As a result, both labor market participation and employment increased spectacularly over the past decade.

This greater flexibility has served young Germans well relative to their European peers. It helped the German economy weather the severe 2009 recession with minimum costs in terms of overall unemployment (Weber, 2015; Scheffel and Krebs, 2017) and, combined with an effective vocational training system (Cahuc and others, 2013), it has contributed to make the German youth unemployment rate the lowest in Europe from 2011 on. Regarding job quality, while the share of employed young people in atypical forms of employment (including so-called mini-jobs) increased sharply after the Hartz reforms, it decreased again strongly in recent years.

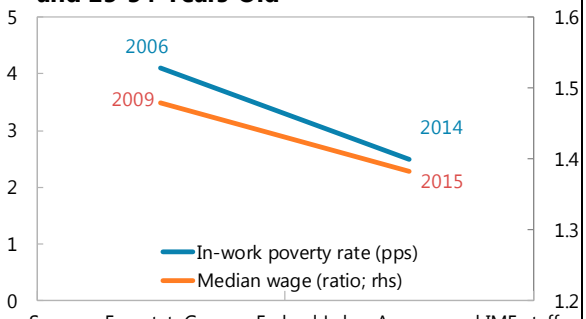
The good performance of the young on the labor market in recent years is also visible in the evolution of their income relative to that of older workers. Median wages of full-time employees aged 15–24 have increased faster than those of all full-time employees between 2009 and 2015. Furthermore, while the overall poverty rate has been slowly creeping up in Germany and is slightly below the EU average both for the whole population and for young adults (Vandenbussche and Grevenbrock, 2017), the in-work at-risk-of-poverty rate of individuals aged 15–24 barely changed between 2006 and 2014, while that of individuals aged 25–54 increased. This suggests that the very good shape of the labor market has benefited the young.

Difference in Unemployment Rate Between 15-24 Years Old and 25-59 Years Old, 2000-2015 (percent)



Sources: Eurostat and IMF staff calculations.

Difference in In-Work Poverty Rates and Relative Wages Between 15-24 Years Old and 25-54 Years Old



Sources: Eurostat, German Federal Labor Agency, and IMF staff calculations.

[1] The effectiveness of active labor market policies is regularly assessed. The Federal Employment Agency's research institute finds that "occupational training and measures taking place directly at employers have distinctly more positive effects on the labor market prospects of participants [than short training and placement services] conducted by private providers" (IAB, 2015).

QUANTIFYING THE ROLE OF THE LABOR MARKET AND FISCAL REDISTRIBUTION

10. Labor market developments and fiscal policy play a key role in poverty and income inequality. The labor market can affect poverty and income inequality through its impact on the distribution of wages (Salverda and Checchi, 2015) and unemployment. This section focuses on unemployment because differences in nominal wage growth across age groups have not been significant.[6] Fiscal redistribution also affects poverty and income inequality, for example, through generosity and comprehensiveness of social safety nets, taxation, and social insurance contributions (IMF, 2017; Marx and others, 2015).

11. Labor market developments and fiscal redistribution have different impacts across age groups. This section attempts to establish some basic associations between labor market outcome and fiscal policy choice variables on the one hand, and income and poverty variables for different age groups on the other. Specifically, we run regressions using an annual panel data set of EU countries between 2007 and 2015, similar to the empirical approach from Jaumotte and others (2013) and Dabla-Norris and others (2015).[7] The main results are presented in Tables 1 and 2.[8] Control variables are included to account for other factors that could affect poverty and inequality, including globalization and technological progress (Pavcnik 2011; Kanbur 2015).[9] The data feature harmonized measurements of income inequality and poverty. This helps overcome limitations on data comparability faced by other cross-country studies (Clements and others, 2015).

12. A key finding from the regressions is a strong and positive association between inequality across generations and long-term unemployment. The reason is that long-term unemployment disproportionally affects the young, driving losses in their incomes relative to those of other age groups. Based on our estimates, a 1 percentage point increase in the long-term unemployment rate is associated with an increase of 0.5 percentage points in the income ratio for the 25- to 49-year-old relative to the 18- to 24-year-old; for those older than 65 the increase is 1.2 percent (Table 1, columns 2–4).[10] Furthermore, such an increase in unemployment is associated

[6] Cross-country data on wage levels by different age groups are limited. Based on the survey data from Eurostat (conducted every four years and available at http://ec.europa.eu/eurostat/web/labour-market/earnings/database), there is no significant difference of nominal wage growth across age groups in Europe between 2006 and 2014.

[7] The sample cover only 2007 and onward because of data availability.

[8] Appendix II provides full set of results, including robustness tests.

[9] The parameter estimates of these control variables are reported in the Appendix II.

[10] The empirical analysis did not detect a statistically significant relationship between long-term unemployment and the net Gini coefficient, after controlling for other factors including country and year fixed effects (Table 1, column 1). The result, however, should not be treated as definitive evidence of the general link between income inequality and unemployment. For example, the net Gini coefficient is only one of many measures for income inequality, and the sample covers a relatively short period. Also, there can be income developments among the employed and others that offset the impact on inequality from income developments of the young. Europe's experience is instructive in this regard because over the course of the crisis the Gini coefficient has not systematically gone up, while incomes of the young relative to retirees have declined.

with an increase in the risk of absolute poverty among the 18- to 24-year-old by 0.5 percentage points versus only 0.3 percentage point for the 50- to 64-year-old and no significant increase for those 65 or older (Table 2, columns 2 and 4). This may reflect lower access to unemployment benefits and minimum income schemes for younger generations. The impact of labor market flexibility on absolute poverty is positive but more uniform across working age groups (Table 2, columns 2–5).[11, 12]

13. Higher public social spending is associated with lower income inequality and poverty at the aggregate level and with higher incomes for older generations relative to the 18–24 age group. The estimation shows that increasing social spending by 1 percentage point of GDP is associated with a lower Gini index of net income by 1.2 percent (Table 1, column 1).[13] Higher social spending is associated with significantly higher incomes for the 50–64 age group relative to the 18–24 age group (Table 1, column 3), possibly reflecting support from early retirement or disability schemes for older workers as well as spending on health care. The negative association between social spending and absolute poverty across age groups suggests a more uniform impact of such spending on poverty than relative incomes (Table 2, columns 2–5).[14]

14. Direct taxation appears to be effective in combatting income inequality and poverty, especially for the young.[15] Raising direct tax revenue by 1 percentage point of GDP is associated with a reduction of the Gini index of net income by 0.6 percent (or 0.2 percentage points of Gini index on average; Table 1, column 1). The estimation also shows that a higher marginal effective tax rate is linked to a lower Gini index, which may reflect the impact from a more progressive tax system. More importantly, coefficient estimates show that a 1 percentage point increase in direct taxes relative to GDP on average associated with a reduction of more than 0.7 percentage points in the income ratio between the older-than-65 and 18–24 age groups (Table 1, column 4). The estimates on the income ratio are not significant for the other age groups. This suggests that income of the elderly is likely to be more affected by an increase in direct tax revenue, for example through higher taxes on pension income. As expected, the estimate of the impact of direct taxes on the risk of absolute poverty is insignificant across all age groups as higher direct taxes do not help reduce absolute poverty (Table 2); however, they reduce measures of relative poverty by bringing down the incomes of wealthier individuals (Table II.3).[16]

[11] Labor market flexibility is measured by the index of flexibility on firing and hiring procedure from World Economic Forum's Global Competitiveness Indicator database. The variable is excluded from the income inequality regressions as the estimated coefficients are statistically insignificant (see Appendix II).

[12] The analysis, however, does not detect a similar pattern when a relative poverty measure is used (see Appendix II).

[13] This corresponds to 0.4 percentage points of Gini index on average, given the Gini sample mean of about 0.3.

[14] When relative poverty measure is used, the results show that social spending reduces poverty only for the elderly, but increases poverty for the young. Additionally, the impact of composition of social spending is also examined. The estimates are statistically insignificant, and they do not materially affect the rest of the results (see Appendix II).

[15] This conclusion is also reached by Ciminelli and others (2017).

[16] The impact estimates of direct taxes on relative poverty diminish from 0.8 percentage point for the young to statistically insignificant 0.4 percentage point for the older-than-65 age group (see Appendix II).

Table 1. Income Inequality Panel Regressions[1]

	(1)	(2)	(3)	(4)
	Gini net (log)	**Net income ratio 25-49 to 18-24 group**	**Net income ratio 50-64 to 18-24 group**	**Net income ratio 65+ to 18-24 group**
Direct tax revenues/GDP	-0.623*	0.405	-0.320	**-0.734****
	(0.363)	(0.279)	(0.276)	(0.348)
Social benefit spending/GDP	**-1.195****	0.0442	**1.345*****	0.887
	(0.523)	(0.659)	(0.475)	(0.990)
Marginal effective tax rate	**-0.299*****	0.126	-0.0865	0.139
	(0.104)	(0.283)	(0.280)	(0.326)
Long-term unemployment	0.0462	0.504*	**0.821*****	**1.157****
	(0.312)	(0.263)	(0.224)	(0.502)
Observations	220	220	220	220
***R* -squared**	0.26	0.37	0.46	0.75

Source: IMF staff calculations.

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

[1] Labor market flexibility is excluded from the income inequality regressions as the estimated coefficients are statistically insignificant. Other control variables include output gap, per capita income, education, trade openness, constant, year and country fixed effects.

Table 2. Absolute Poverty Panel Regressions[1]

	(1)	(2)	(3)	(4)	(5)
	Absolute poverty	**Absolute poverty 18-24 group**	**Absolute poverty 25-49 group**	**Absolute poverty 50-64 group**	**Absolute poverty 65+ group**
Direct tax revenues/GDP	-0.142	-0.313	-0.225	0.0227	0.0791
	(0.147)	(0.190)	(0.158)	(0.175)	(0.398)
Social benefit spending/GDP	**-0.907*****	**-1.347*****	**-0.857*****	**-1.037*****	**-0.793****
	(0.207)	(0.423)	(0.206)	(0.235)	(0.335)
Long term unemployment	**0.334****	**0.541****	**0.432****	**0.336****	0.0213
	(0.135)	(0.247)	(0.158)	(0.139)	(0.129)
Labor market flexibility	**0.0192*****	**0.0235*****	**0.0180*****	**0.0218*****	0.0139*
	(0.00609)	(0.00800)	(0.00595)	(0.00602)	(0.00723)
Observations	226	226	226	226	226
***R* -squared**	0.55	0.46	0.59	0.53	0.30

Source: IMF staff calculations.

Note: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

[1] Absolute poverty is measured by the severe deprivation rate. Other control variables include output gap, per capita income, education, trade openness, constant, year and country fixed effects.

LABOR MARKET POLICIES

Employment is key to reducing gaps in opportunity, incomes, and poverty of the young relative to older generations. A major finding in the previous section is a strong and positive association between inequality across generations and unemployment, which affects the young disproportionately. Our analysis indicates that the labor tax wedge, labor institutions, and the economy's overall performance are closely associated with youth unemployment.

16. Unemployment is the result of a broad range of macroeconomic, structural, and institutional factors. The key explanatory variable is GDP growth (or the output gap)—confirming Okun's law (Banerji and others, 2014, 2015). Structural conditions, including demographic variables such as migration flows (Pissarides and McMaster, 1990), as well as the production structure of the economy (Destefanis and Mastromatteo, 2010), also affect unemployment. Institutional factors such as the functioning of the labor market, product market liberalization, and housing policies are also believed to have an impact on unemployment (Boeri and Jimeno, 2016).

17. Youth unemployment is affected by trends in overall unemployment, as well as by additional structural and institutional factors. Studies that examine youth unemployment generally focus specifically on education and training, labor market institutions, and activation policies.

- *Education and training.* Specific elements of education and training systems seem to have a larger impact on youth unemployment than overall educational attainment. Dual-education apprenticeships that link work-based and school-based programs are helpful in reducing youth unemployment (ILO, 2013; Zimmerman and others, 2013). It is also important to strengthen education systems, including through intensified individual support, lengthened compulsory schooling, and more labor-market- oriented curricula.
- *Labor market institutions.* The effects of employment protection legislation (EPL) and temporary contracts—which contribute to labor market duality—on youth unemployment are mixed. The young are more likely to work under temporary contracts than older workers, which could leave them more vulnerable to losing their jobs during a recession (Choudhry and others, 2012). Conversely, countries with stronger EPL—which tend to have a higher prevalence of temporary contracts—appear to have suffered fewer job losses among the young during the great recession (O'Higgins, 2012).
- *Active labor market policies (ALMPs).* ALMPs share the common goal of putting people to work, but vary widely in scope and funding. It is therefore no surprise that finding an empirical link between this broad category of policies and youth unemployment has proven elusive. Some studies find that ALMPs have a larger impact on youth than on overall unemployment (Choudhry, and others, 2012), whereas others find only limited effect (Crépon and van den Berg, 2016). There is some evidence that the effectiveness of ALMPs is dependent on program design, with wage subsidies, services, and sanctions deemed most effective (Kluve, 2006).

18. To assess the impact of labor market policies on youth poverty and inequality across generations, this section seeks to identify the drivers of unemployment rates of young and older workers, as well as the difference across age groups (Table 3 and Appendix II).[17] We use a panel regression covering the period 2007–14 to be consistent with the previous set of regressions. A regression covering a longer period (2001–14) suggests that the results are robust. Results suggest that, in addition to the output gap, taxation, specific labor market institutions, and policies are closely associated with youth unemployment.

[17] We use a panel regression covering the period 2007–14 (for consistency with the analysis in Section II). A regression with data covering 2001–14, and hence greater variance in the institutional variables, yields similar results.

- *Output gap*. The output gap is significantly negatively associated with unemployment, that is, recovery or boom times are associated with falling unemployment and vice versa for recession times. However, the changes in the economic cycle affect young workers more than their older counterparts—almost twice as strongly, and so also help explain the unemployment gap between younger and older workers. This could be due to a host of factors: younger workers' more limited job-specific skills; lower protection through EPL with a greater share of the young in temporary and part-time jobs (Figure 3); or even perceptions of social fairness, in which the young are considered more easily able to cope with unemployment compared to, say, older workers who may support families.

Table 3. Unemployment Rate Panel Regressions

	Unemployment Rate		
	(1)	(2)	(3)
Variables 1/	**Age 15-24**	**Age 25-64**	**Difference**
Output gap	**-0.82*****	**-0.42*****	**-0.40*****
	(0.14)	(0.07)	(0.08)
Tax wedge	**0.47***	0.14	**0.33****
	(0.27)	(0.14)	(0.16)
Union density	**1.17*****	**0.49*****	**0.68****
	(0.28)	(0.11)	(0.26)
Coordination of wage setting	**-1.16****	**-0.67*****	**-0.49***
	(0.43)	(0.20)	(0.26)
Share of temporary workers	-0.44	-0.24	-0.20
	(0.44)	(0.20)	(0.32)
Share of temporary workers * Output gap	**-0.05****	**-0.02****	**-0.03****
	(0.02)	(0.01)	(0.01)
ALMP spending on training	-16.07	0.97	**-17.04****
	(11.47)	(5.59)	(7.96)
Constant	-23.72	-7.15	-16.57
	(14.21)	(6.20)	(12.10)
Fixed effect	Country, year	Country, year	Country, year
Observations	132	132	132
Number of countries	20	20	20
Adjusted *R* -squared	0.86	0.85	0.81

Source: IMF staff calculations.
Note: Robust standard errors in parentheses. ALMP = active labor market policy.
*** p<0.01, ** p<0.05, * p<0.1.
1/ See Appendix II for variable definitions.

- *Taxation*. A higher labor tax wedge is associated with higher unemployment (Bassanini and Duval, 2007; OECD, 2006). Our findings suggest that the change in the tax wedge is significant in explaining the unemployment rates of young workers (though not that of older workers). Young workers generally have less accumulated human capital, their productivity is lower than that of more experienced workers, and the marginal cost of taxation is higher, especially where progressivity of taxation is low (as is the case with most social security contributions).

- *Labor market institutions—unionization*. Higher union density appears to be associated with higher unemployment levels, particularly for younger workers.[18] This outcome may have arisen because unions may be less attentive to the specific challenges facing the young who have trouble entering the labor market. It could also reflect other factors that have driven both union density and unemployment and that are not among the explanatory variables—indeed, in most EU countries, unionization rates declined during 2004–13, particularly among the young even as youth unemployment rose.[19]

[18] However, Jaumotte and Buitron (2015) find that lower union density is associated with higher inequality as workers' bargaining power is reduced. This is not inconsistent with our findings: raising the remuneration of those in employment should reduce overall inequality, since it narrows the gap with the top earners. However, it may not preempt or even increase inequality across generations if unemployment in a specific age group, such as the young, therefore rises.

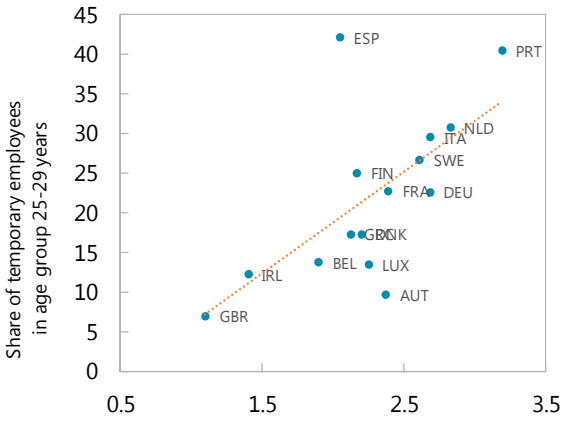
[19] Data on union density by age group are difficult to obtain. However, it appears that union density for younger workers has declined faster than for older workers in recent years. A notable exception is Germany, where union density of the young has risen faster than overall unionization since 2004 (after a significant decline over the preceding decade, though).

- *Labor market institutions—wage setting mechanisms*. The union density variable does not fully capture the role of unions in labor market functioning and in enabling outcomes that address both unemployment as well as inequality: for example, cooperative industrial relations that foster collective bargaining agreements that take the overall macroeconomic situation and unemployment into account can play an important role in lowering unemployment (Siebert, 1997). Whether such strong relations exist is not a function of union density. Here the explanatory variable that captures the degree of coordination in the wage setting process is negatively associated with the level of unemployment, particularly for the young.[20] Unions can also contribute significantly to designing effective apprenticeships and training programs for workers (see below).

- *Labor market institutions—temporary contracts*.[21] Temporary work contracts are more frequent where permanent contracts are subject to more stringent employment protection legislation. While the negative effect on job security is evident, the impact on youth unemployment is more ambiguous. The young, who are typically much more likely to have temporary contracts than older workers, can become more easily unemployed in a downturn (Carmeci and Mauro, 2003). On the other hand, temporary contracts may also make it easier for employers to resume hiring once growth returns. Our findings are consistent with a stronger cyclical response of the youth unemployment rate because a higher share of the young hold temporary jobs.

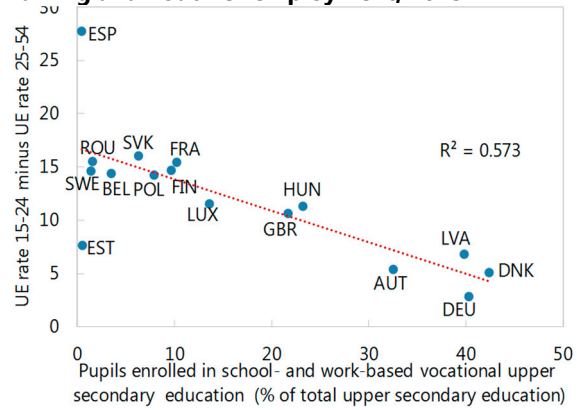
- *Training and education*. Changes in spending on ALMPs that focus on training and education appear to affect the difference in unemployment rates between the young and rest of the working age population (though they are not significant in explaining the

Employment Protection and Temporary Jobs, 2013



Sources: Eurostat and OECD.

Training and Youth Unemployment, 2015[1]



Source: Eurostat.

[1] Countries with available data.

[20] For a third variable measuring the functioning of the labor market, union contract coverage, data points are insufficient to be included in the regressions.

[21] An indicator of the strength of employment protection legislation is not available for many of the countries in the sample.

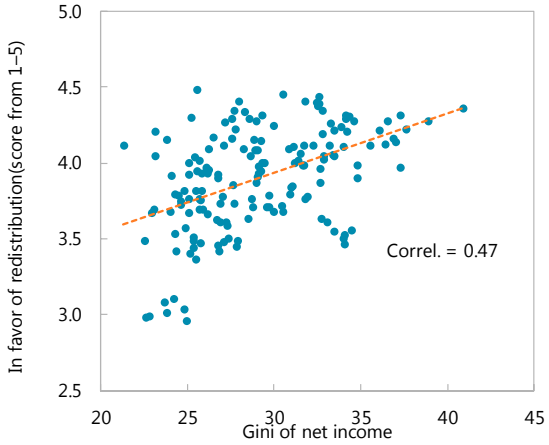
unemployment rates themselves).[22, 23] However, the effectiveness of ALMPs also depends crucially on design features: early intervention, targeting and tailoring to counteract specific disadvantages, imparting of skills, and responsiveness to labor market needs (ILO 2011, 2013). Programs outside of ALMPs that systematically build skills of labor market entrants (for example, young workers) such as the dual-education apprenticeships in Austria, Denmark, or Germany can also play a significant role in lowering youth employment (Brunello and others, 2007; Checchi, 2006; Zimmerman and others, 2013).[24]

FISCAL REDISTRIBUTION

European social protection systems have better protected the elderly from the impact of the global financial crisis than the young. Owing to fiscal constraints, non-pension social benefits have often been curtailed, not indexed to inflation, or more narrowly targeted. As a result, the young were not adequately covered against unemployment risk and the impact of precarious jobs.

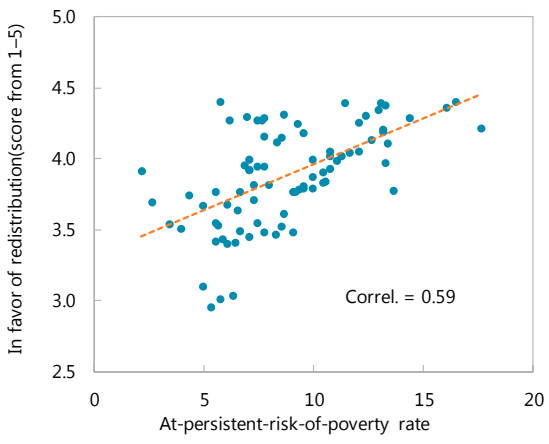
19. Europeans' demand for fiscal redistribution is associated with both income inequality and poverty but not with youth poverty (Appendix IV). This may partly explain why social protection does not adequately protect the young, notably during severe economic shocks. This, in turn, can marginalize the young and have long-lasting social and political consequences (Flash Barometer of the European Parliament, 2014). Moreover, social protection systems were historically designed to address old age risks—a practice that has been reinforced by the political economy of an aging population.

Preferences for Redistribution and Gini of Net Income, Total, 2002–14



Sources: European Social Survey; SWIID; and IMF staff calculations.

Preferences for Redistribution and At- Persistent-Risk-of-Poverty Rate, Total, 2002–14



Sources: European Social Survey; SWIID; and IMF staff calculations.

[22] We have also considered other commonly used labor market policy variables such as the net replacement rate of social benefits, the ratio of minimum to median wages, and others (see Appendix II).

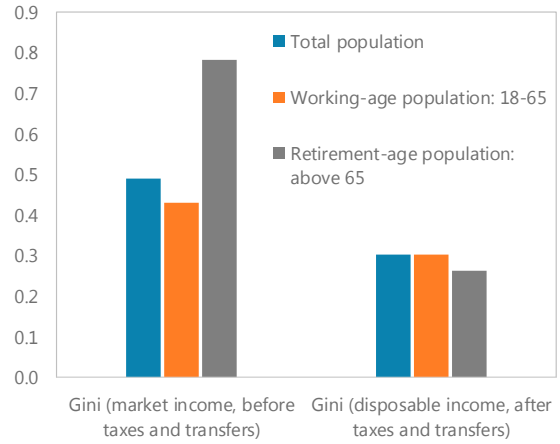
[23] This hypothesis cannot be estimated as ALMP spending is not available by age group.

[24] This variable is not included in our regression, since data availability on school- and work-based vocational programs is limited, reducing the sample size. Broader-based indicators of education levels are not significant.

A. Social Protection Systems Shielded the Elderly from the Impact of the Crisis and Fiscal Consolidation…

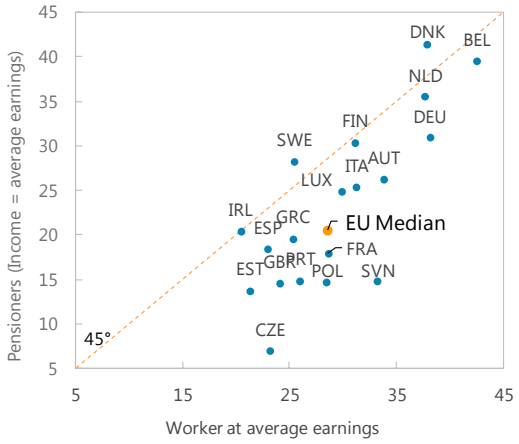
20. Fiscal redistribution in Europe is mainly achieved by focusing on the elderly. This situation reflects two main factors. First, there is the sheer size and large redistributive impact of pension spending. Except for Ireland (Box 4), the Netherlands, and the United Kingdom, most of the reduction in income inequality is achieved through public pension spending (Figure 4).[25] Market income inequality among the elderly is significantly larger than among the working-age population but becomes smaller after redistribution, owing to the large share of social spending on pensions (old age spending accounted for 53 percent of EU countries social spending in 2015; Eurostat, 2017), the redistributive impact of minimum pensions and, in many countries, caps on benefits (Avram and others, 2014). In other words, it is through the reduction of inequality among the elderly that most of the reduction of income inequality is achieved in Europe. While the impact of in-kind benefits on inequality across generations is not considered in this analysis, it is likely to be significant as health spending generally increases with the age of a person (European Commission, 2015a), especially toward the end of life. Second, pensioners benefit from a more favorable tax treatment than the rest of the population at the same level of income, such as extra tax allowances and full or partial relief on taxes and social security contributions on pension income (OECD, 2015b). However, the impact of taxes on reducing inequality plays a much smaller role than that of transfers.

OECD EU Average Redistributive Effect, 2014
(Gini score)



Source: OECD.

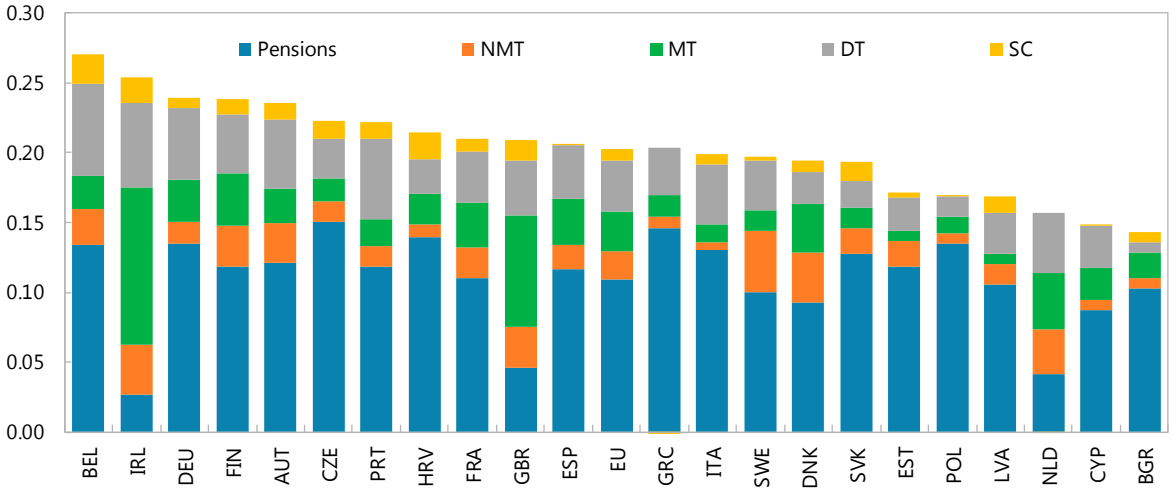
Personal Income Taxes and Social Security Contributions Paid by Pensioners and Workers
(Percent of earnings)



Sources: OECD Pensions at a Glance and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

[25] As the focus is on fiscal redistribution, the impact of privately managed pension schemes is not taken into account.

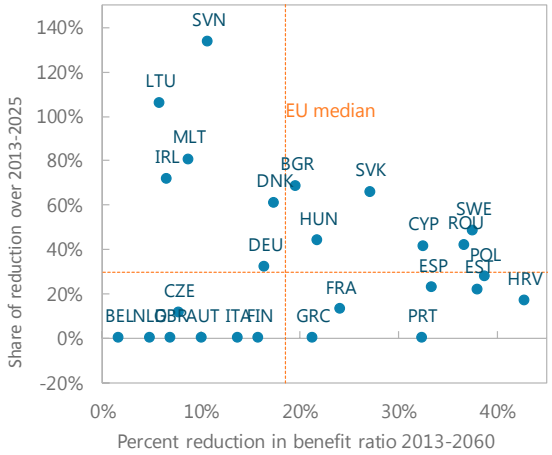
Figure 4. Decomposing Fiscal Redistribution by Instrument
(Reduction of the Gini coefficient achieved by fiscal policy, 2015 or latest)



Sources: EUROMOD and IMF staff calculations.
Note: Pension spending includes old age, disability and survivors. DT = Direct taxes, MT= means-tested spending, NMT = non-means-tested spending, SC = Social contributions. Data labels use International Organization for Standardization (ISO) country codes.

21. Pension reforms adopted during the global financial crisis protected current pensioners, while shifting most of the adjustment burden to future generations of retirees. Cuts in pension payments were temporary and more limited than for other social benefits, to protect acquired rights. Minimum pensions were preserved to avoid increasing old-age poverty. Pension reforms were primarily implemented for sustainability reasons. In many countries, most of the reductions in benefit ratios will be implemented after 2025, protecting workers close to retirement, although nearly 60 percent of the changes in eligibility ratio (share of public pensioners to population aged 65 and older) will take place by that date. Thus, though pension reforms make the system more sustainable and will reduce the burden on future working-age population, they also imply lower replacement rates and longer contribution periods for today's young. These are more difficult to meet as high unemployment and precarious jobs affect their contribution history. When they retire, today's youth may well face a higher risk of poverty than current pensioners.[26] They may also face higher burdens on their disposable income on

Projected Reductions in Benefit Ratios (2013–60) and Share of Reductions Achieved by 2025 (Percent)



Sources: European Commission, 2015a Ageing Report, and IMF staff estimates.
Note: Data labels use International Organization for Standardization (ISO) country codes.

[26] Social Protection Committee (2015) describes the treatment of unemployment periods.

account of higher public debt; analyzing the long-term consequences of recent fiscal policy, however, lies beyond the scope of this paper.[27]

22. Finally, in most countries, indexation of pensions insulated elderly citizens' purchasing power from the impact of the crisis. The statutory indexation of pensions,[28] though weakened on a temporary or permanent basis in many countries (European Commission, 2015b), contributed to real income increases for pensioners (Figure 2).

B. … But not the Working Age Population and, Notably, the Young

23. In contrast, owing to fiscal constraints, non-pension benefits were:

- ***not systematically indexed.*** In many countries, non-pension benefits adjustments lagged inflation, reducing their real value (Bargain and others, 2015; De Agostini and others, 2014; McKnight and others, 2016) and contributing to the decline in real incomes of the working age population (Figure 2). This is the case of the Czech Republic where all social benefits were de-indexed except pensions and housing benefits (Box 3) increasing the already high share of redistribution achieved through pensions (Figure 4).

- ***cut or curtailed in some countries.*** Family allowances, which play a crucial role in income support of the parents, in most cases regardless of their working status or of the young's involvement in education and training, were reduced in several countries such as the United Kingdom in 2013 and France in 2014–15 (OECD, 2014a; Social Protection Committee, 2015). Spending on youth work was reduced in many EU countries and more targeted on the needs of disadvantaged people (Social Protection Committee, 2015; Dunne and others, 2014). Thus, Hüttl and others (2015) argue that the growing inequality and poverty gap across generations was in part due to policy decisions because at a time when "youth unemployment and youth poverty rates increased, government spending shifted away from education, families and children towards pensioners."

- ***more targeted/means tested.*** As universalist programs often seem too expensive when public budget constraints become more binding, there is a tendency to increase the targeting of social spending and reduce universal benefits (Gugushvili and Hirst, 2014; van Oorschot and Roosma, 2015). The global financial crisis reinforced this shift. The impact on poverty and inequality critically depends on the design of the targeting such as eligibility criteria and limited take-up. This is illustrated with two cases, the Czech Republic and Ireland; each has high fiscal redistribution and has increased it in the past decade; Ireland by increasing means testing and the Czech Republic by moving from means testing to another way of targeting benefits based on variables correlated with poverty (notably the number of children) that avoid stigma, reduce administrative

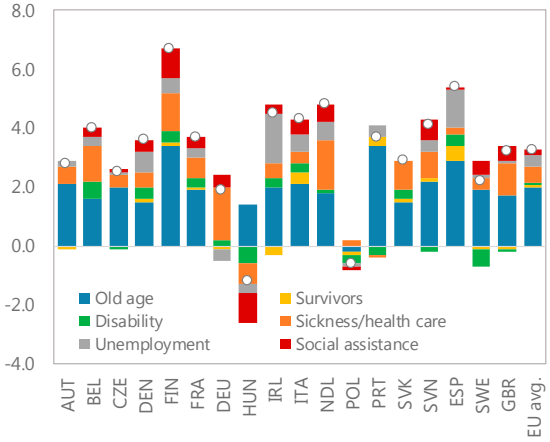
[27] Similarly, analyzing whether today's wealth differentials may contribute to widening income differential between young and old in the future lies beyond the scope of this paper.

[28] Pensions in the EU are linked to wages or prices (or to both) but recently there has been a trend to move toward price indexation (European Commission, 2015b).

costs and burdens, and minimize work disincentives (Boxes 3 and 4). Both approaches were successful. Their experiences show that redistribution can be improved in different ways.

24. Thus, old-age spending grew faster than other benefits, including automatic stabilizers. They contributed to more than 60 percent of the increase in social spending in Europe during the last decade. This is not driven by the aging of the population. Between 2006 and 2012, the number of pension beneficiaries in the EU increased by 3 percent, while real pension expenditure rose by 11.7 percent (Eurostat, 2016).[29]

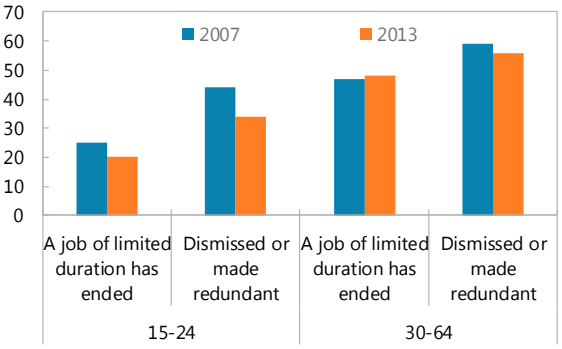
Composition of the Changes in Social Spending
(2007–14, percentage points of GDP)



Source: Eurostat.
Note: Social assistance covers family/children, social exclusion, and housing. Data labels use International Organization for Standardization (ISO) country codes.

25. The design of unemployment benefit systems also contributed to increased youth poverty. The share of young unemployed receiving unemployment benefits has declined since 2007 and is significantly smaller than the share for older unemployed (Leschke, 2015). Unemployment benefit systems offer less generous protection for the young than for the rest of the working age population mainly because of eligibility criteria and duration of unemployment benefits. Regarding eligibility, because unemployment benefits are insurance-based, they require a minimum contribution period (which varies across Europe), a criterion that the young have difficulty meeting, either because they are unemployed after leaving school or because precarious and short-term job contracts limit their contribution periods. In 2012, youth without employment histories were eligible for unemployment benefits or unemployment assistance in 10 of the 21 European Union members of the OECD. For those not eligible, social assistance was available everywhere except in two countries that had a minimum age requirement (Carcillo and others, 2015). Moreover, duration of unemployment benefits is often linked to a contribution period or the age of the unemployed (Arnold and others, 2015; Queyranne, 2017), leading to a shorter effective duration of unemployment benefits for the young.

Beneficiaries of Unemployment Benefits in the EU by Age Group and Type of Contract
(in percent of unemployed)



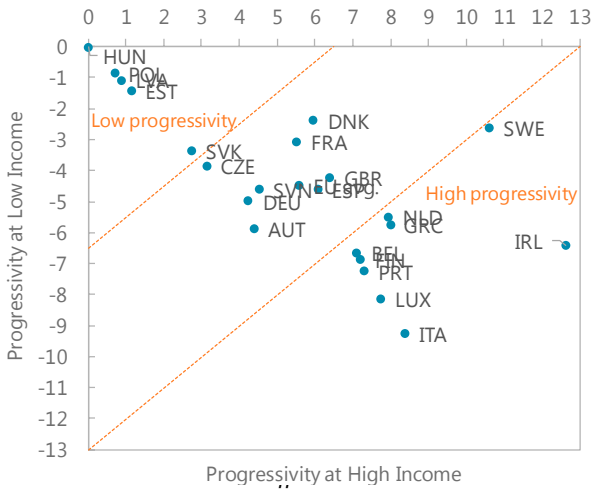
Source: Janine Leschke.

[29] Nonetheless, the fiscal consolidation resulted in the slowdown in the growth of pensions as "the growth in the number of beneficiaries was broadly constant each year over the period while most of the increase in expenditure was concentrated between 2006 and 2009 (9 percent rise) and only small increases were noted from 2010 to 2012" (Eurostat, 2016).

C. Taxes Could Play a Larger Role in Reducing Income Inequality

26. Taxes play a much smaller role in reducing inequalities in Europe (Figure 4). This is also evident in the findings above (Tables 1 and 2). First, indirect taxes (35.1 percent of total tax revenues), which are generally considered regressive (IMF, 2017), contribute more than direct taxes (33.8 percent) to revenue. In addition, social security contributions (SSC) are generally levied at flat rates, except in some countries which reduce SSC for low income earners (OECD, 2014). Progressivity of direct taxes (personal income tax and SSC) remains low in many countries at both lower and higher income levels, especially in Eastern Europe, contributing to their limited redistributive impact (IMF, 2017). However, many advanced European economies improved personal income tax progressivity for low-income earners through in-work benefits (Joumard and others 2012), and family benefits for low-income families with children (OECD, 2014b). Taxes on capital income and wealth, which are mostly borne by older generations, play a marginal role (both in terms of GDP and as a share of total taxes) including taxes on inheritances and gifts which could help limit intergenerational inequality. Importantly, there has been a sharp decline in taxes levied on capital and financial transactions in Europe during 2007–15 (Clements and others, 2015; IMF, 2017).

Personal Income Tax and Social Security Contribution Progressivity, 2015



Sources: OECD and IMF staff calculations.

Note: Progressivity at low (high) income level is calculated as the difference between the average rate of income tax and the employees' social security contributions for a single person (without children) at 67 percent of average earnings (at 167 percent of average earnings) and at average earnings. Data labels use International Organization for Standardization (ISO) country codes.

Box 3. Czech Republic: Reforming the Targeting of Social Spending

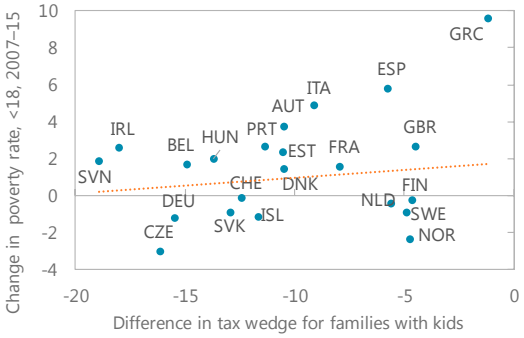
The Czech Republic has one of the lowest inequality and at-risk-of-poverty rates in the EU and OECD, while its social spending as a share of GDP remains below the average and heavily focused on pensions. The low inequality level can be explained by the redistributive policies targeted at low-income groups and most at-risk-of-poverty groups: the unemployed, single parent families, and families with two and more children.

In the 2007–08 tax and welfare reform, the Czech Republic moved away from income testing of family benefits to a single eligibility threshold, and simultaneously increased tax credits (basic and per child).[1] The objectives were to address some of the well-known drawbacks of means testing i.e., to make the social system simpler, cheaper and more user friendly by reducing the paperwork for the social service users. In addition, families with children enjoy a significantly lower effective tax wedge. Finally, all social benefits, except for pensions and housing benefits, ceased to be automatically indexed to cost of living measures, and the unemployment benefit was tightened.

Box 3. Czech Republic: Reforming the Targeting of Social Spending (Concluded)

Social benefits became more efficient at reducing inequalities and alleviating poverty. In contrast to many other countries in Europe, the risk of poverty of the young has declined in the Czech Republic while total spending on family benefits remained almost unchanged. Fiscal redistribution is reducing income inequality by the same amount in 2015 as in 2007 (a reduction of the Gini of 0.22). At the same time, pensions continue to play the biggest role in fiscal redistribution and were safeguarded at the time of post-crisis fiscal consolidation. However, unlike other European countries, it did not result in the increase in inequality across generations. Real incomes of the elderly grew slower than for other age groups and the ratio of 65+/18–24 incomes stayed below 1 (at 0.85 and unchanged).

Tax wedge Difference and Change in Youth Poverty
(percentage points)



Sources: Eurostat; OECD; and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

Recent fiscal measures adopted in 2016–17 include further increases in income tax credits for families with children. While these measures help reduce poverty and inequality, their design could be improved to bring down very high marginal effective tax rate on secondary earners, which is one of the key factors constraining labor force participation of women with young children.

[1] Key measures included the introduction of a higher standard tax credit (2008), the change in housing allowance and the social assistance supplement for housing (2007), the changes in family benefits (2007–08), the reform of the minimum living standard and the introduction of the single personal income tax rate. The first four of these reforms apply primarily to households with earnings below the average wage (Dalsgaard, 2008).

Box 4. Ireland: Increasing the Targeting of Social Spending

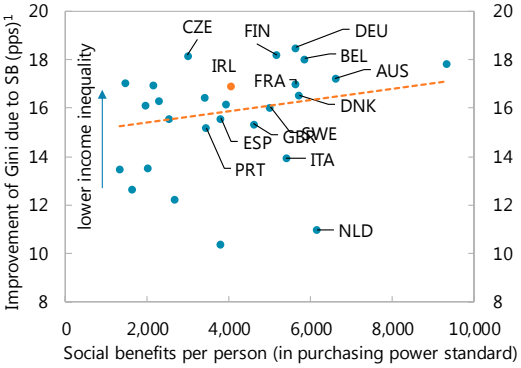
The Irish social protection system mainly targets the neediest through highly means-tested social transfers. Ireland combines a progressive tax system with a high share of means-testing of social benefits: about a third of social protection and about 55 percent of pensions, which play a limited redistributive role in Ireland, are excluded (Giustiniani, 2017).

During the global financial crisis, the share of means-tested benefits increased. Aimed at improving the social conditions of the most disadvantaged, while keeping adequate incentives to return to work, the system of social benefits was significantly recalibrated: eligibility criteria were tightened, means testing was strengthened, the duration of some benefits was shortened, and allowances were in some cases reduced, while back-to-work/school programs were reinforced. Recently, Ireland has sought to address work disincentives created by the tax benefit system by tapering the withdrawal of benefits when beneficiaries return to work.

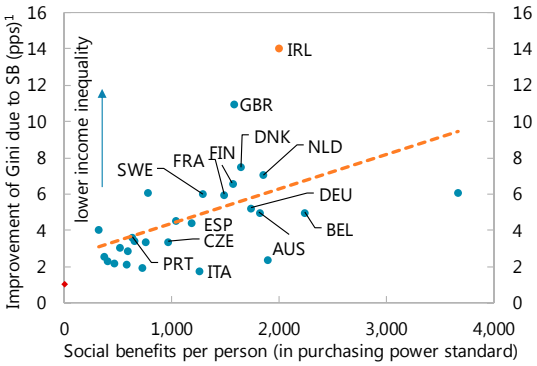
Ireland's welfare system performs strongly in mitigating income inequality and poverty. Social benefit spending in cash (in purchasing power and per capita) is in line with the EU average but its welfare system seems to be more focused on poverty reduction (measured by the difference between the share of population at risk of poverty before and after transfers) than on income redistribution. However, if pensions are excluded, Ireland's efficiency in redistributing income and fighting poverty is well-above EU peers. This suggests that the degree of income redistribution that other EU countries achieve through pension spending, is achieved through social benefits in Ireland and direct taxes.

Box 4. Ireland: Increasing the Targeting of Social Spending (Concluded)

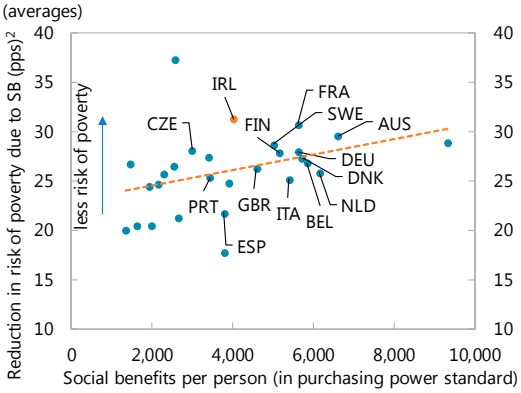
Income Redistribution and Social Benefits, 2007-14
(averages)



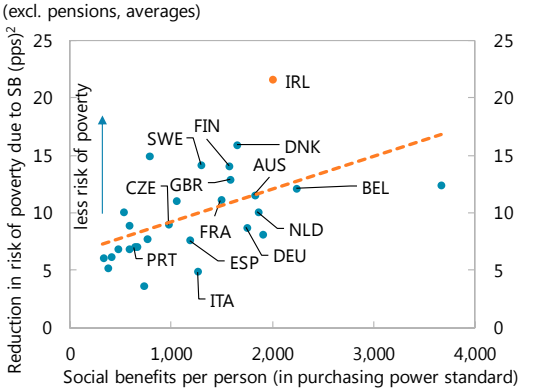
Income Redistribution and Social Benefits, 2007-14
(excl. pensions, averages)



At-Risk-of-Poverty and Social Benefits, 2007-14
(averages)



At-Risk-of-Poverty and Social Benefits, 2007-14
(excl. pensions, averages)



Contributor: Alessandro Giustiniani.
Sources: EUROMOD, Eurostat, and IMF staff calculations.
[1] Positive values indicate a lower Gini coefficient after social transfers and hence a more equitable income distribution.
[2] Positive values indicate a decline in the at-risk-of-poverty ratio due to social transfers.
Note: Data labels use International Organization for Standardization (ISO) country codes.

CONCLUSION: POLICY IMPLICATIONS

27. Overall income inequality has remained broadly stable in the EU over the past decade but disparities in poverty and income inequality across generations have increased markedly. Developments and drivers of overall inequality are well documented but the generational dimension of inequality has received much less attention. In Europe, real disposable incomes of the young have fallen behind those of other generations. Also, the young are facing increasing risks of poverty relative to those faced by other generations. This SDN is a first step in documenting these widening income and poverty gaps across generations in Europe and in discussing the role of labor market developments and public policies.

28. The ongoing cyclical upturn is likely to improve opportunities for the young, but policy measures aimed at labor markets, social protection, and fiscal redistribution are nonetheless needed to stop the young from falling further behind over time. Low youth incomes and youth poverty are rooted in high youth unemployment and weaknesses in public

policies. These problems, around for some time, have been aggravated during the latest recession. In many EU countries, the youth unemployment problem has reached macroeconomic proportions, with potentially grave social and political consequences. Addressing them may involve trade-offs between different generations but there are many measures that would be mutually beneficial, notably those that improve labor market functioning and the skills of the young and macro-economic policies that avoid large shocks. With significant disparities in income inequality and poverty across countries and regions in the EU, policies to address these problems will need to take into account each country's specific circumstances.

29. High youth unemployment has been a major source of growing youth poverty. Unemployment disproportionately affects the young. Also, there is a strong association in the data between unemployment and youth poverty. Facilitating the integration of the young into the labor market is a crucial task facing policymakers. In this regard, market-based and meritocratic institutions in general can help mitigate inequality of opportunity, offering relatively larger benefits for the young. Turning to more specific measures, these could target:

- *Raising labor demand.* As the labor tax wedge is contributing to higher unemployment, consideration could be given to reducing it for low wage workers—a segment of the labor market where there are many youth—through targeted cuts in social security contributions but without reducing eligibility for benefits. Alternatively, higher in-work benefits such as tax credits could create space to lower costs for employers.

- *Strengthening supply.* Well-designed apprenticeship systems, as well as ALMPs that emphasize on-the-job training and reduce skill mismatches, could provide a pool of workers with job-related experience and skills, improve the quality of available jobs for the young, and thereby help reduce labor market duality. To this end, careful design, monitoring, and evaluation, are required. This would, however, imply strengthening cooperation among employers, employee representatives, and the state, which is a long-term task.

- *Ensuring adequate social coverage in a changing job market.* Better protection of workers against the impact of less-stable working conditions through stronger integration into social protection systems could mitigate the insecurity associated with labor market duality, and could yield significant gains for the youth—while preserving labor market flexibility. This is becoming ever more important as automation and digitalization tend to increase the prevalence of such working conditions, particularly for the young. In the medium term, countries may need to revisit their social protection systems which are largely insurance-based and whose benefits mainly depend on employment history.

30. Fiscal redistribution needs to be more inclusive to better tackle youth poverty. Social protection schemes have reduced old-age poverty but they have not prevented an increase in youth poverty following the global financial crisis. Reducing youth poverty is likely to require additional resources. However, for countries with an already high level of social spending and a heavy tax burden, as well as limited fiscal space, this may not be an option. In these countries, reducing youth poverty and inequality across generations in a fiscally-neutral way may require partially rebalancing

fiscal redistribution to better protect the young, while continuing to protect minimum pension assistance schemes to avoid reversing the trend decline in old-age poverty. Reducing youth poverty and inequality across generations can be achieved by:

- *Reforming unemployment and non-pension benefits* to better address challenges arising from high youth unemployment and job instability. Rather than creating new allowances, this calls for reviewing eligibility requirements as well as the design and efficiency of transfers. It also implies better consideration of the distributional impact across age groups of spending measures and reforms implemented to achieve fiscal consolidation when needed.

- *Reforming pensions to increase sustainability and reduce inequality across generations.* In addition to ensuring a more uniform approach to indexation across benefits (pension vs. non-pension), pension reforms should aim to improve burden-sharing across current pensioners and future retirees.

- *Ringfencing and increasing the efficiency of education spending* and training of high school drop-outs to increase the capacity of the young to integrate more easily and on a more sustainable basis into the labor market. Investment in education reduces persistence of income inequality from one generation to the next and increases potential growth (IMF, 2017).

- *Increasing the redistributive impact of fiscal policy with a more progressive tax system.* Besides its direct impact on inequality, increased progressivity could raise the redistributive impact of non-means tested, taxable social benefits. Moreover, taxes on capital income and wealth could play a larger redistributive role.

- *Rebalancing the tax burden across generations.* This can be achieved in various ways, such as via reductions in social contributions paid by employees, while increasing a tax on all incomes paid by all households, as is being implemented in France, where this rebalancing can be revenue neutral but will have a redistributive impact.

Appendix I. Regional Disparities in Poverty and Real Income Across Europe[1]

Although this SDN focuses on aggregate European trends, undoubtedly inequality and poverty across generations also vary significantly across regions. To tease out the main insights from these regional disparities, we classify countries into six distinct regions, based on geographical location and key features in the design of their social protection system. Figure I.1 provides a snapshot of real incomes and poverty rates across age groups in each of these regions for the years 2007 and 2015.

- In *Western Europe*, real income rose across all age groups, but changes in poverty were less evenly distributed. The working age population experienced an increase in poverty, which was especially pronounced for the young—those aged 18 to 24 years old. Conversely, poverty among the elderly declined.

- In *Ireland and the United Kingdom*, real incomes declined slightly for the working age population, whereas real income of the elderly increased significantly. While poverty declined across all age groups, the decline was especially pronounced for the elderly.

- *Southern European* countries were hard hit by the global financial crisis. Real incomes declined for the working age population, most notably for the young. Whereas poverty among the elderly declined, all other age groups experienced a rise in the risk of poverty. Among the youth, the increase of more than 6 percentage points means that today one in four youths in Southern Europe is at risk of poverty.

- In *Northern Europe*, real incomes today are above their pre-crisis level for all age groups, but youth poverty is significantly higher in relative terms.

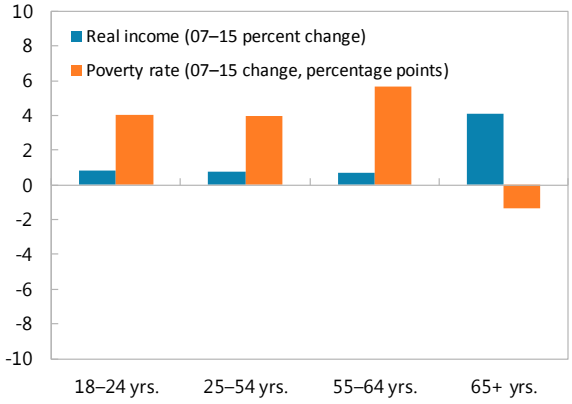
- In the case of *Eastern Europe and the Baltics*, real incomes across all age groups experienced growth relative to pre-crisis levels, and therefore the risk of poverty was more muted. However, it is also worth noting that, although the percentage change in the poverty rate was relatively low, the increase was nevertheless higher for the youth.

[1] The following regional aggregates are used in this section: Baltics (Estonia, Latvia, Lithuania); Eastern Europe (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovenia, Slovakia,); Ireland and the United Kingdom; Northern Europe (Denmark, Finland, Sweden); Southern Europe (Cyprus, Greece, Italy, Malta, Portugal, Spain); Western Europe (Austria, Belgium, France, Germany, Luxembourg, Netherlands).

Figure I.1. EU: Real Income and Poverty by Region, 2007–15[1]

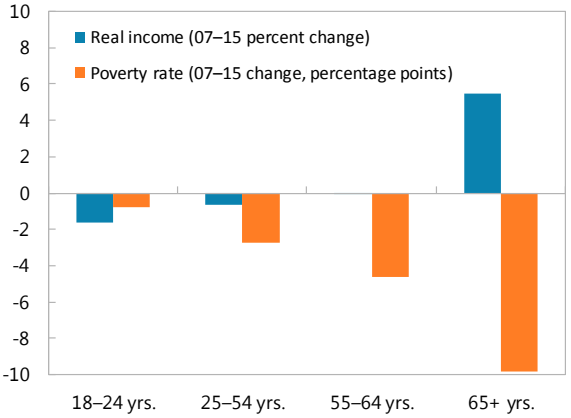
In western continental Europe, the poverty rate for the elderly has declined in contrast to other age groups.

Western Europe



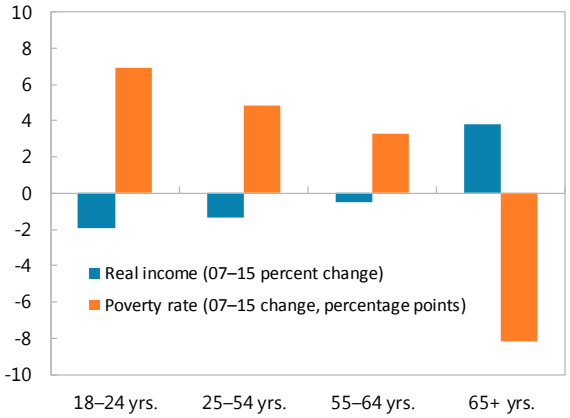
In Ireland and the United Kingdom, poverty declined for all groups, with the biggest decline for the 65+ group.

Ireland and the United Kingdom



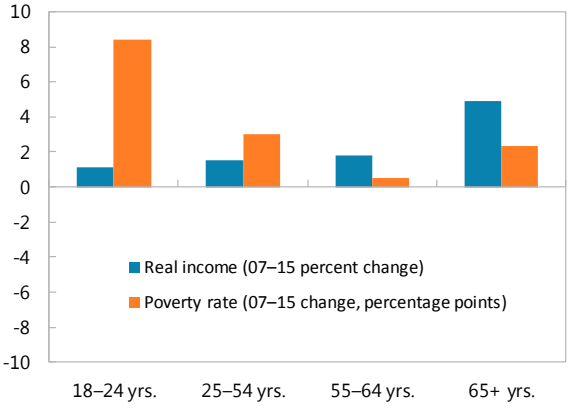
In the South, the income decline and poverty increase fell mainly on the young.

Southern Europe



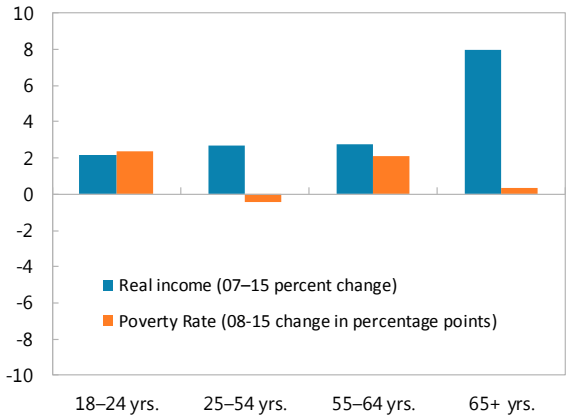
In the North, real incomes grew, but the young had the highest increase in relative poverty rate.

Northern Europe



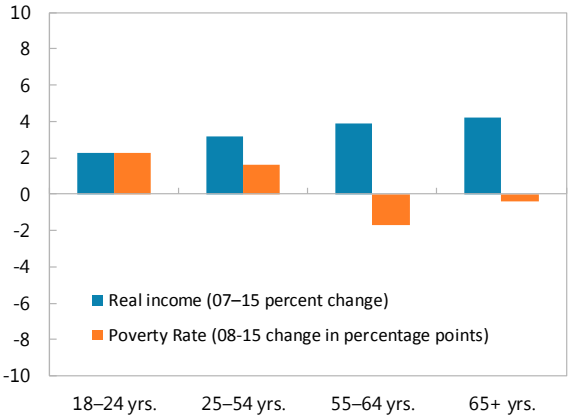
Real incomes increased the most in Eastern Europe…

Eastern Europe



…and the Baltics, keeping increases in poverty at bay.

Baltics



Sources: Eurostat and IMF staff calculations.

[1] Panel shows the compound annual growth rate of median equivalized real income and the change in percentage points of the persistent at-risk-of-poverty rate. Income as change from 2010–15 for Croatia. Poverty as change from 2008–15 for Eastern Europe and the Baltics, change from 2010–15 for Romania, change from 2009–15 for Bulgaria, and excluding Croatia.

Appendix II. The Econometrics of Assessing the Effects on Inequality, Poverty, and Labor Market Outcomes

A. Effect of Fiscal Policies and Labor Market Structure on Inequality and Poverty

Fiscal policies such as direct taxes and social spending are important due to their distributional impact (Martinez-Vazquez and others, 2012; Clements and others, 2015). At the same time, labor market structure affects inequality and poverty from the direct impact on employment and wage levels (Jaumotte and Buitron, 2015). We employ a panel regression setup to estimate the impact of fiscal policies and labor market structure on income inequality and poverty in Europe over the past decade. The sample consists of annual panels of EU countries over the period 2007–15. Specifically, the empirical analysis is based on the following fixed-effects specification:

$$Y_{it} = \alpha(Fiscal\ variables)_{it} + \beta\ (Labor\ market\ variables)_{it} + \gamma(Controls)_{it} + \theta_t + \eta_i + \epsilon_{it}$$

in which Y_{it} denotes the selected income inequality and poverty indicators (see below), $(Fiscal\ variables)_{it}$ include direct tax revenue in percent of GDP, public social spending in percent of GDP, and marginal effective tax rate of median income earner, $(Labor\ market\ variables)_{it}$ include long-term unemployment and labor market flexibility, $(Controls)_{it}$ is a set of standard control variables, including output gap, per capita income, education level, and trade openness (a proxy for the degree of globalization). As part of the robustness check (see below), we also consider additional variables such as composition of public social spending, labor market duality, and ICT capital stock (a proxy for technological progress). Table II.1 gives a full description of these variables and their source. While we attempt to use the appropriate econometric techniques, the reader should be aware that the estimation method may not adequately address the endogeneity of fiscal and labor market variables (e.g. the degree and persistence of income inequality and poverty may contribute to shaping fiscal policies and labor market structure by influencing public opinion regarding income redistribution.) and omitted variable bias (e.g. impact from market liberalization policies) in such macro-level cross-country estimations.

The analysis focuses on the heterogeneity of the effect of fiscal policies and labor market structure on income inequality and poverty across different age group. Regarding income inequality, we estimate the model described above by using as dependent variables both an aggregate inequality measure (i.e., Gini index of equivalized disposable income) and relative income ratios constructed using the median equivalized disposable income of different age groups against that of the young (i.e., 18–24 years old). On poverty, we look at both absolute poverty measure (i.e., severe material deprivation rate) and relative poverty measure (i.e., persistence of at risk poverty measure). We realign the dependent variables accordingly before estimation, given inequality and relative poverty measures from Eurostat have a one-year lag except for UK and Ireland as the data are based on the EU-SILC survey. We then estimate the baseline model for the overall population and for each age group with robust standard errors clustered at the country level. Tables II.2 and II.3 present the full set of the baseline results, including the results for the relative poverty measure.

The baseline results appear to be robust against different model specifications (Tables II.4 and II.5)[1].

- We first extend the model to explore the impact of composition of social spending by adding non-pension social spending in percent of total social spending, as different types of social assistance may induce different behavioral response hence affecting the impact on inequality and poverty (Neihues 2010). The results indicate that impact from a higher non-pension spending contribution to total social spending is small in reducing income inequality once controlling for the overall social spending level, and estimates are generally statistically insignificant (Table II.4, columns 1–2). Non-pension social spending contribution does not appear to affect much the poverty indicators either, except for older age groups (Table II.5, columns 1–3). The positive significant estimates may reflect the importance of pension payment in lifting people out of poverty for these age groups.

- Secondly, we assess the impact of labor market duality (Cazes and others, 2014) by introducing temporary employment share as a proxy of duality to the model. The results suggest very limited additional explanatory power of the temporary employment share variable. Estimates of impact on income inequality and absolute poverty indicators are statistically insignificant (Table II.4, columns 3–4, Table II.5, column 4). When relative poverty is considered, temporary employment share tends to reduce the risk of poverty for the working age group (statistically significant only for the 25–49 age group), but increase the risk of poverty for the group over 65 (Table II.5, columns 5–6), possibly reflecting impact on the denominator (i.e., the median disposable income level).

- Finally, we test the variation of standard control variables of the model by including ICT capital stock to control for technological development (Greenwood, 1997, Pavnik, 2011). The coefficient estimates in again show that they do not have any material impact on our baseline results (Table II.4, columns 5–6, Table II.5, column 7).

B. Impact of Labor Market Institutions and Business Cycle on Unemployment

We study the impact of labor market institutions and business cycle on unemployment using a panel regression setup. The sample consists of annual panels of EU countries over the period of 2007–14 subject to data availability. Specifically, we estimate the following fixed-effects specification:

$$Y_{it} = \alpha + \beta X_{it} + \theta_i + \eta_t + \epsilon_{it}$$

in which Y_{it} denotes labor market outcome variables in country i and at time t that include unemployment rates of different age groups (i.e., 15–24 years old and 25–64 years old) and their differences. Control variables X_{it} include variables on labor market institution, output gap, and interaction terms between output gap and a subset of labor market institution variables. To identify

[1] Selected results are presented. The full set of tables is available upon request.

the role of institutional factors, some studies use multivariate estimation (Jaumotte and Buitron, 2015) or employ univariate models with interaction terms (Banerji and others, 2015). We explore a combination of both approaches. Our model includes multiple labor market features. More specifically, we focus on tax wedge, union density, coordination of wage-setting, spending on ALMP training and share of temporary workers (see Table II.1 for variable definitions). In addition, the analysis includes interaction terms with output gap for share of temporary workers to examine the cyclical feature of its impact.

We have also tested additional institutional factors such as opportunity costs, hiring costs, labor market duality, collective bargaining, education, and labor market polices (as in Banerji and others, 2014). For instance, we used net replacement rate, inactivity trap, ratio of minimum to median wage, EPL, share of low- or high-educated workers, LMP categories 2–7, 8 and 9 (Table II.1) in different specifications. However, the result suggests that these variables are not statistically significant. Moreover, given multicollinearity among some of these labor market institution variables, we used a general-to-specific approach to eliminate explanatory variables to arrive at the specification analyzed in Section II. Nevertheless, the reader should be aware of potential biases of these estimates, as endogeneity issues including those from omitted variables are hard to fully tackle (Daveri, 2001).

Table II.1. Variable Definitions

Variables	Definition	Source
Absolute poverty	Severe material deprivation rate, share of population who have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: they cannot afford 1 to pay rent or utility bills, 2 to keep home adequately warm, 3 to meet unexpected expenses, 4 to eat meat, fish, or a protein equivalent every second day, 5 a week holiday away from home, 6 a car, 7 a washing machine, 8 a color TV, 9 a telephone.	Eurostat
ALMP spending on training	Spending on active labor market policy (ALMP) training in millions of purchasing-power-parity (PPP) euros as percent of thousand total labor force. This is a subcategory of ALMP measures (categories 2-7). These categories include training; job rotation and job sharing; employment incentives; supported employment and rehabilitation; direct job creation and start-up incentives. They exclude labor market services (category 1), out-of-work income maintenance and support (category 8), and early retirement (category 9) schemes.	Eurostat
Coordination of wage-setting	Index from 1 to 5. 1=fragmented wage bargaining, confined largely to individual firms or plants 2=mixed industry and firm-level bargaining, weak government coordination through minimum wage setting or wage indexation 3=negotiation guidelines based on centralized bargaining 4=wage norms based on centralized bargaining by peak associations with or without government involvement 5=maximum or minimum wage rates/increases based on centralized bargaining	Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts database
Direct tax revenue/GDP	Sum of personal income tax and corporate tax in percent of GDP	Eurostat and IMF, World Economic Outlook (WEO)
Education	Share of population with upper-secondary, postsecondary nontertiary, and tertiary education (levels 3-8).	Eurostat
Gini, net (log)	Logrithm of Gini index of equivalized disposable income.	Eurostat
Information and communications technology (ICT) capital per worker	ICT capital per worker, measured in thousands of 2015 US dollars.	Conference Board
Labor market flexibility	Index on hiring and firing practices, extent to which regulations allow flexible hiring and firing of workers, (1 = not at all; 7 = to a great extent).	World Economic Forum
Log of per capita income	Logarithm of GDP per capita, PPP (constant 2011 international dollars).	WEO
Long-term unemployment rate	Long-term unemployment in percent of active population.	Eurostat
Marginal effective tax rate	Marginal effective tax rate for median income earner.	Euromod
Net income ratio	Ratio of median equivalized net incomes between specified age group.	Eurostat
Non-pension social spending/total social spending	Social benefits spending excluding pension payments in percent of total social spending.	Eurostat
Openness	Trade openness, sum of exports and imports (goods and services), percent of GDP	WEO
Output gap	(Real GDP - Real potential GDP) as percent of real potential GDP.	WEO
Relative poverty	The persistent risk of poverty, share of population who have equivalized disposable incomes below the at-risk-of-poverty threshold (60 percent of national median) in the current year and in at least two of the preceding three years.	Eurostat
Share of temporary workers	Temporary employees as percent of the total number of employees.	Eurostat
Social benefit spending/GDP	Social benefits, including social transfers in kind in percent of GDP.	Eurostat and WEO
Tax wedge	Proportional difference between the cost of workers to their employer and the employees' net earnings.	European Commission Tax and Benefits Indicators Database
Unemployment rate	Unemployed population as percent of labor force in corresponding age cohort.	Eurostat
Union density	Trade union density corresponds to the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners (OECD Labour Force Statistics). Density is calculated using survey data, wherever possible, and administrative data adjusted for nonactive and self-employed members otherwise.	Organisation for Economic Co-operation and Development (OECD)

Table II.2. Income Inequality Panel Regression

VARIABLES	(1) Gini net (log)	(2) Net income ratio 25-49 to 18-24 group	(3) Net income ratio 50-64 to 18-24 group	(4) Net income ratio 65+ to 18-24 group
Direct tax revenues/GDP	-0.623*	0.405	-0.320	-0.734**
	(0.363)	(0.279)	(0.276)	(0.348)
Social benefit spending/GDP	-1.195**	0.0442	1.345***	0.887
	(0.523)	(0.659)	(0.475)	(0.990)
Marginal effective tax rate	-0.299***	0.126	-0.0865	0.139
	(0.104)	(0.283)	(0.280)	(0.326)
Long-term unemployment	0.0462	0.504*	0.821***	1.157**
	(0.312)	(0.263)	(0.224)	(0.502)
Output gap	-0.0417	-0.174	0.0915	0.160
	(0.118)	(0.142)	(0.127)	(0.174)
Log of per capita income	-0.314**	0.0330	0.0514	-0.574***
	(0.124)	(0.114)	(0.0901)	(0.166)
Education	-0.104	0.0543	-0.347*	0.296
	(0.209)	(0.208)	(0.195)	(0.338)
Openness	0.0136	0.0351*	0.0339*	0.0130
	(0.0155)	(0.0193)	(0.0198)	(0.0335)
Constant	7.138***	0.526	0.662	6.696***
	(1.359)	(1.243)	(0.977)	(1.793)
Observations	220	220	220	220
***R* -squared**	0.261	0.373	0.464	0.749
Number of countries	25	25	25	25
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes

Source: IMF staff calculations.

Note: Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Table II.3. Poverty Panel Regression

VARIABLES	(1) Absolute poverty Total	(2) Absolute poverty 18-24 group	(3) Absolute poverty 25-49 group	(4) Absolute poverty 50-64 group	(5) Absolute poverty 65+ group	(6) Relative poverty Total	(7) Relative poverty 18-24 group	(8) Relative poverty 25-49 group	(9) Relative poverty 50-64 group	(10) Relative poverty 65+ group
Direct tax revenues/GDP	-0.142	-0.313	-0.225	0.0227	0.0791	-0.451**	-0.785**	-0.408**	-0.342*	-0.356
	(0.147)	(0.190)	(0.158)	(0.175)	(0.398)	(0.170)	(0.368)	(0.163)	(0.180)	(0.379)
Social benefit spending/GDP	-0.907***	-1.347***	-0.857***	-1.037***	-0.793**	-0.168	0.763*	0.316	-0.216	-1.214***
	(0.207)	(0.423)	(0.206)	(0.235)	(0.335)	(0.199)	(0.446)	(0.203)	(0.199)	(0.419)
Long-term unemployment	0.334**	0.541**	0.432**	0.336**	0.0213	-0.0114	-0.164	0.000465	0.0432	0.0109
	(0.135)	(0.247)	(0.158)	(0.139)	(0.129)	(0.284)	(0.450)	(0.266)	(0.289)	(0.330)
Labor market flexibility	0.0192***	0.0235***	0.0180***	0.0218***	0.0139*	-0.0140**	-0.00937	-0.00594	0.00521	-0.0405**
	(0.00609)	(0.00800)	(0.00595)	(0.00602)	(0.00723)	(0.00627)	(0.0142)	(0.00594)	(0.00524)	(0.0161)
Output gap	-0.0136	-0.0231	-0.0134	0.00948	-0.0213	-0.0862	0.102	0.128	-0.108	-0.549**
	(0.0785)	(0.0979)	(0.0715)	(0.0743)	(0.127)	(0.0766)	(0.142)	(0.0888)	(0.0799)	(0.213)
Openness	0.00223	0.0165	0.000968	-0.00117	-0.00163	0.000336	-0.00203	0.00362	-0.0187**	0.0149
	(0.00606)	(0.0105)	(0.00675)	(0.00619)	(0.00918)	(0.00905)	(0.0114)	(0.00983)	(0.00857)	(0.0242)
Log of per capita income	-0.289***	-0.399***	-0.302***	-0.293***	-0.192	-0.145*	-0.245***	-0.151**	-0.0985	-0.128
	(0.0732)	(0.130)	(0.0668)	(0.0802)	(0.161)	(0.0798)	(0.0785)	(0.0658)	(0.0770)	(0.208)
Education	0.142	0.338	0.155	0.150	0.0928	0.260**	0.168	0.130	0.198**	0.397*
	(0.186)	(0.270)	(0.191)	(0.170)	(0.161)	(0.107)	(0.165)	(0.0989)	(0.0855)	(0.198)
Constant	3.112***	4.232***	3.249***	3.123***	2.098	1.678*	2.676***	1.646**	1.180	1.863
	(0.805)	(1.404)	(0.739)	(0.885)	(1.761)	(0.829)	(0.863)	(0.688)	(0.805)	(2.195)
Observations	226	226	226	226	226	190	189	190	190	190
R-squared	0.552	0.463	0.593	0.533	0.296	0.268	0.299	0.337	0.254	0.459
Number of countries	26	26	26	26	26	26	26	26	26	26
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: IMF staff calculations.

Note: Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

[1] For at-persistent-risk-of-poverty variables, lagged independent variables are used for the period in which dependent variables are measured, except for the global competitiveness indicator variable.

Table II. 4. Robustness Check of Income Inequality Panel Regression

VARIABLES	(1) Gini net (log)	(2) Net income ratio 65+ to 18-24 group	(3) Gini net (log)	(4) Net income ratio 65+ to 18-24 group	(5) Gini net (log)	(6) Net income ratio 65+ to 18-24 group
Direct tax revenues/GDP	-0.632*	-0.742**	-0.635*	-0.602*	-0.585	-0.767**
	(0.359)	(0.302)	(0.362)	(0.331)	(0.348)	(0.347)
Social benefit spending/GDP	-1.168*	1.368	-1.183**	1.082	-1.117**	0.903
	(0.619)	(1.208)	(0.544)	(1.000)	(0.516)	(1.002)
Marginal effective tax rate	-0.298**	0.144	-0.296**	0.177	-0.281**	0.105
	(0.110)	(0.343)	(0.115)	(0.331)	(0.102)	(0.334)
Long-term unemployment	0.0320	1.039*	0.0732	1.221**	0.0899	1.180**
	(0.346)	(0.533)	(0.313)	(0.493)	(0.333)	(0.497)
Non-pension social spending/Total social spending	-0.0246	-0.338				
	(0.208)	(0.216)				
Temporary employment share			0.0465	0.448		
			(0.451)	(0.632)		
ICT capital per worker					-0.00745	0.00357
					(0.00770)	(0.0129)
Output gap	-0.0397	0.138	-0.0600	0.161	-0.0222	0.163
	(0.119)	(0.168)	(0.118)	(0.182)	(0.114)	(0.175)
Log of per capita income	-0.310**	-0.479***	-0.301**	-0.510***	-0.305**	-0.579***
	(0.126)	(0.156)	(0.118)	(0.160)	(0.121)	(0.165)
Education	-0.101	0.309	-0.102	0.230	-0.00200	0.00355
	(0.210)	(0.324)	(0.215)	(0.341)	(0.00208)	(0.00360)
Openness	0.0127	0.0110	0.0153	0.00842	0.0136	0.0154
	(0.0158)	(0.0317)	(0.0153)	(0.0378)	(0.0165)	(0.0335)
Constant	7.098***	5.759***	6.995***	5.952***	7.096***	6.730***
	(1.375)	(1.696)	(1.293)	(1.742)	(1.319)	(1.803)
Observations	219	219	212	212	215	215
***R* -squared**	0.262	0.757	0.278	0.759	0.276	0.757
Number of countries	25	25	25	25	24	24
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Source: IMF staff calculations.

Note: Robust standard errors in parentheses. ICT is Information and Communications technology.

*** p<0.01, ** p<0.05, * p<0.1

Table II.5. Robustness Check of Poverty Panel Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**Absolute poverty Total**	**Absolute poverty 18-24 group**	**Absolute poverty 65+ group**	**Absolute poverty Total**	**Relative poverty 25-49 group**	**Relative poverty 65+ group**	**Absolute poverty Total**
Direct tax revenues/GDP	-0.0522	-0.306	0.223	-0.132	-0.305	-0.583	-0.161
	(0.140)	(0.213)	(0.342)	(0.161)	(0.180)	(0.443)	(0.148)
Social benefit spending/GDP	-1.048***	-1.044***	-1.118***	-0.812***	0.193	-1.033**	-0.926***
	(0.244)	(0.339)	(0.300)	(0.215)	(0.186)	(0.404)	(0.220)
Long term unemployment	0.364**	0.561**	0.160	0.383**	-0.0554	0.122	0.323**
	(0.152)	(0.264)	(0.118)	(0.140)	(0.252)	(0.337)	(0.149)
Labor market flexibility	0.0174***	0.0218**	0.00864	0.0191***	-0.00678	-0.0389***	0.0183***
	(0.00589)	(0.00793)	(0.00630)	(0.00628)	(0.00632)	(0.0127)	(0.00605)
Non-pension social spending/Total social spending	0.116	0.0308	0.251***				
	(0.0707)	(0.101)	(0.0834)				
Temporary employment share				0.300	-0.595**	1.119*	
				(0.224)	(0.215)	(0.602)	
ICT capital per worker							0.00239
							(0.00303)
Output gap	-0.0118	-0.0208	-0.0266	0.00284	0.126	-0.564***	-0.0179
	(0.0808)	(0.0955)	(0.128)	(0.0828)	(0.0802)	(0.190)	(0.0790)
Openness	0.00596	0.0115	0.00157	-0.00234	0.00901	0.00426	0.00332
	(0.00963)	(0.0151)	(0.0127)	(0.00632)	(0.00947)	(0.0185)	(0.00711)
Log of per capita income	-0.313***	-0.337***	-0.230*	-0.258***	-0.200**	-0.0411	-0.295***
	(0.0815)	(0.104)	(0.133)	(0.0837)	(0.0794)	(0.155)	(0.0725)
Education	0.137	0.318	0.143	0.126	0.180*	0.321*	0.00166
	(0.194)	(0.288)	(0.166)	(0.177)	(0.0972)	(0.181)	(0.00184)
Constant	3.322***	3.539***	2.380	2.756***	2.140**	0.979	3.170***
	(0.877)	(1.118)	(1.430)	(0.910)	(0.826)	(1.649)	(0.798)
Observations	201	201	201	219	186	186	216
***R* -squared**	0.534	0.476	0.320	0.567	0.376	0.499	0.556
Number of countries	26	26	26	26	25	25	24
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: IMF staff calculations.

Note: Robust standard errors in parentheses. ICT is Information and Communications technology.

*** p<0.01, ** p<0.05, * p<0.1

Appendix III. Data Quality and Comparability

A. Survey Data and Simulations

European Union Statistics on Income and Living Conditions (EU-SILC)

The EU-SILC is a panel survey conducted in EU and other European countries whose micro-household data underpin both the Eurostat *Income and Living Conditions* (ILC) database as well as the OECD *Income Distribution Database*. The survey provides both cross-sectional data pertaining to a given time or time-period as well as longitudinal data pertaining to individual-level changes over time, observed periodically or over a four-year period ("European Union Statistics on Income and Living Conditions (EU-SILC), Access to Microdata"). It has been noted that the comparability issues posed by differences in data collection across countries (for example, including reliance on household surveys as opposed to 'register' data) as well as the allowance for different concepts of self-employment income are addressed in the survey by conceptual harmonization of target variables and the so called "ex ante output harmonization model" employed by Eurostat. ("Comparative EU statistics on income and living conditions", 2007)

Limitations still exist, including the exclusion of social transfers in kind from disposable income, the exclusion of capital gains, and the restriction of the data to the population living in private households.

Labor Force Survey (LFS)

LFS data in the period relevant to this note are considered highly comparable across countries and time given the EU-LFS use of output harmonization. Increased content stability and frequency of surveys have also been implemented from 1998 to counterbalance allowances for country-specific surveys. Further information regarding data methodology as well as the underlying microdata can be found at the Eurostat EU LFS webpage ("European Union Labor Force Survey").

European Social Survey (ESS)

The ESS subjects itself to extremely stringent sampling and collection design, data processing, and quality assessment checks, recognizing that quantifying such concepts as preference or attitude are particularly prone to survey design error, non-representative sampling errors, or timing and national context biases. To this end, the ESS employs periodic reports on measurement quality and equivalence of survey responses vis-à-vis the concept of interest, frequent nonresponse bias analyses, response rate floors, and monitoring and recording of contextual data taken from national media ("Monitoring National Contexts").

EUROMOD

This multi-country tax-benefit microsimulation model simulates a standard set of tax and benefit instruments to analyze the impact of actual, proposed, alternative and hypothetical national policies on household incomes, work incentives, and government budgets of 27 EU countries both individually and at the EU-level. EU-SILC data constitutes a majority of the micro-data input on individual and household circumstances and ensures comparability at that level.

Data limitations preclude the model from considering benefit non-take-up and tax evasion, and although corrections are included in countries where these phenomena are widespread, further technical refinement is needed before the possibility of an overestimation of taxes and benefits can be rejected. Additional descriptions on methods and data are available in Sutherland and Figari (2013) and at https://www.euromod.ac.uk/using-euromod/statistics/.

OECD Pensions at a Glance

Pension systems of all sample countries are directly comparable and encompass reforms legislated before June 2015 as well as all parameters of the system from 2014 onwards. Values reflect benefits of an individual worker entering the system today at age 20 and retiring at a normal pension age defined the statutory retirement age. A single set of economic baseline assumptions (10) are used for all countries such that observed differences in pension levels reflect differences in the system and policies alone (OECD, 2015b).

B. Measuring Poverty

At Risk of Poverty Thresholds and Rates

Unless otherwise indicated, the relative *at-risk-of-poverty threshold* is defined as 60 percent of the national median equivalized disposable income. The *at-risk-of-poverty rate* is then calculated as the proportion of persons with an equivalized disposable income below that threshold. Where figures for subgroups exist, they are calculated based on the poverty threshold for the entire population. (Eurostat, 2014) The *persistent* at-risk-of-poverty rate shows the percentage of the population living in households where the equivalized disposable income was below the at-risk-of-poverty threshold for the current year and at least two out of three of the preceding years.

Issues with Relative Poverty

The measures of poverty defined above are some of the most commonly used and fall under the category of relative poverty, or the proportion of people earning less than a set proportion of a country's median income. When examining poverty over time, however, it is important to note that these relative measures obscure the effects of changes to the poverty threshold that occur when the living standards of the entire population change. This was certainly the case after the financial crisis, when countries saw an overall decline in national income which led to a decrease in the median income, allowing relative poverty to remain somewhat stable and masking the absolute

deterioration of living conditions.

More conceptual concerns regarding the sole use of income as a proxy for living standards and poverty point out that the omission of other assets and wealth from the calculus, while understandable given the scarcity of data on wealth, presents an incomplete picture of economic well-being (Foster and others, 2013).

A Note on Equivalization

The process of equivalization of household income is necessary to disaggregate households into individual population units for analysis, however the implicit assumption of equally-shared income can be problematic, particularly for the youngest dependents. If the main breadwinners in a household are over age 25, measures of youth poverty (18–24) based on equivalized household income would likely underestimate youth poverty; if the young are the main breadwinners, then youth poverty would be overestimated. Recognizing that youth incomes are closely tied to those of their parents when they live in the same household, we have chosen where possible to exclude children under 18 from the analysis.

Alternative Measures

To isolate the development of poverty over time from the effects of changing poverty lines, some measure of absolute poverty is required. This can be accomplished by fixing the cutoff level of the poverty threshold even in the face of economic distress or growth, as is the case with measures of *anchored poverty*. Here, the indirect effects of changing standards of living are held constant (except for inflation adjustments).

Material Deprivation is another, broader approach to poverty measurement which includes considerations of both income and wealth, and aggregates various dimensions of non-monetary well-being into a single measure. This sort of asset-based poverty measurement is critical in capturing an individual's "command over resources"; something that income measures alone cannot communicate (Boarini and others, 2006).

Alternative Approaches in the Measurement of Poverty

	Input-based methods (indirect measures)	Outcome-based methods (direct measures)
Monetary measures	Income measures, budget-standard approach	Basic needs measures
Non-monetary measures	Access to employment, public services	Material deprivation measures, capability indicators (e.g. life expectancy, literacy)

Source: OECD.

C. Measuring Inequality

This note relies primarily on EU-SILC measures of median equivalized net income as well as Gini indices to examine income distribution and inequality across regions and age groups. Recognizing the extremely multi-faceted nature of inequality, additional structural dimensions such as labor market dualities, the unevenness of access to social safety nets, and inequities in redistributive schemes are also examined. Wealth inequality, yet another important driver, is outside the scope of this note.

Equivalized Disposable Income

Statistics on disposable income refer to the total income of a household available for spending or saving, divided by the number of household members converted into equivalized adults by Eurostat. People with missing values for equivalized disposable income as well as those living in collective households and in institutions are excluded from calculations. The equivalence scale considers:

- the first household member aged 14 years or older as 1 person
- each other household member aged 14 years or older as 0.5 person
- each household member aged 13 years or younger as 0.3 person (Eurostat, 2014).

For the purposes of regional time-series analysis, these data are converted into 2013 prices by deflating by national consumer price indices, indexed to 100, then weighted by PPP before aggregation into their respective regions.

Gini

One of the most common measures of inequality, the Gini coefficient is advantageous in that it is independent of the sample mean and population size, symmetrical, and sensitive to transfers of income from the top to the bottom of a distribution. Unless otherwise specified, figures and tables referencing Gini coefficients in this note refer to the Gini of equivalized disposable income. Unfortunately, because this index is not decomposable or additive across subgroups like age, it is not sufficient when a more granular analysis of the population is desired.

Labor's share of income, which has been declining steadily alongside the rise in the Gini coefficient in what appears to be a correlated fashion, has at times enjoyed popularity as a proxy for income inequality. Clements and others (2015) discuss the ways in which changes in labor shares affect the dynamics of income inequality, concluding alongside other recent examinations of this relationship such as Piketty (2014) that the unequal distribution of income *within* labor's as well as capital's share has more weight as a determinant of income inequality, particularly at the top of the wage distribution.

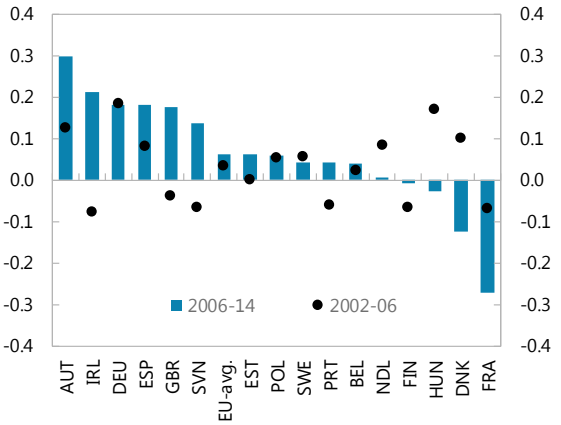
Thus, to provide a profile of income inequality across age groups, simple ratios comparing the median net income of one age group to another are also included in the analysis.

Appendix IV. Preferences for Redistribution

To illustrate the drivers of demand for redistribution in Europe we rely on the European Social Surveys using agreement to statement "Government should take measures to reduce differences in income levels" of the European Social Surveys. Answers range from 1 to 5 with 5 indicating the strongest agreement with the statement. The survey is conducted every two years and is available up to 2014. It covers most but not all EU countries. Changes in demand for redistribution can be measured for 16 EU countries for the period 2006–14 and 18 EU countries for the period 2002–14.

As illustrated in Figure III.1, the demand for redistribution is associated:

Change in Preferences for Redistribution, 2006–14 (Scores from 1 to 5; 5 is the most in favor of redistribution)



Sources: European Social Survey; and IMF staff calculations.
Note: Data labels use International Organization for Standardization (ISO) country codes.

- *Positively to the level of income inequality and even more to the level of poverty*. This is true for relative poverty (as measured by at-risk-of-poverty and persistence of risk-of-poverty rates) and absolute poverty (as measured by severe material deprivation). This suggests that the population expects fiscal redistribution to tackle both issues.

- *Negatively to the level of social spending*. This is a standard result of literature[1] that may explain why the three countries where demand for redistribution declined significantly over 2002–14 (France, Finland, and Denmark) are also the countries where social protection spending is the highest in Europe.[2] As social spending must be financed, the tax burden may also negatively affect preferences for redistribution. In this context, the period 2006–14 saw a massive increase in taxes for fiscal consolidation purposes in France.

- *Weakly to macroeconomic shocks and unemployment*. Though literature highlights the link between demand for redistribution and macro-economic shocks and notably being unemployed (e.g., Alesina and Giuliano, 2009; Guiliano and Spilimbergo, 2014), it appears relatively weak in Europe during the recent period. However, when the period 2002–14 is divided in pre-GFC (2002–06) and global financial crisis/post-global-financial-crisis period (2006–14), demand for redistribution increased significantly in countries that experienced most the impact of the crisis: Ireland, Spain, Portugal. Notably, while demand for redistribution was declining in Ireland and Portugal before the global financial crisis, it increased during the global financial crisis.

[1] For reviews of literature and empirical findings, see Alesina and Guiliano (2009), Olivera (2015), and Schmidt Catran (2016).

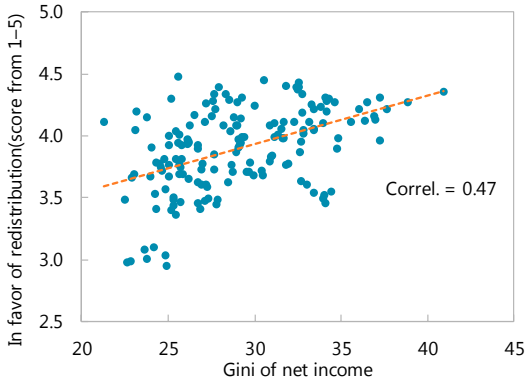
[2] 24.6 percent of GDP in France, 25.6 percent of GDP in Finland, and 23.6 percent of GDP in Denmark in 2015 (Eurostat, 2017). In contrast to France and Denmark, the decline was smaller in Finland during the period 2006–14 than during the period 2002–06.

- *Differ on which age group it should target.* When focusing on poverty, demand for redistribution appears more associated with children's and working age population's poverty than with elderly's poverty. Strikingly, there is a negative association with young adults' poverty (18–24 years old) suggesting that youth poverty is not the focus of the population concern with poverty. When one considers income inequality, demand for redistribution is more associated with income inequality among elderly than among working age population (Figure IV.2).[3]

Figure IV.1 Demand for Redistribution in Europe

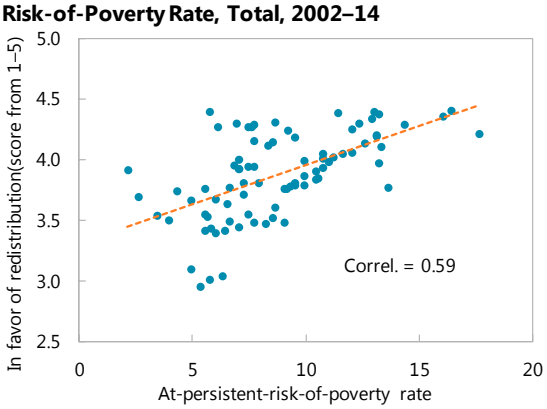
Preferences for redistribution are linked to the level of income inequality.

1. Preferences for Redistribution and Gini of Net Income, Total, 2002–14



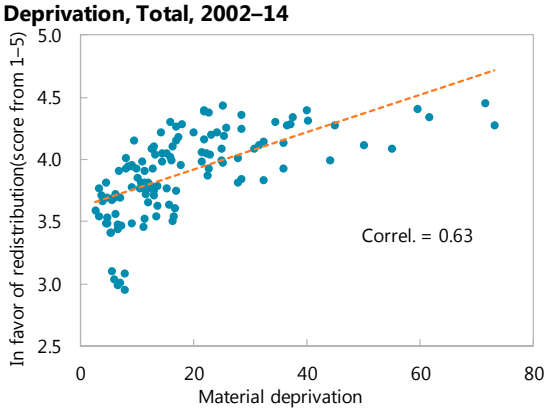
Preferences for redistribution is even more linked to relative poverty... 1/

2. Preferences for Redistribution and At- Persistent-Risk-of-Poverty Rate, Total, 2002–14



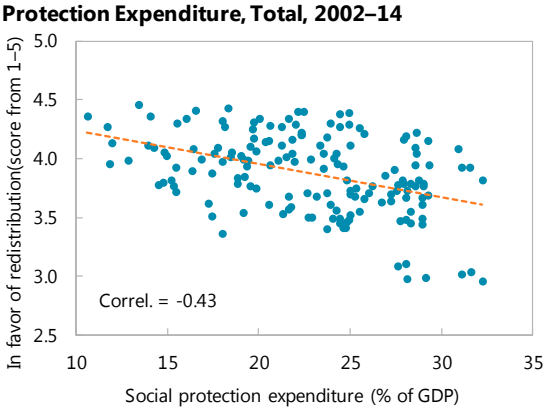
... and particularly absolute poverty.

3. Preferences for Redistribution and Material Deprivation, Total, 2002–14



And are negatively correlated to the level of existing social protection spending.

4. Preferences for Redistribution and Social Protection Expenditure, Total, 2002–14



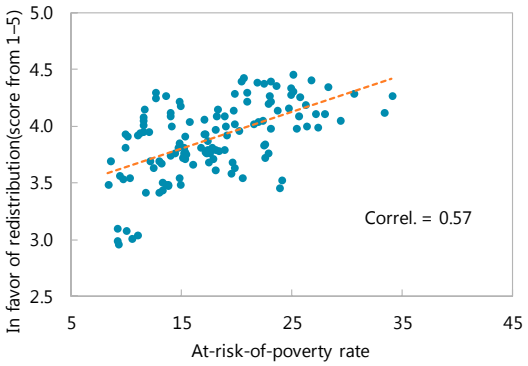
Sources: European Social Survey, Eurostat, and IMF staff calculations.
1/ Using at-risk-of-poverty instead of persistence of poverty provides a similar picture.

[3] Income inequality data distinguish only working age and retirement age population.

Figure IV.2. Demand for Redistribution in Europe and Poverty by Age Group

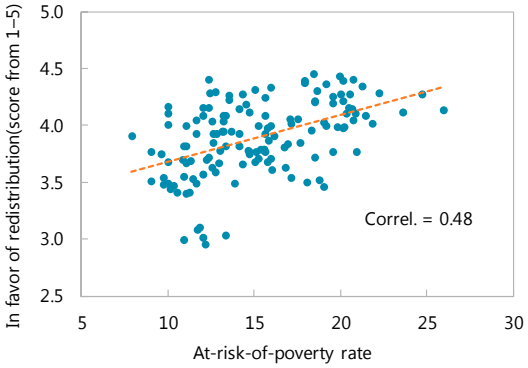
The link between demand for redistribution and poverty is driven by the risk of poverty of children…

1. Preferences for Redistribution and Poverty Rates, Less Than 18 Years, 2002–14



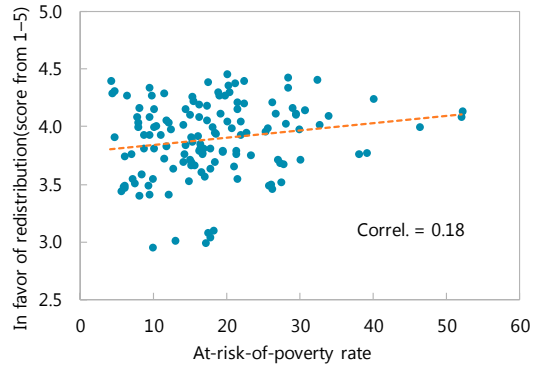
… and to a lesser extent the risk of poverty of the working age population…

2. Preferences for Redistribution and Poverty Rates, Total, 2002–14



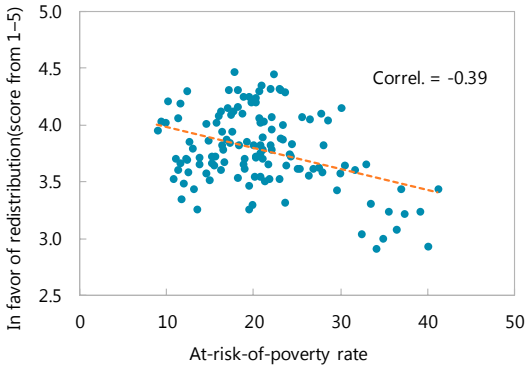
… but not by risk of poverty of people having reached the retirement age 1/

3. Preferences for Redistribution and Poverty Rates, Over 65 Years, 2002–14



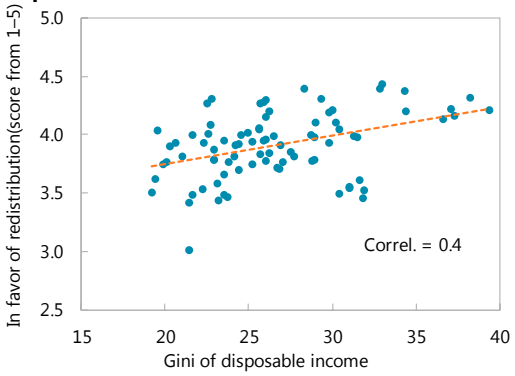
Strikingly, young adults' poverty does not appear to be a motivation for the demand for redistribution.

4. Preferences for Redistribution and Poverty Rates, 18 to 24 Years, 2002–14



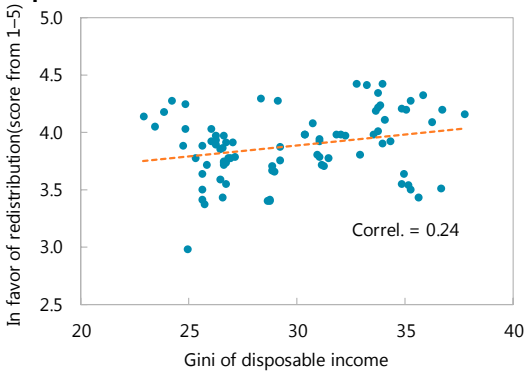
Income inequality of elderly is more closely associated with demand for redistribution… 2/

5. Preferences for Redistribution and Gini of Disposable Income, Over 65 Years, 2002–14



… than income inequality of the working age population.2/

6. Preferences for Redistribution and Gini of Disposable Income, 18 to 65 Years, 2002–14



Sources: European Social Survey, Eurostat, OECD, and IMF staff calculations.

1/ Using at-persistent-risk of poverty increases the correlation for elderly to 0.32 but remains significantly lower than for less than 18 years (0.49) or for the 18–64-year-old (0.55) while there is no correlation for the young between 18 and 24 (0.07).

2/ Using the market Gini leads to similar results.

Literature distinguishes two motivations for demand of protection: self-interest and social beliefs about fairness and social justice.[4] If self-interest is the main motivation, demand for redistribution of a specific age group should be more correlated to poverty / inequality affecting this particular age group than poverty / inequality of the whole population while the reverse would show if social norms are the main driver of demand for redistribution. Except in the case of the young, the correlations do not allow to distinguish the main motivation:

- For all age groups (less than 18, 18–64, 65 and older), the demand for redistribution is positively associated to all indicators of poverty, whether one considers the poverty of the whole population or poverty of the own age group.
- The demand for protection of the retirement age population is strongly associated to absolute poverty but little (and much less than for other age groups) to relative poverty. Again, this is true whether we look at poverty of the whole population or poverty of the elderly only.
- The demand for protection of the young (18–24years old) is positively associated to all indicators of poverty of the whole population. This link is stronger than for any other age group. However, the demand for redistribution of the young is not associated (or in one instance negatively associated) to poverty indicator of their own age group. This is the only case where social beliefs appear stronger than self-interest.

[4] The literature also shows that demand for redistribution is also linked to perceived social mobility and fairness of opportunity (Alesina and others, 2017; Benabou and Ok, 2001) and by personal history (Alesina and Guiliano, 2009; Guiliano and Spilimbergo, 2009).

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