STUDY ON INTERGENERATIONAL FAIRNESS

Final Report

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Abstract

English

This study provides original evidence about the relative economic conditions of different generations in EU countries and on the intergenerational impact of policies introduced after the global economic crisis started in 2008 from the perspective of intergenerational fairness.

To do so, the study makes use of statistical analyses of EU-SILC microdata and on simulations through the EUROMOD model to answer a set of research questions concerning the intergenerational effects of tax and benefit systems, automatic stabilisers and fiscal consolidation measures, in-kind benefits, possible policy scenarios, and the economic and policy preferences of different age groups.

The study includes a focus on the effects of the COVID-19 impact on the Italian labour market, measuring the cushioning effects due to both existing and new social protection measures introduced to support those hit by the economic consequences of the pandemic.

French

L'étude analyse, dans une perspective d'équité intergénérationnelle, la situation économique des différentes générations ainsi que l'impact intergénérationnel des politiques introduites après la crise de 2008 dans les pays de l'UE.

Pour ce faire, l'étude s'appuie principalement sur l'analyse statistique des micro-données d' EU-SILC et sur des modélisations réalisées à l'aide du modèle EUROMOD, afin de répondre à diverses questions relatives à l'équité intergénérationnelle. Celles-ci concernent les effets intergénérationnels : des systèmes d'imposition et de transferts sociaux, des stabilisateurs automatiques et des mesures d'assainissement budgétaire, des transferts sociaux en nature, de diverses mesures éventuelles ainsi que des préférences économiques et politiques des différentes générations.

L'étude analyse également l'impact de la crise de la COVID-19 sur le marché du travail italien ainsi que l'atténuation de cet impact grâce aux politiques de protection sociale existantes, mais aussi grâce à de nouvelles mesures de soutien aux personnes touchées par les conséquences économiques de cette crise.

German

Unter dem Aspekt der Generationengerechtigkeit liefert diese Studie neue Erkenntnisse über die relative wirtschaftliche Lage unterschiedlicher Generationen in den EU-Ländern und untersucht die generationenübergreifenden Auswirkungen der politischen Maßnahmen, die nach der Krise 2008 eingeführt wurden.

Die Studie führt statistische Analysen mit EU-SILC Mikrodaten und dem Mikrosimulationsmodell EUROMOD durch, um Fragen zu generationenübergreifenden Effekten von Steuer- und Sozialleistungssystemen, automatischen Stabilisatoren und Maßnahmen zur Haushaltskonsolidierung, dem Effekt von Sachleistungen, möglichen alternativen Politikszenarien und den wirtschaftlichen und politischen Präferenzen verschiedener Altersgruppen zu beantworten.

Außerdem befasst sich die Studie mit den Auswirkungen der COVID-19 Pandemie auf den italienischen Arbeitsmarkt und misst den mildernden Effekt der bereits bestehenden und neuen Maßnahmen zur sozialen Sicherung.

One-page summary

This report provides original evidence about the relative economic conditions of different generations in European Union (EU) countries. This evidence relies mostly on the European Union Statistics on Income and Living Conditions (EU-SILC), on econometric and statistical analyses, as well as using EUROMOD as a policy simulation tool.

The report is divided into seven chapters. Each of the first six chapters aims at answering the following six major questions about intergenerational equity in EU countries, and how it evolved from the period before the 2008–2012 economic crisis until present:

1. How can intergenerational fairness be defined, measured and assessed at the EU level?
2. How do EU Member States' tax and benefit systems perform in terms of redistribution across different age groups?
3. Did automatic stabilisers and fiscal consolidation, undertaken in certain EU Member States in the wake of the 2008–2012 economic crisis, impact upon different age groups asymmetrically? And, if so, in what way?
4. How did changes in spending on in-kind benefits affect intergenerational fairness?
5. What policy recommendations could be formulated to better support intergenerational fairness during the crisis period? What would have been the impact of such policies, had they been applied?
6. What political economy considerations are most relevant in the design of future policy measures to ensure intergenerational fairness?

These chapters present empirical analyses providing both a thorough assessment of the related concepts and a comprehensive description of the policy implications of the main findings.

Because of data availability, the empirical evidence presented in this report (in chapters 1 to 6) does not refer to the current COVID-19 crisis period. However, the report also includes a seventh chapter which, although it does not relate to intergenerational fairness considerations per se, presents the main findings of microsimulations about the effects of the COVID-19 crisis on the income distribution of individuals and households in Italy (in the year 2020).

The report also has a detailed annex (in a separate document) where, for each chapter, further original analyses, not included in the main text due to space constraints, are presented.

Main policy conclusions and recommendations

The report combines different approaches and methodologies to measure and assess intergenerational fairness in the EU.

Particular attention is paid to the effect on intergenerational fairness of tax and social protection benefits, in-kind benefits (health care and education), and reforms introduced following the 2008 economic crisis.

The main findings and recommendations from the report are outlined below:

- The lack of long and harmonised longitudinal datasets for most EU countries - following various generations in different phases of their lives - makes it difficult to analyse intergenerational fairness under a life-cycle approach (and to compare Member States under this approach)[1]. The further development of such datasets would thus contribute to inform the intergenerational fairness debate.

- Over 2002–2017, a higher share of total social protection spending was oriented towards the support of the elderly population than towards the support of the non-elderly population in the majority of EU countries. This pro-elderly orientation in social protection spending strengthened in most EU countries over time.

- Individuals in retirement age (i.e. the age group 65–74 and 75+) saw the strongest increases (or lowest declines) in real disposable income between 2007 and 2014 in EU countries on average (for both the equivalised household income and the individual income), while young adults (18–24) were those worst affected by the 2008 economic crisis.

- While the market income fell for people of working age following the 2008 economic crisis (especially over 2008–2011), austerity measures aggravated the situation between 2009 and 2011. Despite the subsequent introduction of expansionary measures, the welfare state was unable to compensate market income losses for the population of working age.

- Investments in healthcare and education would have significantly reduced poverty across the different age groups. Gains would have particularly affected older people in relation to healthcare, and households with a reference person aged 35–64 in relation to education, by alleviating their children expenses.

- The decomposition of overall income inequality showed that just a small proportion of it can be attributed to differences between age groups (i.e. between people of different age), as more than 95% of overall inequality is related to inequality within age groups (i.e. between people of similar age). This result is observed for both disposable income and extended income (i.e. when the monetary value of healthcare services and formal education is included in income).

[1] In terms of measurement of intergenerational fairness, the study highlights pros and cons of two possible approaches. The first approach consists in comparing individuals (from different generations) of different ages at the same point in time (i.e. in the same calendar year). The second approach would do the opposite and consist in comparing individuals (from different generations) when they were at the same phase of their life (at the same age), by comparing data from different time periods (i.e. longitudinal data spanning over different calendar years). While it would enable the measurement of intergenerational fairness across peoples' life cycle, such a life-cycle approach and possible international comparison under it are however heavily limited by the lack of sufficient longitudinal data. For this reason, the study almost exclusively rely on the first approach for its analyses, providing only brief experimental analyses on a few existing longitudinal datasets under the second approach.

- Member States have different policy options to address income inequalities among their citizens without affecting the balance of their public budgets. A set of revenue-neutral reform scenarios - combining, on the one hand, income from an additional income tax on individuals in the highest income decile or a reduction in the annual indexation of pensions together with, on the other hand, an enhancement of targeted social policies - is proposed and assessed. These scenarios reflect different possible goals for improving redistribution between and/or within generations.

- In terms of political preferences and perceptions, middle-age groups (aged 30 to 50) are more likely to support equitable redistribution of resources via the welfare state than younger and older age groups. Further estimates on self-perceived wellbeing suggest older-age individuals (typically over 70) tend to perceive their standards of living as good enough, while younger cohorts perceive inadequate state support, especially during recessionary periods.

- A preliminary analysis of the econcomic effects of the covid pandemic (for the year 2020) in Italy suggests that people at the lowest end of the income distribution are those who have suffered the largest market income losses. Yet, emergency measures introduced in Italy during the pandemic are estimated to have been effective in tackling such losses, mitigating the increase in poverty and even leading to a slight decrease in disposable income inequality.

Executive summary

Aims and research questions of the report

This report provides original evidence about the relative economic conditions of the different generations in European Union (EU) countries. This evidence has been obtained by using available micro datasets – mostly the European Union Statistics on Income and Living Conditions (EU-SILC) – and by applying appropriate econometric and statistical techniques, as well as by making use of EUROMOD as a policy simulation tool.

The report is divided into seven chapters. Each of the first six chapters aims at answering the following six major questions about intergenerational equity in EU countries, and how it evolved from the period before the 2008–2012 economic crisis until present:

1. How can intergenerational fairness be defined, measured and assessed at the EU level?

2. How do EU Member States' tax and benefit systems perform in terms of redistribution across different age groups?

3. Did automatic stabilisers and fiscal consolidation, undertaken in certain EU Member States in the wake of the 2008–2012 economic crisis, impact upon different age groups asymmetrically? And, if so, in what way?

4. How did changes in spending on in-kind benefits affect intergenerational fairness?

5. What policy recommendations could be formulated to better support intergenerational fairness during the crisis period? What would have been the impact of such policies, had they been applied?

6. What political economy considerations are most relevant in the design of future policy measures to ensure intergenerational fairness?

These chapters present empirical analyses aimed at answering these research questions, providing both a thorough assessment of the related concepts and a comprehensive description of the policy implications of the main findings.

Because of data availability, the empirical evidence presented in the report (in chapters 1 to 6) does not cover the current COVID-19 crisis period. However, the report also includes a seventh chapter which, although it does not relate to intergenerational fairness considerations per se, presents the main findings of original microsimulations of the effects of the COVID-19 emergency measures on the income distribution of individuals and households in Italy (in the year 2020).

The report also has a detailed annex (in a separate document) where, for each chapter, further original analyses, not included in the main text due to space constraints, are presented. The content of each chapter is summarised below.

Intergenerational fairness: Definition, measurement and assessment

Chapter 1 first discusses the two methodological approaches that may be adopted to analyse intergenerational fairness, and, afterwards, presents original analyses of

employment and income gaps between individuals belonging to different generations. The first approach compares outcomes achieved by individuals of different ages at the same point in time (year); the second approach compares outcomes of these individuals when they were of the same age (i.e. individuals are compared in different calendar years). Pros and cons of the two approaches are discussed. Whereas the first approach does not require a large amount of panel data, it has the limitation of being unfit to outline to what extent the gaps between individuals of different ages – which we consider as our main indicator for the intergenerational divide – are due to the different stage of life they are in (the 'age effect') or to different conditions experienced at the same age by individuals born in different years (the 'cohort effect').

By using EU-SILC data, Chapter 1 mainly adopts the first approach, and compares employment statuses, earnings and incomes of workers and equivalised individuals of different ages (in the same calendar year). To distinguish the role played by redistributive policies (i.e. taxes and transfers) on intergenerational fairness, findings concerning three different concepts of household income – market, gross and disposable income – are compared. However, relying on an Italian administrative dataset, the final part of Chapter 1 also presents insights about the comparison of individuals belonging to different cohorts along a significant portion of their life, following the second approach to intergenerational fairness.

A general finding is that, in all countries, younger workers (those aged between 15 and 24, and between 25 and 34) have lower labour incomes than workers of prime age (those aged between 35 and 44). Tax redistribution and transfers through unemployment benefits reduce the income age gap between workers, and the same reduction in the income age gap emerges when individual incomes are compared to equivalised incomes. However, the redistribution is not sufficient to close that age gap. Effective 'predistributive' measures – i.e. measures acting on the labour market (e.g. investment in individual human capital, labour market reforms reducing the segmentation that disadvantages younger workers, and product market reforms that, by reducing rents and entry barriers in some markets, may improve the competitive position of new entrant young workers) – should be strengthened and directed to improving the relative conditions of new generations.

Further, clear evidence emerging from this chapter is that – although older and more educated workers usually benefit from higher mean wages – a worker's age and education alone do not explain the major part of income differences between workers. The bulk of earnings inequality emerges within groups of individuals with apparently similar characteristics (including age). Of course, intergenerational fairness – here summarised as an age earnings gap – is a crucial issue, especially when these gaps are not related to differences in workers' ability or productivity. However, the main implication of the evidence shown in Chapter 1 should encourage researchers and policymakers to investigate why there is high earning inequality within groups of apparently similar individuals. This should also aim at assessing the acceptability of such high earnings gaps in the markets.

From the case study about Italy based on a suitable cohort-based data set, it emerges that – despite a generalised rise in women's labour market participation rates and a rising average level of education in the Italian population across the observed generations – employability and earnings of young individuals have diminished overtime. These findings provide initial evidence of worsening labour market conditions for younger cohorts.

Intergenerational fairness and the EU Member States' tax and benefit systems

Chapter 2 first focuses on the characteristics of the welfare state in EU countries, providing evidence on the age orientation of social protection spending across them, as well as on how this changed between 2002 and 2017. To this aim, the chapter first presents evidence on trends and the composition of expenditure on social protection benefits, especially from the Eurostat European System of integrated Social Protection Statistics (ESSPROS) database. The examination of the composition of social protection spending shows that, in all countries, spending in the sickness/healthcare function and in the old-age and survivors function represented the largest share of social protection benefit expenditure accounting, on average across the EU countries, for over 75% of total social protection spending in 2017. This evidence suggests that, in 2017, a higher share of total social protection spending was oriented towards the support of the elderly population groups rather than to the non-elderly population in most EU countries. The analysis of the dynamics of different social protection expenditures also points to a substantial increase in the share of total social protection spending oriented towards the support of the elderly population groups. Chapter 2 also presents an index of the age orientation of social protection spending, which corrects for differences in the population structure and in the unemployment rates across countries, and is therefore better suited to reflect differences in the relative generosity of the systems for different age groups. This index again reveals that there is a substantial orientation of social protection spending towards the support of the elderly population in all countries.

The chapter also examines the intergenerational fairness implications of the redistributive effects of taxes and benefits in EU countries based on microdata from EU-SILC. Since this chapter looks at the redistributive effects of tax and benefit systems in different EU Member States across all age groups and not only across the working-age age groups, old-age pensions are considered in it as part of social transfer income. Although public pensions are generally seen as part of the safety net, occupational and private pensions are not redistributive programmes per se and therefore arguably not suitable for capturing interpersonal redistribution. Despite these considerations, given that old-age pensions are the main source of income of pensioners, it would not be appropriate to exclude them from the analysis. Therefore, following the standard practice in the literature and given the aggregation of income sources in EU-SILC, we include old-age pensions (public pensions and occupational pension plans) as part of the social transfer income and private pensions as part of the market income.

In line with expectations, social transfers were found to account for a higher share of gross household income among older age groups than among younger age groups. Moreover, taxes and social security contributions were found to account for a higher share of gross household income among younger than among older age groups in many EU countries, pointing to the significant pro-elderly bias of the tax systems. Analysis of the changes over the 2007–2017 period revealed that the patterns of change were quite diverse across countries, with the pro-elderly bias of the tax systems becoming stronger in some countries, and weaker in others.

Breaking down the overall redistributive effects of taxes and benefits in each EU country into the redistributive effects of old-age pensions, non-old-age benefits and taxes reveals that, in most EU countries, the redistributive effect achieved by old-age pensions is much larger than that achieved by non-old-age benefits or by taxation, reflecting the fact that old-age pensions are the main source of income of pensioners. However, as discussed above, given that old-age pensions encompass both interpersonal and intertemporal redistribution, it is difficult to ascertain the degree of interpersonal redistribution within the overall effect. The analysis also revealed that taxes and non-old-age benefits in EU countries play a rather moderate role in redistributing between age groups. Investigating trends in the redistribution over the 2007–2017 period, Chapter 2 also reveals that, on average and in most EU countries, the redistributive effects of taxes and benefits declined. Although there is large cross-country variation, in most countries the decrease in the overall redistribution was driven by old-age pensions and non-old-age benefits, and to

a lesser extent by taxes. In most countries, changes in the inter-age-group redistribution were much smaller than the change in the intra-age-group redistribution. However, in some countries, the change in the inter-age-group redistribution made a substantial contribution to the overall change in redistribution (almost exclusively driven by the change in the inter-age-group redistributive effects of old-age pensions).

Finally, Chapter 2 also takes a direct account of household composition and reveals that a significant share of the redistributive effects of the tax and benefit systems in different EU countries is taking place within multigenerational households. On average, around 15% of the total redistributive effects of the social transfer systems in the 27 EU countries is accounted for by social transfers accruing to individuals, other than the benefit recipients and the members of their nuclear family, through shared living arrangements. The importance of these 'indirect' redistributive effects is higher in countries where the prevalence of multigenerational households is higher, reflecting the important role played by the family in these countries in protecting against poverty (and other social risks), especially when economic conditions are challenging, and adequate social protection systems are absent. These results also point to the impact of multigenerational living arrangements in offsetting some of the age bias of the tax and benefit systems.

The evidence presented in this chapter points to a rising pro-elderly bias in social protection spending and in the extent to which tax and benefit systems allocate resources across age groups in many EU countries. However, as discussed above, caution needs to be used because an essential function of old-age pension systems is to redistribute intertemporally over the lifecycle and, therefore, they cannot be purely seen as part of the safety net. Moreover, the intrahousehold sharing of resources – as our analysis highlighted – but also the interhousehold transfers may offset some of the effects of any potential age bias of social protection spending on the welfare outcomes of different age groups.

Intergenerational fairness and the effects of the 2008–2012 crisis

Chapter 3 makes use of the EUROMOD microsimulation model to analyse changes in real disposable income across generations from 2007 to 2014 and to assess the effect of changes in market incomes, automatic stabilisers and discrete policy changes on the incomes of different age groups.

According to the evidence shown in the chapter, individuals of retirement age, i.e. the age groups 65–74 and 75+, saw the strongest increases (or lowest declines in some countries) in real disposable income between 2007 and 2014, both when measured in terms of equivalised household income (+9.9% and +4.9% respectively for these two age groups at EU average level) and of individual income (+14.1% and +7.5% respectively for these two age groups at EU average level). Only in DE, EL, IE and IT, were the real incomes of pensioners lower in 2014 than before the 2008 economic crisis. The underlying effects leading to income increases for older age groups differ considerably across countries. In most cases, policy effects or automatic stabilising effects, hence the welfare state, were driving income increases, which is not surprising as the prime income source of older people is not the labour or capital market but public pensions.

When analysing income developments of the working age population, a strong difference emerges between the older group of working people (55-64), on the one hand, and the prime-working-age population (25–54) on the other hand. While the average incomes of the former improved, incomes of the latter decreased. This difference was largely driven by the market income effect, as the 55-64 age group had higher gains or lower losses, with the gap being most pronounced at the end of the crisis between 2011 and 2014.

The two youngest generations were negatively affected by the crisis, with income losses among young adults (18–24) more pronounced than those experienced by children (0–17). The former experienced, on average at EU level, real disposable income erosions of 5% at the household level and of 22% at the individual level. Neither the policy effect nor the automatic stabiliser effect were able to significantly compensate for market income losses for this age group. The incomes of the youngest age group fluctuated strongly, mainly driven by policy changes (e.g. child benefits). For the two youngest generations, as well as for the two oldest ones, a strong difference between equivalised household income and individual income was visible. This finding suggests that young people living in a household with their parents or grandparents were to some extent sheltered from the shock of the crisis.

Regarding the various subperiods in the 2007–2014 timespan, the results show a general trend of market incomes declining already in the 2007–2009 subperiod. The welfare state was able to compensate for those income losses mostly by discrete policy changes. In 2009–2011, unemployment and wage cuts continued, while policy changes exacerbated income losses. In the 2011–2014 period, market incomes widely recovered. Fiscal policies differed strongly across EU countries in that period. Automatic stabiliser effects were remarkably weak for young adults (18–24) and only to a limited extent compensated for market income losses.

Notably, the distributional effect of the crisis across generations was remarkably stable across countries and over the three observation periods. In particular, the finding that young people aged between 18 and 24 lost ground while older Europeans (especially those aged between 65 and 74) were the least affected by the crisis holds for the vast majority of countries. This might be often linked to structural factors. For example, young employees usually face the highest risk of becoming unemployed. In addition, welfare states often rely on insurance-based benefits, where eligibility is bound to a minimum employment period, and benefit levels depend on previous wages. Again, young people have comparably low incomes due to lack of seniority, and often do not qualify for unemployment benefits due to short employment periods.

Based on these findings, the chapter states that the best way for EU countries' governments to support intergenerational fairness during the crisis would have been to strengthen the employment and income conditions of young adults, including through more generous unemployment benefits (an issue investigated in Chapter 5).

Intergenerational fairness and in-kind benefits

Chapter 4 focuses on the link between in-kind benefits and intergenerational fairness by using a macro- and a micro-perspective. Specifically, the main factors related to intergenerational fairness are analysed in terms of public budget resources, reform trends, individual perceptions and the use of in-kind transfers. The chapter then provides a specific micro-analysis on income inequality by comparing disposable income and a measure of extended income (i.e. imputing monetary value to in-kind public transfers) in the three most populous EU countries (DE, FR and IT).

The time patterns of the various components of in-kind benefits are analysed by making use of data from Eurostat and the Organisation for Economic Co-operation and Development (OECD). A review of reforms introduced in EU welfare states is then conducted to verify whether these reforms have changed the generosity of in-kind benefit schemes available to individuals belonging to different age groups. Cross-country microdata recorded in the 2016 and 2017 waves of EU-SILC – which contain ad hoc modules with information about the use, affordability and financial burden of healthcare services and the affordability of formal education – are analysed to compare, across age

groups and countries, the individual probability of accessing healthcare and formal education services with or without some difficulty. Finally, the 2007 and 2018 waves of EU-SILC are analysed to compare levels and trends of inequality and poverty in the three EU countries with the largest population size by using the extended income approach, which adds to disposable income the imputed monetary value of health-related and education-related in-kind benefits. The monetary value of healthcare is attributed to each respondent in EU-SILC by following an insurance-based regression method while, in the case of education, the amount of yearly expenditure per student is attributed to all individuals who are studying in the year of the survey.

Results show that countries where healthcare and long-term care expenditure is higher are less likely to experience huge differences in access to healthcare services across age groups. Specifically, healthcare expenditure reduces the share of households experiencing difficulties in out-of-pocket payments for healthcare services, and higher healthcare expenditure is particularly useful to reduce the financial burden of medical care or medicines for older households, the ones that more frequently need medical services, with direct effects on the extent of intergenerational unfairness.

A similar result is found when the extent of intergenerational fairness is analysed with regard to education. In the vast majority of EU countries, households with a reference person aged between 35 and 64 years are the ones that frequently experience difficulties in facing formal education expenditure, as compared with other households. This result derives from the fact that individuals aged between 35 and 64 years often have children who are enrolled in tertiary education, which is generally more expensive than compulsory education.

The availability of in-kind services clearly reduces overall income inequality in DE, FR and IT. However, the extent of inequality mitigation deriving from in-kind benefits is mostly related to a reduction in income differences within a specific age class rather than to a direct reduction of intergenerational unfairness. In particular, by decomposing overall income inequality by age groups, it is shown that just a small share of overall income inequality can be ascribed to differences between age groups, while more than 95% of income inequality is related to inequality within age groups (even when the monetary value of healthcare services and formal education is taken into account). Consistent with the findings of Chapter 1, this result suggests that inequality is very often related to differences in individuals' characteristics within a given age class rather than to age differences. However, higher spending on education might reduce income inequality among the youngest, which is very often related to inequality in access to formal education.

Simulations on possible revenue-neutral reform scenarios

Chapter 5 uses EUROMOD microsimulations to assess the effect of 12 revenue-neutral reform scenarios on changes in the distribution of disposable income between generations during the crisis period. The analysis uses similar modelling techniques as in Chapter 3 to develop 'what-if' scenarios where the isolated distributional impact of policy reforms can be estimated. Simulated disposable incomes of different generations before (baseline scenario) and after the introduction of a policy in a given year are compared, thus keeping all other factors constant. In addition to the change in the intergenerational income distribution, the effects of reforms on the overall at-risk-of-poverty (AROP) rate and income inequality measured by the Gini coefficient (which measures economic inequality in a population) and the income quintile ratio (S80/S20) are analysed.

Considering there is no single fair or optimal distribution of disposable income across different generations, the chapter assesses whether simulated policies would have

maintained or reduced effective changes in the intergenerational income distribution during and in the wake of the crisis. Policies increasing government income are combined with policies increasing government spending into revenue-neutral reforms.

The analysis puts a focus on revenue-neutral reform packages that could have counteracted the divergent trends in the growth of disposable income observed in Chapter 3: the relatively strong growth of disposable income in the oldest age groups (65–74 and 75+), and the decline in disposable income among young adults (18–24) and children (0–17).

To increase government income, various scenarios are modelled: a reduction in the annual indexation of pensions by 1 percentage point (p.p.) after 2007, a reduction in the annual indexation of pensions above the median income by 2 p.p. after 2007, and an additional income tax of 10% on individuals in the top income decile. On the benefits side, the following scenarios are modelled: an additional unconditional child benefit (for those under 19 years of age), an additional unemployment benefit for young people (18–25) with no qualifying period, a 50% social insurance contributions (SIC) reduction for lower-income earners, and a means-tested anti-poverty benefit for households. The level of the benefits (expenditure side of the state budget) are determined by the amount of revenue generated by the respective reduction in pensions or by an increase in income tax (revenue side of the state budget). The level of the SIC reduction is fixed; thus, the number of beneficiaries depends on the amount of savings generated.

The effects of the policies are simulated for a sample of EU countries. The main finding is that an unemployment benefit for young people financed either by a decrease in pension indexation or by an additional tax on high-income earners would have reduced the divergence in income growth between young adults and older generations during the economic crisis. Furthermore, using the funds generated by a reduction in indexation of pensions over four years (2008–2011) would have reduced the differences in income growth between the young adults and the oldest age groups between 2007 and 2014. Using all funds generated by the simulated additional 10% tax on the incomes of people in the top income decile, however, would have overcorrected and raised the income of young adults more than that of other age groups in our sample. Child benefits, in combination with either pension indexation reductions or a top decile additional income tax, would have redistributed income to the youngest generation (0–17) and from an equivalised household perspective to their parents. However, each of the three revenue-generating policies would have generated more resources than required to bring the income growth of children between 2007 and 2014 in line with the average income growth across all generations. The SIC reduction for low-income earners financed by the tax on high-income earners would have redistributed income from high-income individuals to lower-income individuals, but it would not have significantly changed poverty rates or the income distribution between generations. In other words, this reform would have primarily redistributed income within generations, not between generations. The means-tested anti-poverty measure would have benefited the two youngest age groups the most. Most importantly, however, it could have been used to strongly reduce income inequality and poverty. If combined with the simulated tax on high-income earners, the anti-poverty benefit would have reduced the average AROP rate across the analysed set of countries from 16% to 6.1%, while the S80/S20 ratio would have dropped from 4.8 to 3.6.

In summary, the microsimulations carried out in Chapter 5 show that countries could have achieved a markedly different intergenerational and overall distribution of disposable income without changing the overall level of government budget balance.

Political economy considerations

Chapter 6 examines political economy considerations of equity and fairness between generations, deriving from choices that are revealed in individuals' preferences and attitudes. More specifically, this chapter investigates how intergenerational fairness is influenced by differences across age groups in their views on intergenerational equity, inequality aversion, and more generally institutions that respond to different intergenerational inequalities.

By using data from the European Social Survey, Chapter 6 identifies trends and age-group–specific effects in attitudes towards different components of intergenerational equity (considering a 'representative' individual in each age group in a weighted sample of EU countries). The main focus is on analysing age differences in the perception of equity and of the distribution of resources in the economy via the welfare state (pension, childcare and family), and more generally in attitudes to social equality and in inequality aversion across age groups. The chapter thus contributes to the reflection on the political economy of intergenerational fairness, and specifically looks at the changes that have occurred during the last decade since the onset of the 2008 economic crisis in the EU.

Important differences across age groups in attitudes towards equality emerge, where at EU average level it appears that middle-aged groups are more likely to support it. The same is true when estimates are run focusing on inequality aversion, since inequality seems to reduce public satisfaction more intensely among younger age groups. Attitudinal estimates are consistent with political economy explanations where older individuals tend to perceive that their standards of living are good enough, and younger cohorts, which are more likely to rear children, tend to believe they do not receive enough support from the government. Finally, Chapter 6 reports a negative and significant link between inequality and wellbeing.

Effects of the COVID-19 pandemic on income distribution: a preliminary outlook (for Italy for the year 2020)

Finally, Chapter 7, based on the main results of ongoing research, focuses on the current COVID-19 crisis period by estimating the effect of the pandemic on the income distribution of individuals and households in Italy. To this aim, using a static microsimulation model based on a link between EU-SILC 2017 data and the datasets of the Italian National Institute of Social Security (INPS), the effects of the pandemic are investigated on incomes obtained by those found in the various deciles of the distribution and on inequality and poverty indices. The analysis is carried out first by focusing on individuals, i.e. by simulating changes in earnings due to the pandemic, and then on households, i.e. by observing changes in equivalised incomes. For both units of observations, changes in market incomes (i.e. before public redistribution) and in disposable incomes are compared in order to measure the extent of the compensatory effect due to the redistributive measures already in place (e.g. the minimum income scheme called 'Citizenship Income') or those that were introduced or strengthened during the crisis – e.g. the Wages Guarantee Fund (CIG), the EUR 600 allowance, and the additional minimum-income scheme called 'Emergency Income'. The effects of the pandemic are simulated for the whole of 2020 under three different scenarios capturing an increasing duration of the pandemic (and related emergency policies). According to the reported results, Chapter 7 shows that the pandemic has determined a drop in workers' and households' disposable income, but the drop has been much lower than that the observed market incomes, thus signalling that the emergency measures introduced by the Italian government have been effective in partially cushioning the worsening of income distribution due to the pandemic. Importantly, market incomes drop more for those found in the poorest deciles of the distribution, because 'non-essential workers' – i.e. those employed in sectors whose activity was suspended due to lockdown measures – earn relatively less. However, the redistribution was rather effective since the ratio between the amount of the emergency

benefits received and the income loss was higher for the poorest than for the richer deciles. The chapter also finds a relatively moderate increase in the incidence of low-income individuals and in the AROP rate when emergency measures are considered. Furthermore, compared with the ‘no crisis scenario’, inequality indices largely grow in all scenarios when the focus is on market incomes, whereas they slightly decrease once compensatory welfare benefits are considered. This evidence clearly signals the crucial role played by cash welfare transfers to mitigate the most serious economic consequences of the pandemic.

Introduction

This study provides an analysis of intergenerational fairness in the European Union, by addressing different dimensions of this concept and evaluating the effects of possible policy reforms. Findings of the research, mostly relying on original analysis and simulations on EU-SILC microdata and using the EUROMOD tool, are organised as follows.

Chapter 1 presents original analyses of employment and income gaps of individuals belonging to different generations presenting two possible approaches: 1) Comparing outcomes achieved by individuals of different ages at the same point in time (i.e. in the same calendar year); 2) Comparing outcomes of these individuals when they had the same age (i.e. individuals are compared in different calendar years). The chapter then illustrates the possible outcomes of the different approaches. Despite limitations in data availability hindering the full deployment of the second approach, an experiment using Italian administrative data is provided.

Chapter 2 focuses on the characteristics of the welfare state in EU countries, providing evidence on the age balance of social protection spending and how this changed between 2002 and 2017. The chapter also examines the intergenerational fairness implications of the redistributive effects of taxes and benefits in EU countries.

Chapter 3 makes use of the EUROMOD microsimulation model to analyse changes in real disposable incomes across generations from 2007 to 2014 and assess the effect of changes in market incomes, automatic stabilisers and discrete policy changes on the incomes of different age groups.

Chapter 4 focuses on the link between in-kind welfare benefits and intergenerational fairness using a macro and a micro perspective. Specifically, the main factors related to intergenerational fairness are analysed in terms of public budget resources, reform trends, individual perceptions and use of in-kind transfers. The chapter also provides a specific micro analysis on income inequality by comparing disposable income and a measure of extended income (i.e. obtained adding to monetary disposable income the imputed monetary value to in-kind public transfers) in the three most populous EU countries: France, Germany and Italy.

Chapter 5 uses EUROMOD microsimulations to assess the effect of 12 revenue-neutral reform scenarios on changes in the distribution of disposable income between generations during the economic crisis period that started in 2008. By means of 'what-if' scenarios, the distributional impact of policy reforms is isolated and estimated. In addition to the change in the intergenerational income distribution, the effects of reforms on the at-risk-of poverty rate (AROP) and income inequality measured by the Gini-coefficient and the income quintile ratio (S80/S20) are analysed.

Chapter 6 examines political economy consideration of equity and fairness between generations deriving from choices that are revealed in individuals' attitudes, which in democratic societies influence the preferences of the average individuals in each country. More specifically, differences on views around intergenerational equity, inequality aversion, and more generally institutions that respond to different intergenerational inequalities are investigated.

Finally, Chapter 7 estimates the effect of the current pandemic on the income distribution of individuals and households in Italy. By using a static microsimulation model based on a link between EU-SILC 2017 data and administrative data, the effects of the pandemic on incomes obtained by those found in the various deciles of the distribution and on inequality and poverty indexes are investigated. The chapter also assesses the extent of

the compensatory effect due to the redistributive measures already existing before the pandemic and of those introduced or strengthened during the crisis.[2]

[2] *The results presented here are partly based on EUROMOD version I2.0+. EUROMOD is maintained, developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex, in collaboration with national teams from the EU member states. We are indebted to the many people who have contributed to the development of EUROMOD. The process of extending and updating EUROMOD is financially supported by the European Union Programme for Employment and Social Innovation 'Easi' (2014–2020). The results and their interpretation are the authors' responsibility.*

1. How can intergenerational fairness be defined, measured and assessed at the EU level?

Summary

This chapter discusses the two approaches that may be followed to analyse intergenerational fairness, the first comparing individuals of different ages at the same point in time (year) and the second comparing these individuals at the same age in different time periods. Pros and cons of the two approaches are clearly noticed, arguing that the first perspective does not require access to long panel data but has the limitation of being unfit to disentangle how much of the gaps among individuals of different ages are due to the different phases of the life where they are (the age effect) or to different conditions at the same age experienced by individuals born in different years (the cohort effect). By using EU-SILC data – specifically the 2007 and 2018 waves – this chapter mainly follows the first approach and compares employment status, earnings and incomes of individuals of different ages (incomes of equivalised individuals are computed with reference to household income), also focusing on how the conditions of the various generations evolved from 2006 to 2018. To distinguish the role played by redistributive policies (i.e. taxes and transfers) on intergenerational fairness, findings concerning three different concepts of household income – market, gross and disposable income – are compared. Furthermore, detailed analyses about the role played by age differences as a driver for income inequality are shown with a view to inferring whether focusing on mean differences between individuals of different ages is enough to capture the largest part of the level and trends of income inequality between individuals and households in EU countries. Finally, the chapter provides insights from the comparison of individuals belonging to different cohorts along a significant portion of their life, according to the second approach of intergenerational fairness. As harmonised longitudinal datasets for EU countries following various generations at the same phase of their lives are unavailable, an Italian administrative dataset is used to derive some implications on trends of intergenerational fairness by comparing labour market trajectories at the same stage of life (i.e. from age 25 to 34, and during the 10-year period following the entry into the labour market) of individuals born from 1950 to 1984.

1.1. Concepts and data

Intergenerational fairness may be considered from two, not necessarily alternative, perspectives, the first focusing on comparing individuals of different ages in the same point in time, the second comparing these individuals at the same age in different time periods.

Firstly, the focus is on the relative socioeconomic conditions of individuals belonging to different cohorts/generations (i.e. born in different calendar years, for instance in different decades) and living in the same point in time. According to this approach, intergenerational fairness might be, for instance, evaluated by comparing working conditions or the total amount of paid taxes and received benefits of those aged 30 and 60 in a given year. Based on the comparison of contemporary, but differently aged individuals, this perspective has the advantage that it can be observed by using cross-sectional data that is more easily available (e.g. through the EU-SILC, which will be

extensively used in this report). However, this kind of analysis has the limitation of not distinguishing between age and cohort effects.

Age effects relate to the fact that individuals' income and employment patterns evolve over the life course and, thus, individuals who belong to different cohorts but have exactly the same outcomes during their entire life would be characterised by gaps in their outcomes if observed at a given point in time when they are differently aged. For instance, two individuals with the same 'permanent incomes' and annual incomes which increase linearly along the work experience would be characterised by income gaps if they are observed in the same year when they are aged 35 and 55, respectively. Cohort effects relate, instead, to the fact that income and employment patterns may change across generations. For instance, in periods of intense economic growth the younger generations might benefit from better income dynamics over their entire working life in comparison with the previous generations or, in contrast, restrictive pension reforms might reduce pension prospects of the cohorts of active individuals in comparison with current pensioners.

As mentioned, comparing individuals of different ages at the same point in time (calendar year) does not allow researchers to distinguish age and cohort effects. For example, observing lower incomes for the younger generation in a certain year might be due to a general worsening of the younger cohort with respect to the older cohort – i.e. to a 'cohort effect' – or to a mere 'age effect' that might also have remained constant across generations (e.g. if wages grow with experience and the wage-experience path has not changed overtime). In other words, focusing on comparisons between individuals of different ages might prevent distinguishing between cohorts and age effects. In turn, this may hide the determinants of possible intergenerational unfairness if further analyses are not carried out.

To distinguish between age and cohort effects one should ideally be able to follow the second aforementioned approach which consists in observing individuals belonging to different cohorts along (at least) a portion of their life, e.g. comparing conditions at the same age of individuals belonging to different cohorts (i.e. observing them in different calendar years). The second approach has the major drawback that it requires long panel data to be carried out and, to the best of our knowledge, this kind of data exists only in the few countries where longitudinal surveys have existed for many years (e.g. Germany and the UK), or where administrative longitudinal data is extensively used for socioeconomic research (e.g. Northern European countries – where, however, this data is not freely available for researchers – and Italy, where longitudinal administrative data on workers' careers have been recently developed). Furthermore, this approach requires carrying out dynamic microsimulations about the future careers of individuals belonging to younger generations if aiming to compare the results of individuals belonging to various cohorts over their lifecycle (e.g. if aiming to compare the expected pensions of individuals belonging to subsequent generations). When proper longitudinal datasets are available, comparing cohorts' performances at a relatively young age, for instance when aged 30 or after 10 years from the entry in the labour market, is simpler since observed outcomes can be referred to and no microsimulations (unavoidably based on several assumptions) have to be carried out.

Therefore, from an empirical perspective, carrying out robust intergenerational comparisons which allow researchers to distinguish age and cohort effects is seriously affected by data availability and by a general lack of long panel tracking in EU countries of at least a representative sample of individuals belonging to various cohorts for at least a certain portion of their adult lives. Conversely, a detailed comparison of different cohorts observed in the same year (period) is much easier and less expensive to carry out. Even if, as remarked, this type of comparison does not allow researchers to disentangle age and cohort effects, it is well suited to show the relative income or employment conditions of differently aged individuals (or households with a differently aged household head) in a certain year. Mostly, this type of comparison – concerning, e.g. individuals' employment

status or income from various sources – may be carried out in a cross-country comparison fashion by using available datasets at the EU country level, such as the EU-SILC.

For these reasons, if interested in comparing a large number of countries, the first approach must be followed – and it is indeed the main approach that has been followed in this report, and also in this chapter – even if caveats about the possible intersection of age and cohort effects have to be highlighted and, likewise, implications and policy suggestions related to the results have to be assessed with extreme caution.

Nevertheless, in answer to the question that is the title of the chapter, both approaches are followed in what follows, even if, because of data availability, quantitative analyses for all EU countries are carried out according to the first approach only. Pure cohort studies have been carried out for the case of Italy only – by making use of the administrative-survey–linked panel AD-SILC – to provide an empirical exercise about the possibilities of comparing trajectories of different birth cohorts in the same portion of their lives (e.g. observing individuals belonging to different cohorts at the same age and, thus, in different calendar years).[3]

1.2. Comparing socioeconomic conditions of contemporary individuals belonging to different age groups

According to the first approach presented in Section 1.1, in this section we compare across all EU countries (considering the former EU-28 scope, i.e. also including the UK) the relative conditions of individuals belonging to the various age groups, also focusing on how these conditions evolved from 2006 to 2018 and how public policies – i.e. taxes and cash transfer systems (including allowances specifically devoted to workers) – act to cumulate or amplify differences engendered by the market. To this aim, we carry out descriptive and econometric analyses for all EU countries by using EU-SILC cross-sectional waves, thus distinguishing between the pre- and the post-2008 crisis periods.

In more detail, we use EU-SILC 2007 as the starting wave, since it is the first wave where all countries mandatorily presented gross values for all individuals' and households' income sources (before that wave, for instance, Southern European countries only recorded income amounts net of taxes), while, we use EU-SILC 2018 as the final wave, which is the latest wave delivered by Eurostat at the time of drafting this report. Hence, in this section we compare the socioeconomic conditions of individuals and households interviewed in EU-SILC 2018 with the conditions recorded in EU-SILC 2007.[4] Note, however, that for HR the first available EU-SILC wave refers to 2010, while EU-SILC 2017 is the last available wave for IE, MT, SK and the UK. Also note that, when considering annual incomes, EU-SILC values refer to the calendar year before the interview year (therefore, 2006 and 2017 in our case), apart from IE and the UK,[5] while other variables, e.g. occupational conditions, refer to the year of the interview. For convenience, despite the aforementioned slight differences for some countries, in this section we will thus refer

[3] Note that in this report, for space constraints, we provide neither population structure by age in the observed period nor projections of age pyramids in future years. However, this information is readily available on the Eurostat website (see https://ec.europa.eu/eurostat/databrowser/view/demo_pjan/default/table?lang=en for observed age pyramids in recent years and https://ec.europa.eu/eurostat/databrowser/view/proj_19np/default/table?lang=en for demographic projections).

[4] In all analyses shown in this chapter, we made use of the cross-sectional sample weights recorded in the EU-SILC.

[5] In IE, the income reference period refers to the 12 months prior to the interview while in the UK, it is centred on the interview date, and incomes are then converted to annual equivalents.

to 2006 and 2017 when income values are considered and to 2007 and 2018 when 'current status' variables are concerned.[6]

The focus of the project is to compare differently aged individuals. In this chapter, we distinguish individuals through five age classes – 15–24, 25–34, 35–44, 45–54 and 55–65 – when focusing on labour market outcomes (Sections 1.2.1 and 1.2.2), while we also add under-15 and over-65 age groups when observing equivalised income (i.e. when the unit of reference for computing income is the household; Section 1.2.3). Furthermore, when focusing on the age class of the head of household (i.e. the household member with the highest income, from any source), we consider three classes – under 34, 35–65 and over 65 – since almost no individuals are head of the household when aged below 25. The analysis of income gaps according to the household head age class are shown in Annex 1.

More in detail, this section is structured as follows.

Section 1.2.1 presents descriptive results and estimates obtained from multivariate estimates of the probability of differently aged individuals of being 'active' – i.e. being a worker or unemployed for a whole year – and of being characterised by negative labour market events, e.g. unemployment spells over a year or working through an atypical contractual arrangement (that is often involuntary and paid less than a standard contract).[7]

We then consider in Section 1.2.2 active individuals and observe, through both descriptive and econometric multivariate regressions, the distribution of mean annual earnings and labour incomes by age classes, also focusing on individuals' risks of receiving low incomes and paying attention to the inequality within youth. We analyse the determinants of income inequality within each age group and decompose income inequality by subgroups of individuals defined according to their age. To assess the role on intergenerational fairness played by the tax and transfer system, we compare gross income and net income values for countries which also present net values and we compare mean labour income including the amount of unemployment benefits received in the year.

Section 1.2.3 focuses on the household as the unit of observation. Individuals of different ages will be compared by looking at their equivalised income, i.e. the income gained by all household members, normalised through the equivalence scale to take into account the returns of scale of living in households of different sizes.[8] We will thus compare, through descriptive and econometric analyses, mean equivalised income and relative poverty risks of differently aged individuals and will investigate income inequality within age groups through decomposition exercises. The intersection between individuals' low pay and household poverty risk will also be interrogated. We will also compare findings concerning three different concepts of household income – market, gross and disposable income – to capture the role played by redistributive policies (i.e. taxes and transfers) on intergenerational fairness assessed through equivalised income.

Furthermore, to better highlight intergenerational fairness among households with different compositions, Annex 1 shows the distribution of equivalised household income by considering age groups defined according to the age of the household head – that is

[6] Note that in the tables and figures presented in this section, we do not specify that HR, IE, MT, SK and the UK differ in relation to observed years.

[7] Despite being aware that a part-time contract may be voluntarily requested by the worker, we include part-time arrangements among the disadvantaged labour market statutes, as in this chapter we are mostly interested in analysing earnings differences and whether part-time contracts are associated with lower labour incomes.

[8] To compute equivalised income, we use the 'OECD modified scale' which assigns 1 to the household head, 0.5 to all members aged at least 14 and 0.3 to members aged less than 14.

defined as the main income earner within the household (independently of the income source) – instead of according to the age of each household member.

Finally, in this chapter, the most insightful evidence – obtained comparing socioeconomic outcomes of individuals belonging to different age groups in EU-28 countries in two points in time and according to several income concepts – is presented through tables and figures. Further detailed tables, especially regarding the distribution of labour market status and mean incomes in the various age classes in 2006 and 2017, are included in Annex 1, even if they are not commented on in detail in the following sections.[9]

1.2.1. Individuals' labour market outcomes

Comparing labour market outcomes of young individuals requires a clear definition of which groups of individuals are defined as a worker or as an active individual. Negative labour market performances of the young might indeed depend on worse outcomes of individuals similarly participating in the labour market, or to a different degree of participation to the labour market. For instance, younger individuals might prefer a short-term or fixed-term arrangement since they are still in education.

To disentangle the observation of labour market variables and earnings levels from the confounding presence of different motivations behind participation choices by youth, in Sections 1.2.1 and 1.2.2 we rely on a rather stringent definition of 'active' individuals. Indeed, we consider as active only those individuals who report in the EU-SILC interview to have been employed (full- or part-time) or unemployed for the whole calendar year recorded in the wave (i.e. 2006 and 2017). In other words, we exclude from the definition of active individuals all those individuals that in the observed year have spent – according to their self-reported labour market status – at least a month over the year as a student, a pensioner, disabled or unfit to work, or as an inactive person (we include among the inactive those in compulsory military service or fulfilling domestic tasks and care responsibilities).

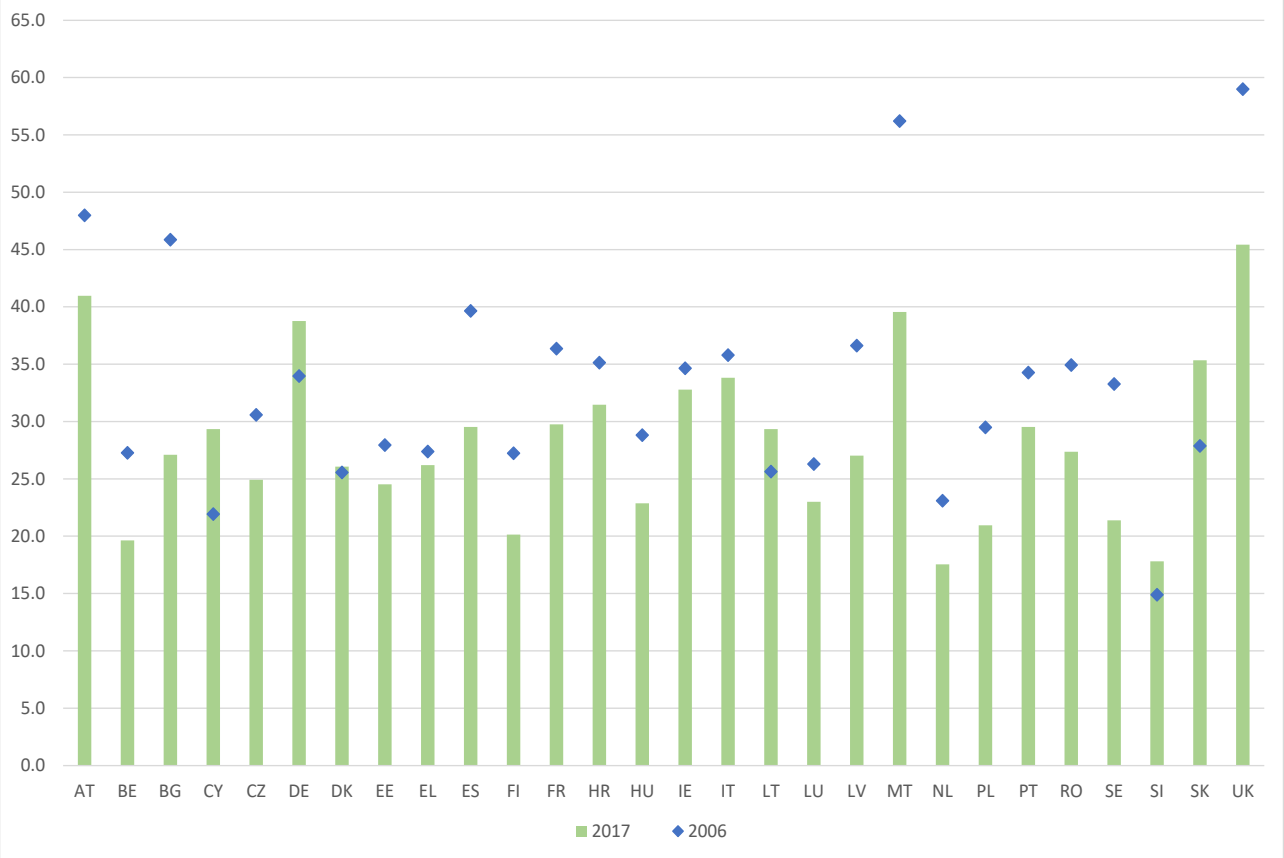
Figure 1.1 shows that the share of individuals aged 15–24 considered active according to our definition differs greatly across EU countries: in 2017, the UK had the highest value (45.4%), followed by BE (41%), while the lowest values belonged to NL (17.5%) and SI (17.8%). Moreover in 23 out of 28 countries, the share of active workers has reduced from 2006 to 2017 and the size of the reduction was significantly large in some countries (e.g. BG, MT, ES and SE). This reduction might be due, on the one hand, to an increase in participation in tertiary university programmes by young people but, on the other hand, might also reflect worsening labour market conditions that place a large share of young individuals into the category of NEET (Not in Employment, Education or Training).

Disadvantaged labour market conditions for young people emerge when estimating the number of months spent in unemployment by active individuals in 2017 (see Table A1.2, where individuals' socio-demographic variables are included among the covariates; we run regressions by each EU country and the same estimation model is used for all EU countries). The table expresses the variation in the number of months in unemployment for individuals of different ages with respect to individuals aged 35–44 (the reference category in the estimates). This is due in part to the long period of time spent searching for a first job after the end of a young person's studies. In all countries, except DE and NL, active individuals aged 15–24 spent a number of months in unemployment significantly higher than prime-aged individuals (i.e. those aged 35–44). Note also that a significantly higher length of unemployment also characterises those aged 25–34 in 20 out of 28

[9] Tables included in the Annex to Chapter 1 are numbered with the prefix A1.

countries, thus signalling that younger workers are relatively disadvantaged in concern to the duration of time spent looking for work. However, as clarified in previous sections, being based on cross-sectional data, this type of evidence is not enough to clarify whether this disadvantage emerges because of worsening conditions across cohorts or because of a mere age effect that penalises all cohorts in the starting phase of their working career.

Figure 1.1: Share of active individuals among those aged 15–24



Source: EU-SILC data

Also note that in 15 out of 28 countries, the estimated months of unemployment are statistically significantly higher for those aged 55–65 than for prime-aged individuals, while in 4 countries (IT, MT, RO and the UK) these risks are significantly lower. Different relative risks for the older workers are clearly associated with the characteristics of the pension system which affects the probability of individuals aged 55–65 of being in the active population. Indeed, in countries characterised by early retirement schemes, the weakest workers (those more at risk of unemployment) might retire before age 65 thus affecting the composition of our sample. Conversely, where no (or limited) options for early retirement exist, relative unemployment risks for older workers might emerge.

Aside from the observation over a whole year, the EU-SILC also records, through a set of variables, the individual employment status at the moment of interview (i.e. in 2007 and 2018). We have thus computed, by age groups, the share of individuals who were in negative labour market status at the moment of their interview, i.e. were unemployed or had a part-time or a fixed-term arrangement. The Annex to Chapter 1 shows the distribution of all these statuses by age groups, while Figures A1.4, A1.5 and A1.6 focus on the change in the period 2007–2018 experienced, on average, by those aged 15–24.

As emerges from Tables A1.23 to A1.27 included in the Annex, in most countries young people – i.e. those aged less than 35 – experience the highest risks of being unemployed or employed through an atypical (often involuntarily and less paid) contractual arrangement.

As concerns those aged 15–24, the share of those who self-report in the EU-SILC interview to be unemployed rather than employed (as an employee or self-employed) is very heterogenous across countries and has increased in 16 out of 28 countries from 2007 to 2018. A dramatic rise characterises EL, IT and ES (Figure A1.4), where the share of those under 25 who consider themselves as unemployed was over 50%, 45% and 35% in 2018, respectively.

The share of under-25s working part-time is also very heterogenous across countries (Figure A1.5), even if that share increased in 23 out of 28 countries from 2007 to 2018. Large differences across countries also emerge concerning the share of under-25s working through a fixed-term employment contract (Figure A1.6); the trend of this share is mixed across the EU, even if some countries – notably DE and IT – were characterised by an impressive rise.

1.2.2. Distribution of individuals' labour income by age

Earnings and labour income

We first present statistics about the mean labour income of active workers belonging to the five age classes. Concerning individuals, we consider three income variables: earnings (concerning employees only), labour incomes (from employment and self-employment) and labour income plus unemployment benefit, as a final income dimension that allows us to capture the impact of redistribution through transfers on labour market outcomes.

Furthermore, to capture the effect on intergenerational fairness exerted by tax redistribution, these income variables are considered both gross and net of taxes (where, according to the EU-SILC definition, taxes on labour income include personal income taxes and social contributions paid by the worker). However, some countries – CY, CZ (apart from earnings), DE, DK, FI, HU (in 2007), MT, NL, SK and the UK – do not provide net incomes.

The mean values of all six income dimensions in 2006 and 2017 are presented in the Annex, while in this section we focus on labour income and on the extensive concept where unemployment benefits (UB) are added to labour income. Note that we consider only those with positive annual earnings when computing mean earnings, while we also include the rather few active individuals with zero labour income in a year when we compute mean values of the other individuals' income concepts.

Tables A1.3, A1.4 and A1.5 show, respectively, the mean index numbers of gross labour income, net labour income and net labour income plus UB in 2006 and 2017, where the reference group is workers aged 55–65. As concerns those aged 15–24, although we take into account only individuals who were active for the whole year (to depurate from the effect of possible months spent studying or in inactivity during a year), in all countries – except EE and LV in 2007 – a large income gap emerges with respect to older workers. However, in 12 out of 28 countries the relative mean income of those aged 15–24 increased in the period 2006–2017. Furthermore, in 15 out of 18 countries which provide

net figures, the gap observed with respect to labour gross income reduces when the effect of tax and transfer redistribution is taken into account, i.e. when we focus on net labour income plus UB, even if in most cases the size of the reduction in the gap is rather limited (compare Tables A1.3 and A1.5).

Those aged 25–34 fare worse than older workers in 18 out of 28 countries as concerns gross labour income (Table A1.3) and in 11 out of 18 countries when we focus on the two net income dimensions (Tables A1.4 and A1.5).

Table 1.1: OLS estimates of annual gross log labour incomes of active workers in 2017. Coefficients of age classes (reference age class: 35–44)

	15–24		25–34		45–54		55–65		N
AT	-0.459***	[0.048]	-0.105***	[0.034]	0.189***	[0.031]	0.197***	[0.037]	5 530
BE	-0.298***	[0.057]	-0.166***	[0.029]	0.054*	[0.028]	-0.009	[0.032]	4 838
BG	-0.530***	[0.056]	-0.147***	[0.030]	0.015	[0.029]	-0.093***	[0.032]	6 727
CY	-0.760***	[0.041]	-0.444***	[0.026]	0.114***	[0.028]	0.132***	[0.032]	4 559
CZ	-0.319***	[0.031]	-0.093***	[0.017]	-0.045***	[0.015]	-0.121***	[0.018]	7 879
DE	-0.476***	[0.038]	-0.110***	[0.025]	0.050**	[0.022]	-0.038	[0.024]	10 661
DK	-0.492***	[0.072]	-0.287***	[0.043]	0.174***	[0.039]	0.061	[0.041]	5 151
EE	-0.305***	[0.050]	-0.052*	[0.027]	-0.029	[0.027]	-0.203***	[0.028]	6 270
EL	-0.641***	[0.035]	-0.285***	[0.017]	0.141***	[0.015]	0.125***	[0.019]	17 601
ES	-1.055***	[0.047]	-0.376***	[0.027]	0.058**	[0.025]	0.197***	[0.029]	14 138
FI	-0.436***	[0.042]	-0.188***	[0.025]	0.051**	[0.023]	-0.064***	[0.025]	9 614
FR	-0.535***	[0.036]	-0.207***	[0.023]	0.108***	[0.023]	0.148***	[0.027]	9 727
HR	-0.494***	[0.038]	-0.227***	[0.023]	0.050**	[0.024]	0.034	[0.027]	7 418
HU	-0.244***	[0.053]	-0.039	[0.034]	0.014	[0.029]	-0.073**	[0.033]	6 239
IE	-0.777***	[0.053]	-0.241***	[0.036]	0.141***	[0.035]	-0.067*	[0.040]	4 374
IT	-0.809***	[0.030]	-0.323***	[0.018]	0.135***	[0.016]	0.154***	[0.018]	18 631
LT	-0.585***	[0.058]	-0.243***	[0.036]	-0.037	[0.035]	-0.182***	[0.037]	4 843
LU	-0.648***	[0.077]	-0.179***	[0.041]	0.058	[0.040]	0.062	[0.055]	4 420
LV	-0.281***	[0.060]	-0.093***	[0.033]	-0.155***	[0.033]	-0.251***	[0.035]	5 108
MT	-0.390***	[0.026]	-0.129***	[0.017]	0.040**	[0.020]	-0.001	[0.024]	7 334
NL	-0.531***	[0.060]	-0.084***	[0.032]	0.072**	[0.031]	-0.089***	[0.034]	11 591

PL	-0.274***	[0.031]	-0.114***	[0.016]	0.012	[0.017]	-0.012	[0.019]	12 347
PT	-0.608***	[0.027]	-0.251***	[0.016]	0.135***	[0.015]	0.192***	[0.018]	13 557
RO	-0.326***	[0.045]	-0.037	[0.027]	-0.005	[0.026]	-0.090***	[0.032]	6 888
SE	-0.585***	[0.055]	-0.201***	[0.032]	0.054*	[0.031]	-0.019	[0.033]	6 045
SI	-0.309***	[0.045]	-0.249***	[0.022]	0.045**	[0.020]	-0.123***	[0.026]	11 130
SK	-0.239***	[0.028]	-0.081***	[0.018]	-0.012	[0.018]	-0.044**	[0.021]	6 828
UK	-0.693***	[0.045]	-0.111***	[0.032]	0.044	[0.031]	-0.222***	[0.034]	5 731

(*) OLS = ordinary least squares. Control variables: dummies on gender, citizenship, educational attainments, being enrolled in an education programme. Individuals with zero incomes are not considered. Standard errors in brackets. *** p < 0.01, ** p < 0.05, * p <0.1.

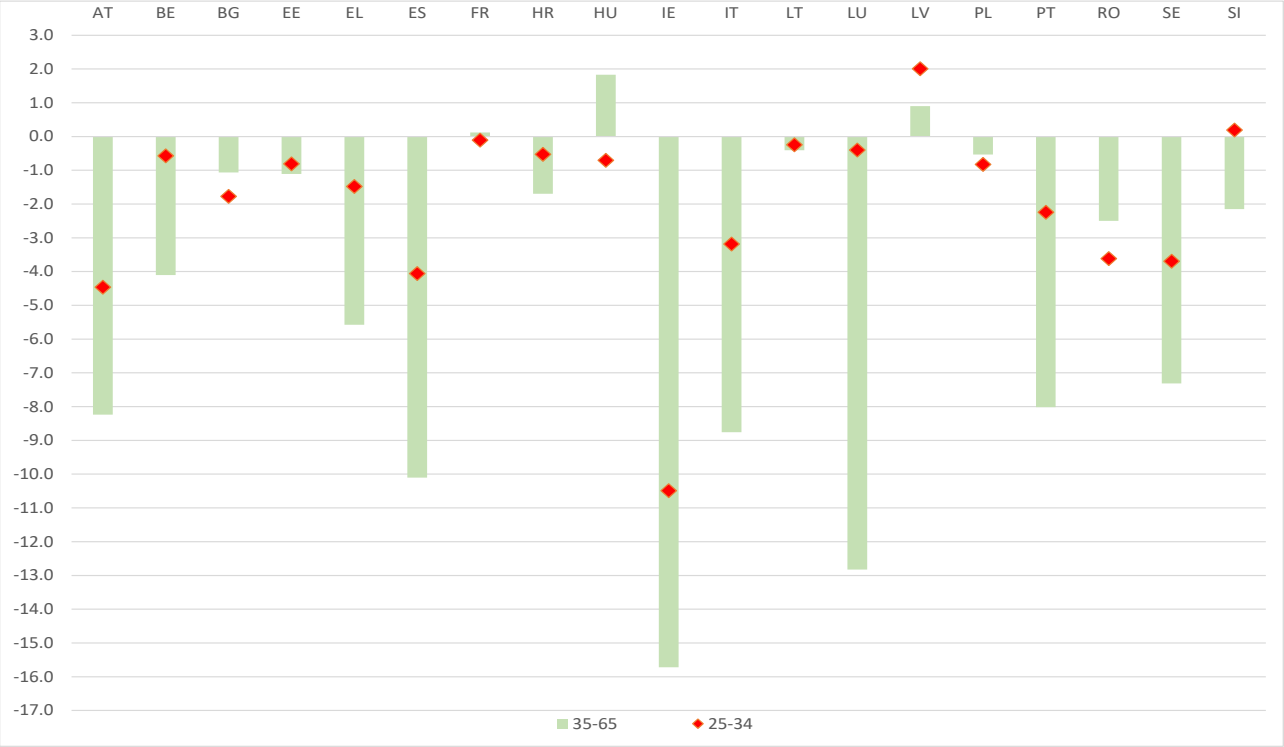
Source: EU-SILC data

However, mean values might be plagued by composition effects, since active individuals belonging to various groups might differ along many dimensions and mostly according to the educational attainment which is usually higher among the younger cohort. To distinguish from compositional effects, we have thus estimated through ordinary least squares (OLS) annual log income gaps of differently aged individuals controlling for their socio-demographic characteristics (gender, dummies on education and citizenship). Note, however, that in our estimates, we cannot control for workers' labour market experience, which is a crucial driver of individuals' earnings, since this variable is recorded only in few countries in the EU-SILC. To avoid any bias in estimates because of an arbitrary assignment of a positive value to individuals who have zero income (whose log income is then missing), we have carried out these estimates excluding from the analyses zero-income individuals. Estimated coefficients and statistical significance of age classes (when controlling for the aforementioned dummies variables) are computed with respect to prime-aged workers, i.e. those aged 35–44 (Tables 1.1, A1.6 and A1.7).

Independently of the income concept, those aged 15–24 earn significantly less than prime-aged individuals in all countries, and there is a significant gap between those aged 25–34 and those aged 35–44 in almost all countries. We also find that those aged 55–65 fare worse than the reference group (i.e. the estimated coefficient is negative and statistically significant) in 12 EU countries, while they fare better in 7 countries. These differences across countries are likely related to differences in the experience-earnings patterns in the various countries (e.g. if automatic wage increases when experience rises are established by contracts) and to the different propensity of older workers to participate in the labour market (e.g. if lower-paid workers have access to early retirement schemes, the remaining older workers are positively selected among those earning higher wages).

Nevertheless, tax redistribution – likely through mechanisms linked to progressivity – reduces the estimated income gap in all countries except HU and LV, as shown by Figure 1.2 where the change – in percentage points – in OLS estimated gaps in annual log labour incomes when moving from gross to net values for workers aged 15–24 with respect to those aged 25–34 and 35–65 is shown. However, the size of the reduction in the gap differs greatly across countries. Specifically, consistent with the lower progressivity of their personal income tax design, the reduction is generally slow in Eastern European countries, where personal income tax systems are often based on a rather flat tax rate schedule.

Figure 1.2: OLS estimated wage differentials in gross and net labour incomes among age groups



(*) Control variables: dummies on gender, citizenship, educational attainments and being enrolled in an education programme. Individuals with zero incomes are not considered.

Source: EU-SILC data

Finally, we devote attention to the distribution of unemployment benefits, measuring how many active individuals who were unemployed at least a month in the reference year were entitled to receive unemployment benefits. Figure A1.7 in Annex 1 shows the share of young unemployed, i.e. those aged 15–24, who actually received an unemployment benefit in the year. An extremely high heterogeneity across EU countries emerges: in 7 out of 28 countries more than 50% of the unemployed receive unemployment benefits, while the share is below 10% in 11 out of 28 countries.

Data for all age groups is shown in Table A1.8 in the Annex and signals that, on average, apart from DK in 2017 where no differences emerge, the entitlement to unemployment benefits among active individuals who experienced an unemployment spell over the year is everywhere lower for young people than for the other age groups. This gap might be due to both entitlement conditions which penalise those with few or no previous work experience and to the lack of coverage of some atypical arrangements through which young people are more often employed, as shown in Section 1.2.1.

Working poverty risks

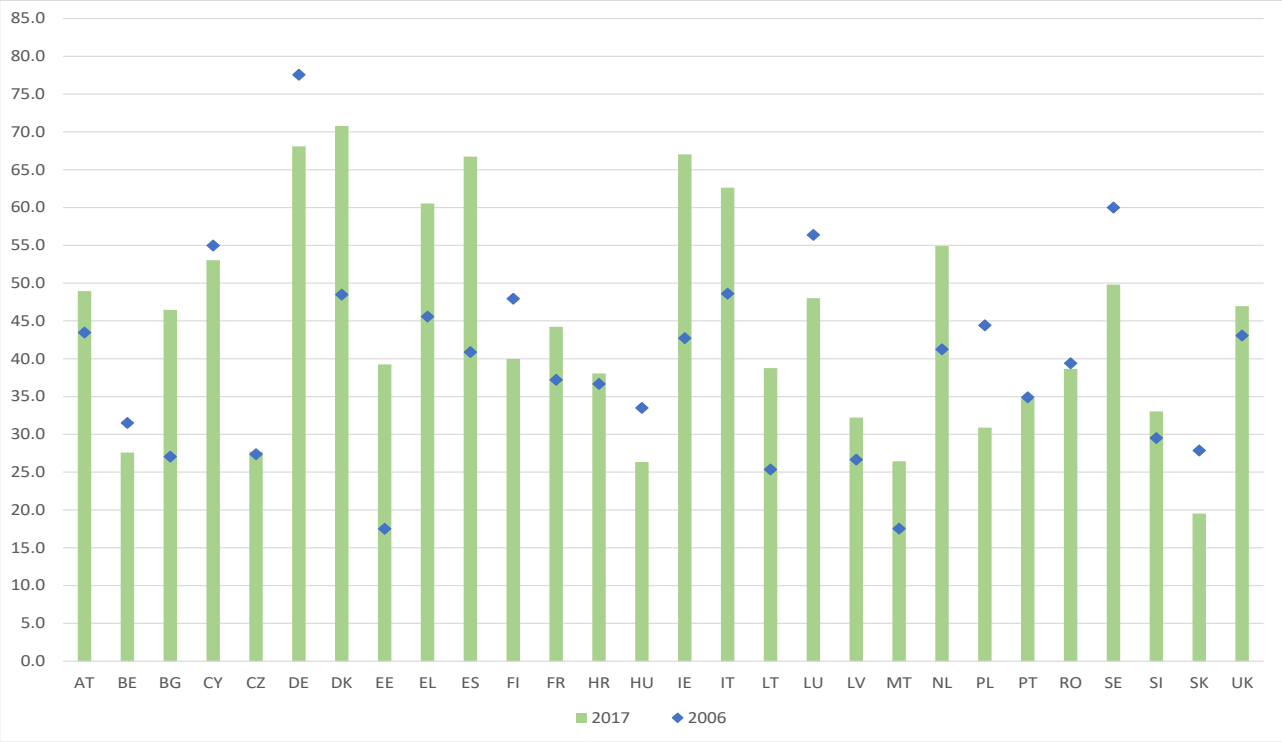
We now pay attention to low-paid workers, who are identified – among those active individuals who earned a positive labour income in the year – as those with an annual gross labour income lower than 60% of the median of the national distribution of gross

labour income (i.e. the median of the distribution of gross labour income among individuals aged 15–65).

We thus identify low earners according to a relative line, i.e. based on the income distribution of their peers. In what follows, we also use the term 'working poor according to gross labour income' (or, for brevity, working poverty, being clear that we are referring to the individual income dimension) to define low-paid workers and to avoid confusion with the EU definition of working poor that is based instead on equivalised disposable income. It should be noted that the concept of working poverty we use in this section is very different from the EU definition of in-work poverty (IWP). Our definition is based on individuals' income only and is computed considering all workers including those employed for only a few weeks a year. In contrast, the EU definition of IWP is a hybrid concept, as it mixes labour market considerations at the individual level with household characteristics and incomes: the EU indicator of IWP risk is defined by combining an individual's conditions for identifying the workers and a household's economic conditions to identify the poverty status. According to this definition, an individual is considered in-work poor in a year when i) they are aged 18–64 and are in employment (as an employee or a self-employed person) for at least half of the year, and ii) they belong to a household with an annual equivalised disposable income lower than 60% of the median of the national distribution of equivalised disposable income. In Section 1.2.3, we will also show how our concept of working poverty crosses with the standard concepts of household relative poverty captured by the at risk of poverty (AROP) indicator.

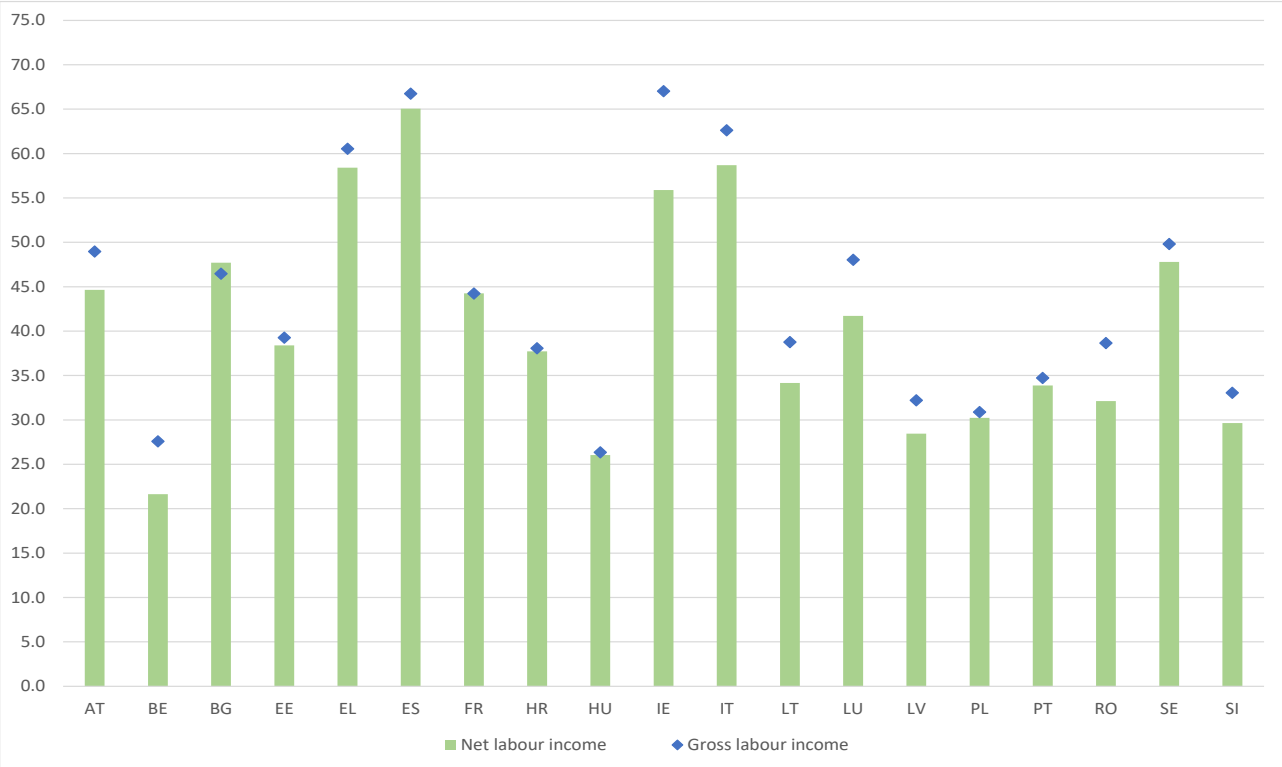
Our findings about the relative low-pay risk of younger workers are basically confirmed when we estimate – through a probit model – the predicted probabilities of being 'working poor according to gross labour income' by age classes, controlling for a set of individuals' socio-demographic characteristics, thus distinguishing the descriptive evidence from the workers' composition (Table A1.9).

Figure 1.3: Share of workers aged 15–24 earning less than 60% of the national median (annual gross labour) income



Source: EU-SILC data

Figure 1.4: Share of workers aged 15–24 earning less than 60% of the national median annual gross or net labour income in 2017



Source: EU-SILC data

Table A1.10 in the Annex shows that – consistent with the evidence previously reported about mean incomes – in all countries (except LV when comparing younger and older workers) workers aged 15–24 are the most at risk of earning a gross labour income below the 60% of the median threshold, whereas more mixed evidence emerges concerning workers aged 25–34. However, the extent of the low-pay risk differs greatly across countries (Figure 1.3): in 8 countries, more than 50% of workers aged 15–24 earn less than 60% of the median of gross annual labour incomes and the working poverty risk increased in 19 out of 28 countries from 2006 to 2017. Nevertheless, tax redistribution slightly reduces this risk, as signalled by Figure 1.4 which shows that the working poverty risk is higher in all countries when computed on gross rather than on net annual incomes (note that the working poverty line changes accordingly when the considered income concept changes).

Income inequality among young people

When analysing the labour income distribution, we have so far focused only on mean differences between differently aged individuals, thus implicitly assuming that the age class is per se a sufficient dimension to represent income gaps. However, as noted by the economic literature (e.g. Franzini and Raitano 2019), earnings gaps within groups of workers with similar characteristics (including age) are growing over time in developed countries.

To observe the possible determinants of labour income inequality among young people, we have carried out a set of Mincerian OLS regressions on the subsample of active workers aged 15–25 with a positive annual income in 2017, controlling for gender, education, a dummy for self-employed and a square polynomial on age (Table 1.2). Interestingly, we find that in 22 out of 28 countries a significant gender wage gap emerges among young people, penalising women. Moreover, higher education is, as expected, associated with higher wages, even if in seven countries the younger individuals who have already attained a tertiary degree do not obtain a significantly higher labour income. Hence, mechanisms of inequality also characterise younger workers, thus suggesting young people should not be considered a unique homogenous group.

We also run these Mincerian regressions including parents' characteristics, proxied by their education, to capture the possible residual impact of parental characteristics on intergenerational inequality, on top of the possible mechanisms acting through higher education usually achieved by children coming from more advantaged backgrounds. To this aim, in Table A1.11, we used EU-SILC 2011 (i.e. incomes 2010) where parental background characteristics of those aged at least 25 are recorded and regress labour incomes of young workers aged 25–34 adding parental education dummies (namely, the highest degree attained by the father or the mother) to the socio-demographic controls used in Table 1.2.[10] A significant wage gender gap penalising females is confirmed in all countries and, likewise, attaining a higher degree is significantly rewarded in all countries (apart from DK where the wage premium for tertiary graduates is not statistically significant). Interestingly, however, consistent with findings by Raitano and Vona (2015) and Raitano et al. (2016), coming from a higher socioeconomic background is associated with a significant further increase in earnings in half of EU countries and this emerges despite the economic literature pointing out that earnings premiums related to parental background usually develop along the working career and are lower at a young age (Haider and Solon 2006).

[10] We exclude from the analysis individuals without national citizenship to avoid confounding effects on parental background dummies exerted by the migration status.

Table 1.2: OLS regressions of annual gross log labour income on workers' characteristics in 2017, individuals aged 15–24

	Female		Upper secondary		Tertiary		N
AT	-0.165	[0.101]	0.373***	[0.143]	0.661***	[0.183]	381
BE	-0.165*	[0.095]	0.666***	[0.149]	0.865***	[0.178]	146
BG	0.025	[0.134]	0.575***	[0.168]	0.642**	[0.272]	209
CY	-0.229***	[0.087]	0.519***	[0.127]	0.466***	[0.151]	192
CZ	-0.243***	[0.058]	0.297***	[0.099]	0.237	[0.144]	342
DE	-0.170**	[0.067]	0.574***	[0.073]	1.054***	[0.134]	520
DK	-0.422***	[0.093]	0.308***	[0.109]	0.663***	[0.230]	188
EE	-0.157*	[0.082]	-0.215*	[0.113]	-0.244	[0.158]	293
EL	-0.174**	[0.072]	0.045	[0.134]	0.189	[0.166]	493
ES	-0.261**	[0.107]	-0.050	[0.133]	0.057	[0.136]	487
FI	-0.154**	[0.071]	0.266	[0.172]	0.511**	[0.212]	336
FR	-0.081	[0.073]	0.417***	[0.106]	0.613***	[0.114]	437
HR	-0.153***	[0.047]	0.239**	[0.116]	0.431***	[0.145]	616
HU	-0.202**	[0.088]	0.377***	[0.113]	0.563***	[0.193]	282
IE	-0.168**	[0.081]	0.213	[0.164]	0.471***	[0.181]	259
IT	-0.327***	[0.064]	-0.013	[0.085]	-0.010	[0.148]	714
LT	-0.242	[0.156]	0.692**	[0.325]	0.723**	[0.356]	170
LU	-0.306***	[0.079]	0.406***	[0.096]	0.475**	[0.188]	237
LV	-0.135	[0.092]	0.351**	[0.135]	0.457**	[0.188]	195
MT	-0.066*	[0.039]	0.181***	[0.045]	0.432***	[0.058]	684
NL	-0.399***	[0.071]	0.373***	[0.095]	0.591***	[0.113]	351
PL	-0.294***	[0.052]	0.204**	[0.084]	0.510***	[0.116]	632
PT	-0.236***	[0.057]	0.140**	[0.064]	0.092	[0.102]	627
RO	-0.498***	[0.090]	0.561***	[0.099]	0.941***	[0.183]	330
SE	-0.212**	[0.093]	0.591***	[0.143]	0.439*	[0.241]	266
SI	-0.518***	[0.066]	0.262***	[0.093]	0.243	[0.155]	434

SK	-0.106**	[0.046]	0.415***	[0.109]	0.282*	[0.160]	401
UK	-0.156	[0.097]	-0.239	[0.162]	-0.095	[0.190]	358

(*) Individuals with zero income are not considered. Control variables: dummies on self-employed, age and age squared. At most lower secondary is the reference category for education. Standard errors in brackets. *** p < 0.01, ** p < 0.05, * p < 0.1.

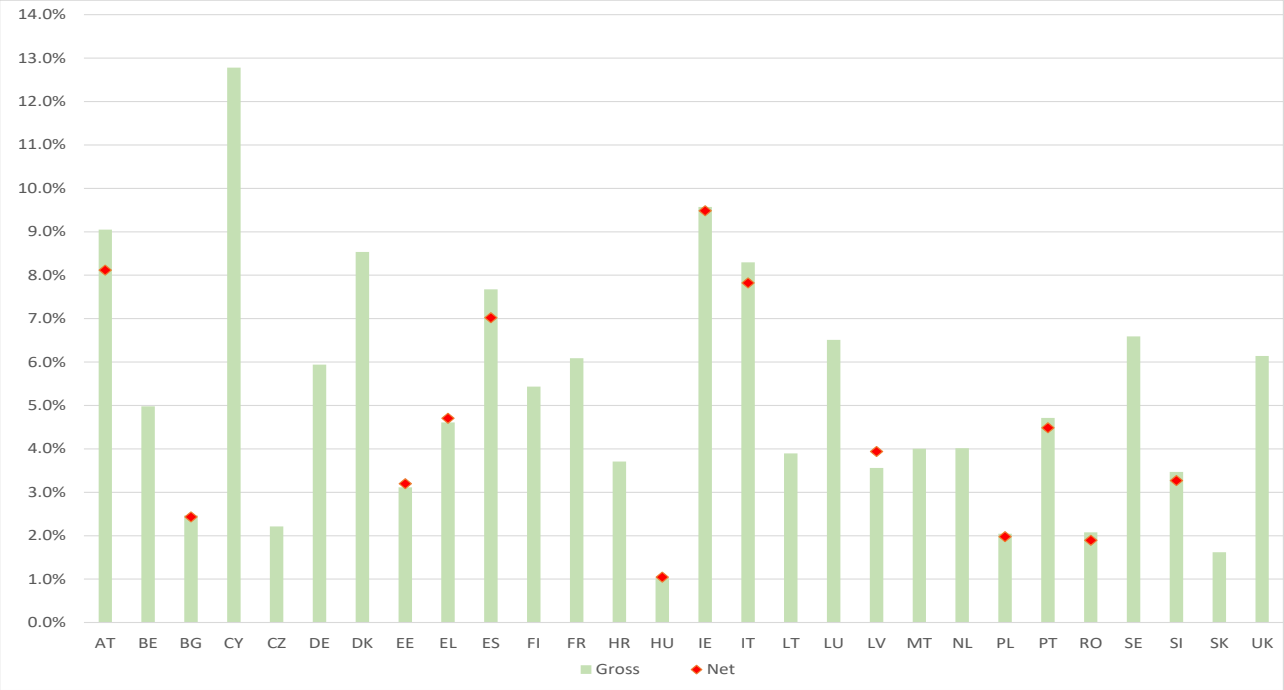
Source: EU-SILC data

To better understand the role of workers' features as a driver of annual gross labour income inequality, we also split the workers into subgroups according to their age class or to the interaction between age class and educational degree (15 subgroups) and assess – through a decomposition exercise by subgroups of workers – the relative size of the inequality that emerges within and between the various groups. By doing so, we can measure the share of total inequality due to differences in mean earnings between the various groups – hereafter 'between inequality' – and the share of inequality not due to mean differences between subgroups, which refers to individuals belonging to the same subgroup – hereafter 'within inequality'. To this aim, we use the Theil index of inequality. Unlike the Gini index, it is perfectly decomposable among groups being expressed as the sum of between and within inequality. The between-group inequality is computed through a counterfactual distribution imputing the mean wage of the j-th group to all the individuals who fall in that specific group, while the within-age-group inequality is the weighted average of the inequality within each group.[11]

By distinguishing workers by the five age classes, we find that the age divide is able to explain only a limited share of gross annual labour income inequality (Figure 1.5). Actually, in all countries but Cyprus, mean income gaps between differently aged workers explain less than 10% of the total income inequality.

[11] In the Theil decomposition, inequality within each group is weighted by the relative income earned by each group.

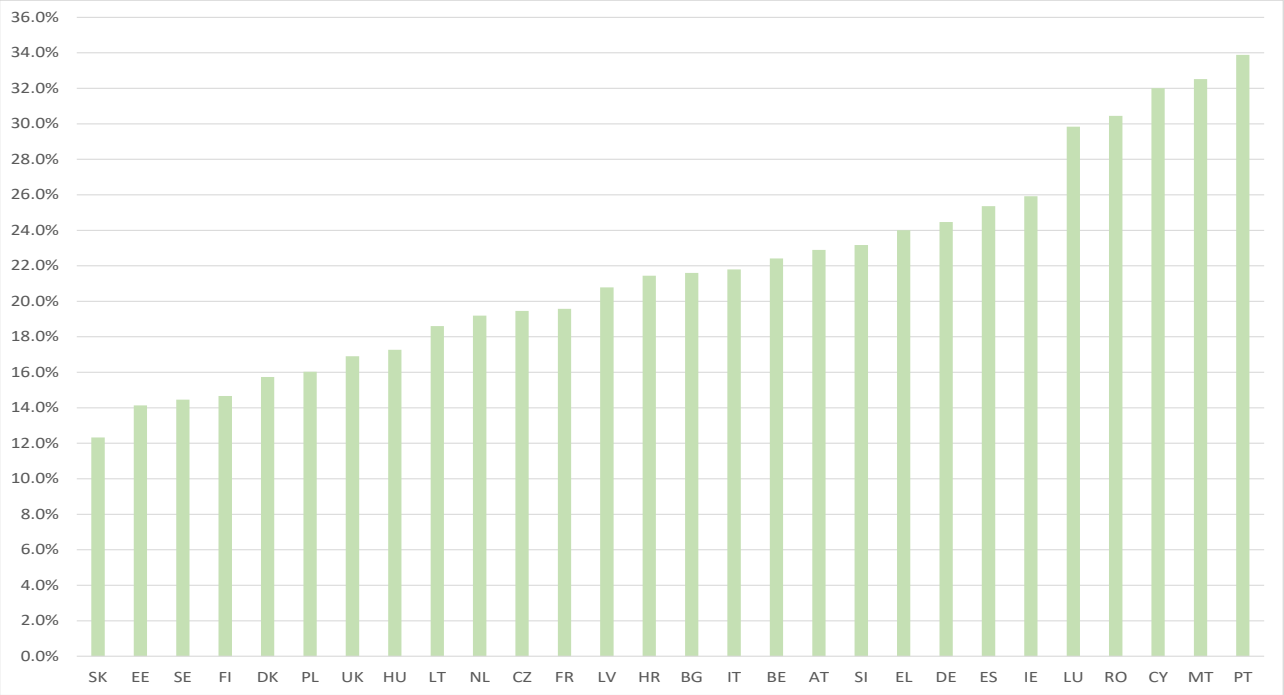
Figure 1.5: Theil decomposition of annual gross labour earnings by age classes in 2017, share of the between-age-classes component



Source: EU-SILC data

However, the limited size of the 'between age' component may be due to the fact that, within the same age groups, differently educated individuals coexist and, as shown, education is a crucial driver of individuals' earnings. To capture this further mechanism, as mentioned, we built 15 subgroups interacting with the 5 age classes and the 3 educational dummies about the highest attained degree (at most lower secondary, upper secondary or tertiary) and carried out the Theil decomposition by these 15 groups (Figure 1.6). As expected, the share of total inequality explained by the mean differences between groups of those differently 'aged and educated' increases in all countries and becomes higher than 30% in 4 countries (RO, CY, MT and PT). However, despite the heterogeneity in the share of total inequality explained by the between-age-education divide in EU countries, these divides are able to explain at most one third of the total inequality. Hence, the inequality within workers with both similar age and education is largely predominant in EU countries, thus signalling that further drivers at the individual and firm level might explain inequality levels and trends.

Figure 1.6: Theil decomposition of annual gross labour earnings by education and age classes in 2017, share of the between-subgroups component



Source: EU-SILC data

Finally, to evaluate how much of the total inequality within each age group is explained by observable workers' and firms' characteristics, we carried out an exercise comparing the unconditional standard deviation of annual gross earnings of employees with the standard deviation of the residuals (the RMSE) of OLS income regressions on a large set of covariates as an index of residual inequality.[12] This exercise allows us to verify how much of the unconditional individual earnings gaps might be associated with individuals' characteristics or depend on factors unobservable in the empirical setting. To this aim, Table 1.3 shows the share of total inequality explained by dozens of individuals' and firms' characteristics and confirms that, despite the several covariates introduced in the estimates (see footnote of Table 1.3), in all countries more than half of total inequality is 'residual', i.e. it is not due to mean differences between individuals with different observed characteristics.[13]

Therefore, the results of the empirical exercise presented in this section show that, contrary to widely held opinion, the height of labour income inequality only to a limited extent depends on divides between individuals of different ages and different skills. This evidence is also corroborated by the estimate of residual inequality that shows that a major part of total inequality does not depend on observable worker and firm characteristics. Furthermore, the evidence that age and education explains a limited share of earnings inequality signals that – despite, on average, higher education is associated with higher wages – very high inequality also emerges within groups of individuals with the same age and education, thus suggesting that investment in education doesn't enable the avoidance of having (strong) earnings inequality within a group of workers of a similar

[12] We consider employees only since the firm's and contract's detailed characteristics are recorded in EU-SILC.

[13] In detail, the 'explained' share of inequality shown in Table 1.3 is given by the ratio between (SD-RMSE) divided by the unconditional SD from each age group.

education level (and age) as shown by the large disparities of earnings achieved by similarly educated (and similar aged) workers.[14]

Table 1.3: Share of the unconditional standard deviation of log annual gross earnings of active workers by age classes explained by workers' and firms' characteristics in 2017

	15–24	25–34	35–44	45–54	55–65
AT	29.0%	48.8%	35.2%	52.4%	48.3%
BE	50.0%	29.5%	37.6%	39.0%	41.9%
BG	37.9%	30.5%	32.0%	30.2%	37.4%
CY	37.3%	33.3%	44.5%	44.7%	44.6%
CZ	27.3%	28.5%	37.7%	40.3%	42.3%
DE	36.0%	37.5%	44.2%	41.2%	44.6%
DK	74.4%	51.0%	41.8%	46.2%	46.0%
EE	10.4%	28.6%	34.3%	34.5%	31.1%
EL	16.1%	29.9%	39.5%	35.4%	48.1%
ES	25.8%	34.5%	42.0%	46.6%	51.2%
FI	41.9%	49.8%	57.4%	52.2%	61.0%
FR	24.1%	36.0%	41.3%	43.4%	49.0%
HR	16.6%	29.4%	31.3%	31.4%	38.3%
HU	39.2%	37.3%	37.2%	40.1%	49.0%
IE	40.3%	44.0%	40.6%	50.1%	47.4%
IT	22.6%	26.8%	32.9%	34.6%	39.0%
LT	34.1%	23.9%	33.9%	33.7%	43.9%
LU	42.0%	31.9%	42.3%	38.8%	31.4%
LV	36.7%	38.9%	44.8%	44.1%	39.1%
MT	30.9%	34.3%	36.6%	35.4%	39.0%
NL	43.1%	56.7%	55.2%	54.7%	60.4%
PL	19.4%	25.1%	23.4%	26.2%	27.6%

[14] On this subject, Franzini and Raitano (2019) show that in Italy approximately 40% of tertiary graduates earn less than the mean labour income of upper secondary graduates and 25% earn less than the mean labour income achieved by lower secondary educated workers.

PT	15.1%	29.5%	30.5%	39.0%	42.9%
RO	16.1%	27.1%	24.8%	26.4%	33.8%
SE	16.1%	32.9%	40.2%	41.6%	57.5%
SI	34.8%	48.0%	39.3%	35.7%	47.1%
SK	40.6%	31.4%	32.3%	30.4%	32.6%
UK	5.0%	40.2%	37.1%	36.8%	32.5%

(*) Individuals with zero earnings are not considered. The control variables are dummies on gender, citizenship, educational attainment, dummies for those still in education, occupation (2-digit ISCO dummies), part-time contracts, fixed-term contracts, sector of activity (1-digit NACE dummies) and firm size.

Source: EU-SILC data

Therefore, as pointed out by Franzini and Raitano (2019) in their research based on the case of Italy, the share of earnings inequality not explained by individuals' characteristics (including their skills and their productive abilities) is sizeable and very little is known about its determinants, also because the theoretical and the empirical literature have focused much more on earnings gaps between individuals with different characteristics instead of investigating the determinants of the gaps among similar individuals. For instance, one important point to clarify by using proper employer–employee linked datasets should be how much of such inequality originates within or between firms. This initial step could orientate further research in order to better evaluate the role played by – among others – factors such as market structure and its degree of competition, collective bargaining, industrial relations and wage-setting processes, and the propensity to technological and organisational innovation. A further topic to be investigated in future research concerns the influence of institutional factors on within inequality, in particular the deregulation of the labour market that started in many EU countries in the mid-1990s and led to an increasing share of atypical and precarious workers, especially in the younger generation.

1.2.3. Distribution of household equivalised income by individuals' age class

When an individual's economic wellbeing is assessed by looking at the total resources they have at their disposal because these resources are shared within the household, household composition becomes a crucial factor (see also Chapter 2 on this issue).

Young people's economic wellbeing – independently of their employment status – depends indeed on all income, from any source, obtained by household members. Therefore, when individuals' income is assessed by looking at the equivalised income (i.e. the income divided by the equivalence scale to take into account differences in household size and composition), inactive or unemployed young people might have a high income (or vice versa) because of the household condition.

Moving from the individual perspective to a household-based perspective, it becomes then crucial to distinguish the individual condition according to their individual outcome (pointed out in Section 1.2.2) from the individual condition based on outcomes of all household members, synthetised by the equivalised incomes.

Accordingly, in this section we compare income and economic risks of differently aged individuals, by using household income to compute their economic wellbeing, i.e. the equivalised income. Furthermore, to compare outcomes before and after tax and transfer redistribution, we will make use of three different equivalised annual income concepts:

1. Market incomes, given by gross incomes earned by all household members and coming from all market sources, i.e. employment, self-employment and capital. Market incomes are thus zero for individuals living in households receiving only income from pensions or other public transfers.[15]

2. Gross incomes, computed adding welfare cash benefits (pensions and other welfare transfers expressed gross of personal income taxes in all countries in the EU-SILC) to market incomes.[16]

3. Disposable incomes, obtained subtracting social contributions paid by the worker and personal income taxes paid on all income sources from gross incomes.

Composition of young people's households

To estimate how many young individuals cohabitate with other older family members (e.g. their parents) and may thus share resources (but have also to sustain other needs, especially when older family members face health problems) and how many live alone, or without older family members, we have computed the share of individuals aged 15–24 or 25–34 who lived in a 'young household' at the moment of the EU-SILC interview, defined as a household whose oldest member is aged below 35 (Table A1.12).

The share of those aged under 24 living only with young household members is rather limited in all countries, apart from Northern European countries where it exceeds 30%, thus suggesting that the large majority of young people cohabitate with their parents and can thus share resources with older family members (while also being burdened by related needs). In ES, HR, IT, MT, PT and SK, less than 5% of individuals aged 15–24 live with no household members aged over 35. As expected, the share of those living in 'young households' rises among those aged 25–34 even if large differences across countries emerge: in 2017, the highest and the lowest values characterise DK (84.7%) and MT (9.5%), thus signalling that the comparison of equivalised income by age classes in EU countries is greatly affected by the different model of young people's household composition in the various countries.

Furthermore, Figure A1.8 compares the share of those 25–34 living in 'young households' in 2007 and 2018 suggests that the economic crisis – and the related increased difficulty of finding an adequately paid and stable job – might have changed young people's propensity to leave the family home, since the share of those living in young households reduced in 23 out of 28 countries from 2007 to 2018.

[15] Capital incomes are computed adding income from rental of a property or land and interest, dividends and profits from capital investments in unincorporated business.

[16] In further analyses, not shown in this report, we include old-age, disability and survivors benefits in pensions while the 'other transfers' are composed of individual welfare benefits (unemployment benefits, sickness, maternity and education allowances) plus cash benefits directly devoted to households (family and housing allowances plus other social assistance benefits).

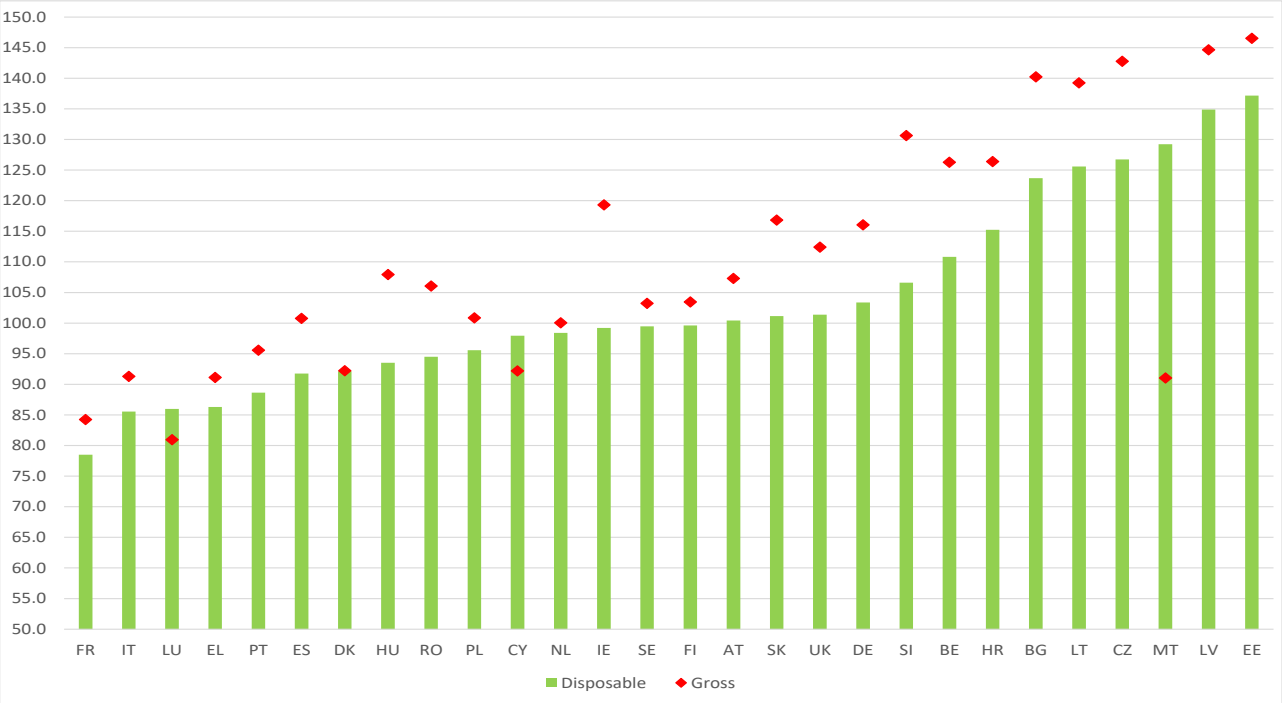
Mean equivalised incomes by age classes

In relation to mean annual equivalised gross incomes (i.e. before tax redistribution) of differently aged individuals, mixed patterns emerge. In comparison with individuals aged over 65, mean gross incomes of those aged 15–24 are lower in eight countries and income gaps larger than 30% favouring young people only emerge in five countries (Table A1.13).

Furthermore, the relative conditions of those aged 15–24 with respect to those aged over 65 worsen in almost all countries when disposable incomes instead of gross incomes are considered (Table A1.13 and Figure 1.7), thus suggesting that income taxes and mostly social contributions that are levied on labour incomes reduce the incomes of the elderly less than those of young people who work or live with labour income recipients. The same pattern emerges when comparing gross and disposable equivalised incomes of those aged 25–34 and over 65 (Table A1.14 and Figure 1.8).

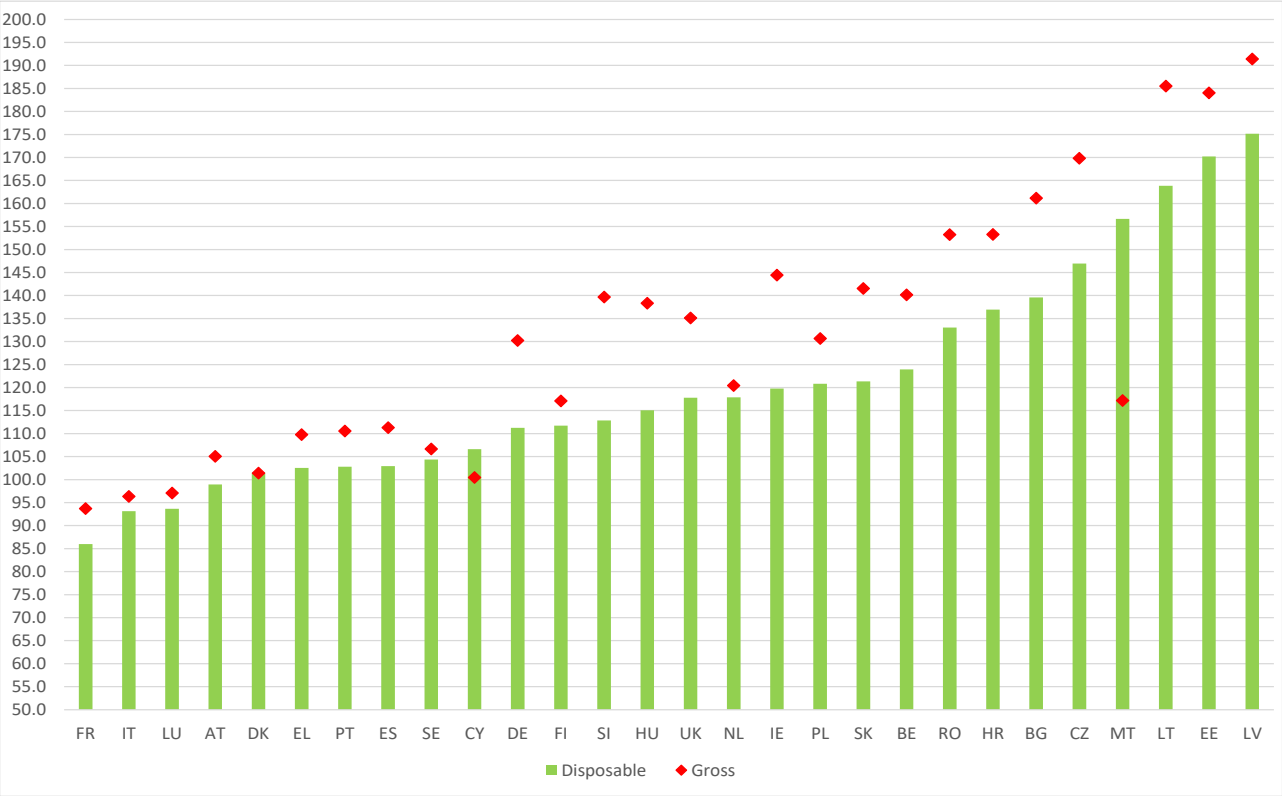
To control for household characteristics, we also ran Mincerian regressions on equivalised log gross and disposable income in 2017, where characteristics of the individual and the household head (i.e. the main income recipient in the household) are included among the covariates (Tables A1.15 and A1.16). The reference category for the regression is made up of prime-aged individuals (i.e. aged 35–44): in all countries except three for gross income and six for disposable income, 15 to 24-year- olds have an income significantly lower than prime-aged individuals, even if the gap reduces in almost all countries when moving from gross to disposable income because of tax redistribution. Interestingly, concerning gross income, when controlling for the covariates, those aged over 65 fare better (according to the statistically significance of the estimated coefficient) than those aged 35–44 in 12 EU countries, while the equivalised income of those aged over 65 is statistically significantly lower than the one of those aged 35–44 only in 2 countries, EE and IE.

Figure 1.7: Mean annual gross and equivalised disposable income in 2017 of individuals aged 15–24, index number: individuals over 65 = 100



Source: EU-SILC data

Figure 1.8: Mean annual gross and equivalised disposable income in 2017 of individuals aged 25–34, index number: individuals over 65 = 100



Source: EU-SILC data

AROP by age classes

According to the EU definition, income poverty is computed through the At-Risk Of Poverty (AROP) indicator, that measures how many individuals have an income below 60% of the median of the national equivalised income. Here, we compare the incidence of relative poverty according to the AROP concept by age class (using the same AROP threshold for all age classes) computed looking at three income concepts: market, gross and disposable income (Tables A1.17, A1.18 and A1.19, respectively).

Table 1.4: Predicted probabilities of being at risk of poverty according to equivalised disposable income in 2017

	<15	15–24	25–34	35–44	45–54	55–65	>65
AT	16.8	14.2	13.5	12.4	13.7	14.1	13.2
BE	21.1	22.2	16.8	19.9	16.1	14.0	9.3
BG	26.8	23.9	22.2	22.1	23.5	19.9	18.0
CY	16.3	14.3	14.7	15.3	15.3	17.9	12.8

CZ	15.1	12.5	8.4	11.3	8.6	8.8	6.4
DE	16.0	17.5	15.9	15.2	16.8	19.0	12.7
DK	16.3	12.5	15.7	16.9	11.2	15.8	7.8
EE	22.5	21.4	22.2	20.5	23.6	25.0	20.3
EL	21.6	26.7	18.0	20.5	21.7	17.7	9.3
ES	26.4	28.8	21.8	20.9	24.5	20.4	12.9
FI	13.5	12.9	15.0	12.2	11.9	10.3	8.4
FR	18.5	16.8	14.1	13.4	13.8	9.7	7.5
HR	23.1	22.1	17.1	19.4	19.5	20.1	14.7
HU	13.4	16.8	11.1	14.5	14.0	12.4	8.1
IE	14.6	21.9	10.5	12.8	16.3	14.8	12.8
IT	26.1	27.7	21.3	20.4	22.8	20.3	11.8
LT	28.8	21.1	19.8	22.0	23.8	24.8	19.2
LU	20.1	18.3	16.7	17.9	19.1	15.8	15.1
LV	24.5	25.7	21.2	23.1	24.5	26.9	20.3
MT	24.3	18.5	12.4	17.1	17.1	14.8	13.1
NL	16.1	14.7	11.7	14.6	13.5	13.9	7.3
PL	15.4	19.5	15.1	15.7	18.7	16.6	9.5
PT	20.4	23.0	17.5	17.2	19.7	17.8	10.7
RO	30.8	31.0	26.2	26.3	25.0	18.8	12.7
SE	21.6	18.4	19.7	19.8	17.8	12.6	7.3
SI	16.1	14.8	13.3	15.1	15.8	12.3	9.3
SK	17.4	16.1	10.6	12.7	11.5	8.4	5.4
UK	21.5	20.6	15.4	17.9	16.5	18.6	12.0

(*) Average marginal effects estimated through a probit model. Control variables: dummies on the gender of the individual and the household head, dummies on citizenship, education and age class of the household head.

Source: EU-SILC data

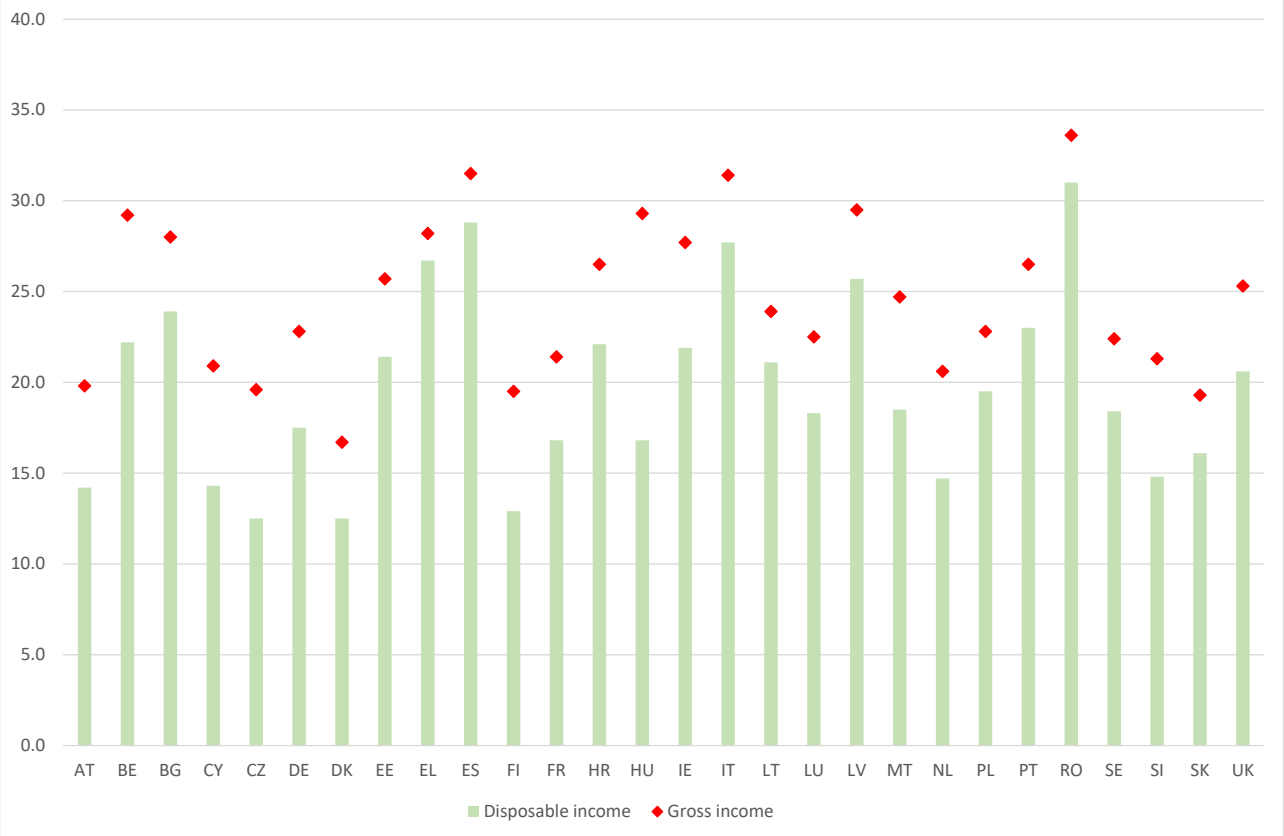
As mentioned, market incomes are by definition low, or zero, for those households living mostly by cash welfare transfers, as pensions or minimum incomes. Accordingly, the

incidence of relative poverty computed on market income is, as expected, very high among the elderly. The distribution of AROP according to market income by age classes shows a mixed pattern, even if individuals aged 15–24 are characterised by a higher risk than prime-aged individuals (Table A1.17).

When focusing on gross incomes, which also include cash welfare transfers, almost half of the countries (13) are characterised by an AROP incidence higher among those aged 15–24 than among the elderly (Table A1.18). As expected, because of tax progressivity, the incidence of poverty reduces for all age groups, and for young people too, when tax redistribution is considered and when we focus on disposable incomes (Table A1.19). However, it is worth mentioning that this decrease in the AROP incidence when moving from equivalised gross to equivalised disposable incomes largely differs across countries, because of the different degree of progressivity and pro-poorness of the tax schedule.

These patterns are clearly confirmed when we estimate the predicted AROP probabilities through probit regressions where individuals' and household heads' characteristics are controlled for (Table 1.4).[17] Finally, Figure 1.9 shows the size of the reduction in the AROP incidence for individuals aged 15–24 when we move from gross to disposable income and confirms that, also controlling for household composition effects, the extent of the reduction in the poverty risk due to tax progressivity differs across EU countries.

Figure 1.9: Predicted probabilities of being at risk of poverty for individuals aged 15–24 according to equivalised gross and disposable income in 2017



Source: EU-SILC data

[17] Being based on an estimation model, the predicted probability thus differs from the values on AROP incidence provided on the Eurostat database.

Afterwards, we investigated the intersection between individuals' working poverty risks, defined according to the approach explained in Section 1.2.2 and focusing on individual gross annual labour income, and household poverty risk computed through the AROP on equivalised disposable income (only active workers with positive incomes are considered when carrying out this analysis).

As noticed by Raitano (2019), among others, poverty risks for workers and households (and inequality in general) can be considered engendered by a sort of process made up of three steps: i) individual outcomes in the labour market (captured by wage levels and the quality of employment); ii) equivalised market incomes of all household members, crucially affected by the characteristics of household members (i.e. by the number of income recipients in the household, that depends on the composition by age of the household) and by the number of household members (that is anyway captured by the equivalence scale), where the concept of market income also includes gross capital incomes (e.g. interests, dividends and rents); and iii) equivalised disposable incomes after taxes and transfers (where in-kind and non-monetary incomes should also be taken into account).

In our opinion, the best way of depicting the main drivers of the various risks which individuals and households are exposed to, together with the effects of policies to counteract them, is to distinguish the step where these risks emerge. To this end, by relying on proper microdata (such as that collected in the EU-SILC), a proper strategy should seek to explicitly highlight the risks that emerge in step 1 (i.e. individual outcomes in the labour market, also including those who involuntarily work for only a few months of the year in order to avoid the exclusion of many precarious workers contrary to what is done in the EU IWP approach) and, then, to investigate the association between individuals' low pay risk with households' outcomes linked to market and disposable income (i.e. the association between low income risks based on step 1 with low income risks based on income concepts used in steps 2 and 3).

For instance, if we wanted to focus on risks emanating from low pay (or the lack of a minimum wage), in our view it would be better first to measure how many individuals receive wages that are so low that they would risk falling below the poverty threshold if they lived alone. Then, it would be interesting to ascertain how many (and which) individuals are not poor if the household level is considered and, then, what is the role played by capital incomes, other labour income recipients and social transfers in the household income. This would assess the role played by household composition, non-labour income and welfare redistribution. Therefore, it would be interesting to study the correlation (by household and worker types) between low annual earnings and relative poverty, and to see why and when the findings of the two concepts are inconsistent.

To this aim, we compute two simple indicators: 1) how many individuals who are working poor according to our definition (i.e. they earn less than 60% of the median gross labour income) are not poor if we focus on the household 'equivalised' dimension (Table 1.5); 2) how many individuals, among those who have a labour income above the working poverty 'low-pay' line becomes poor when the AROP on equivalised disposable income is computed (Table 1.6).

The lack of a clear link between individuals' labour market outcomes and household condition is clearly confirmed by these indicators, which show that there is not a perfect overlapping between the two concepts of low income. In particular, in all countries but BG at least 50% of the working poor aged 15–24 are not in an AROP status in 2017 (Table 1.5). Moreover, a not negligible share of non-poor workers drop in poverty when household resources and needs (because of the household size due to the effect of equivalence scales) are considered to measure individuals' economic wellbeing (Table 1.6, where the relatively small size of the values depends on the fact that these

percentages are computed with respect to the number of non-poor workers, which is usually higher than the number of poor workers).

Table 1.5: Share of workers who are poor according to individual labour income but are not poor according to equivalised disposable income (% values)

	2006					2017				
	15–24	25–34	35–44	45–54	55–65	15–24	25–34	35–44	45–54	55–65
AT	82.2	62.9	74.0	73.2	65.1	78.9	61.2	71.0	68.1	66.0
BE	67.6	71.8	64.6	69.9	82.7	77.4	74.6	66.7	65.0	67.8
BG	42.3	46.4	39.4	51.1	56.1	47.2	55.2	46.7	53.1	53.5
CY	86.7	77.4	71.0	86.0	81.3	73.4	67.4	59.2	67.0	64.3
CZ	62.4	72.4	59.2	73.3	80.8	73.7	74.1	67.4	76.2	69.4
DE	79.6	65.3	69.2	63.9	66.1	78.7	62.4	68.5	67.4	58.7
DK	63.0	71.1	71.7	79.4	85.2	71.8	71.0	66.8	71.4	74.2
EE	63.9	65.7	54.1	56.0	74.3	70.4	61.8	58.0	61.2	73.1
EL	70.3	71.5	58.0	58.1	60.3	61.3	67.3	61.0	55.5	52.4
ES	72.9	67.2	60.5	64.9	62.9	56.2	56.3	51.9	46.6	55.0
FI	71.4	71.7	66.6	65.6	74.4	79.2	68.9	67.2	66.2	75.4
FR	68.6	75.2	68.7	62.4	76.5	73.2	71.1	61.0	60.9	72.0
HR	59.6	68.9	53.6	54.3	49.7	65.3	68.9	52.5	55.2	50.0
HU	69.0	67.8	59.6	58.5	60.1	66.2	71.3	55.0	48.8	49.8
IE	74.0	83.3	71.5	76.2	69.6	78.0	76.5	75.1	70.0	68.4
IT	60.9	67.3	57.8	58.1	63.7	60.1	59.6	49.8	51.3	53.7
LT	81.7	71.5	62.2	65.3	61.3	60.7	68.5	49.4	51.8	53.4
LU	70.0	68.9	67.9	71.9	75.9	67.8	56.0	54.3	53.5	53.5
LV	81.3	63.8	56.1	57.4	63.8	67.6	67.8	56.9	52.3	54.4
MT	79.8	68.9	74.9	69.9	65.0	68.9	81.1	69.8	77.3	80.3
NL	95.6	83.6	81.0	86.8	80.5	79.0	72.3	69.2	70.6	65.5
PL	63.6	64.3	51.7	56.8	69.5	70.2	68.5	60.2	54.9	57.2
PT	75.0	75.3	53.7	68.3	61.2	59.8	67.7	53.1	52.9	55.9

RO	52.3	45.8	43.1	43.5	50.2	56.2	44.3	34.5	39.3	36.8
SE	68.4	71.5	72.2	78.8	87.1	69.8	61.5	55.6	63.1	73.0
SI	85.0	78.1	70.7	77.8	78.1	76.4	74.4	62.4	63.1	65.6
SK	76.0	78.9	62.7	71.8	76.3	65.5	61.3	50.9	61.4	62.7
UK	76.7	67.0	69.3	71.1	74.6	80.3	69.9	70.2	65.3	66.0

Source: EU-SILC data

Table 1.6: Share of workers who are not poor according to individual labour income but are poor according to equivalised disposable income (% values)

	2006					2017				
	15–24	25–34	35–44	45–54	55–65	15–24	25–34	35–44	45–54	55–65
AT	1.3	1.7	2.7	2.0	2.4	1.7	1.8	4.3	2.5	1.2
BE	2.3	1.4	2.3	1.8	1.5	1.0	1.7	3.5	3.7	1.0
BG	4.7	4.0	5.7	6.3	6.0	6.2	5.4	5.9	3.4	3.0
CY	0.0	3.4	4.7	3.4	2.9	1.6	3.1	5.0	5.1	3.1
CZ	0.7	1.0	2.6	1.5	0.4	1.3	1.0	2.0	2.1	0.6
DE	1.2	2.8	2.3	2.6	2.3	3.5	3.2	2.9	2.8	2.5
DK	0.3	0.0	1.5	0.8	0.3	0.0	0.9	2.3	0.9	1.6
EE	1.4	1.7	4.4	3.6	1.3	2.3	2.5	3.6	3.6	1.3
EL	3.6	3.8	7.2	11.1	8.3	7.5	5.3	6.0	9.2	8.3
ES	2.7	3.5	7.2	6.4	4.1	3.3	5.8	6.0	9.1	3.9
FI	0.2	0.3	1.2	0.4	0.4	0.0	0.3	0.6	0.9	0.2
FR	1.7	1.8	3.5	4.3	3.4	2.0	1.6	3.5	3.6	2.7
HR	5.6	3.8	4.7	6.0	4.4	3.3	2.7	5.1	4.6	2.8
HU	2.0	2.9	4.2	3.3	0.8	1.8	1.3	2.1	3.9	4.0
IE	0.7	0.7	2.6	2.3	2.4	3.6	0.4	1.8	2.1	2.4
IT	2.6	3.9	6.6	6.1	3.9	3.6	4.5	6.7	6.1	4.4
LT	1.7	2.7	4.9	1.7	1.6	1.5	3.3	5.9	4.0	1.6
LU	2.6	4.8	5.0	5.9	2.7	10.2	5.8	6.9	7.6	7.7
LV	0.9	2.7	4.1	3.4	3.2	2.8	1.6	3.1	2.9	3.1
MT	1.5	2.3	6.4	4.4	1.2	0.2	1.6	3.6	5.2	3.1
NL	0.7	1.2	2.8	1.3	0.5	0.2	0.6	2.1	2.1	1.6
PL	6.3	5.9	8.3	7.3	2.3	5.2	2.6	3.8	5.9	4.5
PT	7.9	3.2	8.1	5.6	5.6	4.2	5.6	5.8	6.7	6.0
RO	2.1	2.8	4.3	2.7	2.7	4.1	3.1	5.0	3.9	3.4
SE	2.0	1.2	1.6	1.6	0.8	2.3	2.2	2.6	1.4	0.6
SI	1.7	1.6	2.2	2.0	1.9	4.7	3.4	2.6	2.6	2.1

SK	1.7	1.3	4.2	2.8	1.3	1.9	2.3	4.3	4.2	1.9
UK	4.5	3.0	3.9	2.4	2.2	2.1	2.7	3.8	3.3	3.7

Source: EU-SILC data

Between and within equivalised income inequality according to the individuals' age

Finally, we investigate income inequality within each age group by measuring how much disposable income inequality is due to the mean income gaps of individuals belonging to the various age classes.

Therefore, decomposing the Theil index of inequality according to the approach already presented in Section 1.2.2, we measure how much of total equivalised income inequality is due to mean differences between age groups or emerging within each age class (Table 1.7, where we consider the five age classes used so far). As expected, the between-group component is higher when labour or market incomes are considered, since the possibility to earn labour income is physically constrained for households with older members. The age-class divide explains instead a very low share of total inequality in all countries, especially when disposable instead of gross income is considered.

Table 1.7: Theil decomposition of equivalised incomes in 2017 – between components by age classes

	Labour income	Market income	Gross income	Disposable income
AT	22.3	20.4	4.1	3.4
BE	28.2	24.8	4.9	3.3
BG	14.2	12.9	4.7	2.9
CY	18.9	16.7	2.4	2.4
CZ	31.6	30.1	10.5	7.5
DE	24.4	21.4	4.2	1.7
DK	27.8	19.3	6.6	6.5
EE	22.1	21.6	10.5	9.4
EL	17.1	15.2	1.5	1.0
ES	17.9	15.2	1.7	1.4
FI	30.7	25.9	6.9	6.3
FR	28.9	13.5	2.8	3.5
HR	19.1	18.4	4.3	3.1

HU	19.5	19.4	2.8	1.2
IE	14.1	13.4	3.8	2.3
IT	18.6	15.8	2.1	2.3
LT	17.9	17.1	6.8	5.0
LU	24.5	19.4	2.2	1.2
LV	16.9	16.6	7.5	6.8
MT	5.6	5.3	1.9	5.3
NL	32.0	27.7	4.7	3.7
PL	16.3	16.1	3.0	2.1
PT	22.1	19.3	0.9	0.8
RO	17.1	17.1	4.2	2.9
SE	30.4	23.7	6.7	6.0
SI	26.8	24.7	5.2	1.2
SK	18.2	18.1	4.8	3.2
UK	20.8	18.2	3.8	2.3

(*) Individuals with zero equivalised incomes are included in the computation.

Source: EU-SILC data

1.3. Comparing socioeconomic conditions of individuals at the same phase of their lives belonging to different cohorts: a case study about Italy

To extend the assessment of intergenerational fairness, we also provide some insights about the comparison of individuals, belonging to different cohorts, along a significant portion of their lives, according to the second approach of intergenerational fairness highlighted in Section 1.1. As harmonised longitudinal datasets for EU countries following various generations at the same phase of their lives are unavailable, we rely on an Italian dataset – developed by matching EU-SILC waves with longitudinal administrative archives managed by the National Social Security Institute (INPS) – to derive some implications of trends of intergenerational fairness by comparing labour market trajectories in the same phase of the life of individuals born from 1950 to 1984. The aim is to shed more light on this issue from a different perspective and to suggest possible additional indicators of intergenerational fairness to be used at the EU level.

In more detail, we make use of the AD-SILC dataset, that has been developed by enriching the information collected in 2004–2017 waves of the EU-SILC with the

administrative longitudinal information on all job relationships (as an employee or a self-employed) experienced from entry into the labour market up to 2018 by the individuals surveyed in the EU-SILC. The administrative source used for the matching is the INPS Archive which tracks all job relationships, recording in detail worked weeks and gross earnings (in this section, we consider real earnings, inflated by using the HICP).

To carry out the analyses shown in this section, we have extracted from the EU-SILC the subsample of individuals born from 1950 to 1984. In more detail, we first compare working careers experienced by these cohorts of individuals in the 10-year period when they were aged 25 to 34. Then, to overcome the issue related to the fact that, at the same age, individuals may have different work experience because of the different lengths of their educational path – and educational attainments of Italian workers have indeed increased across cohorts – we observe the career patterns experienced by individuals from the 1st to the 10th year after the year of entry into the labour market.[18]

When we compare, in different calendar years, the cohorts when aged 25 to 34, we compare 4 large cohorts: 1950–1959, 1960–1969, 1970–1979 and 1980–1984.[19] When we, instead, compare the first 10-year career pattern, we drop the oldest cohort (earnings are recorded in our dataset starting from 1975), and compare 5 cohorts: 1960–1964, 1965–1969, 1970–1974, 1975–1979 and 1980–1984.

We assess the evolution across cohorts of career patterns focusing on four outcomes:

1. Total number of worked weeks over the 10-year period (considering periods worked under each type of contractual arrangement).

2. Mean annual number of worked weeks over the 10-year period, considering, as the denominator for computing the mean, only those years with at least a working spell (we exclude years without working spells, since our dataset does not distinguish involuntary unemployment from voluntary inactivity and, thus, we cannot infer the reason behind a full year spent without working).

3. Mean annual earnings as a private employee per year with a working spell as a private employee over the 10-year period. As concerns earnings, we only refer to private employees since their earnings are more precisely recorded from 1975 in the administrative archives.[20]

4. The standard deviation of mean annual earnings as a private employee per year with a working spell as a private employee over the 10-year period, to capture whether the within-cohort inequality has changed over time.

In what follows, we present the conclusions referring to the four outcomes through graphs showing index numbers computed, for each cohort, with respect to the oldest cohort. Outcomes are also shown distinguishing workers by gender and education (at most lower secondary, upper secondary, tertiary).

Before showing the results, it should be noted that this type of analysis is the most suitable for investigating a possible dwindling of labour market opportunities for young

[18] The entry year is not considered. We define the entry year as the oldest year with a job relationship lasting more than 12 weeks in the year.

[19] Individuals born in 1984 are the youngest individuals which we can observe until they are aged 34 in our dataset.

[20] The reason why we restrict our attention to private employees' earnings only is twofold: i) self-employed incomes are plagued by problems of underreporting and truncation in the administrative archives; and ii) earnings of public employees, 'parasubordinate' workers (i.e. individuals formally acting as self-employed but usually working as substitutes of employees) and professionals have been available, with some limits, only since 1996. However, note that records concerning periods spent as public employees and self-employed (including atypical contract arrangements) have been used to measure the total labour worked weeks.

workers across Europe. The economic literature has devoted limited but growing attention to analysis of earning patterns across generations in some OECD countries. Beaudry and Green (2000) and Beach and Finnie (2004) found a declining entry wage for those who entered the labour market during the 90s in Canada (by 10% to 15%) in contrast with steady upward shifts in the earnings profiles for the 60s and 70s cohorts. In Germany, the picture is quite different: the earnings of young cohorts grew at the same rate as those of other cohorts over the period 1976–1984 (Fitzenberger et al. 2001). As for Italy, Rosolia and Torrini (2007 and 2016), using administrative data, offered preliminary evidence on the deterioration of entry wages over the 90s compared to older generations, finding that younger generations experience a permanent loss in working life earnings due to a lower entry wage, which is not offset by a faster career. By using a previous release of the AD-SILC dataset (a much smaller release since only individuals belonging to the 2005 wave of the EU-SILC were observed), Naticchioni et al. (2016) documented the evolution of the experience-earnings profiles of employees in the Italian private sector over the first six years of working career across three birth cohorts (1965–1969, 1970–1974 and 1975–1979). This evolution highlights a deterioration of the earnings dynamics in the early phase of the career for the most recent cohorts compared to older ones, and it reveals that high skilled workers are particularly penalized. By using the same release of the EU-SILC, Struffolino and Raitano (2020) calculate the complexity of seven-year-long early careers, applying sequence analysis methods. Findings indicate that early-career complexity (i.e. frequency of changes among contractual arrangements and occupational statuses) have increased across cohorts, especially for those individuals more exposed to the Italian labour market deregulation process that started in the mid-1990s, and that a worsening condition has been experienced mostly by medium and low-educated individuals and women belonging to the youngest cohorts.

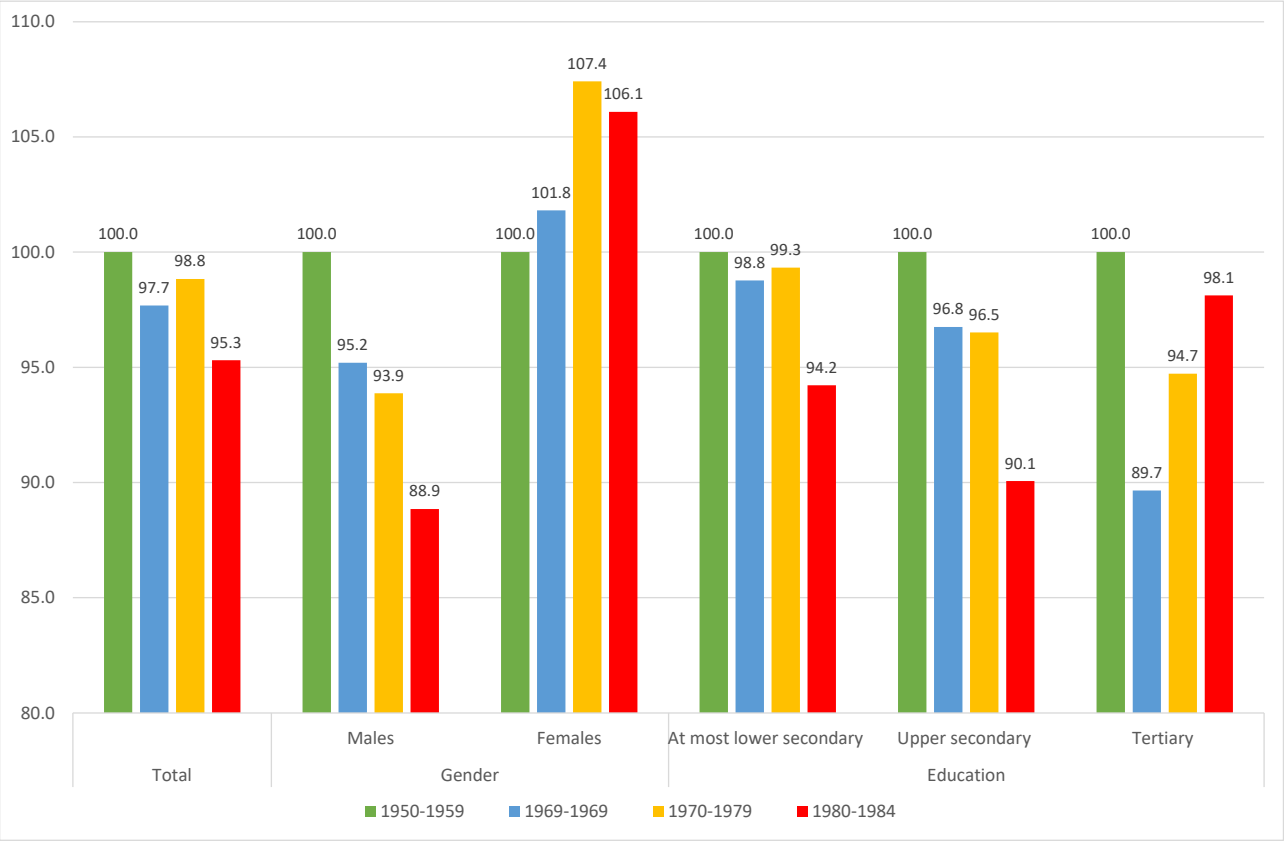
Finally, in this chapter we show descriptive evidence of the trends of the various outcomes across cohorts. However, descriptive plots should be taken with caution for two main reasons. First, they do not take into account changes in the labour force composition over time, e.g. changes in individual characteristics such as increases in educational attainment and female participation. Second, they do not account for business-cycle effects on the patterns characterising different cohorts at different seniorities (i.e. years of experience) in the labour market.[21]

1.3.1. Labour market outcomes when aged 25–34

Figure 1.10 shows that the number of worked weeks over the 10-year period when workers were aged 25–34 has reduced across cohorts. In particular, those born in 1980–1984 are characterised by a 4.7% reduction in worked weeks with respect to those born in the 1950s. However, the pattern is completely different between men and women: the reduction is very large among males (-11.1%) and characterises all cohorts of individuals born from the 1960s as compared to those born in the 1950s, while for females an increase emerges, consistent with the higher labour market entry of women in the Italian labour market. As well, a reduction in the work intensity from the first to the last cohort emerges independently of the educational attainment, with the largest decrease emerging among middle-educated workers (-9.9%). Further, when we compute yearly mean worked weeks only considering worked years, females born in 1980–1984 are no longer characterised by an increase in work intensity (Figure A1.9), thus signalling that the pattern shown in Figure 1.10 is due to a decrease of the share of women who are employed only for a few years in the observed 10-year period.

[21] Naticchioni et al. (2016) apply a dynamic model instead to depurate earnings-experience patterns from GDP growth, also controlling for several individuals' characteristics.

Figure 1.10: Total worked weeks from age 25 to 34, index number: cohort 1950–1959 = 100



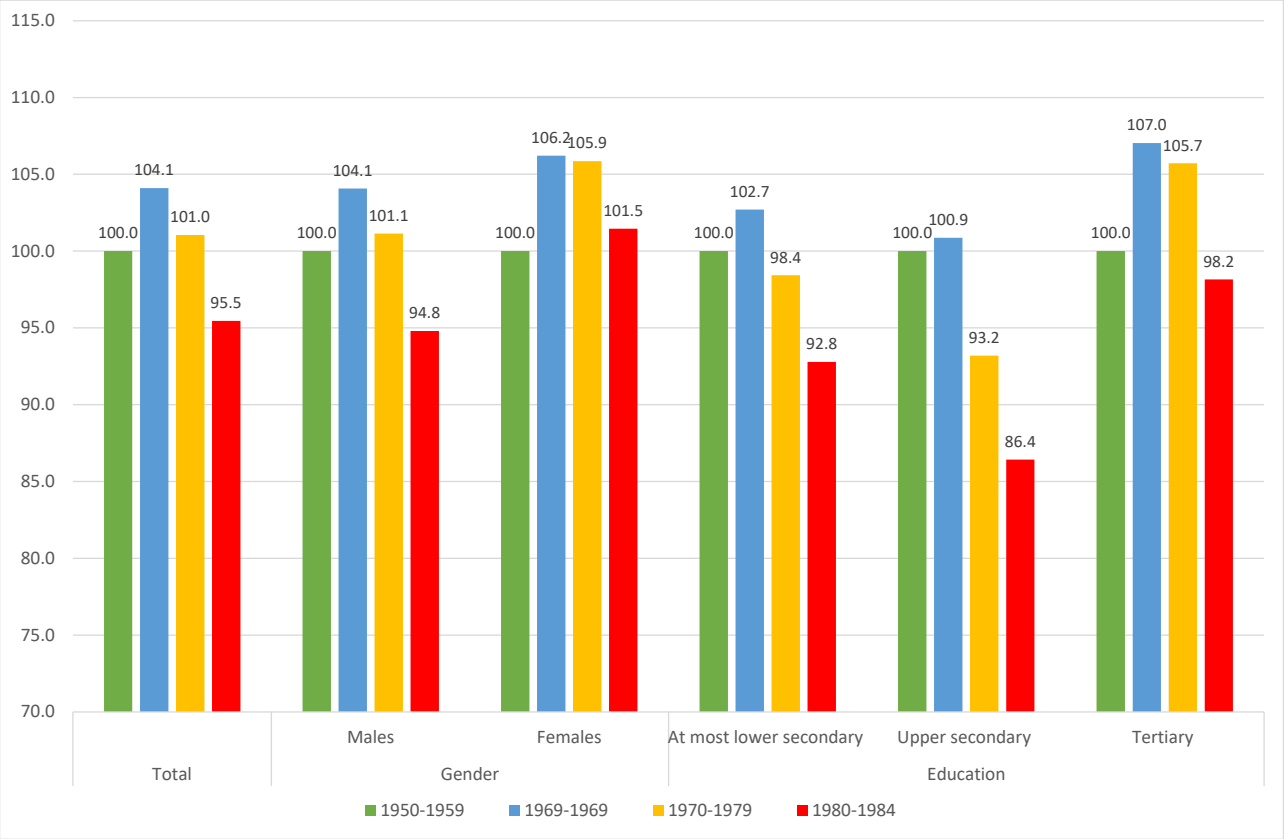
Source: AD-SILC data

Hence, following a cohort-based approach – i.e. by comparing individuals born in different decades when they had the same age – some clear conclusions for intergenerational fairness emerge from this evidence. Actually, it appears clear that – despite a generalised rise in the labour market participation rates of females and a rising average level of education in the Italian population across the observed generations (the share of graduates has increased from around 10% among those born in the 50s to approximately 25% for the recent cohorts) – the frequency of employment spells of young individuals has reduced over time, thus providing first evidence of worsening labour market conditions for younger cohorts

As already mentioned, intergenerational fairness may also be investigated by looking at wages obtained in the same phase of the working life by individuals born in different decades. As concerns wages of private employees (Figure 1.11), we confirm findings by Rosolia and Torrini (2016) and Naticchioni et al. (2016), since we find that mean annual earnings have reduced across cohorts, and especially that the youngest cohort suffers from a significant decrease in real annual gross earnings (with the mean being computed only by considering years with positive earnings in the 10-year period). The decrease in mean earnings across cohorts is coupled by an increase in within-inequality in the youngest cohorts, as captured by the standard deviation of mean earnings as a private employee from age 25 to 34 (Figure A1.10). On average, the within-cohort inequality increased by 5.2% from the oldest to the youngest cohorts and the increase is particularly

striking among males (+29.5%) and among the least educated workers (+64.8%), while a reduction in within-inequality emerges among tertiary graduates in the youngest cohorts.

Figure 1.11: Mean annual (inflation-indexed) earnings as a private employee per year with a working spell as a private employee from age 25 to 34. Index number: Cohort 1950–1959=100



Source: AD-SILC data

In addition to the evidence about worked weeks, a decrease in earnings from the oldest to the youngest cohort is particularly worrisome and signals a worsening of the conditions of workers in the labour market. Actually, we should have instead expected a not negligible increase for at least two reasons (not controlled for in our descriptive analysis): i) a changing composition of the workforce, with an increasing share of high-skilled workers within the younger cohorts; and ii) a real income growth that should increase real earnings over time (remark that we only index earnings by the inflation rate, without incorporating the real GDP or productivity growth).

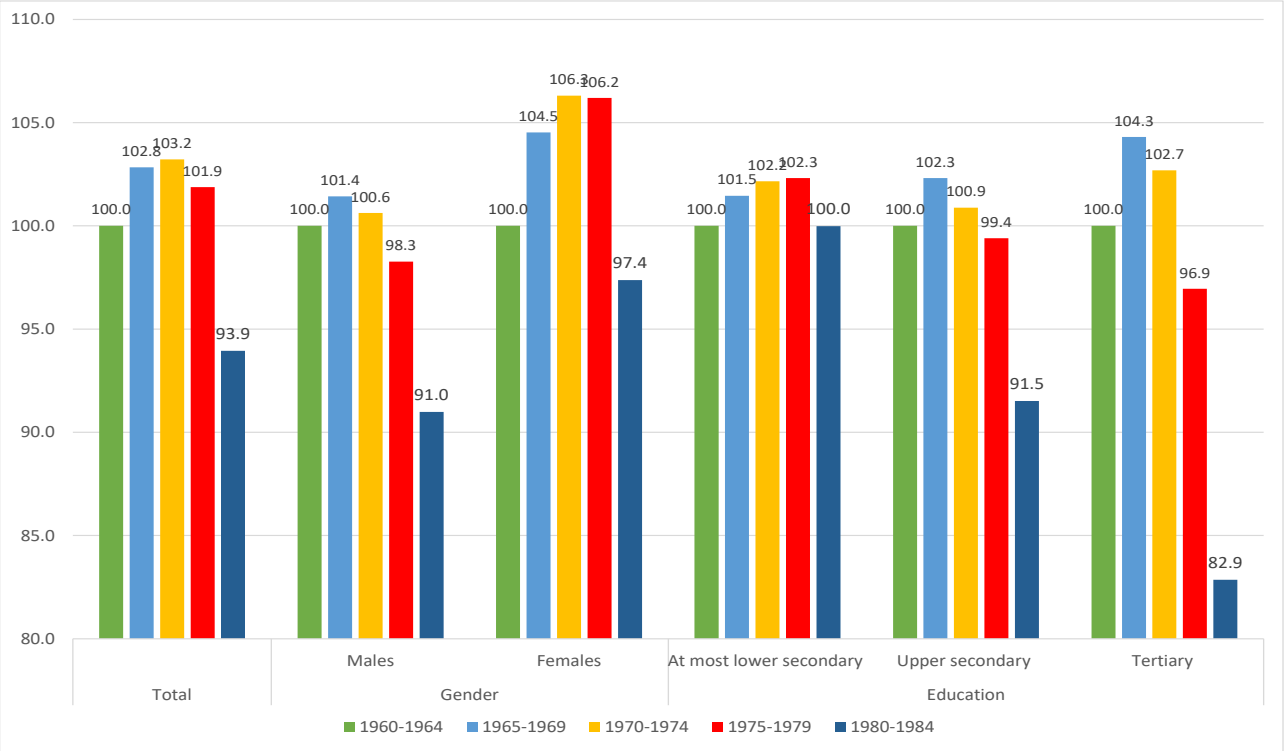
Therefore, it is relevant to try to explain what might have been the driver of the observed deterioration for the youngest cohort, as well as for skilled individuals, as concerns mean earnings in the youngest cohort. Following Naticchioni et al. (2016), one possible explanation could emerge from standard supply and demand considerations. In the past few decades, educational attainment has shown a general increase in Italy and one might argue that the deterioration for the youngest cohort has been worse for the high-skilled since these workers have become far less scarce in the economy. However, it needs stressing that Italy is a country where educational levels are rather low with respect to

other European and OECD countries. Arguing that there is simply too much higher education in Italy would also imply that the Italian production system has some peculiar features so that the demand for skills is much lower than in other European/OECD countries. Another possible explanation lies in the institutional changes that have occurred in the last few decades in Italy, where a labour market deregulation process has been underway. The hypothesis that an increase in flexibility could have entailed a reduction in bargaining power for young individuals is perfectly reasonable and plausible, since new atypical and temporary contracts introduced by the reforms have been used mainly for young people. Another important step in this explanation is to understand why the decrease in bargaining power has been greater for skilled individuals. This might be accounted for by the fact that the new forms of atypical and temporary contracts have been used for graduates on a very large scale, and this in turn could have been due to a difficulty for Italian labour demand to absorb the increasing share of graduates on regular contracts, associated with higher wages.

1.3.2. Labour market outcomes in the 10 years after the entry

Consistent with previous evidence, the total number of worked weeks in the 10-year period reduces for younger cohorts when we observe labour market outcomes from the 1st to the 10th year after entry into activity (Figure 1.12). Such decrease is particularly intense for males and for tertiary graduates. Note that the same pattern emerges when we depurate from possible years entirely spent without working and focus on mean annual worked weeks over the first 10 years of the career excluding possible years spent with 'zero weeks' from the computation (Figure A1.11).

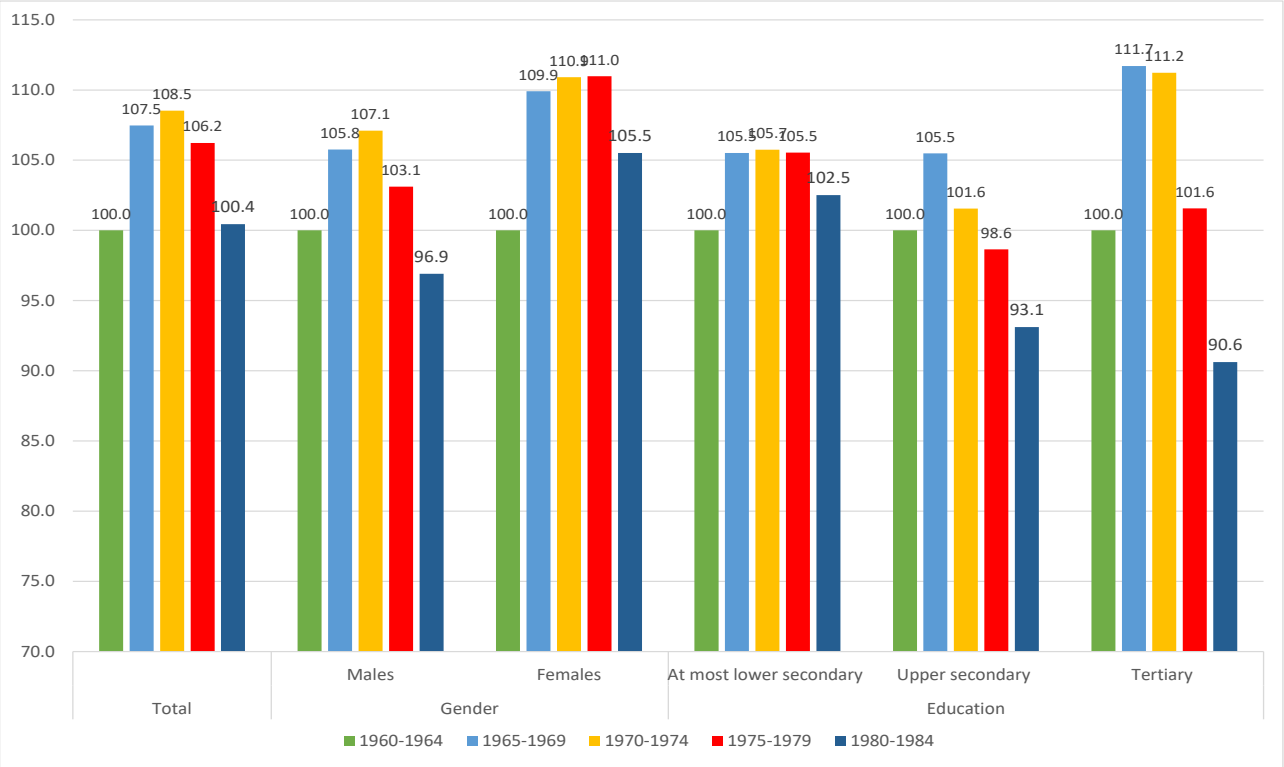
Figure 1.12: Total worked weeks in the 10 years after the entry in the labour market, index number: cohort 1960–1964 = 100



Source: AD-SILC data

As concerns mean earnings as a private employee (Figure 1.13), mixed results emerge. Mean annual earnings are constant when comparing those born at the beginning of the 1960s and at the beginning of the 1980s, while earnings increased for the middle cohorts.[22] However, results are heterogenous according to workers' gender and education. In particular, in the youngest cohorts large penalties with respect to previous cohorts emerge for males and for workers with an upper secondary or a tertiary degree.

Figure 1.13: Mean annual (inflation-indexed) earnings as a private employee per year with a working spell as a private employee in the 10 years after the entry in the labour market, index number: cohort 1960–1964 = 100



Source: AD-SILC data

No clear trends emerge, instead, as concerns earnings inequality within cohorts at the beginning of the career, as captured by the standard deviation of mean annual earnings in the observed 10-year period (Figure A1.12). However, a not negligible rise of earnings inequality in the first 10 years of the career characterised females born in 1965–1979.

[22] Results shown in Section 1.3.1 and 1.3.2 should be compared with caution because of the different observed phase of the working life, i.e. at fixed ages but, possibly, very different labour market experiences (Section 1.3.1), or at fixed experiences but different ages (Section 1.3.2). For example, low-skilled individuals who entered the labour market at a young age may have high experience at age 35, while, conversely, individuals may have heterogenous ages when observed in the first 10-year period of the working career. The difference in the two approaches is the reason why analyses by both age and experiences are presented in this report.

1.4. Conclusions

In this chapter, the relative conditions of individuals of different ages have been assessed by applying two different methodological approaches.

First, using EU-SILC 2007 and 2018 waves, we investigated across countries the evolution of intergenerational fairness in the observed period by comparing employment conditions and incomes of individuals of different ages at a certain year. To distinguish the role played by redistributive policies (taxes and transfers) on intergenerational fairness, findings concerning three different concepts of household income – market, gross and disposable income – were compared. As remarked in the chapter, this approach – the easiest to apply given the unavailability of EU harmonised long panel data covering subsequent generations – has the limitation of being unfit to disentangle how much of the gap between individuals of different ages is due to the different phases of their life in which they are (the age effect) or to different conditions at the same age experienced by individuals born in different years (the cohort effect).

Secondly, by focusing on the case of Italy where a detailed longitudinal administrative dataset on workers' career is available, the chapter also shows insights about the comparison of individuals belonging to different cohorts along a significant portion of their life, according to the aforementioned second approach of intergenerational fairness.

The analysis based on the EU-SILC focused on both workers and equivalised individuals as the unit of observation of the observed phenomena.

A general result is that in all countries younger workers (those aged 15–24 and 25–34) have lower labour incomes than prime-aged workers. Tax redistribution and transfers through unemployment benefits usually reduce the wage age gap among workers, and the same cushioning effect of redistribution emerges when one focuses on equivalised incomes thanks to the effects associated with the household composition (e.g. the presence of two income recipients within the household). However, the redistribution is not enough to close that age gap. Effective 'predistributive' measures – i.e. measures acting where intergenerational fairness develops, namely on the labour market – should then be strengthened and directed at improving the relative conditions of new generations. An inexhaustive list of alternative policy tools might include: investment in high-quality human capital, especially for those coming from less advantaged backgrounds; labour market reforms which may reduce the negative consequences on younger generations associated with deregulation processes which in some countries created a segmented labour market that mostly penalised the younger generations; product market reforms which, by reducing rents and entry barriers in some markets, may improve the competitive position of new entrant young workers; and an increase in minimum wages which may increase earnings of the low-paid individuals, among which a large share is made of young workers. The idea that labour market trends and reforms introduced in the last decades might have worsened the economic conditions of the young generations is also supported by the evidence on the Italian case based on long administrative panel data, which allowed us to compare labour market outcomes of workers born in different decades but observed at the same age/experience.

A further clear finding emerging from this chapter is that – even if older and more educated workers usually benefit from higher mean wages – worker's age and education alone are not able to explain a major part of income differences among workers. Therefore, the bulk of earnings inequality emerge within groups of individuals with apparently similar characteristics (such as age). Of course, intergenerational fairness – here mostly synthesised as an age earnings gaps when dozens of further individual characteristics are controlled for – is an issue since age earnings gaps emerge and these gaps should be closed, especially when they are not related to differences in workers'

ability or productivity. However, the main implication of the evidence about the so-called ‘within subgroup’ inequality is that research and policies should investigate why large earnings inequality emerges within groups of apparently similar individuals, with the aim of assessing the acceptability of the earnings gaps emerging in the markets.

Finally, by comparing individual low-pay risks to poverty risks based on equivalised incomes, the chapter showed that these two risks do not perfectly overlap. This implies that family composition may represent a buffer against individual labour market risks when more than one income recipient cohabit in the same household or, on the contrary, might amplify negative economic conditions for individuals earning low incomes and living in large households without other income recipients. From this approach, it can be seen that measures fostering an increase in labour market participation, especially of those belonging to the poorest households, and supporting their incomes and opportunities (through both cash and in-kind welfare benefits) may help reduce age earnings gaps and income inequality.

2. How do Member States' tax and benefit systems perform in terms of redistribution across different age groups?

Summary

Using data from aggregate social protection spending statistics from the Eurostat ESSPROS database covering the period 2002–2017, this chapter shows that a higher share of total social protection spending is oriented towards the support of elderly population groups than to the non-elderly population in the majority of EU countries and that this pro-elderly orientation in social protection spending has strengthened in most EU countries over time. Furthermore, employing microdata from the EU-SILC, the chapter shows that social transfers account for a higher share of gross household income among older age groups than among younger age groups. Although there is some evidence that this pattern has strengthened over time in many countries, this appears to be largely explained by market income forces. In contrast, taxes and social security contributions were found to account for a higher share of gross household income among younger than among older age groups in many EU countries, pointing to the significant pro-elderly bias of their tax systems. Analysis of the changes over the period 2007–2017 revealed that the patterns of change were quite diverse across countries, with the pro-elderly bias of the tax systems strengthening in some countries and weakening in others. Breaking down the overall redistributive effects of the social transfers and tax reveals that, in most EU countries, the redistributive effects achieved by old-age pensions is much larger than either that achieved by other non-elderly benefits or by taxes. Moreover, the analysis reveals that taxes and non-old-age benefits in all EU countries have a rather moderate role in redistribution between age groups. In most countries, the between- age-group redistributive effects are largely achieved by old-age pensions. Investigating trends in redistribution reveals that on average and in most EU countries, the redistributive effects of tax and benefit systems declined between 2007 and 2017. Although there is a large cross-country variation, in most countries the decrease in overall redistribution was mainly driven by the decrease in redistributive effects of old-age pensions and non-old-age benefits and less so by taxes. Moreover, it was found that although in most countries changes in the between-age-groups redistribution were much smaller than the change in the within-age-group redistribution, in some countries the change in the between-age-groups redistribution made a substantial contribution to the overall change of redistribution. The final section of this chapter provides evidence about the importance of multigenerational living arrangements and shows that a substantial part of the redistributive effects of the tax and benefit systems in many European Union countries operate within these types of households.

2.1. Introduction

With inequality on the rise in many industrialized countries, and with the drastic cuts in public spending and rises in taxes undertaken following the 2008 financial and subsequent economic crisis, affecting different parts of the distribution differently, interest in the redistributive effects of tax and benefit systems has increased substantially.[23]

[23] Examples of previous studies examining the redistributive effects of tax and transfer include among many others Immervoll et al. (2005), Immervoll and Richardson (2011), Whiteford (2008), Avram et al. (2014), Caminada et al. (2017), Causa and Hermansen (2017) and Paulus et al. (2009).

Despite this surge of interest in the redistributive effects of the tax and transfer system, very few studies explicitly examine how different tax and benefits systems redistribute between different age groups. Nonetheless, the financial crisis started in 2008 and the governments' reaction to it have affected different generations differently, which could in turn have implications for intergenerational inequalities. Also, the size of inequality and the effectiveness of redistribution differ between generations, which makes it crucial to examine how, and to what extent, the redistributive effects of different tax and benefit instruments differ across age groups and how these affect the degree of inequality between them. As mentioned above, despite its importance, the issue of how EU Member States' tax and benefit systems perform in terms of redistribution across age groups is rarely studied. One exception is the recent study by Bussolo et al. (2019) who analyse the performance of the 28 EU countries in terms of both vertical and horizontal redistribution across age groups over the period 2007–2014 using microsimulation techniques.[24] They found that the majority of EU countries (with the exception of some Eastern European countries) have experienced an increase in overall redistribution between 2007 and 2014. With respect to redistribution between age groups, they found that in Southern and Western Europe, both automatic stabilisers and changes in the tax systems alleviated the burden on younger generations, while in Eastern Europe, policy changes had the potential to increase inequality between age groups.

This chapter builds on and extends the existing evidence concerning the intergenerational fairness effects of the tax and benefit systems in the 27 Member States of the EU in various ways: by providing a detailed account of the age orientation of the tax and benefit systems that are in place in different European countries using aggregate social protection spending statistics from the European System of integrated Social Protection Statistics (ESSPROS) database (Section 2.2); by providing estimates of age profiles relating to taxes and social transfers (Section 2.3.2); by examining the redistributive effect of tax and benefit systems and how these contribute to within-age-group and between-age-groups inequalities (Section 2.3.3); by investigating how the redistributive effects of tax and benefit systems across EU countries changed over the period 2007–2017 and how the change in the between- and within-age-group inequality redistribution contributed to the change in the overall redistribution over this period (Section A2.1 in Annex 2); and finally by taking a direct account of the effects that shared living arrangements among generations have on the assessment of the redistributive effects of tax and benefit systems (Section A2.2 in Annex 2).

2.2. Evidence from aggregate social protection spending statistics

This section analyses the dynamics of aggregate social protection spending over the 15-year period 2002–2017 across different EU Member States with the aim of assessing the extent to which there has been a shift in social protection expenditures over time and whether this shift has affected different age groups differently. The analysis draws on social expenditure data from the European System of integrated Social Protection statistics (ESSPROS) database. Under ESSPROS, social protection encompasses interventions from public or private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs (e.g. sickness; invalidity and disability; old age; parental responsibilities; the loss of a spouse or parent; unemployment; housing; and social exclusion), provided that there is neither a simultaneous reciprocal nor an individual arrangement involved (EUROSTAT, 2016, 2017). ESSPROS expenditure statistics are broken down in social protection benefits, administration costs and other expenditures.

[24] The concept of vertical inequality measures inequality over the range of individuals rather than groups whereas horizontal inequality measures inequality between groups defined in terms of various socioeconomic characteristics.

Social protection benefits are further classified into the following eight main functions: (1) sickness and healthcare; (2) disability; (3) old age; (4) survivors; (5) family and children; (6) unemployment; (7) housing; and (8) social exclusion not elsewhere classified (n.e.c.).

Each function covers a variety of benefit types including both cash benefits (including tax credits) and in-kind benefits as well as means-tested and non-means-tested benefits. Section 2.2.1 investigates how the overall spending on social protection benefits changed over the period 2002–2017 in different EU Member States, first as a percent of the gross domestic product (GDP) in each year and as a percentage of the real 2002 GDP and then in absolute terms (i.e. in PPP 2010 euros/per capita). Section 2.2.2 then investigates the contribution of each function to the overall change in social protection benefits spending for each country over time. Given the differential age relevance of different functions, this analysis gives a first indication of the generational orientation of social protection spending in each EU country and its dynamics over time. However, given that the relative magnitude of social protection spending depends on the demographic structure of the population and the economic conditions in each country at a point in time, cross-national comparisons as well as comparisons over time may confound both demographic and economic effects (e.g. rising unemployment), thereby leading to a false assessment of the age orientation of different social protection systems. In order to disentangle the confounding effects of demographic and economic changes in Section 2.2.3, we derive a measure of the generational orientation of social protection spending which takes into account differences in the population structure of different countries and changes in the population structures over time.

2.2.1. The overall size of social protection benefits expenditures

In 2017, expenditures on social protection relative to GDP were estimated at 26.9% in the EU-27 (Table A2.1). Across the EU-27 Member States, this ratio was highest in FR (31.7%) followed closely by DK (30.8%) and FI (30.1%) and then by AT, DE, SE, IT, NL and BE. By contrast, social protection expenditure represented less than 18% of GDP in CZ, SK, BG, MT, EE, LV, IE and LT with the lowest share estimated in RO (14.1%).

Compared to 2002, the share of expenditures on social protection benefits relative to GDP was much higher in 2017. However, there has been quite large heterogeneity in the magnitude of the increases across EU member states. The largest increases were recorded in EL (6.9 percentage points) and in FI (6 percentage points) followed by IT, NL and ES (4 to 5 percentage points) while somewhat more moderate increases were recorded in FR, CY, EE, PT and DK (ranging from 2.7 to 3.6 percentage points). By contrast, SK (-0.5 percentage points), SE (-0.6 percentage points), IE (-0.9 percentage points), PL (-1 percentage point), SI (-1.1 percentage points), MT (-1.3 percentage points) and HU (-1.6 percentage point) each recorded lower ratios of social protection expenditure to GDP in 2017 compared with 2002.

In terms of how overall spending developed in different subperiods, Table A2.1 shows that while in the period 2002–2007 most countries recorded either decreases or relatively small increases in the share of social protection benefit expenditures (from public and private bodies) relative to GDP, during the period 2007–2012 most countries recorded substantial increases in their social protection benefit expenditures (except for HU which recorded a small decrease). During 2012–2017, most countries again recorded decreases in the share of social protection benefit expenditures relative to GDP. IE stands out: it is one of the countries with the largest increases in social protection benefit spending of their GDP in the period 2007–2012 and the largest recorded decrease of around 8.4 percentage points of the GDP in the period 2012–2017.

The changes described above reflect both changes in social protection benefit expenditures but also changes in GDP, and therefore may conceal differences and changes in the size of social protection benefit expenditures. This is particularly relevant for the period covered here given the substantial adverse effect of the financial crisis on the GDP in many EU Member States as well as on the various economic risks faced by their population (e.g. increase in unemployment) which would also impact the absolute level of social protection expenditures.

To isolate changes in social protection spending driven by GDP dynamics from actual changes in social protection spending, Table A2.2 reports estimates of the social protection expenditures expressed as a share of the real 2002 GDP (i.e. indexed at 2010 euros). In contrast to the patterns estimated when expressing social protection spending as a percent of current GDP, all countries recorded an increase in social protection spending when this is expressed as a share of the real 2002 GDP. The largest increases were recorded in LT (16.7 percentage points) and LV (14.5 percentage points) followed by RO, PL, EE and SK (from 1 to 14 percentage points). By contrast, the countries with the smallest recorded change are IT (3 percentage points), LU (4 percentage points) and PT, EL, CY, HU and AT (all at around 5 percentage points).

To further isolate these two forces, we next examine the evolution in the level of social protection expenditures per capita. As shown in Table A2.3, in 2017, the (population weighted) average per capita public expenditure on social protection benefits in the EU-27 member states was EUR 7 343. Of all the EU member states, LU had the highest per capita expenditure in 2017 (EUR 13 209 per capita), followed by DK (EUR 10 287 per capita). Other countries with above the EU-27 average social protection spending include DE, NL, SE, AT, FR, FI and BE (the UK also had above average spending on social protection benefits). By contrast, social protection expenditures were below EUR 4 000 per capita in SK, HU, EE, HR, PL, LT and LV with the lowest recorded level in RO and BG (EUR 2,534 and EUR 2,344 per capita respectively). Differences between countries in the level of social protection benefit expenditures are partly related to differing economic levels, but they also reflect diversity across countries in the generosity of their social protection systems, differences in the demographic composition of their populations, cross-national differences in unemployment rates and other social, institutional and economic factors affecting both the capacity and the scope of social protection spending in different countries.

2.2.2. The composition of social protection benefit expenditures

Figure A2.1 breaks down total spending on social protection benefits in 2017 into seven social protection functions. The figure consists of two charts. The first chart presents the breakdown in terms of per capita spending (expressed in PPP constant 2010 euros) by function while the second presents breakdowns in terms of the share of the spending for each function within the total social protection benefit spending.

In all countries spending in ‘sickness and healthcare’, ‘old age’ and ‘survivors’ functions represented the largest share of social protection benefit expenditures, accounting together for over 75% of the total social protection benefit spending in 2017 (with a range from 61% and 65% in DK and LU to 84% to 87% in MT, PT and RO).

Spending on sickness and healthcare was as high as 39% of total social protection benefit spending in IE and 34% to 35% in DE, MT, SI, HR and NL, 30% to 33% in CZ, SK, LT and EE, down to around 20% to 23% in IT, PL, FI, DK and DE and as low as 18% in CY. The variation in spending on old-age and survivor functions across EU-27 Member States is even larger. The country with the largest spending ratio on the old-age and survivors

function is EL where it accounts for as much as 63% of total social protection benefit spending, followed by PT and IT where it is somewhere near 58%. RO, CY, PL, MT, ES and AT also recorded ratios of over 50%. By contrast, in LU, DK and DE spending on old-age and survivor functions made up around 39% to 40% of the total social protection benefit spending and in IE around 34%. Spending on 'family and children' as well as the 'unemployment' 'housing' and 'social exclusion not elsewhere classified (n.e.c.)' functions made up a much lower share of total social protection benefit spending in all countries compared to the old-age, survivors, sickness, healthcare or disability functions.

The share of family and children spending within the total social protection benefit spending was highest in LU (15%), followed by PL, EE and HU (12% to 13%), around 11% in DE, DK, LV and BG and 10% in SE, FI and AT. Overall, across the 27 EU Member States, it was around 9%. By contrast, the share of spending on the family and children function represented less than 6% of the overall social protection benefit spending in Southern European countries and NL.

Spending on unemployment represented the next largest component of social protection benefit spending in most countries. On average across the EU-27 Member States spending on unemployment represented 5% of the overall social protection spending (weighted by countries' population size) with a range from around 9% and 8% in IE and ES respectively to around 2% in SI, MT, HR, HU and PL and to less than 1% in RO.

Finally, spending on 'housing' and 'social exclusion' was the smallest component of the total social protection benefit spending in most countries (except for CY, DK and SE). On average across the 27 EU countries, spending on these functions together represented 4% of the overall social protection benefit spending, ranging from around 9% in CY and 7% in DK to around 1% in a number of countries including ES, HR, BG. IT, LV, RO, EE, PT and PL. Overall, the evidence suggests that a higher share of total social protection spending is oriented towards the support of the elderly population groups than to the non-elderly population in the majority of European Union countries.

Figure A2.2 shows how the total per capita spending on each social protection function changed over the period 2002–2017 (note that countries in this figure are sorted by the level of 2017 social protection benefit spending). With the exception of DE and to a lesser extent IT, in all other countries old-age and survivor functions were the social protection functions with the largest absolute increase in spending. Increases in old-age spending were particularly large in Luxemburg and Finland (over EUR 1 500) but also in SE, FR, PT, RO, NL, DK, IE, AT and BE (EUR 900 to EUR 1 500). In contrast, the countries with the smallest recorded increases in public spending per capita on old-age and survivor functions are LV (EUR 398), HU (EUR 329) and IT (EUR 227). Spending per capita on sickness and healthcare was the function with the next largest recorded increase in most countries. Exceptions here are DK and DE which recorded much larger increases in sickness, healthcare and disability spending per capita than in the old-age and survivor functions, as well as Italy which generally had a uniform change in spending per capita across the different social protection functions. The spending per capita on family and children exhibited much more moderate dynamics in all countries.

Figure A2.3 shows the percentage point change in the share of expenditures on different social protection functions within the total social protection benefit spending. Mirroring the results discussed above, in most countries over the period 2002–2017, there has been a substantial increase in the share of total spending allocated to old-age and survivor functions. The most substantial increase was recorded in PT where the share of spending on old-age and survivor functions increased by 13 percentage points, followed by FI, ES, SK and RO (which all recorded an 8 percentage points increase) and CY and HU (which both recorded a 7 percentage points decrease). Smaller increases were recorded in SE, BE, IE, CZ and EL (where the increase was at a magnitude of around 4 to 6 percentage points) and even smaller in LU, AT, MT and FR (around 2 to 3 percentage points) and the

smallest in DK, NL and SI (less than 1 percentage point increase). In contrast, the share of spending on old-age and survivor functions decreased by around 8 percentage points in LV, by around 5 percentage points in IT and by 2 to 3 percentage points in LT, DE, EE and PL.

In most countries, increases in the share of old-age and survivor functions in total social protection benefit spending were accompanied by decreases in the share of spending in the functions of sickness and healthcare, disability, and family and children. The largest decrease in the share of spending on the sickness and healthcare function was recorded in CY, EL and PT (6 to 8 percentage points); for the disability function in PL, PT, HU and SI (4 to 6 percentage points) and for the family and children function in RO and IE (around 5 percentage points). Non-negligible reductions in the family and children function were also recorded in FI, MT, PT and LU (2 percentage points) and to a lesser extent in SI, NL, FR, CY and AT (1 percentage point reduction).

For the unemployment function, the patterns across countries were more mixed with some countries recording substantial reductions in unemployment spending (including, for example, DK, DE, BE and RO – which recorded increases of around 4 to 5 percentage points – as well as FI, MT, SE and ES – around 3 percentage points – and to a lesser extent in PL, PT, SI, NL, FR, HU and SK – with recorded increases of around 1 to 2 percentage points) and others recording either no change (e.g. IE, CY, CZ, LV and EL) or even an increase. The last group of countries include LU and AT which recorded a 1 percentage point increase, LT and EE which recorded a 2 percentage point increase and IT (increase by 4 percentage points). Although most countries recorded a decrease or no change in the share of family and children spending, a minority of countries recorded an increase in the share of this function, ranging from 1 percentage point in SK, CZ and LV, 2 percentage points in EL, EE and IT, and up to 8 percentage points in PL.

Overall, when taken together the evidence on the dynamics of different social protection benefit expenditures points to a substantial increase in the share of total spending (from public and private bodies) on social protection oriented towards the elderly and a corresponding decrease in the share of spending oriented towards the non-elderly population.

2.2.3. Assessing the generational orientation of social protection expenditures

The dynamics of social protection spending described above show a picture of the overall balance of social protection spending allocated to different age groups across EU Member States and how the overall distribution of social protection spending across different functions has changed over time. However, because countries differ substantially in terms of income levels, their population structure and the extent to which their populations face particular types of risks, the raw spending data on social protection may reflect the confounding impact of all these factors. Moreover, changes in social protection spending within countries over time will conflate changes resulting from policy choices affecting the allocation of social spending across different groups with changes resulting from changes in population share of different subgroups, including for example changes in the population share of the elderly population and differences in the proportion of unemployed.

Following Lynch (2001), to examine how the orientation of the total social protection expenditures towards different age groups differs across countries and within countries

over time, we constructed a measure which provides a summary comparison of social protection benefit spending on the elderly (aged 65+) to expenditures on the non-elderly (age 0–64), netting out the confounding effect of differences in the population structure and in unemployment rates. The measures in Table 2.1 show a basic Elderly to Non-elderly Spending Ratio (ENSR) for the 27 European Union Member States and for the UK for the years 2002, 2007, 2012 and 2017. The expenditures defined as 'non-elderly' are the ESSPROS expenditures on family and children and the unemployment functions. The 'elderly' expenditures are old-age and survivors functions, as well as expenditures on Early Retirement Pensions due to Disability (included within ESSPROS Disability Function) (recall that under ESSPROS, social protection encompasses all interventions from public and private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs). Excluded from these measures are all other spending categories within the disability function as well as all spending in the housing and other social exclusion n.e.c. (mainly social assistance) functions, due to the difficulty of determining the age of the recipients of the spending in these categories. Also excluded is spending under the sickness and healthcare function, again because of the unavailability of data to determine the age profiles of healthcare spending in different countries. A third excluded spending category is public expenditure on education, which is the main expenditure on children and young adults in most countries and therefore can be expected to have a substantial impact on the measure. Unfortunately, it is not possible to determine the degree and the direction of the bias of not including the spending categories listed above in the spending ratio measure.

We constructed two variants of the measure: one including all spending types (i.e. both cash benefits and in-kind benefits) within the functions comprising the spending ratio measure and one including the cash benefits only. To account for differences in the demographic structure of the population across countries and over time, both measures are adjusted for the ratio of over-65s to under-65s in the population of each country and in each year. The ratio is also adjusted by the number of registered unemployed (rather than the number of beneficiaries) in order to isolate the impact of differences in the coverage and the generosity of the social protection systems for the unemployed from differences in unemployment rates, and therefore allow for meaningful cross-national and across time comparisons. This baseline measure adopts a common age cut-off to differentiate between the non-elderly and the elderly population. Sensitivity analysis which uses the effective retirement age to define the age cut-off produces very similar conclusions (Table A2.4).[25]

The results reported in Table 2.1 reveal very clearly that the social protection spending in all EU countries is characterised by a substantial 'pro-elderly bias': a higher share of spending oriented towards the support of the elderly population than towards the non-elderly population. This is evident in terms of both the measure which only includes cash benefit spending as well as the measure augmented to include in-kind benefits spending, although the 'pro-elderly bias' is slightly more pronounced in terms of the cash-benefit-only variant of the spending ratio measure. Across all 27 EU Member States, the (unweighted) average elderly to non-elderly spending ratio in 2017 stood at around 2.5. The country with the largest ratio was RO (16.2), followed by EL (8.9), HR (6.5) and PL (5.3). Other countries with above the (unweighted) EU-27 average spending ratio are PT, SK, CY and SI (over 4) and ES, EE, HU, SE, MT, LV, LT, BG and IT (around 3). In contrast, the countries with the lowest ratio were DK, FR, AT, NL, CZ and LU (1.5 to 2), BE (1.4) and IE (1.3).

Table 2.1: Per capita elderly/non-elderly spending ratios (ENSR), the ratio between the social protection expenditures on the elderly (aged 65+) and the social

[25] The effective retirement age in each country and year are taken from the OECD database: Average effective age of retirement in 1970–2018 in OECD countries. See https://www.oecd.org/els/emp/average-effective-age-of-retirement.htm.

protection expenditures on the non-elderly (age 0–64), adjusted for differences in the population structure and in unemployment rates, 2002–2017

	Evaluated based on cash benefits components of relevant functions included in the measure only					Evaluated based on cash and in-kind benefits of the relevant functions included in the measure only				
	2002	2007	2012	2017	2002–2017 % change	2002	2007	2012	2017	2002–2017 % change
LU: Luxemburg	1.22	1.25	1.40	1.70	0.40	1.17	1.21	1.37	1.65	0.41
DK: Denmark	0.77	2.05	2.41	2.40	2.13	0.87	1.36	1.69	1.68	0.94
DE: Germany	1.97	2.18	1.75	1.50	-0.24	1.62	1.90	1.53	1.27	-0.22
NL: Netherlands	1.12	1.92	2.04	1.79	0.60	1.09	1.95	2.16	1.85	0.69
SE: Sweden	1.20	2.46	3.20	3.39	1.82	1.25	2.39	2.83	2.74	1.19
AT: Austria	1.71	2.13	2.12	2.10	0.23	1.34	1.64	1.65	1.64	0.22
FR: France	1.74	2.22	2.44	2.13	0.23	1.74	2.21	2.36	2.06	0.18
FI: Finland	1.47	1.36	1.63	1.64	0.11	1.41	1.29	1.53	1.58	0.12
BE: Belgium	0.85	0.82	0.84	1.36	0.59	0.84	0.82	0.85	1.46	0.73
EU-27			2.81	2.46				2.62	2.26	
IT: Italy	8.93	2.20	2.92	2.75	-0.69	8.61	2.15	2.84	2.66	-0.69
IE: Ireland	1.04	1.24	1.72	1.26	0.20	0.90	1.10	1.75	1.25	0.40
ES: Spain	1.69	1.44	3.03	3.96	1.35	1.51	1.32	2.96	3.65	1.42
SI: Slovenia	4.21	4.92	4.98	4.45	0.06	3.59	3.96	4.44	3.85	0.07
PT: Portugal	2.19	2.90	4.12	4.64	1.12	2.25	2.93	4.13	4.63	1.06
CZ: Czechia	3.76	2.72	3.62	1.76	-0.53	3.78	2.68	3.61	1.76	-0.53
EL: Greece	5.48	2.99	8.92	8.88	0.62	5.04	2.91	8.38	8.45	0.68
MT: Malta	2.73	4.36	4.62	3.20	0.17	2.78	4.18	3.70	2.94	0.06
CY: Cyprus	1.76	1.91	2.74	4.49	1.55	1.75	1.87	2.66	4.35	1.49
PL: Poland	10.99	10.57	14.90	5.27	-0.52	10.91	9.92	12.92	4.90	-0.55
SK: Slovakia	8.91	5.70	6.01	4.54	-0.49	7.94	5.89	6.19	4.73	-0.40

HU: Hungary	2.88	3.09	5.76	3.58	0.24	2.59	2.86	5.61	3.42	0.32
EE: Estonia	13.54	6.66	6.24	3.66	-0.73	10.78	5.05	4.45	2.76	-0.74
HR: Croatia			7.60	6.48				7.03	5.48	
LT: Lithuania	15.60	3.07	7.14	3.14	-0.80	10.25	2.45	6.40	2.71	-0.74
LV: Latvia	7.01	2.80	8.01	3.15	-0.55	6.43	2.52	6.79	2.86	-0.55
RO: Romania	4.60	5.54	10.79	16.19	2.52	4.11	4.66	9.31	13.62	2.32
BG: Bulgaria		6.51	5.14	2.91			4.97	4.43	2.62	

(*) Countries are sorted by the level of 2017 expenditures on social protection benefits (in ppp constant 2010 euros). The EU-27 average is computed as the population-weighted average of the national values across the EU-27 member states.

Source: Data processing of Eurostat ESSPROS databases, see https://ec.europa.eu/eurostat/web/social-protection/data/database

Analysis of the changes in the ratio over time shows substantial cross-country variation. In some countries, the ratio fell substantially over the period 2002–2017 (which implies a reduction in the elderly orientation of the social spending) while in others, the spending ratio increased substantially. Countries where the spending ratio decreased are LT (-80%), EE (-73%), IT (-69%), LV (-55%), CZ (-53%), PL (-52%), SK (-49%) and DE (-24%), reflecting the larger relative increases in the spending on non-elderly than elderly social protection spending components included in the index (weighted for differences in the demographic structure of the populations). In contrast, countries which recorded increases in their spending ratio are RO, DK and SE (where the spending ratio more than doubled or almost tripled over this period), CY, ES and PT where it doubled and finally EL, NL, BE and LU where it increased by 40% to 60%. Much more moderate (between 6% and 24%) increases were found in HU, AT, FR, IE, MT, FI and SI.

As shown in the second panel of Table 2.1, including the decreases in in-kind benefits – within the relevant functions which were included in the elderly to non-elderly spending ratio measure – has a relatively small impact on the spending ratio estimates in most countries. It does not alter any of the conclusions concerning the age orientation of social protection benefit spending nor how the overall balance of public spending on different age groups have changed in different countries over time. Also, note that these results are also robust to the use of a country- and year-specific effective retirement age to define the elderly and non-elderly age cut-off (as shown in Annex Table A2.4).

However, it should be stressed that the measures employed here exclude spending on sickness and healthcare as well as a large part of the disability function because of the difficulty of determining the age of the recipients of these benefits. Therefore, it might not give a complete picture of the effects on the generational balance of the different social protection systems across Europe nor how it changed over time in different EU member states. Notwithstanding this shortcoming, the evidence of the dynamics of different social protection benefits expenditures considered here points to a substantial increase in the share of total social protection benefits spending oriented towards the support of elderly population groups and a corresponding decrease in the share of spending oriented towards the non-elderly population in the majority of EU Member States. Chapter 4

examines in more detail the intergenerational fairness implications of benefits in-kind (including education and sickness and healthcare) to give a complete picture of the age orientation of social protection systems across Europe.

2.3. Evidence from the EU-SILC

2.3.1. Data, concepts and methods

The aggregate social protection spending data analysed in the previous section gives a reasonably good view into the priority areas of social spending both across different countries as well as within countries over time. However, the analysis cannot answer the question of how different countries redistribute within and across age groups nor how this might affect the degree of inequality across age groups. Moreover, resource pooling and sharing within multigenerational households (but also interfamily transfers) may offset some of the effects of any potential age bias of social protection programmes on welfare outcomes for different age groups. In this section, we empirically assess the distributional impact of tax and benefit systems across different age groups drawing on microdata from 2008 and 2018 EU-SILC cross-sections. The period considered in this section differs from the period considered in Section 2.2 because EU-SILC did not record gross values for all individuals' and households' income sources prior to the 2007 cross-section (see also discussion in Chapter 1). Also, the income reference period within EU-SILC is the calendar year before the interview year (therefore, 2007 and 2017 in our case), apart from the UK for which it is the current year, and IE, for which the survey is continuous and income information is collected for the last 12 months. For convenience, we will thus refer to 2007 and 2017 in the remaining part of this chapter to describe the period considered.

EU-SILC includes detailed and reasonably comparable income data for the 27 European Union Member States (plus the UK). Some components of income are recorded at the individual level (i.e. for each adult in the household) while others are at the household level. The components that are recorded at the individual level are: gross employees' incomes; gross cash benefits or losses from self-employment; pensions from individual private plans; unemployment benefits; old-age benefits; survivor's benefits; sickness benefits; disability benefits; and education-related allowances. The components that are recorded at the household level are: rental income; family/children–related allowances; social exclusion income not elsewhere classified; housing allowances; regular inter-household cash transfers received; interest, dividends and profits from capital investments in unincorporated businesses; and income received by people aged under 16.

Following the official EU-SILC definition, the household disposable income measure used in the analysis of this section is derived by summing up all the above components and subtracting taxes on income, social security contributions and regular taxes on wealth and regular inter-household transfers.[26] To adjust for differences in the needs of households of different size and composition, we adjust household disposable income using the modified OECD equivalence scales. The resulting equivalised household disposable income is used as the indicator of the economic wellbeing of each individual within the household. When analysing the redistributive effect of tax-benefit systems, we break the equivalised household disposable income down into the following income components:

- Equivalised household market income (Y_{MI}): Comprising gross earnings from employment and self-employment, income from capital and any private pension

[26] EU-SILC does not include data on non-cash benefits. Therefore, the analysis here does not include non-cash benefits – the redistributive effects of non-cash benefits will be considered separately in Chapter 4.

income as well as private transfers received from other households received by all household members equivalised using the modified OECD equivalence scales.

- Equivalised household old-age pension benefits (Y_{PEN}): Comprising all old-age pension benefits and survivor's benefits received from all household members equivalised using the OECD equivalence scales.

- Equivalised household non-old-age benefits (Y_{BEN}): Comprising unemployment benefits; sickness benefits; disability benefits; and education-related allowances received by all household members plus total household income from family/children–related allowances; social exclusion income not elsewhere classified and total housing allowances equivalised using the OECD equivalence scales.

- Equivalised household social transfer income (Y_{TRAN}): Comprising equivalised household old-age pensions (Y_{PEN}) and equivalised household non-old-age benefits (Y_{BEN}).

- Equivalised taxes and social security contributions (T): Comprising all taxes and social security contributions paid by all household members adjusted by OECD equivalence scales.

2.3.2. Tax and social transfers age profiles

To assess how the tax and benefit systems in different EU countries redistribute between different age groups and to investigate how this has changed over time, this section examines the social transfers' age profiles and the tax rates' age profiles based on the 2008 and 2018 EU-SILC cross-sections. The social transfers rates for each age group in each year are calculated as the ratio of the average equivalised household social transfer income (Y_{TRAN}) to the average equivalised gross household income (Y_{GI}) of each age group. The average tax and social security contribution rates are calculated as the ratio of the average equivalised tax and social security contributions to the average equivalised gross household income of each age group (Y_{GI}).

Figure A2.4 presents the social transfers' age profiles for each of the EU-27 Member States and the UK in 2017. As mentioned above, they are computed as the ratios of the average equivalised household social transfers income to the average equivalised gross household income of each group. On average, across all the 27 EU Member States and across all age groups (i.e. the 'total' in the charts below), the average social transfer rate in 2017 stood at 22%, ranging from around 17% in MT and LV to around 25% to 27% in IT, FR, PT, EL and LU. Factors explaining the observed wide cross-country variation in the average transfer rates across countries include differences in the coverage and the generosity of the benefit and old-age pension systems (including differences in effective retirement age) as well as differences in market incomes. Unfortunately, the type of analysis employed here cannot disentangle the relative importance of each of these factors. As one would expect, in all countries the highest social transfers rates are observed for the older age groups, whose incomes are predominantly composed of transfers, particularly old-age and survivor pensions, whereas they are lowest for the middle-age groups. The unweighted EU-27 average social transfers rates for the 65–74 age group stood at around 73% (i.e. social transfer income accounts for 73% of the average equivalised gross household income of this age group). The countries with the highest social transfers rates among the 65–74 age group in descending order are LU (84%), AT, BE, NL and DK (around 79% to 80%) as well as PT, FI, FR and CY (between 74% and 77%). In contrast, the countries with the lowest average social transfers rates

among the 65–74 age groups are BG, EE and LV (around 55% to 56%) followed by LT and HR at 60% and 63% respectively. Other countries where the social transfers rates among the 65–74 age group are below the EU-27 (unweighted) average are SI, CZ, DK, HU, EL, RO and UK (between 70% and 74%) as well as ES, IT, IE, PL, SK and SE (around 68% and 66%).

Figure A2.5 shows how the social transfers age profiles changed between 2007 and 2017 in different EU countries. Because the social transfers rates are calculated as the ratio of total social transfers income to total gross household income, the change in social transfers rates of different age groups may be driven either by developments in their social transfers income or in market incomes (or both). To disentangle the relative importance of the two, Figure A2.5 shows in addition to the social transfers rates the percent change in market income for each age group. In around half of the Member States, the social transfers rates increased by less (or even decreased in some of these Member States) for the younger age groups than for older age groups. This smaller increase in the social transfers rate for the younger than the older age groups, in most Member States, can be explained by developments in their market incomes (i.e. age groups which experienced larger decreases in social transfers rate tend to be those who experienced larger increases in their market incomes). Therefore, the change in social transfers age profiles in these countries appears to reflect to a large extent an automatic reaction of their benefit systems to changes in market income rather than active policy changes. This explanation does not appear to hold for BG and to lesser extent for CY. For example, in BG market income increased more for the younger than for the oldest age group yet the social transfers rates increased for all age groups and even more so for the oldest age group. In contrast, in some other Member States (EE, LT, PL and SK), the social transfers rates either increased by more or decreased by less for younger than for older age groups. Also, for some other Member States (DE, DK, FI, IT, LU, NL, RO and SE), the change in the age profiles of social transfers rates does not reveal any clear pattern except from the decrease in social transfers rates being more pronounced for the 55–64 age group.

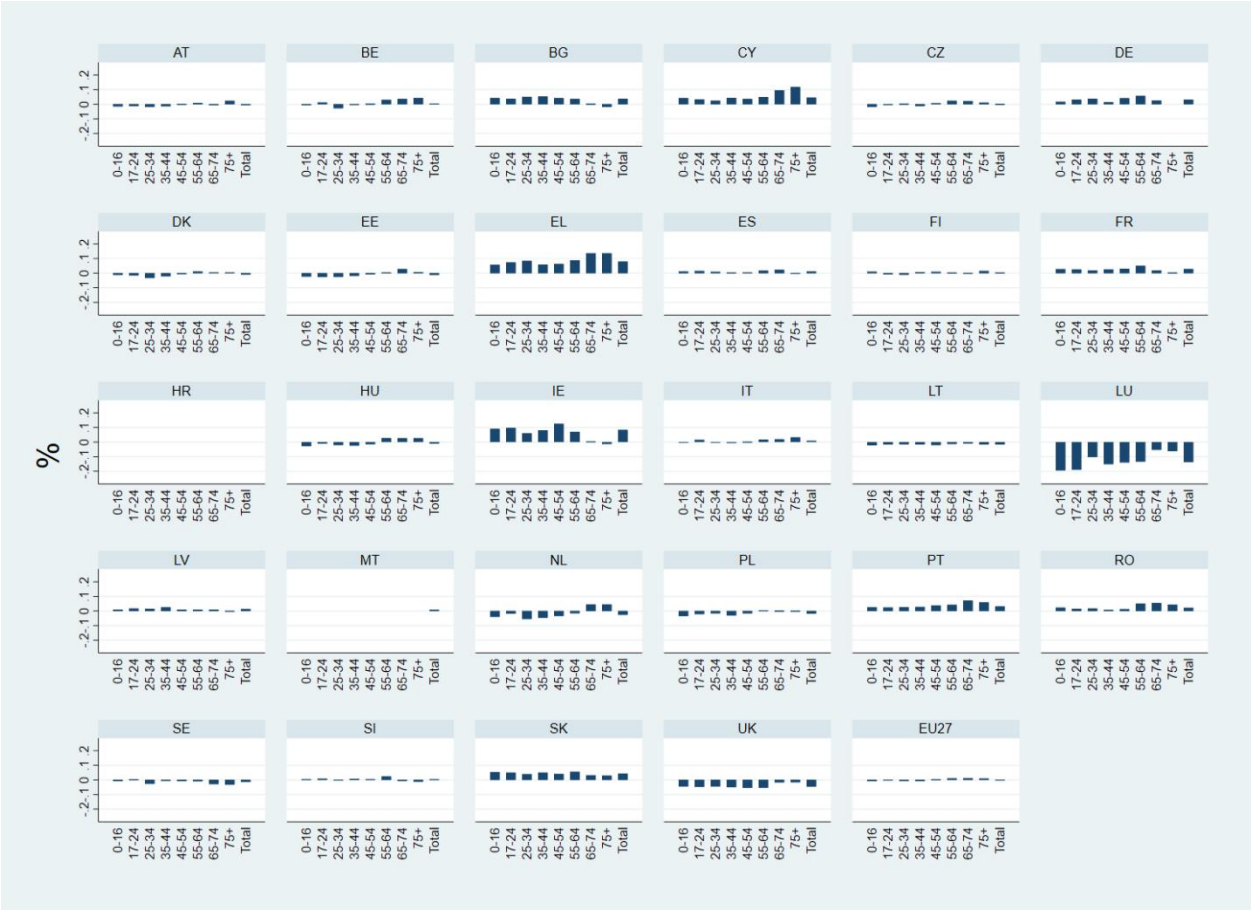
Figure 2.2 compares the tax and social security contribution rates for different age groups. In all countries, the age profile in the tax and social contributions rates is either flat or increases only slightly with age up to the pre-retirement age group and decreases for post-retirement age groups. The age profile observed in most of the countries therefore does not follow the typical hump-shaped age profile that is observed for equivalised gross household income which would be expected to characterise age-progressive tax systems (Bussolo et al., 2019). Rather, the pattern in most countries appears to suggest that the tax system treats low-income age groups (i.e. age groups for which the average income is lower than that of other age groups) differently, mainly reflecting the differential treatment of old-age pensions versus other income sources. It can be argued that – in the countries where taxes and social security contributions account for a much higher share of gross income of younger than older age groups – there is a higher degree of pro-elderly bias in the tax system. Such countries include IE, LV, CZ, SI and BG (but also SK, EE, HU, RO, FR, UK, ES, LV and BE). In contrast, the countries where the tax system appears to be less biased towards the elderly population include SE, LU, CY and DE and to a lesser extent HR, PT, PL, FI, AT, EL, NL and IT.

Figure 2.2: The average tax and social contribution rates by age group across European Union countries and the UK, 2017

(*) The age variable is missing for Malta and therefore the age profiles cannot be derived. The average tax and social contribution rate of each age group is computed as the ratio of the average household tax and social security contributions to the average gross household income. Source: 2018 EU-SILC data.

Figure 2.3 shows the change in tax and social security contribution rates relative to 2007 by age group. Although there is again considerable cross-country variation, in many countries the tax and social security contribution rates increased more for younger than for older age groups or decreased less for younger than for older age groups. The 'pro-elderly bias' of the tax systems in these countries has increased. This was particularly the case for BG, EE, FR, DK, HU, IE, LU, PL, SE, SI, SK, and the UK. In contrast, in AT, BE, CY, CZ, DK, EL, ES, FI, HU, IT, NL, PT and RO, there has been a decrease in the 'pro-elderly bias' of their tax and social security system (i.e. the tax and social contribution rates increased more – or decreased less – for the older than for the younger age groups). No significant change is observed in LT, FI, LV and SI.

Figure 2.3: The change in tax and social security contribution rates by age group across different European Union countries, 2007–2017



(*) The age variable is missing for Malta and therefore the age profiles cannot be derived. The tax and social contribution rate of each age group is the ratio of the average household tax and social security contributions to gross household income of each age group. Source: 2008 and 2018 EU-SILC data.

The overall picture that emerges from the analysis in this section is twofold. On the benefits side, the age profiles indicate that the social protection benefit systems in most countries are characterised by a strong pro-elderly bias but that the degree of the bias remained relatively stable over time (most of the changes in age profiles in social transfers rates appear to be largely explained in most countries by changes in market income rather than active policy changes, suggested by the fact that larger increases (decreases) in social transfers were associated with larger declines (increases) in market income. On the tax side, the patterns are more diverse across countries, with the pro-elderly bias of the taxation systems strengthening over time in some countries and weakening in others.

2.3.3. Inequality and redistribution across Europe in 2017

This section examines the degree of inequality in disposable and market incomes and the overall size of the redistributive effects of taxes and social transfers in the EU-27 Member States and the UK in 2017. The overall redistributive effects of taxes and social transfers in each country as well as for the EU-27 in 2017 is calculated as the absolute reduction in inequality from pre-tax, pre-social transfers income to post-tax, post-social transfers

income (i.e. the difference between equivalised household market income (Y_{MI}) Gini inequality and the equivalised household disposable income (Y_{DI}) Gini inequality).

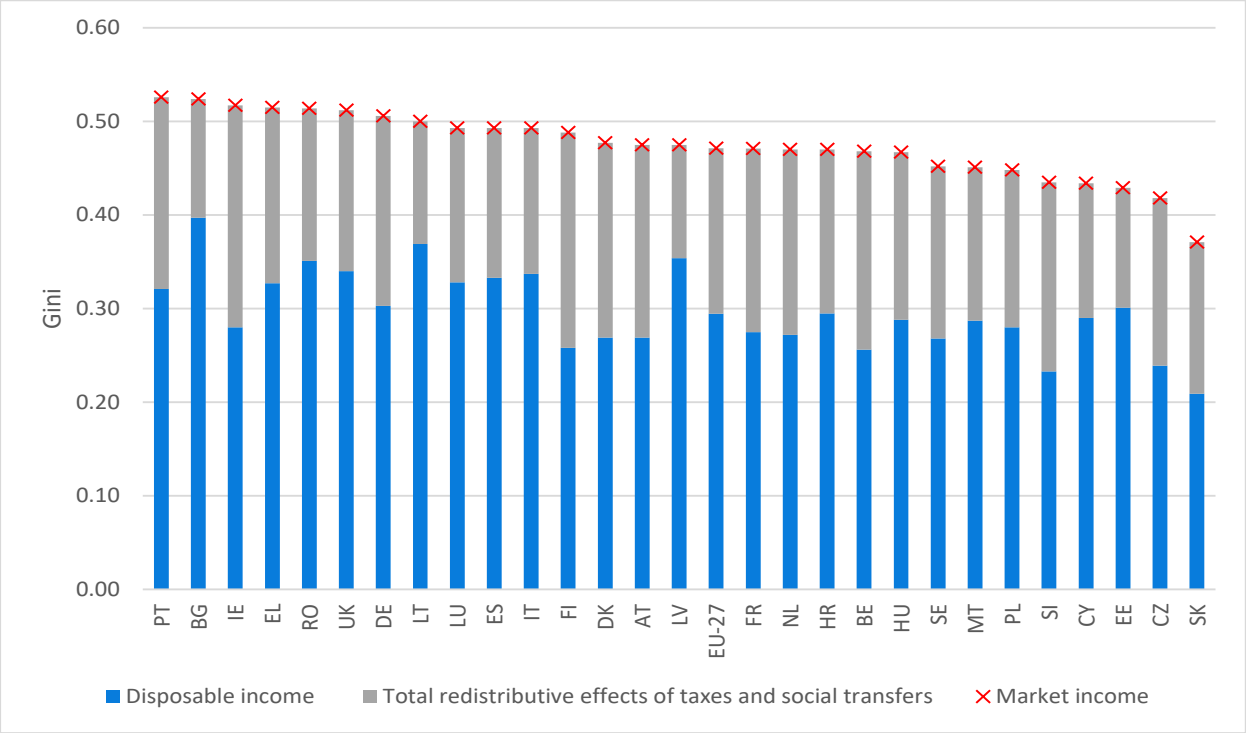
$Gini_{Redistribution} = Gini_{MI} - Gini_{DI}$ (1)

Figure 2.4 shows the Gini coefficient for market and disposable income for each of the EU-27 Member States and for the UK. Countries are listed in order of their Gini of disposable income from smallest to largest. As one would expect, the figure indicates that a wide range of inequality exists across the 27 EU Member States in terms of both measures. In term of equivalised household disposable income inequality, the average (unweighted) Gini inequality for all 27 EU Member States in 2017 was around 30. The country with the largest disposable income Gini inequality was BG with a Gini coefficient of almost 40, followed by LT, LV and RO, all with Gini coefficients at around 35 to 37. Other countries with above-average equivalised household disposable income inequality are in descending order – UK, IT, ES, LU, EL, PT, DE, EE and HR – with Gini coefficients around 30 to 35. In contrast, the countries with the lowest disposable income inequality were SK (21), SI (23), CZ (24) and BE (26) and FI (26) as well as SE, AT, DK and NL (all around 27).

Cross-country differences in equivalised household market income inequality are also very large although slightly smaller than in terms of equivalised household disposable income. On this measure, the countries with the highest levels of inequality are PT, BG, IE, EL, RO, UK, DE and LV, with values of 0.50 and over. The countries with the lowest market income inequality are SK with a Gini coefficient of around 0.37 followed by CZ (around 0.42), EE, CY and SI (0.43 to 0.44) and PL, MT and SE (0.45 to 0.46).

Figure 2.4 also shows the redistributive effects of tax benefit systems in the 27 EU countries (evaluated as specified by equation (1) in absolute terms as the difference between equivalised household market and disposable income inequality in each country). The highest level of redistribution is found in IE (24 Gini points) and FI (23) followed by BE, DK, AT and PT (at around 21) and DE, SI, NL and FR at around 20 Gini points. Lower levels of redistribution are recorded in EL (19 Gini points), SE, CZ, HU and HR (around 18) and the UK, PL, LU, MT, RO, SK, ES and IT (all around 16 to 17). The lowest levels of redistribution are found in LV (at just 12 Gini points) as well as BG, EE and LT (13). Note that the level of redistribution is also highly variable in countries with similar levels of household market income inequality: for example, market income inequality stands at around 51 to 52 Gini points in both LT and IE, but disposable income inequality stands at around 37 points in LT compared to 28 points in IE.

Figure 2.4: Equivalised household disposable and equivalised household market income Gini inequality and the total redistributive effects of taxes and social transfers in different European Union countries, 2017



(*) Countries are sorted by the level of equivalised household market income inequality from largest to smallest. The EU-27 average is calculated as a simple (unweighted) average of the relevant statistics for the EU-27 Member States. See also Table A2.6.

Source: 2018 EU-SILC data.

Figure 2.5 breaks down the total redistributive effects of taxes and social transfers in each country into the partial redistributive effect of old-age pensions, (non-old-age) social benefits and taxes and social security contributions. The redistributive effect of each these income components was estimated by applying the Reynolds-Smolensky (1977) redistribution index. This approach applies different tax and benefit instruments sequentially and compares inequality after the application of each tax and benefit instrument with the counterfactual distribution without the instrument. Under this approach, the partial redistributive effect of old-age pensions and benefits depends on the order in which their effects are evaluated. We correct for this by taking the average of the effects evaluated at different orders. The chart on the left in Figure 2.5 shows the absolute redistributive effect of old-age pensions and non-old-age benefits and taxes while the chart on the right portrays their percent contribution in total redistributions. Countries are listed in order of their total redistribution from largest to smallest. On average, old-age pensions reduce equivalised market income inequality by around 10 Gini points (accounting for 54% of the total reduction of total income inequality), non-old-age benefits and taxes and social security contributions reduce market income inequality by around 5 and 4 Gini points (accounting for 22% and 19% respectively of the total reduction of equivalised market income inequality).

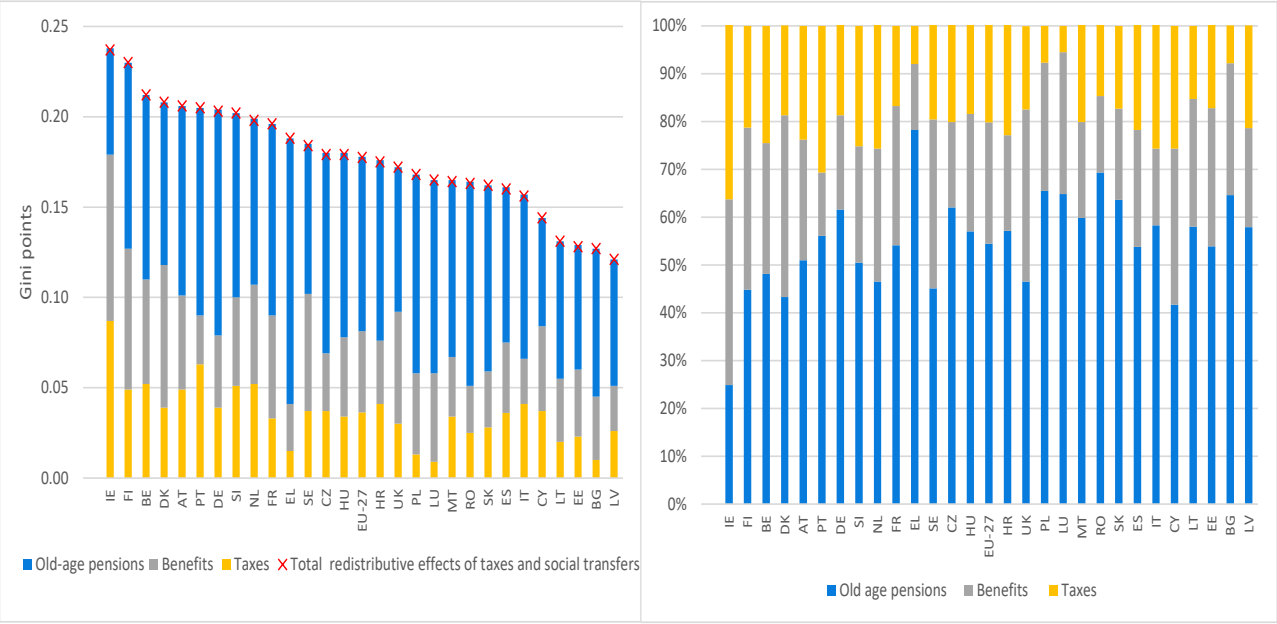
The redistributive effects of old-age pensions range from around 6 Gini points in IE and CY to around 15 Gini points in EL. The effects of old-age pensions are also above average in DK and PT (reducing market income inequality by around 12 Gini points).

Slightly higher than the EU-27 (unweighted) average effects are found in RO, CZ, PL, LU, FR, AT, FI, SK, BE, SI and HU (around 10 to 11 Gini points). Countries where old-age pensions have below average redistributive effects include NL, IT, DE and ES (9 Gini points), SE, BG, LT and the UK (around 8 Gini points) and LV and EE (around 7 Gini points).

Non-old-age social benefits have much lower redistributive effects in all countries, ranging from just 2 to 3 Gini points in IT, LV, EL, RO, RT, SK, CZ and MT to 9 Gini points in IE and 8 Gini points in DK and FI. In HR, BG, LV, EE, ES, DE, HU and PL, it is around 4 Gini points while in CY, LU, SI and AT, it is around 5 Gini points and in NL, FR and BE, it is around 6 Gini points.

The redistributive effect of taxes in most countries is lower or close to the level of redistribution of old-age pensions or that of benefits. IE and PT provide two exceptions. In IE, the redistributive effect of taxes is close to 9 Gini points (indeed, it is the country with the highest redistributive effect of taxes), or two times higher than the redistributive effect of old-age pensions (around 5 Gini points) and very similar to the level of redistribution of benefits. In PT, the redistributive effect of taxes is higher than that of benefits but smaller than that of pensions. In all other countries, the redistributive effect of taxes is either lower or very similar to the redistributive effects of benefits. The weakest redistributive effects for taxes are found in LU, BG, PL, EL and LV (where they are found to reduce inequality by less than 2 Gini points). As can be more clearly seen in the chart on the right in Figure 2.5 (which shows the contribution of old-age pensions, non-old-age benefits and taxes in overall redistribution), the largest share of redistribution relies on old-age pensions in most countries.

Figure 2.5: The redistributive effect of old-age pensions, benefits and taxes and their contribution to overall redistribution in European Union countries and the UK, 2017



(*) Countries are sorted by the level of overall redistribution from largest to smallest. The EU-27 average is calculated as a simple (unweighted) average of the relevant statistics for EU-27 member states. The size of the redistributive effect of old-age pensions, benefit and taxes are quantified based on the Reynolds-Smolensky (1977) approach which applies different tax and benefit instruments sequentially and compares the inequality (in terms of Gini coefficient) after the application of each tax and benefit instrument with the counterfactual distribution without the instrument (see text for details). See also Table A2.8.

Source: 2018 EU-SILC data

To better understand how different benefit and tax systems perform in terms of income redistribution within and between age groups, we next use subgroup decomposition techniques to calculate the part of market and disposable income inequality that is due to between-age-groups inequality and the part that is due to within-age-group inequality. Again, the analysis is first undertaken for the total equivalised household disposable income and then separately for old-age pensions, non-old-age social benefits and taxes, and social security contributions sequentially in order to examine their within-age-group and between-age-groups redistributive effects (i.e. the degree to which each reduces respectively the within-age-group and between-age-groups market income inequality) in different countries. The decomposition analysis in this section is undertaken based on the GE(2) index which allows subgroup decompositions.[27]

Figure 2.6 presents the results of this decomposition for equivalised household market income inequality and equivalised household disposable income inequality as measured by the GE(2) index. Starting with equivalised household market income inequality, we can see that in all countries the effect of within-group age group inequality far outweighs the effect of the between-age-groups inequality. The between-age-groups effects never account for more than one fifth of the market income inequality, and they usually account for substantially less. The countries where the contribution of between-age-groups differences in equivalised household market income inequality is the largest are CZ, SK and SI, where the between-age-groups differences account for 20%, 18% and 17% of total market income inequality respectively. In contrast, the countries where the contribution of between-age-groups differences to total equivalised household market income inequality is the smallest are BG, IE and EL, where between-age-groups differences account for less than 5% of the total equivalised household market income inequality.

Between-age-groups differences account for an even lower share of total equivalised household disposable income inequality. On average, the contribution of between-age-groups differences in the overall equivalised household disposable income inequality is less than 1% with a range of just 7% in EE to less than 1% in a number of countries including EL, ES, PT, UK, CY, SI, DE, BG, HU and LU. This contribution is between 2% and 4% in the remaining countries.

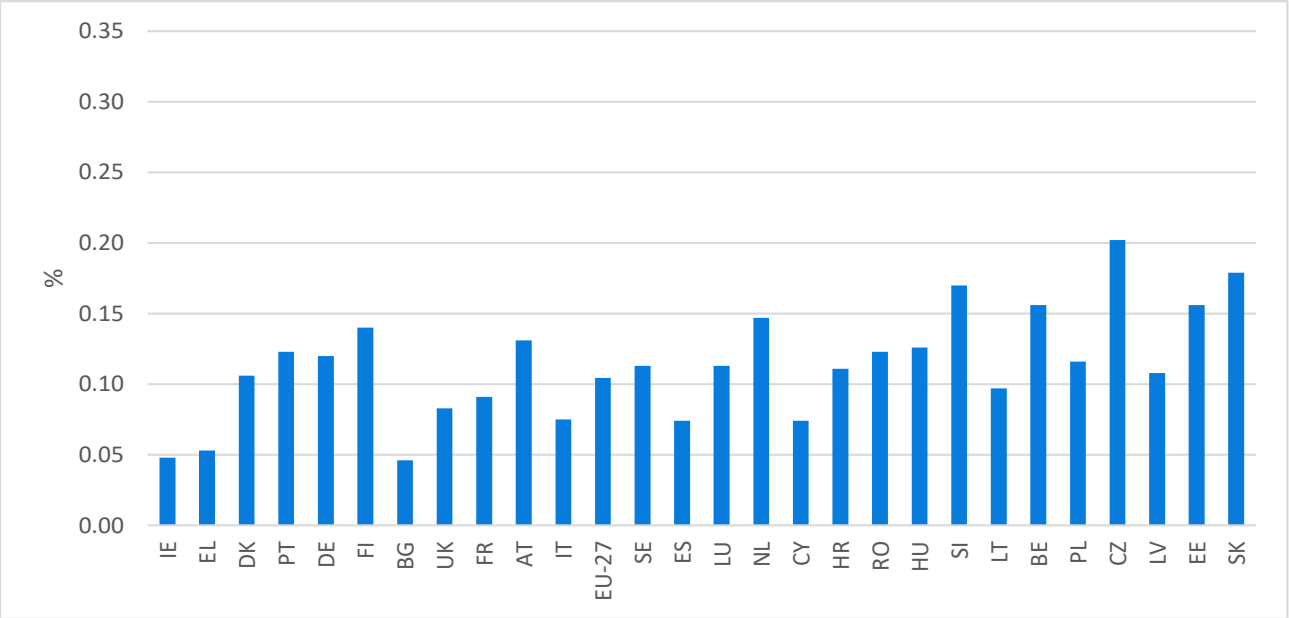
Figure 2.7 breaks down the total redistributive effects of taxes and social transfers in each country into their between-age-groups and their within-age-group redistributive effects. In all countries, the within-age-group redistributive effect of the tax and benefit systems is considerably higher than their between-age-groups redistributive effects. On average (unweighted), across the 27 EU countries, the (unweighted) between-age-groups redistributive effects account for just 17% of the overall redistribution with a range from 30% in CZ to around 6% in IE and 9% in EL. Other countries with between-age-groups redistributive effects well above average are BE, SK, EE, NL, SI, DK, HU, RO, LV, LU, LT and FI (20% to 25%). In contrast, countries where the between-age-groups redistributive

[27] Similarly to the GE(1) (or Theil index) used in Chapter 1, the GE(2) is part of the generalised entropy family which allows subgroup decompositions. We use the GE(2) rather than the Theil index employed in Chapter 1 because of its better properties when income includes both zero and negative values, which is very important in the analysis of the partial redistributive effects of old-age pensions, non-old-age benefits and taxes given the high frequency of zero values in these variables. Following Mookherjee and Shorrocks (1982) and Jenkins (1995), the decomposition formula for the GE(2) is the following: GE(2) $=\sum_k v_k(\lambda_k)^2 GE(2) + \sum_k v_k[(\lambda_k)^2 - 1]$, where K is the number of age groups (0–16, 17–24, 25–34, 35–44, 45–54, 55–64, 65–74 and 75 and over), v_k is the share of population in the age group k, and λ_k is the ratio of the average income in the subgroup k to total average income. The first set of terms in equation (2) represents the part of total inequality that is due to inequality within age groups, and the second term the degree of inequality that results from differences in the average income of subgroups.

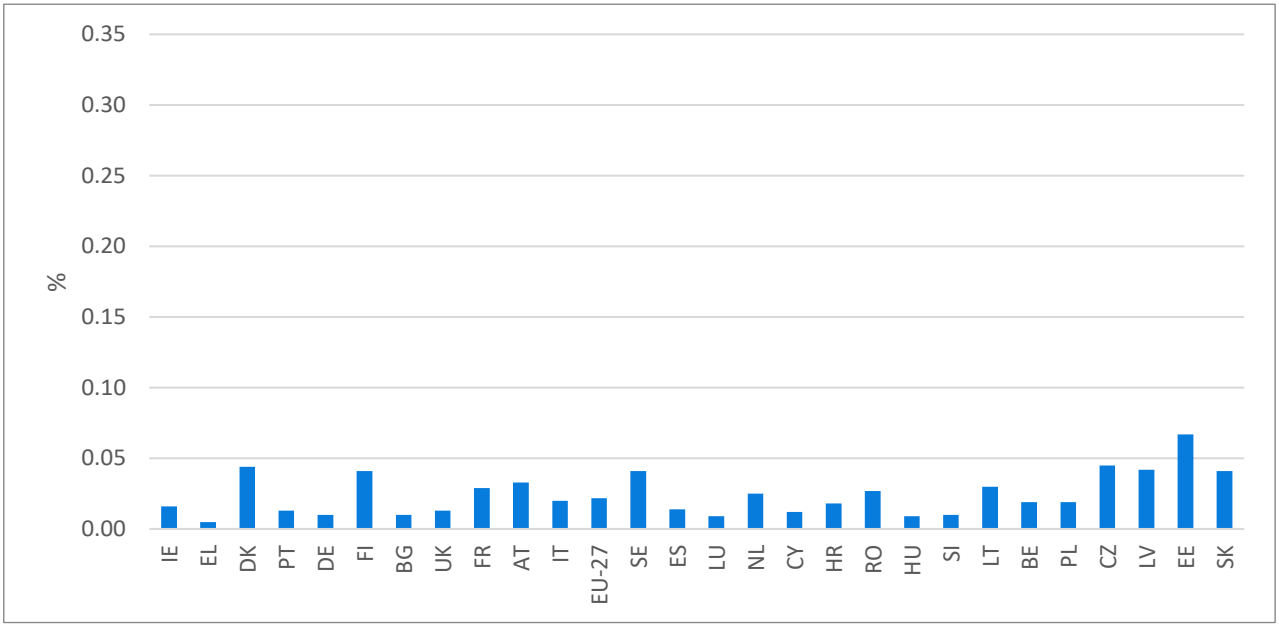
effects are below the EU-27 average include ES, IT, BG, FR, CY, DK and UK (12% to 15%).

Figure 2.6: GE(2) decomposition: The contribution of between-age-groups inequality to equivalised household market income inequality and equivalised household disposable income inequality in European Union countries and the UK, 2017

Equivalised household market income inequality



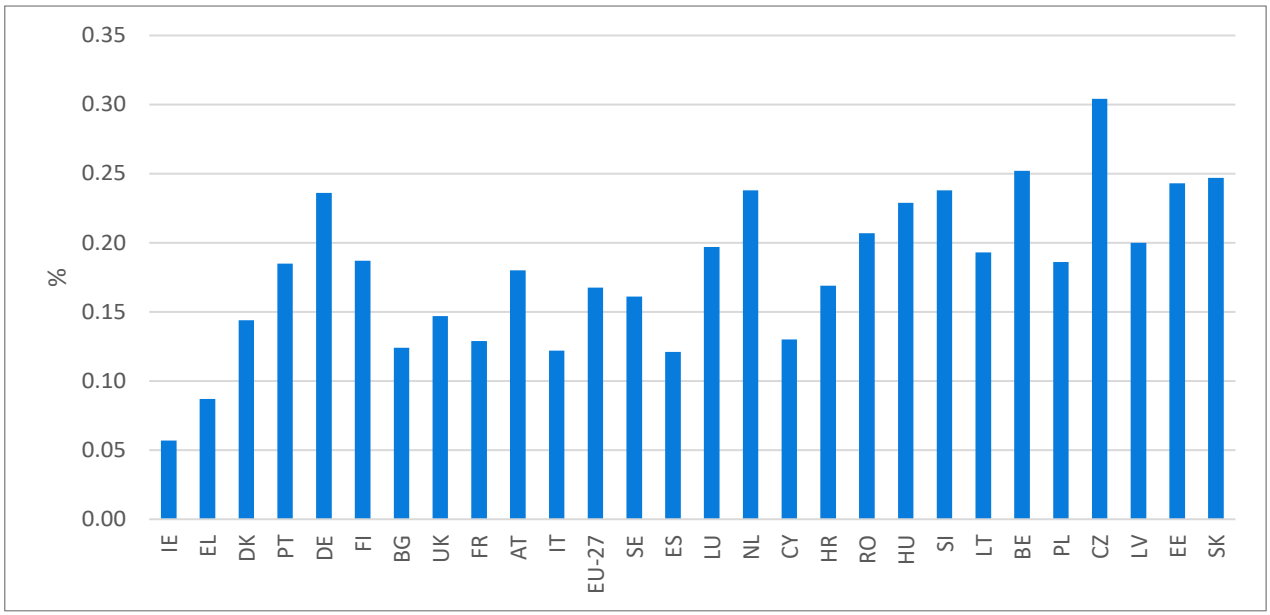
Equivalised household disposable income inequality



(*) Countries are sorted by the level of overall redistribution from largest to smallest as measured by the GE(2) index. The EU-27 average is calculated as a simple (unweighted) average of the relevant statistics for the 27 EU member states respectively. See also Table A2.9.

Source: 2018 EU-SILC data

Figure 2.7: GE(2) decomposition: Between-age-groups redistributive effects as a percent of the overall redistribution in European Union countries and the UK, 2017



(*) Countries are sorted by the level of overall redistribution from largest to smallest as measured by the GE(2) index. The EU-27 average is calculated as a simple (unweighted) average of the relevant statistics for the EU-27 member states respectively. See also Table A2.9.

Source: 2018 EU-SILC data.

Figure 2.8: The contribution of between-age-groups redistribution of old-age pensions, non-old-age social benefits and taxes in the total redistribution in European Union countries and the UK, 2017

(*) Countries are sorted by the level of overall redistribution from largest to smallest. The EU-28 and EU-27 statistics are calculated as a simple (unweighted) average of the relevant statistics for the EU-27 countries respectively. See also Annex Table A2.9.

Source: 2018 EU-SILC data

Finally, Figure 2.8 shows the contribution of the between-age-groups redistribution achieved by old-age pensions, non-old-age benefits and taxes in total redistribution. It shows that in all countries the between-age-groups redistribution is achieved mainly by old-age pensions. On average, the between-age-groups redistributive effects of old-age pensions account for 11% of the overall redistribution. Taxes have a rather small effect in reducing between-age-groups inequalities in most countries: the largest effects are found in CZ (where they accounted for around 2% of the total redistributive effect) followed by LT, LV and EE (around 2 percent), while their effects are negligible in FR, IT, EL, PT and ES. In all countries, the between-age-groups redistributive effect of non-old-age benefits was even smaller or even negative in some countries (e.g. EE, LV, LT and DE), suggesting that the non-old-age benefits in these countries increase the between-age-groups inequalities. The smallest effects for non-old-age benefits (besides the negative ones) are found in IT, ES, PL and EL (negligible in all) while the largest are in SI (1.7%) and SE (1.4%) as well as in SK, LU, DK and AT (around 1%).

2.3.4. Multigenerational households and redistribution through shared living arrangements

In line with the standard practice in related literature, in Sections 2.3.2 to 2.3.4, we computed the redistributive effects of the tax and benefit systems as the difference between equivalised household market income and equivalised household disposable income (and the respective partial effects of old-age pensions, non-old-age benefits and

taxes received by all household members equivalised to account for differences in size and composition of different households). The underlying assumption behind this approach is that all incomes in the household are pooled and shared equally between all household members. This measure includes incomes received by the individual and/or their spouse but also income received by other people who live in the same household but who do not belong to the same family unit (e.g. co-resident parents or co-resident adult children) – where family unit is defined as a single individual or a couple with any dependent children. In this framework, the intra-household choices do not depend on who in the household receives each income source, which is obviously a restrictive assumption (Karagiannaki and Burchardt 2020).

Although this section uses the assumption that the incomes received by all household members are pooled and shared equally, it adopts a modelling framework, which takes direct account of whether different income components that comprise the equivalised household disposable income of each household member is deriving from income received by the individual and/or their spouse or from income received by other household members who live in the same household. This disaggregation is relevant for individuals who live in multigenerational households (e.g. young adult children with their parents or households with elderly people living with their adult children and grandchildren). This allows us to isolate the effect of old-age pensions and/or non-old-age benefits received by individuals living in the same nuclear family as the individual from that of old-age pensions and/or non-old-age benefits received by household members from other family units within the household.

Section A2.2 in Annex 2 took direct account of household composition examining the impact of multigenerational living arrangements on the redistributive effects of tax and transfer systems in different European countries and the extent to which resource pooling and sharing within multigenerational households may offset some of the effects of any potential age bias of social protection programmes on welfare outcomes for different age groups. This analysis allows us to isolate the effect of old-age pensions and/or non-old-age benefits received by individuals living in the same nuclear family as the individual (which we call ‘family unit old-age pensions’ and ‘family unit benefits’ respectively) from that of old-age pensions and/or non-old-age benefits received by household members from other family units within the same household (which we call ‘old-age pensions received by other household members’ and ‘non-old-age benefits received by other household members’ respectively). The analysis revealed that a significant share of the redistributive effects of the tax and benefit systems in different EU countries is taking place within multigenerational households. On average, around 15% of the total redistributive effects of the benefit systems in the 27 EU countries is accounted for by benefits accruing to individuals other than the benefit recipient and members of their nuclear family through shared living arrangements. The importance of these ‘indirect’ redistributive effects is higher in countries where the prevalence of multigenerational households is higher, reflecting the important role of the family in these countries in protecting against poverty (and other social risks) especially when economic conditions are challenging and adequate social protection systems absent. The results also point to the impact of multigenerational living arrangements in offsetting some of the age bias characterising the tax and social protection systems.

2.4. Conclusions

Over the last few years, the issue of intergenerational fairness has been at the centre of many academic and policy debates. Yet very few empirical studies exist that examine how social provisions for different age groups vary across countries or across time. This chapter presents evidence on the age balance of social protection spending across the 27 European Union Member States (and in the UK) and of how this has changed between

2002 and 2017. It also presents evidence on how EU countries redistribute within and between age groups and how this has changed over time.

Section 2.2 presented evidence on trends and composition of expenditures on social protection benefits as in the EUROSTAT ESSPROS database for the years 2002–2017. Under ESSPROS, social protection is defined as encompassing 'all interventions from public and private bodies intended to relieve households and individuals of the burden of a defined set of risks or needs, provided that there is neither a simultaneous reciprocal nor an individual arrangement involved' (EUROSTAT, 2016, 2017). As one would expect, there is very large cross-country variation in social protection benefit spending across European Union countries. Differences between countries in the level of social protection benefit spending are partly related to different economic conditions, but they also reflect diversity across countries in the generosity of their social protection systems as well as differences in the demographic composition of their populations, cross-national differences in unemployment rates and other social, institutional and economic factors affecting both the capacity and the scope of social spending in different countries.

Analysis of the composition of social protection spending shows that in all countries spending in sickness, healthcare and in old-age and survivors functions represented the largest share of social protection benefit expenditures, accounting together, on (unweighted) average across the 27 European Union countries, for over 75% of total social protection benefit spending in 2017. Spending on family and children as well as on the unemployment and the housing and social exclusion n.e.c. functions made up a much lower share of the total social protection benefit spending in all countries.

In all countries, expenditures on social protection benefits increased substantially over the period 2002–2017, both relative to GDP and in absolute terms. Analysing trends in the composition of social protection benefits expenditures over time shows that in all countries – with the exception of DK, DE and to a lesser extent IT – old-age and survivors functions were the social protection programmes with the largest absolute increases in per capital spending. Spending on family and children exhibited much more moderate dynamics in all countries. A similar picture emerges when looking at how the share of each social protection function in total social protection spending changed over the period 2002–2017.

In most countries, increases in the share of old-age and survivor functions in total social protection benefit spending were accompanied by decreases in the share of spending in the functions of sickness and healthcare, disability, and family and children but the magnitude of the decrease for each of these functions differed substantially across countries. For the unemployment function, the patterns across countries were more mixed, with some countries recording substantial reductions in unemployment spending and others recording either no increase or even an increase. Overall, taken together, the evidence of the dynamics of different social protection benefit expenditures points to a substantial increase in the share of social protection spending oriented towards the support of the elderly population groups, with a corresponding decrease in the share of spending oriented towards the non-elderly population in most European Union countries.

Section 2.2 also presented an index of the age orientation of social protection benefits spending which corrects for differences in population structure and differences in the unemployment rates across countries. It is therefore better suited to reflect differences in the relative generosity of the systems for different age groups. This index again revealed that there is a substantial orientation of social protection benefits spending towards the support of the elderly population in all countries. Analysis of the changes in the index over time showed substantial cross-country variation in how the age balance of the social protection benefits spending has changed over the period 2002–2017.

Section 2.3 examined the intergenerational fairness implications of the redistributive effects of taxes and benefits in the 27 Member States of the European Union based on

microdata from EU-SILC. Section 2.3.2 compares the age profiles of social transfers and taxes in 2007 and in 2017. In line with expectations, social transfers (which consist of both old-age and non-old-age benefits) were found to account for a higher share of gross household income among older than among younger age groups. This pattern has strengthened over time in many countries. However, in most countries this pattern appears to be largely explained by market income forces, suggested by the fact that larger increases (decreases) in social transfers were associated with larger declines (increases) in market income. In contrast, taxes and social security contributions were found to account for a higher share of gross household income among younger than among older age groups in many EU countries, pointing to the significant pro-elderly bias of their tax systems. Analysis of the changes over the period 2007–2017 revealed that the patterns of change were quite diverse across countries, with the pro-elderly bias of the tax systems strengthening in some countries and weakening in others.

Analysis of the within-age-group and between-age-groups inequality in disposable and market incomes and in the overall redistribution in Section 2.3.3 showed that, in all countries, the effect of within-group age group inequality far outweighs the effect of the between-age-groups inequality when considering equivalised household market income inequality. Also, between-age-groups differences account for an even lower share of total equivalised household disposable income inequality. On average, the contribution of between-age-groups differences in the overall equivalised household disposable income inequality is less than 1 %.

Breaking down the overall redistributive effects of taxes and benefits in each country into the redistributive effects of old-age pensions, non-old-age benefits and taxes in Section 2.3.3 revealed that in most European Union countries the redistributive effects achieved by old-age pensions are much larger than either that achieved by (non-elderly) benefits or by taxes. Moreover, the analysis revealed that in most European countries, taxes and non-old-age benefits have a rather moderate role in redistributing between age groups. In most countries, the between-age-groups redistributive effects of their benefit and tax systems is largely achieved by old-age pensions.

Investigating trends in the redistribution over the period 2007–2017, Section A2.1 in Annex 2 revealed that the redistributive effects of taxes and social transfers declined in most EU countries, with the exception of PT, CY, ES, IE, FI, EL, LV, FR and MT. Although there is a large cross-country variation, the decrease in the overall redistribution was driven, in most countries, by the decrease in redistributive effects of old-age pensions and non-old-age benefits and less by taxes. Moreover, it was found that – although in most countries changes in the between-age-groups redistribution were much smaller than the change in the within-age-group redistribution – the change in the between-age-groups redistribution made a substantial contribution to the overall change in redistribution in some countries. However, this was almost exclusively driven by the change in between-age-groups redistributive effects of old-age pensions.

Finally, Section 2.3.4 used household composition to examine the impact of multigenerational living arrangements on the redistributive effects of tax and transfer systems in different European countries and the extent to which resource pooling and sharing within multigenerational households may offset some of the effects of any potential age bias of social protection programmes on welfare outcomes for different age groups. The analysis revealed that a significant share of the redistributive effects of the tax and benefit systems in different EU countries is taking place within multigenerational households. On average, around 15% of the total redistributive effects of the benefit systems in the 27 EU countries is accounted for by benefits accruing to individuals other than the benefit recipient and members of their nuclear family through shared living arrangements. The importance of these ‘indirect’ redistributive effects is higher in countries where the prevalence of multigenerational households is higher, reflecting the important role of the family in these countries in protecting against poverty (and other

social risks), especially when economic conditions are challenging and adequate social protection systems absent. The results also point to the impact of multigenerational living arrangements in offsetting some of the age bias characterising tax and social protection systems.

Although the evidence presented in this chapter points to a rising pro-elderly bias in the social protection spending and in the extent to which tax and benefit systems redistribute across age groups in many EU countries, caution is needed, given that an essential function of old-age pension systems is to redistribute intertemporally over the life cycle and therefore cannot be purely seen as part of the safety net. Moreover, the intrahousehold sharing of resources within multigenerational households – as our analysis highlighted – and the interhousehold transfers may offset some of the effects of any potential age bias of social protection systems.

3. Did automatic stabilisers and fiscal consolidation undertaken in certain Member States in the wake of the economic crisis impact upon different age groups asymmetrically and in what way?

Summary

This chapter analyses developments of real disposable incomes across generations, by asking 'Did automatic stabilisers and fiscal consolidation undertaken in certain Member States in the wake of the economic crisis impact upon different age groups asymmetrically and in what way?' It disentangles income effects caused by changes in market incomes, automatic stabilisers and welfare policies. We find that the distributional effect across generations was remarkably consistent across all EU-27 countries and stable over the analysed period of 2007–2014. On average, over all EU-27 countries, individuals in retirement age (i.e. the age group 65–74 years and 75+ years) experienced the strongest increases and lowest declines in real disposable income, while young adults (18–24 years) were those worst affected by the crisis. The income growth of the oldest generations was primarily driven by policy changes. The income loss for young adults was primarily driven by a loss in market income. Neither discrete policy changes (policy effect) nor the automatic stabilisers effect was able to significantly counteract this group's loss in market income. The real disposable income of the age group 55–64 on average increased slightly, while the incomes of children (0–17) and of the prime-working-age population (25–54) decreased slightly.

3.1. Methodology

Changes in public spending and taxes undertaken during the recent financial and economic crisis have affected different generations asymmetrically. We assess how disposable incomes evolved and how tax and transfer systems acted to reduce or amplify differences engendered by the markets. Due to varying country features such as different age distributions, similar policies might have had diverging intergenerational effects. In this chapter, we take a deeper look at underlying mechanisms of income changes during and in the wake of the economic crisis. We estimate which effects (market income effect, automatic stabiliser effect and policy effect) were driving income gains or losses across generations. The analysed period extends from the beginning of the economic crisis (also known as the global financial crisis) in 2007 up until 2014 to capture developments in the recovery phase. Additionally, we distinguish between the periods 2007–2009, 2009–2011 and 2011–2014.

We understand 'fiscal consolidation' as all changes to a country's tax-benefit system over the analysed period. 'Automatic stabilisers' are defined as all policies with an automatic, in most cases, countercyclical effect on the income of individuals and/or households that have already been inherent to a country's welfare system. These include progressive income taxes which decrease (increase) individuals' relative tax burden when their income decreases (increases), as well as unemployment and social assistance benefits which provide an alternative form of income for individuals losing their labour income.

3.1.1. Microsimulation

The analysis relies on microsimulation using the tax-benefit model EUROMOD, which covers the most important features of income tax systems, social (insurance) contributions and cash benefits of all EU Member States in a comprehensive, flexible and consistent way. The model is based on microdata from the European Survey of Income and Living Conditions (EU-SILC). In the analysis, we focus on the years 2007, 2009, 2011 and 2014 which reflect the income situation before, during and in the wake of the economic crisis.[28] In our analysis, we include EU-27 countries. Croatia cannot be considered as the model and input data in EUROMOD is only available since 2011 and thus does not cover the crisis period.

The impact on generations is measured by the change in disposable income. The disposable income is calculated by subtracting social (insurance) contributions, income taxes and capital taxes from market incomes and monetary benefits.

Disposable income = market income + monetary benefits - social insurance contributions - taxes

3.1.2. Decomposition analysis

The sum of changes in disposable income (i.e. the total effect) can be decomposed into three effects: the market income effect, the automatic stabiliser effect and the policy effect. The nominal effect is the fourth effect resulting from the decomposition, but will not be covered in this report as it is a negligible effect.

Total effect = Policy effect + market income effect + automatic stabiliser effect (+ nominal effect)

First, the policy effect is decomposed, followed by the market income effect and the automatic stabiliser effect. Developments captured by those three effects are summarised in Table 3.1. below.

Table 3.1: Overview of the disaggregated effects

Market income effect	Automatic stabiliser effect	Policy effect
Changes in employment income Changes in self-employment income	Changes in population eligible for a benefit Changes in granted benefit amounts, e.g. due to higher needs	Introduction of new taxes or benefits Abolition of existing taxes or benefits

[28] As input data for the simulation model, SILC data from 2008, 2010, 2012 and 2015 is used as the income information provided in those datasets always refers to the previous year.

Changes in capital income Changes in private pension income	Changes in tax liability due to changes in tax base or eligibility for tax credits and allowances	Changes in eligibility criteria Changes in tax rate or benefit level Indexation of benefits ≠ CPI

The market income effect describes changes to disposable income caused by changes in the population's market income. Market income includes gross income from employment and self-employment, capital income (e.g. from investment, property) and private pension income before contributions and taxes.

The automatic stabiliser effect refers to changes in disposable income due to a country's tax-benefit system that are not caused by changes in the policy system per se (i.e. policy effect) but the number of people affected by a policy and the transferred amounts. Automatic stabilisers are policies which by their design seek to counteract changes in income. This includes replacement incomes in the case of unemployment (unemployment benefits, unemployment assistance and social assistance) as well as policies where the burden on the individual is positively correlated with the level of income, for example progressive income taxes.

The policy effect describes the effect on disposable incomes caused by discrete changes of taxes and benefits, including public pensions. In other words, it captures the introduction of new policies and the termination of existing ones, as well as changes in the level, eligibility criteria and other parameters of taxes and benefits. Those changes in parameters in most cases refer to indexations of benefits, like child benefits and public pensions, that are above or below the consumer price index (CPI). The rationale behind this is that recipients of a benefit that is adjusted below (or above) the CPI would be able to buy less (more) given the change in prices. Our methodology does not allow distinguishing whether such indexations are implemented only in exceptional cases or on a regular basis. Hence, even if indexations above or below the CPI are inherent to a benefit, they are nonetheless included in the policy effect.

Box 3.1: Reallocation of benefits

Cash benefits in EUROMOD are usually assigned to the household head. For the individual income approach, reallocation to individuals whose wellbeing should be improved by the benefit is needed. Based on this approach, we identify two groups of benefits:

1) Benefits intended to improve the wellbeing of children: The most common policies in this group are unconditional child benefits and childbirth grants as well as education allowances for children. Where needed, these benefits are reassigned from the parents to their children. Family-related benefits which compensate parents for a reduction in income (replacement incomes related to parental or maternal leave) or childcaring duties all well as child-related tax benefits linked to the income of parents (child tax credits or tax allowances which compensate for the reduced economic capability due to children) are not reallocated. We argue that the primary purpose of these measures is not to improve the wellbeing of children

but to increase financial incentives for parenthood and/or to provide a replacement income for gainful employment of parents. Hence, the primary beneficiaries are parents, not children.

2) Benefits intended to support the wellbeing of the whole household, including the wellbeing of dependent children or the elderly: These are primary means-tested benefits like social assistance, minimum income benefits, housing benefits or heating allowances. We reallocate those benefits among household members in such a way that children will receive half of the amount (= 50%) of an adult (= 100%).

3.1.3. *Equivalised household income vs. individual income*

There are two commonly used approaches to assess disposable income: the household and the individual level. The advantage of the former approach is that it roughly approximates intra-household transfers assuming a fair sharing of income between household members. Additionally, it accounts for economy of scale related to different household sizes. The individual approach focuses on changes of personal disposable income and allows the isolation of income changes of individuals and thus an assessment of the discrete effects on generations. This approach is a relevant complement to the rather traditional household approach as it relates to the original income recipient and does not conflate changes in the disposable incomes of different household members, neglecting household composition.

For the household perspective, equivalised household incomes are calculated applying the modified equivalisation scale by the OECD, where the oldest household member is given a weight of 1, all other members aged 14 or above a weight of 0.5 and all members aged below 14 a weight of 0.3. To evaluate disposable income on the individual level, adjustments in the microsimulation model are required. Information on market incomes in EU-SILC is recorded for each person individually, with the only exception of capital income that is collected for the household jointly and thus attributed to the household head (i.e. the person with the highest individual income). Apart from individualised benefits like pensions and unemployment benefits which stay with the original recipient indicated in the input data, EUROMOD by default allocates benefits to the household head. We reassign these benefits to those individuals that are actually targeted by a policy (see Box 3.1. for further details).

3.2. *Results*

This section will first discuss the aggregated effect, i.e. the total effect, on disposable incomes of different generations between 2007 and 2014, as well as on different subperiods. Subsequently, results of the decomposition analysis addressing market income effects, automatic stabiliser effects and policy effects are presented.

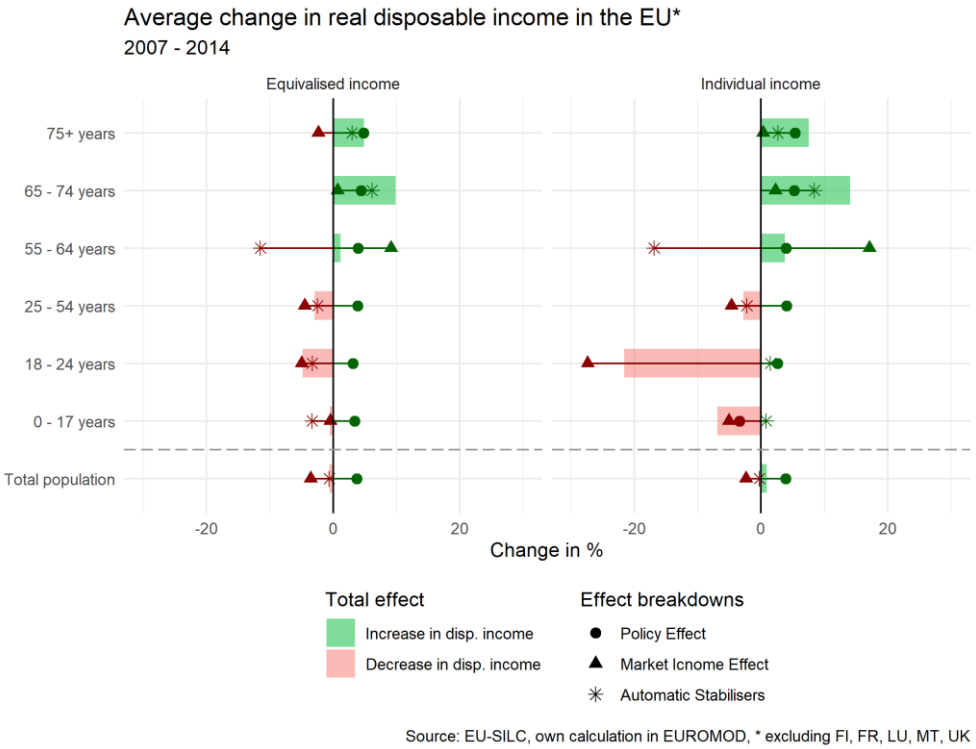
3.2.1. The aggregated effect

The figures below show the change in disposable income during and in the wake of the economic and financial crisis (2007–2014) by generations (i.e. age groups below 18 years, 18–24 years, 25–54 years, 55–64 years, 65–74 years and 75+ years, as well as the

total population). The bars show the overall effect on disposable income (right side/green: positive; left side/red: negative). The pyramid, the star and the dot respectively show the market income effect, the effect of automatic stabilisers and the policy effect on disposable income. Figure 3.1 shows the weighted averages for all EU-27 countries for the period 2007–2014. The graph on the left shows the changes in real disposable income using the equivalised household income; the graph on the right shows the results for the individual-level analysis. Figures 3.3 and 3.4 depict changes in individual income for each country (corresponding figures for equivalised income are provided in Annex 3 (Figures A3.1 and A3.2).

When comparing average incomes across all 27 EU Member States for all age groups in 2007 to those in 2014, the European population on average experiences a slight decrease in real disposable income of about 1% on the household level, and a slight increase of the same extent on the individual level. This indicates that the income development of small households was more favourable than that of larger households. The overall variation in the change of disposable incomes between countries is high. While disposable incomes in BG increased by more than 26%, they dropped by around 18% in CY and by over 38% in EL. Other countries like AT, BE, CZ, DE, HU, LT, LV, NL and SI saw very little change in average disposable income over the same period. The results for FR, FI, LU, MT and the UK should be interpreted with care and are not entirely comparable to the other countries because the results for these countries relate to different periods: FR 2006–2014, FI 2008–2015, MT 2009–2014, LU 2008–2015 and the UK 2008–2013. While the overall developments (i.e. for the total population) in real disposable income differed substantially, the relative changes for different generations were remarkably consistent across countries.

Figure 3.1: Weighted averages for EU-27, 2007 v 2014



Source: EU-SILC, own calculation in EUROMOD, * excluding FI, FR, LU, MT, UK

Pensioner generation 75+ years: Individuals of pension age saw one of the strongest increases and lowest declines in disposable income in all European countries. The generation 75+ experienced average increases in equivalised household income of about 5% and average increases in individual income of 8%. Incomes of this generation rose in the first and third subperiod analysed and slightly dropped at the peak of the crisis between 2009 and 2011. Particularly in the first subperiod (2007–2009), the average incomes of those aged 75+ rose above average.

Pensioner generation 65–74 years: On average, across all countries the disposable income of individuals 65- to 74-years-old grew the most among all generations with an increase of 10% between 2007 and 2014 when considering equivalised household income and 14% when considering individual income. This result is observed in most countries, with the strongest increases observed in RO and BG. Individuals aged 65 to 74 only saw their incomes drop in EL, IE and IT for both income measures and, when looking only at individual incomes, also in DE. On average, the income development of the two generations of pensioners was very similar with the gap between them opening towards the end of the crisis (2011–2014) when income increases of the 65- to 74-year-olds were stronger than those of the generation aged 75+.

Woking-age generation 55–54 years: People aged 55 to 64 years were the third age group that had, on average, higher incomes at the end of the crisis than they did at its start. Average disposable incomes increased both when equivalised household income (1%) and individual income (4%) are considered. Income changes of this age group were quite moderate with average increases in the first and third periods and average decreases in the second period ranging between 2% and 5%.

Working-age generation 25–54 years: Real disposable income of the principal working-age generation, 25- to 54-year-olds, declined from 2007 to 2014 for both income measures by about 3%. Income effects were negative for this age group throughout the crisis. Individual incomes partly recovered only between 2011 and 2014, while the average change in equivalised household income remained negative. Again, the effect on the disposable income of this age group was very consistent across countries. Only in IE, LT and LV (equivalised household income) and PL and SE (individual income) did members of this group see an increase in income higher than the national average.

Young adults 18–24 years: The group hit hardest by the economic crisis were individuals aged 18–24 who experienced an average income decline of 5% in equivalised household income and 22% in individual income. People in this age group saw their income decline strongly relative to the national average in AT, BG, CY, ES, IE, LU, LV and RO when only equivalised household income is considered, and in BE, IT, PT and SI for both equivalised household income and individual income. The average income development of young adults was continuously negative throughout the analysed period. Interestingly, while for all other age groups the period at the peak of the crisis (2009–2011) was the most disadvantageous, incomes of the 18–24 on average eroded most at the beginning and the end of the crisis.

Children 0–17 years: From 2007 to 2014, real disposable incomes of the youngest generation (0–17 years) stagnated at the household level and decreased at the individual level by a considerable 5%. As most children do not have an income on their own, individual income is highly driven by policies targeted at children. Consequently, changes in corresponding benefits had particularly strong impacts in CY, CZ, EL, HU, MT, PL, SI and the UK. Incomes of children were subject to the highest ups and downs during the crisis. Individual incomes on average increased by 17% between 2007 and 2009, before decreasing by 13% until 2011 and decreasing by a further 2% between 2011 and 2014.

3.2.2. Equivalised household vs. individual income

The equivalised household incomes of older generations developed less favourably than their individual incomes. This suggests that a significant amount of older people live together with other individuals whose incomes were rising slower or decreasing more quickly. For younger generations, the opposite is the case: their individual incomes decreased more than their equivalised household incomes. This means that many individuals in this age group live in households with higher income individuals, i.e. their parents and grandparents. In other words, without income sharing within households, there would have been a much stronger drop in the disposable income of children and young adults.

3.2.3. Different periods of the crisis

A comparison of the periods 2007–2009, 2009–2011 and 2011–2014 shows that the negative effect of the crisis was strongest in the second period, 2009–2011 (see Figure A3.3 in the Annex), when incomes across all generations declined by almost 2%. In contrast, in the first and third period, disposable incomes across all generations grew by about 1%. Aggregated effects are very consistent across both income measurements. The only exception is the youngest generation (0–17 years), where the change in equivalised household income is contrary to the change in individual income between 2007–2009 and 2011–2014.

What is noteworthy is that the distributional effect of the crisis across generations is rather stable over time. In particular, the finding that young people aged 18 to 24 lost ground while older Europeans (especially 65 to 74) were affected the least by the crisis holds for all subperiods. Both groups of pensioners on average saw the strongest increases (or smallest decreases) in disposable income in all periods. In contrast, individuals aged 18 to 24, were continuously affected worst by income losses.

Market income, automatic stabiliser and policy effect

As mentioned above, the average total effect between 2007 and 2014 on real disposable income was stagnant, with a loss of about 1% at the household level and a gain of 1% at the individual level. On average, across the whole population and across EU-27 countries, the policy effect (of +4% at both household and income levels) and the market income effect (of -4% at household level and -2% at individual level) almost evened out. The average automatic stabiliser effect is close to 0%. Table 3.2 summarises average effect sizes by age group as also shown in Figure 3.1. It should be noted that the direction of disaggregated effects varied considerably between countries and – while average effects across countries might provide an intuition – developments in certain countries might deviate strongly.

Table 3.2: Strength of different effects 2007 v 2014, EU-27 weighted averages

Generation	Total effect	Market income effect	Automatic stabiliser effect	Policy effect

Equivalised household income	0–17	-0.5	-0.5	-3.3	3.4
	18–24	-4.8	-5.0	-3.3	3.1
	25–54	-3.0	-4.5	-2.5	3.9
	55–64	1.2	9.1	-11.5	3.9
	65–74	9.9	0.7	6.1	4.4
	75+	4.9	-2.3	3.0	4.8
	Total	-0.6	-3.6	-0.6	3.8
Individual income	0–17	-6.9	-5.1	0.8	-3.4
	18–24	-21.6	-27.4	1.5	2.6
	25–54	-2.8	-4.7	-2.2	4.1
	55–64	3.7	17.1	-16.9	4.0
	65–74	14.1	2.3	8.4	5.3
	75+	7.5	0.3	2.7	5.4
	Total	0.9	-2.4	-0.3	3.9

Market income effect

The market income effect was naturally one of the driving factors of disposable income during the economic crisis. In the first period of the crisis (2007–2009), the age group 55–64 was the only one that recorded moderate average real income increases of 1% (household level) and 4% (individual level), although losses were already high in LV, IT, LT and PT. Market incomes of 65- to 74-year-olds stagnated, while all other age generations experienced losses in labour and capital income. The most negatively affected generation was young adults (18- to 24-year-olds) with average losses of -4% in household income and of a remarkable -11% in individual income. Individual market incomes of young adults only increased in AT, CY, DE, EL, NL and RO between 2007 and 2009. Losses were particularly high in the Baltic States that had already been hit hard by the crisis in the first period. In the second part of the crisis (2009 to 2011), developments on the markets turned more unfavourable; however, on average it was again the generation of 18- to 24-year-olds that was affected most negatively.

In the third period (2011–2014), average market incomes increased by 2%; however, deviations between generations were the strongest in this period. While young adults recorded another loss of -13% in average individual incomes, the oldest generation on the labour market (age group 55–64) saw income increases by a remarkable 12%. However, there are a number of countries where opposite developments are found: BG, HU, IE, LT, LV, SE and SK.

In summary, the market income effect was on average the most favourable for the age group 55–64. Between 2007 and 2014, the average income increase of this generation across all EU-27 countries totalled +9% and +17% at the household and individual level respectively. Depending on the income approach taken, 65- to 74-year-olds recorded slightly increasing or stagnating market incomes, while the oldest age group (75+) experienced slightly decreasing or stagnating effects. All other generations were affected by a negative market income effect. Young adults (18- to 24-year-olds) saw the sharpest decline in real wages and/or the highest increase in unemployment with average market income losses of -5% in equivalised household income and -27% in individual incomes. As such, the reduction in market income is clearly the main reason why the overall real disposable income of this age group was the one to decrease the most across all age groups. This is not surprising given that unemployment among young people was one of the most visible consequences of the economic crisis in Europe (e.g. Bell and Blanchflower, 2011).

Automatic stabiliser effect

Automatic stabilisers seek to cushion changes in market income. The automatic stabiliser effect captures changes in disposable income caused by a country's tax-benefit system that is already in place. While countries might implement either expansive or restrictive policy measures, automatic stabilisers such as progressive tax systems, unemployment, social assistance and other means-tested benefits function in a countercyclical way. They seek to counteract income losses but also income increases and thus stabilises the economy. When looking at the average automatic stabiliser effect across all EU-countries (and across all generations) the effect's strength was quite weak in all subperiods analysed. However, in contrast to the mean market income effect that captured common trends across countries quite well, the mean of the automatic stabiliser effect has to be interpreted with caution.

On average, across all EU-27 countries and at both the household level and the individual level, the automatic stabiliser effect between 2007 and 2014 was slightly negative. As already mentioned, the average across countries yields puzzling results, for example for the prime-working-age generation (25–54 years) for which it suggests that – instead of counteracting the decline in market income – automatic stabilisers further exacerbated the reduction in real disposable income. Hence, we shift the focus of our interpretation to country-level results shown in Figures 3.3 and 3.4. These depict that automatic stabilisers did counteract the developments of market income, with only minor deviations for pensioners and children. Overall, the strength of the automatic stabiliser effect correlated with the strength of the market income effect. When looking at country-level results, we find that automatic stabilisers had the strongest positive effect on children. This was particularly pronounced in CY, EE, EL, ES, LT and LV and can be explained by the fact that child benefits are often means tested based on the income of parents. Thus, child benefits acted as an automatic stabiliser by increasing the individual income of children whose parents experienced a decrease in their (market) income.

Policy effect

The average policy effect had a positive impact on real disposable incomes of Europeans reaching up to +4%, both at the household level and the individual level. However, the policy effect was extremely heterogenous across countries. While some countries pursued expansionary fiscal policy between 2007 and 2014, others increased taxes and/or decreased benefits. For example, the policy effect on disposable income in PL was of around 15% for all age groups, in RO it ranged from 13% to 39%, in SK it was of around

20%, and in BG it ranged from 30% to 40%. In contrast, policy changes had a negative effect on disposable income of -15% to -20% in LV, of around -15% for all age groups in EL and of between -8% and -10% for individuals up to the age of 64 in IE.

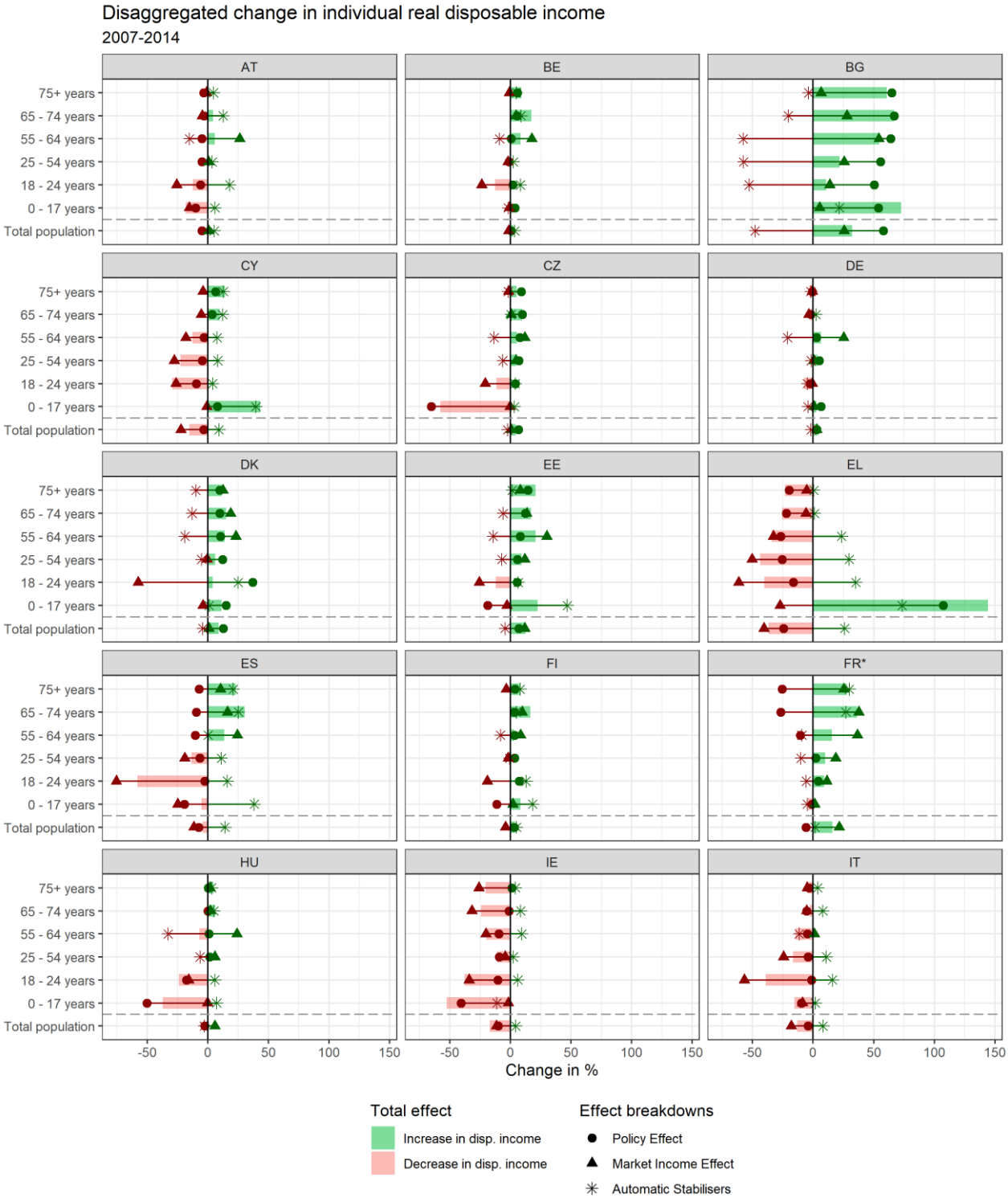
When looking at different periods of the crisis, the policy effects turned negative between 2007 and 2009 in CZ, EE, HU, IE, IT, LV, LT, PL and SI. Those countries introduced austerity measures at the beginning of the crisis. Policy effects turned homogenously negative across countries from 2009 to 2011 with minor exceptions such as BG, DE, MT and PL. Children and pensioners who depend most on the welfare state were hit hardest by the benefit cuts implemented. Between 2011 and 2014, policy effects within Europe diverged strongly as some countries switched to expansionary fiscal policies while others still adhered to budget cuts.

Across the total period, children experienced the least favourable average policy effect. Cuts in child-related benefits included the abolishment of birth grants in RO and freezes or cuts in child benefits as in EE and the UK. This general trend does not hold for CY, EL, NL and SK where children benefited from expansionary policies.[29] The aggregated policy effect on pensioners between 2007 and 2014 was positive in most European countries (except for those hit hardest by the crisis like EL, ES, IE, IT and PT, but also in AT and DE),[30] which can be explained by well-indexed public pensions.

[29] For FR, LU and the UK, we also estimated diverging trends; however, due to data availability, the periods are not fully congruent and results not entirely comparable.

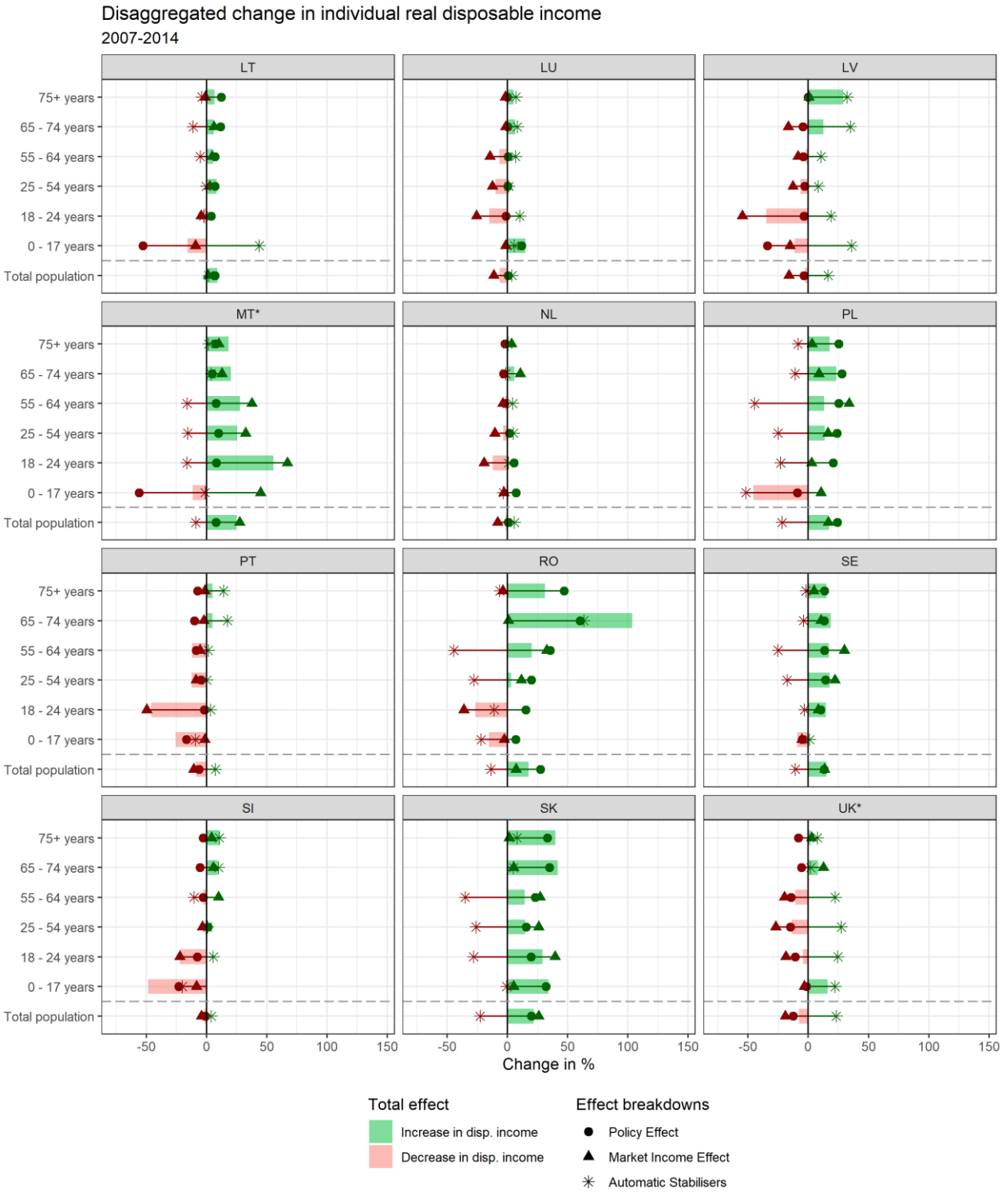
[30] This applies to FR as well, but due to different time periods, the results are not entirely comparable.

Figure 3.3: Changes in individual incomes across EU-27, 2007 v 2014 (I)



Source: EU-SILC, own calculation in EUROMOD; *FI: 2007-2015, FR: 2006 - 2014,

Figure 3.4: Changes in individual incomes across EU-27, 2007 v 2014 (II)



Source: EU-SILC, own calculation in EUROMOD; *LU: 2007-2015, MT: 2009-2014, UK: 2008 - 2013

3.3. Conclusions

In this chapter, we assessed changes in real disposable incomes across generations and disentangled the underlying effects. For our analysis, we used the tax-benefit microsimulation model EUROMOD based on microdata from the Survey of Income and Living Conditions (EU-SILC). We focused on the years 2007, 2009, 2011 and 2014 which reflect the income situation before, during and in the wake of the economic crisis. The impact on all generations is measured by the change in disposable income both at the household level (equivalised household income) and at the individual level (individual income). The sum of changes in disposable income (i.e. total effect) is decomposed into three effects: the market income effect, the automatic stabiliser effect and the policy effect.

Over the whole observation period from 2007 to 2014, the weighted average across all 27 EU Member States showed, for the total population (i.e. taking all age groups into consideration), a real decrease in disposable income of about -1% at the household level and a slight increase of 1% at the individual level. A comparison of the periods 2007–2009, 2009–2011 and 2011–2014 shows that the negative effect of the crisis on disposable incomes was the strongest in the second observation period (2009–2011), with a decline of almost -2%. In contrast, in the first and third periods, disposable incomes across all generations grew by about 1% for both the equivalised household income and the individual income.

While the overall strength of the effect on disposable incomes differed strongly by countries (e.g. disposable incomes in BG increased by more than 26% but dropped by around 18% in CY and over 38% in EL), the relative effect on different generations is remarkably consistent across countries. In other words, weighted averages of total effects, i.e. the policy effect, market income effect and automatic stabiliser effect combined, represent general trends across EU countries during the analysed period and are not driven by individual outliers.

Our findings show that individuals in retirement age, i.e. the age group 65–74 years and 75+ years, saw the strongest increases (or lowest declines) in real disposable income between 2007 and 2014, for both the equivalised household income and the individual income. Real incomes of pensioners were lower in 2014 than before the crisis only in DE, EL, IE and IT. The underlying effects leading to general income increases for these age groups differ considerably among countries. In most cases policy effects or automatic stabiliser effects, hence the welfare state, was driving the income increases, which is not surprising as the prime income source of older people is not the labour market or the capital market but public pensions.[31]

When analysing income developments of the working-age population, there is a strong difference between the 55- to 64-year-olds and the prime-working-age populations aged 25–54. While average incomes of the former improved, incomes of the latter decreased. This difference was to a major extent driven by the market income effect, as 55- to 64-year-olds had higher gains or lower losses, with the gap most pronounced at the end of the crisis between 2011 and 2014. The automatic stabiliser effect reacted to market income developments. The policy effect was in all countries quite comparable between the two.

The two youngest generations were negatively affected by the crisis with income losses of young adults (18–24 years) more pronounced than that of children (0–17 years). The

[31] Public pensions accounted for 93% to 100% of total pension income in 2007.

former experienced average income erosions of -5% at the household perspective and -22% at the individual perspective. It seems that this group was already significantly affected by unemployment during the first phase of the crisis and had difficulties to re-enter the labour market even in the recovery phase. Neither the policy effect nor the automatic stabiliser effect were able to compensate market income losses enough to keep parity with pre-crisis levels. Exceptions are BG, DK and to a very limited extent FI, MT, SE and SK. Incomes of children were subject to the most pronounced changes in the course of the crisis. As incomes of children are highly dependent on benefits, those were also the driving factor of ups and downs. While the average policy effect in the EU was +17% in the first period (2007–2009), it was -13% between 2009 and 2011 when the first austerity measures were introduced.

For the two youngest as well as for the two oldest generations, a strong difference between equivalised household income and individual income was visible. This finding suggests that young people living in a household with their parents or grandparents were to some extent sheltered from the negative effects of the crisis. Young people living on their own – which represent about 10% to 15% of this age group (see Table 9) – were, in contrast, significantly affected by the crisis.

To summarize the general trends across EU-27 countries, it can be said that while market incomes already started to decline in the period 2007–2009, the welfare state was able to compensate those income losses mostly by discrete policy changes. In 2009–2011, unemployment and wage cuts continued while policy changes exacerbated income losses as a consequence of the first austerity measures. In the period 2011–2014, market incomes widely recovered. Fiscal policies differed strongly across EU countries in this period. Automatic stabiliser effects were remarkably weak for young adults aged 18–24 and only to a limited extent compensated market income losses.

What is noteworthy is that the distributional effect across generations is generally stable over the three observation periods. In particular, the finding that young people aged 18 to 24 lost ground while older Europeans (especially those 65 to 74) were affected least by the crisis holds for the vast majority of countries. This might often be linked to structural factors. For example, young employees usually face the highest risk of losing employment on the principle ‘last in, first out’. In addition, particularly Bismarckian welfare states highly rely on insurance-based benefits, where eligibility is bound to minimum employment periods and benefit levels depend on previous wages. Again, young people have comparably low incomes due to lacking seniority and often do not qualify for unemployment benefits due to short employment periods This is dramatically confirmed in our analysis for the age group 18–24, whose high losses due to unemployment (market income effect) were compensated only to a limited extent by the automatic stabiliser effect.

Based on these findings, the best way for the governments of EU Member States to support intergenerational fairness during the crisis would have been to strengthen the employment and income situation of young adults. One possible course of action would have been more generous unemployment benefits for this age group (see Chapter 5).

Our results are in line with previous studies showing that the average incomes of children and working-age adults were more affected by the crisis than those of older people, because older people’s incomes continued to rise at a steady rate (European Commission, 2017). In most countries, indexation of pensions insulated elderly citizens’ purchasing power from the impact of the crisis. In contrast, owing to fiscal constraints, non-pension benefits were not systematically indexed, cut or curtailed in some countries and/or became subject to means testing. At the same time, the above-mentioned structural problems in unemployment insurance systems were found to have resulted in less generous protection for the young than for the rest of the working-age population (Chen et al., 2018).

4. How did changes in spending on in-kind benefits affect intergenerational fairness?

Summary

This chapter focuses on the influence of in-kind benefits on intergenerational fairness, both from a macro and a micro perspective. The focus in more detail is on the main factors related to intergenerational fairness from different perspectives, namely in terms of public budget resources, reform trends, individual perceptions and use of in-kind transfers. The time pattern of the various components of in-kind benefits are analysed by making use of the Classification of the Functions of Government (COFOG) data provided by Eurostat to obtain information on overall health and educational (public) expenditure and on the various subcomponents of the latter for all EU countries. The Organisation for Economic Co-operation and Development (OECD) database on health spending, which provides information on the final consumption of healthcare goods and services, including personal healthcare (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services, as well as health administration), is then exploited to analyse the main subcomponents of health expenditure, focusing on 23 EU countries for which information is available. Then, in the last section of the chapter, a specific micro analysis on income inequality is presented, which compares disposable income and a measure of extended income (i.e. attributing a monetary value to in-kind public transfers) in FR, DE and IT: the three largest EU countries in terms of population. The approaches proposed in the chapter mix various methodologies and qualitative and quantitative analysis. Thus, they have the advantage of balancing the possible biases of each perspective taken alone by coupling quantitative information, on public and private resources concerning in-kind benefits, with qualitative information on the reform trends and on perceptions related to the quality of services.

4.1. Concepts and data

In this chapter, we analyse the influence of in-kind benefits on intergenerational fairness, both from a macro and a micro perspective. We thus focus on the main factors related to intergenerational fairness from different perspectives, namely in terms of public budget resources, reform trends, individual perceptions and use of in-kind transfers. Then, in the last section of the chapter, we present a specific micro analysis on income inequality by comparing disposable income and a measure of extended income (i.e. attributing a monetary value to in-kind public transfers) in the three EU countries with the largest populations: France, Germany and Italy.

In Section 4.2, we compare the share and trends of GDP spending and financing for the various components of in-kind benefits to highlight possible different levels and trends of welfare-services components devoted to the various age groups. The macro analysis is conducted by making use of the Classification of the Functions of Government (COFOG) data provided by Eurostat to obtain information on overall health and educational (public) expenditure and on the various subcomponents of the latter for all EU-28 countries. Additionally, we use the OECD database on health spending – which provides information on the final consumption of healthcare goods and services including personal healthcare (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration) – to analyse the main subcomponents of health expenditure focusing on 23 European countries for which this information is available.

In Section 4.3, we carry out a review of reforms introduced in EU welfare states to assess whether these reforms have changed the generosity of in-kind benefit schemes available to individuals belonging to different cohorts. Particular attention will be devoted to possible reforms that have changed the conditions for having access to education, healthcare and long-term care and childcare services.

In Section 4.4, we make use of available cross-country microdata recorded in the 2016 and 2017 waves of the European Union Statistics on Income and Living Conditions (EU-SILC) to compare, across EU-28 countries and age groups, the actual individual probability of accessing healthcare and formal education services. For instance, we make use of EU-SILC variables – about the use, affordability and financial burden of healthcare services and the affordability of formal education – though micro-econometric univariate and multivariate estimates of the age gaps in access to these services. These detailed analyses are carried out by exploiting the specific ad hoc module of the EU-SILC about 'Access to services' carried out in 2016 to test whether different conditions characterise individuals and households belonging to different generations. In addition, other information about costs and availability of healthcare services are recorded in the ad hoc 2017 EU-SILC module on 'Health and Children's Health'.

Finally, in Section 4.5 we use the 2007 and 2018 waves of the EU-SILC microdata to compare levels and trends of inequality and poverty using the extended income approach. Even though we are aware that the identification and monetisation of costs and benefits of in-kind transfers require questionable assumptions, given that there is no commonly agreed method to impute the monetary value of in-kind services provided by governments to individuals or households, we carry out an estimation exercise for the three largest EU countries. In more detail, as concerns the methodology, the monetary value of healthcare services is imputed to individuals by adopting an insurance approach and by taking into account selected specific characteristics which are likely to influence the self-assessed health status. Then, we attribute to different individuals the monetary amount of formal education using information provided in the EU-SILC database on the current education activity. The analysis of income inequality and poverty is conducted by comparing alternative indexes computed on disposable and extended incomes across different age classes, years and countries.

The approaches proposed in this chapter, which mix various methodologies and qualitative and quantitative analysis, have the advantage of balancing the possible biases of each perspective taken alone by coupling quantitative information on public and private resources concerning in-kind benefits with qualitative information on the reform trends and on individual perceptions on the quality of services.

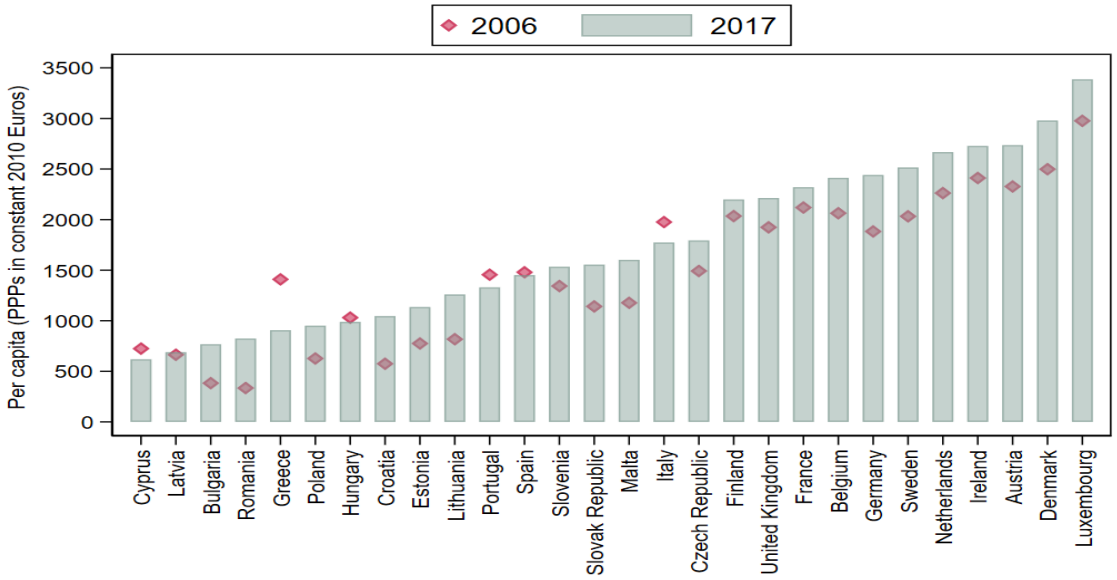
Finally, it should be noted that because of space constraints and the length of the various analyses carried out in this chapter, many figures and tables (numbered with the prefix A4) are included in the Annex rather than here.

4.2. Descriptive macro-evidence on government expenditure on in-kind benefits by function

This section complements findings of Chapter 2 about social expenditure trends, showing a more granular view of government expenditure on healthcare services, formal education and family and children benefits in two periods, 2006 and 2017, using Eurostat COFOG data and OECD data on health spending for EU-28 countries. To better compare the amount of government expenditure on in-kind benefits across countries and in the two periods, all monetary values are presented in per capita PPP constant 2010 euros and as a percentage of GDP in the Annex.

Figure 4.1 shows that the per capita amount of overall expenditure on healthcare services taken from Eurostat COFOG data, with a few exceptions (CY, EL and IT), have generally increased in all European countries considered from 2006 and 2017. Among all 28 countries considered, CY has the lowest per capita value in 2017 and LU takes the lead even though, in general, a large number of Eastern European countries rank at the bottom of the ranking while the Northern and continental countries are at the top.

Figure 4.1: Health expenditure per capita



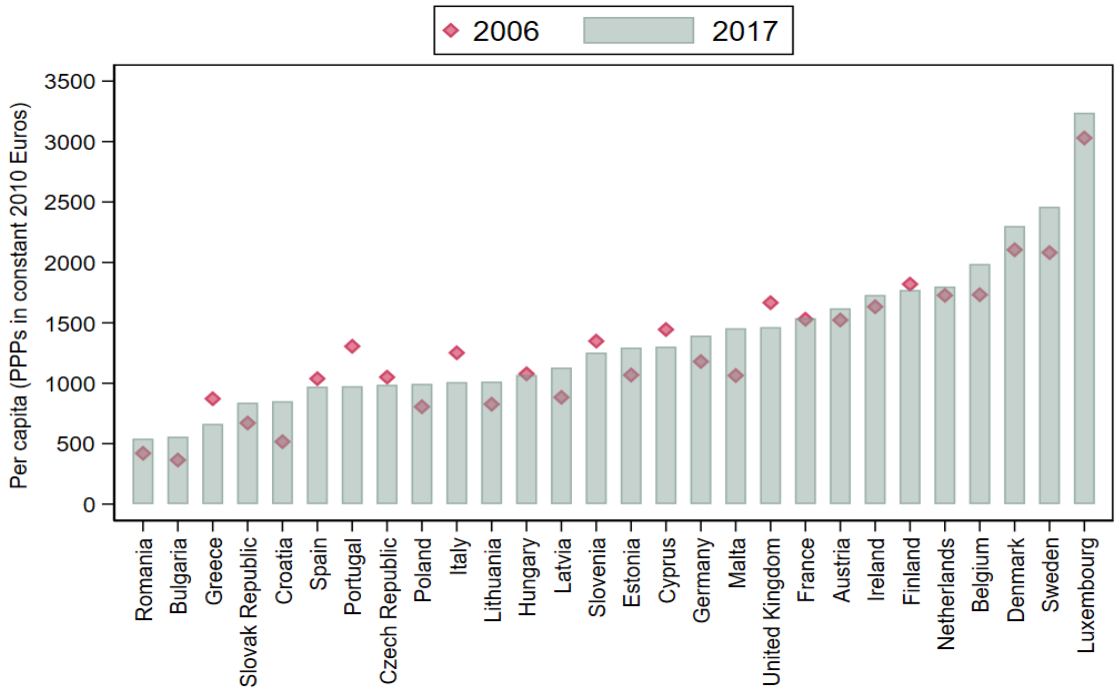
Source: COFOG data

However, when we consider health expenditure as a percentage of GDP, LU falls down in the ranking and DK takes first position (Figure A4.1). As a percentage of GDP, CY, LV, HU, IE, EL, MT, PT and IT are the countries to have decreased the amount of health expenditure from 2006 to 2017.

Figures 4.2 and A4.2 show the amount of expenditure on formal education per capita and as a percentage of GDP, respectively. As in the case of health expenditure, in 2017 LU takes the first position in the ranking when we focus on per capita values, while SE and DK take the top two positions when we look at health expenditure as a percentage of GDP. On the opposite side of the ranking, RO, BG and EL have the lowest values of educational expenditure both per capita and as a percentage of GDP.

Regarding changes over time in educational expenditure, it is worth noting that, although in many countries educational expenditure per capita has slightly increased from 2006 to 2017, most countries recorded lower levels of expenditure on formal education as a percentage of GDP in 2017 than in 2006. A remarkable exception is HR where the proportion of GDP on educational services has increased from 3.4% to 5.3% between 2006 and 2017.

Figure 4.2: Educational expenditure per capita



Source: COFOG data

We also use COFOG data on EU-28 countries to analyse levels and trends of a specific subcomponent of overall expenditure on formal education, i.e. the amount of expenditure per capita in tertiary education. Figure A4.9 shows that most countries had higher levels in 2017 than in 2006, with two main exceptions: the UK and DK. Denmark, however, was second after LU in 2017. However, when the amount of tertiary education expenditure is measured as a percentage of GDP (Figure A4.10), the picture changes a lot. LU falls down in the ranking and IT has the poorest performance among all countries considered. Moreover, the share of GDP dedicated to tertiary education has generally decreased in most European countries.

We use OECD data to analyse the main subcomponents of health expenditure by function focusing on 23 European countries for which information is available (Figures A4.3 and A4.4). The expenditure on curative and rehabilitative care is the most important component of the overall health expenditure. Figure A4.3 shows that in all countries but LU[32] the amount of per capita expenditure dedicated to curative and rehabilitative care services has greatly increased over time. In 2017, DE had the highest amount and LV the lowest among all 23 countries considered. Figure A4.4 shows curative and rehabilitative care services expenditure computed as a percentage of GDP. In this case, FR and DE take the two highest positions in the ranking and LV confirms its poor performance. As regards changes over time (considering only countries for which information is available for both 2006 and 2017), LU and LV are the only two countries where the proportion of GDP dedicated to curative and rehabilitative care services decreased between 2006 and 2017.

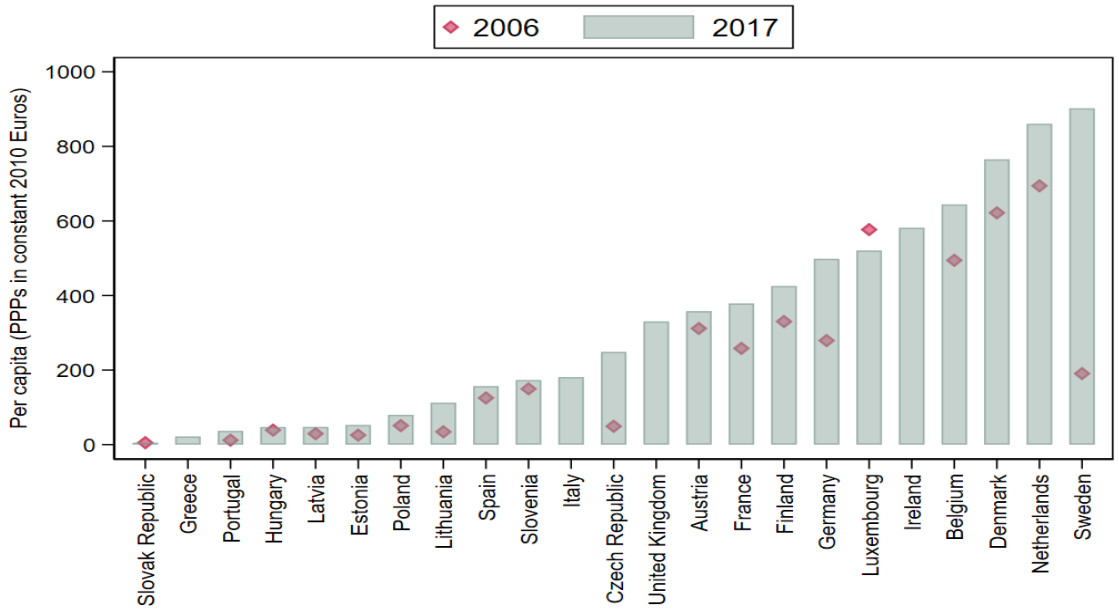
[32] Note that information on curative and rehabilitative care expenditure are not available for EL, IT and IE in 2006.

Figures A4.5 and A4.6 present an additional specific subcomponent of overall health expenditure: expenditure on medical goods. FR and DE recorded the highest values in 2017, both per capita and as a proportion of GDP. Moreover, these two countries experienced notable growth in the expenditure of medical goods between 2006 and 2017. However, it is important to observe that the amount of expenditure dedicated to medical goods, especially when measured as a proportion of GDP (Figure A4.6), has decreased in most of the 23 countries included in the analysis.

Figures 4.3 and A4.7 present a cross-country comparison on the expenditure on long-term care services, respectively[33] per capita or as a share of GDP. As in the case of the expenditure on curative and rehabilitative care services presented in the previous figures, the per capita amount of expenditure dedicated to long-term care has generally increased over time, with the only remarkable exception of LU.[34]

It is also worth noting that the higher share of GDP dedicated to long-term care in 2017 than in 2006 is related to the increase over time in the share of old-aged individuals which are, on average, the main users of long-term care services. This result has important implications in terms of intergenerational fairness given that a larger share of GDP is now dedicated to older generations than in the past.

Figure 4.3: Expenditure on long-term care per capita



Source: OECD data

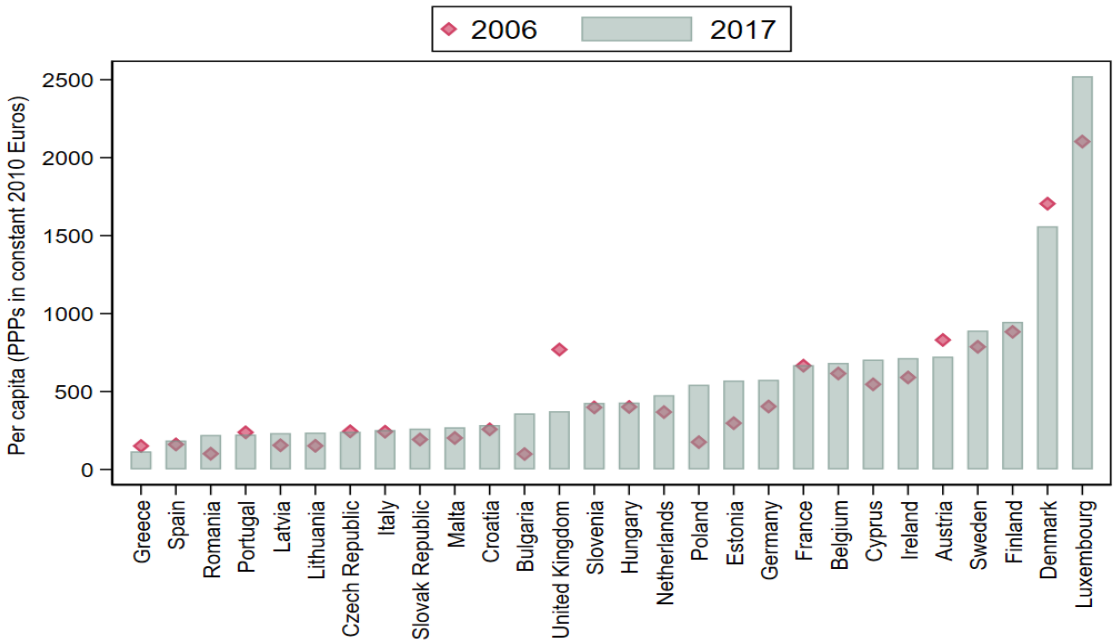
Finally, we conclude this section by looking at social expenditure on family and children which, in terms of intergenerational fairness, is very important to reveal transfers dedicated to young families and their children. Figure 4.4 shows that in 2017, Southern and Eastern European countries ranked low when looking at social expenditure for family

[33] Long-term care refers to care and support to meet people's needs when they lack the ability to live an independent living and typically cannot perform some activities of daily living or instrumental activities of daily living. It includes a number of services such as home care, day care, telecare and home help.

[34] It is noteworthy that CZ, DK, LV, LU, IE, PL, SK and SE do not include that part of long-term care expenditure related to social services in 2006.

and children per capita, while LU and Northern countries took the first positions in the ranking. This situation is generally confirmed when social expenditure for family and children is measured as a percentage of GDP (Figure A4.8). Moreover, it should be noted that this specific subcomponent of social expenditure has been increasing over time in most of the EU-27 countries with some remarkable exceptions: AT, DK and the UK. However, despite a decrease since 2006, DK was shown to have the highest percentage of GDP dedicated to family and children in 2017 among the countries included in the analysis. We can conclude that support to families with children varies significantly by country, which can explain intergenerational differences in the available income of families and hence in intergenerational fairness.

Figure 4.4: Social expenditure on families and children per capita



Source: COFOG data

4.3. Healthcare reform trends in EU countries

Health and long-term care take up a larger share of public in-kind resources, followed by education, as well as childcare, all of which have important benefits from an intergenerational fairness standpoint. For instance, healthcare is a time varying source of welfare spending in terms of change in share of expenditure over time, although it is not always directed to those of lesser means, but to those with the highest demand, i.e. middle-income groups (Costa-Font and Zigante, 2016). Given that such programmes exert long-term effects and can potentially expand human capital, they might give rise to further unfair income inequality later in life, and hence exert significant intergenerational fairness effects. However, in a setting where it is difficult to accurately identify those needing benefits (unlike for cash benefits), in-kind benefits' designs rely on individuals to self-identify themselves as needing specific in-kind benefits. The latter is known as a 'self-targeting' property of public provision (Nichols and Zeckhauser, 1982). Similarly, some in-kind benefits entail an expansion of human capital of less endowed individuals, which

might improve intergenerational fairness. However, the expansion of public health and education spending can lower the price of such investment which might, in turn, give rise to an overconsumption of such services by specific age groups. Finally, as we discuss in Chapter 6, in-kind transfers might be developed because median voter taxpayers prefer them over cash transfers, as they ensure a set of minimum adequate quantities of a select few commodities (Reinhardt et al., 1987).

In this section, we have reported the main trends in health and long-term care spending as well as in spending on education and childcare in European countries. This broad category of welfare spending can be defined by in-kind benefits (as opposed to cash benefits examined in other parts of the report) which, without exception, have positive effects on the wellbeing of individuals benefiting from them. Given that the effects of such benefits are dynamic and emerge later in life, the impact of investing on such in-kind benefits in some countries can explain the emergence of differences in wellbeing across generations or age cohorts. In summary, this section documents important changes in expenditures on in-kind benefits during the last decade. More specifically, we document a reduction in spending in the midst of the economic crisis. European countries differ in the way they organise their health, education, long-term care and childcare services.

Next, we report evidence of policy and reforms in each of the areas examined (health, long-term care, education and childcare) by age group, as well as some description of the main reforms that have taken place during the period examined (which in some cases are shown in a simple table). We make use of some indicators that measure the effects of such reforms in some specific areas. For instance, we examine the existence of unmet needs in healthcare or early dropouts in education services. We have carried out an analysis of reported reform in the period 2006–2018 in a series of European countries, using data from both Eurostat COFOG and OECD as well as survey data mainly from the European Social Survey (ESS) and EU-SILC. Ultimately, the purpose of this section is to illustrate the heterogeneity of approaches to in-kind benefits across European Union countries, and the trends in terms of spending and reforms in place.

Policy reforms in healthcare indicate an increase in patient cost-sharing over the period examined, unlike in long-term care where we observe an expansion of entitlements. In contrast, spending on education reveals a decline in a number of European countries. Finally, childcare spending shows a different pattern where in some countries, reforms have been put in place to support working families, but there have been large cross-country differences.

Intra-country trends in healthcare spending

From 2012 to 2017, health spending relative to the GDP declined in a number of countries such as IE, ES, PT, IT and EL alongside a number of countries such as NL (Figure A4.11). In contrast, in some other countries like DE, SE, AT, BG and BE, we observe a rise in health spending relative to GDP. These trends, mainly resulting from fiscal consolidation adjustments after the economic crisis, suggest a significant reduction in health spending which has implications on intergenerational fairness after 2012. We come back to this point when we discuss the effects of the economic crisis and its adjustments.

Table A4.1 reports the trends in the share of health spending on GDP over time in a number of European countries. We show that for IE, a country that has been severely affected by austerity reform during the economic crisis, relative spending was 10.5% in 2010 and that it dropped to 7.1% in 2018. Similarly, in IT, the share of spending in 2018 (8.8%) was smaller than in 2010 (9%). The same is true for EL (9.6% in 2010 and 7.8% in 2018) and for LU, HU, SI, ES and PT which exhibit smaller declines. Other countries exhibit no or negligible change in spending share such as AT, BE, FI, FR and PL. Finally,

we observe some countries where the spending share of GDP increased such as DE and CZ.

One of the potential intergenerational effects of health spending lies in the fact that older individuals are more likely to suffer from comorbidities, and hence use healthcare proportionally more than other age groups. To document this effect, Figure A4.12 reports evidence on the breakdown of health spending by age group for the NL, the only country where Eurostat provides data for more than one year. We observe a sharp rise in the share of health spending for persons over 85 years old, consistent with the idea that health systems increasingly devote a larger share of resources to older individuals (given that morbidity and time to death increase with age) (Costa-Font and Vilaplana, 2020). This might have implications on intergenerational fairness. However, as stated, part of such age effects responds to differences in morbidity at an older age, which is potentially preventable by early interventions, and to the obvious effects that proximity to death imply.

Long-term care spending

In addition to healthcare, long-term care (LTC) is a unique type of service that has some of the characteristics of heavily subsidised healthcare, but its main component is personal care, which has traditionally been provided within the household for which demand has been less common. Long-term care is typically made of healthcare and non-healthcare–related long-term-care. The former is typically added to health spending data (as following OECD Health Data classifications). Long-term care is commonly consumed by individuals at the end of their life, and spending on this category of social services depends on the availability of support in the household. In contrast to healthcare, long-term care spending in some countries is means tested and offered as social assistance (the UK and IT) while some countries have universalised the systems of supports and subsidies (DE, NL and ES) after a nationwide reform that extends the systems of subsidies and supports. However, with very few exceptions the family is still the main provider (and implicitly the funder) of LTC. There is substantial heterogeneity across the OECD countries in total and public LTC expenditures. As a share of GDP, such expenditures (which exclude care provided by the household) range from 3.7% in the NL to 0.2% in PT, with the OECD average at 1.5% of the GDP. Most of the recent change in LTC expenditure has been driven by changes in the public sector subsidy and alongside ageing, the share of female employment and institutionalisation influence expenditures (Olivares-Tirado et al. 2011; Huei-Ru et al. 2016).

Long-term care spending exhibits significant influence on intergenerational fairness insofar as it increases the wellbeing of older age individuals and their caregivers. Table A4.2 reports the trends in long-term spending as a share of GDP for 2006–2014, which in almost every country significantly increased. However, there are vast differences across countries which depend on the extent of female labour market participation and females as the main caregiver (typically a middle-aged woman in most European Union countries). In some countries like BG, we barely observe any change, which suggests that either older age individuals go with significant unmet needs, or that the family simply takes care of older age individuals. In both cases, long-term care can influence intergenerational effects on wellbeing, especially of lower income families that in the absence of support are likely to go with unmet needs. However, unlike in healthcare, there are no common standards (Costa-Font and Zigante, 2020).

Figure A4.13 distinguishes between health-related long-term care and social-related long-term care and reveals that most long-term care spending is actually health-related (publicly funded) long-term care. The weighted EU average for long-term care spending (health + social) is at 1.3% of GDP (2017). The total long-term care as a share of GDP ranges from over 3% of GDP in SE and the NL to less than 0.1% in SK

Figure A4.14 distinguishes the health and social classification of LTC spending that OECD follows in its OECD Health Data. It reveals that a significant share of long-term care is healthcare related, as opposed to social care related alone, namely it serves a healthcare purpose related to overcoming healthcare needs from old-age disability. Expenditure trends suggest that the NL and Scandinavian countries (including non-EU countries) exhibit the highest share of GDP spending, while southern European and Eastern European countries, where family informal care is the main source of care, is at the bottom of spending shares.

Figure A4.15 shows a clear positive linear association between GDP per capita and total LTC spending per capita, with a flattening out effect around a certain income level which is explained by Luxemburg which appears as an outlier. Consistently with expectations, female labour market participation exerts a steep effect on LTC spending. This is because informal caring also has costs for society in terms of the opportunity costs and gender inequality resulting from absence of female labour market participation (less tax and social security contributions, more (old-age) poverty among women, and costs in terms of mental wellbeing.) Figure A4.15 indicates that there is a limit to how much the expansion of average income (measured using per capita GDP) increases long-term care use. The effect of per capita GDP captures a number of potentially unobservable effects that are associated with income such as quality expectations of LTC.

In contrast, Figure A4.16 does show a clear non-linear effect of ageing on LTC spending per capita. Namely, ageing increases LTC spending per capita, but there is a certain point after which it does not. Next, Figure A4.17 reports evidence suggestive of a clear positive linear association between long-term care spending per capita and health spending per capita, though it tails up at higher levels of spending.

However, the documented change in spending during the economic downturn in the past decade might not be detrimental to people's health if we judge it by the literature on downturns and health (Ruhm 2000). Yet, the effect depends on country characteristics and country institutions in place. In some Scandinavian countries, social protection systems allow citizens to face the effects of a downturn more easily. For instance, FI suffered a severe recession at this time with an increase in unemployment from 2% to 18%, which, however, had no adverse effects on health, quite the contrary. During the crisis, alcohol consumption decreased, with favourable effects on mortality, and suicide decreased (Hintikkaet al., 1999). Economic crisis is generally associated with insecurity about the future, as households worry about the growing debt and loss of wealth, and thus change their perceptions of their employment and income prospects (Ra and Pistaferri, 2012). This might not affect the health of the population, although some evidence from EL reports that the health of newborns is sensitive to the changing economic conditions associated with the economic crisis (Kyriopolous et al., 2019). The Greek economy experienced a heavy recession followed by an adjustment programme that required fiscal consolidation measures and internal wage devaluation in both the public and private sectors. During the last decade, gaps in life expectancy gains among the low and highly educated widened. In ES, some research shows that the social gradient in child health has become steeper after the economic downturn (Rajmil et al., 2013). Kyriopoulos et al. (2019) show that in EL, households exhibited greater healthcare consumption responses to changes in their income during the austerity reforms.

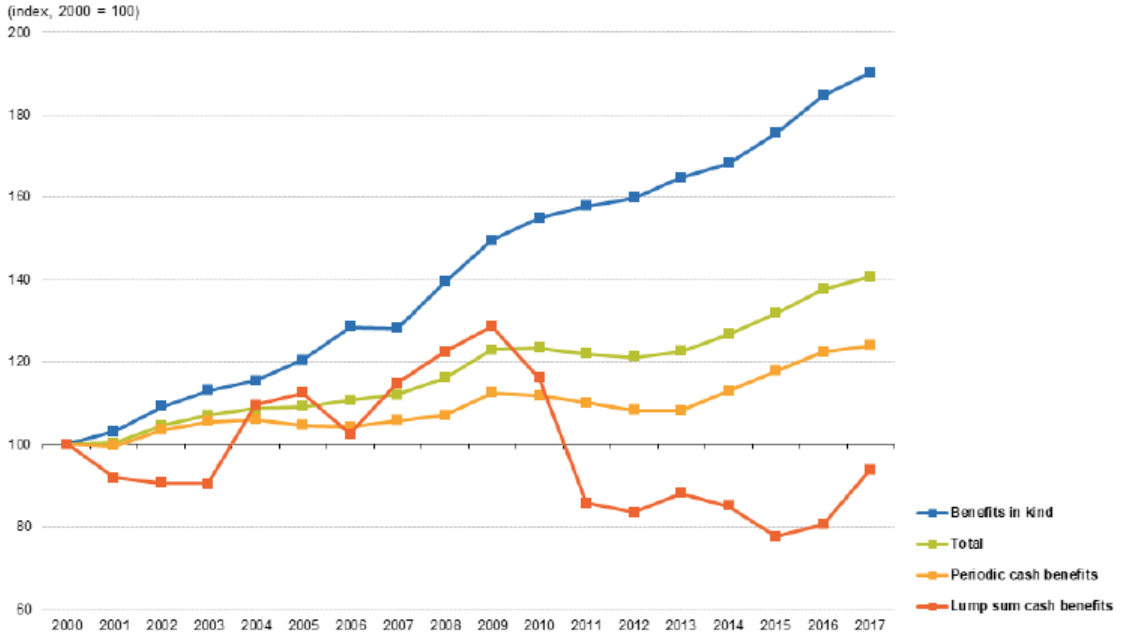
Trends in education and child in-kind benefits spending

Education spending is heterogeneous across European countries. However, while in most countries we observe a reduction in the share of GDP devoted to education (BG, IE, ES,

FR and IT among others), we still observe evidence of an increase in education spending in a handful of countries such as BE and DE (Table A4.3 in the Annex).

Figure 4.5 documents the changes in child benefits over the period under examination. The trends suggest that while cash benefits do not exhibit a large and significant rise over time, we observe a clear and steep increase in spending on in-kind services.

Figure 4.5: Spending on family and children benefits at constant prices by type of disbursement, EU-27 (index 2000 = 100).



Note: EU-27 excluding Bulgaria and Croatia to ensure that the data presented have the same coverage of countries throughout the time-series. In 2017, these two Member States contributed 0.6 % of the EU-27's total expenditure on family/children benefits. Constant price indices are based on 2010 prices in euro terms. Includes provisional data.
Source: Eurostat (online data codes: spr_exp_ffa and nama_10_gdp)

Source: Eurostat data

Satisfaction with the health and education system and life satisfaction

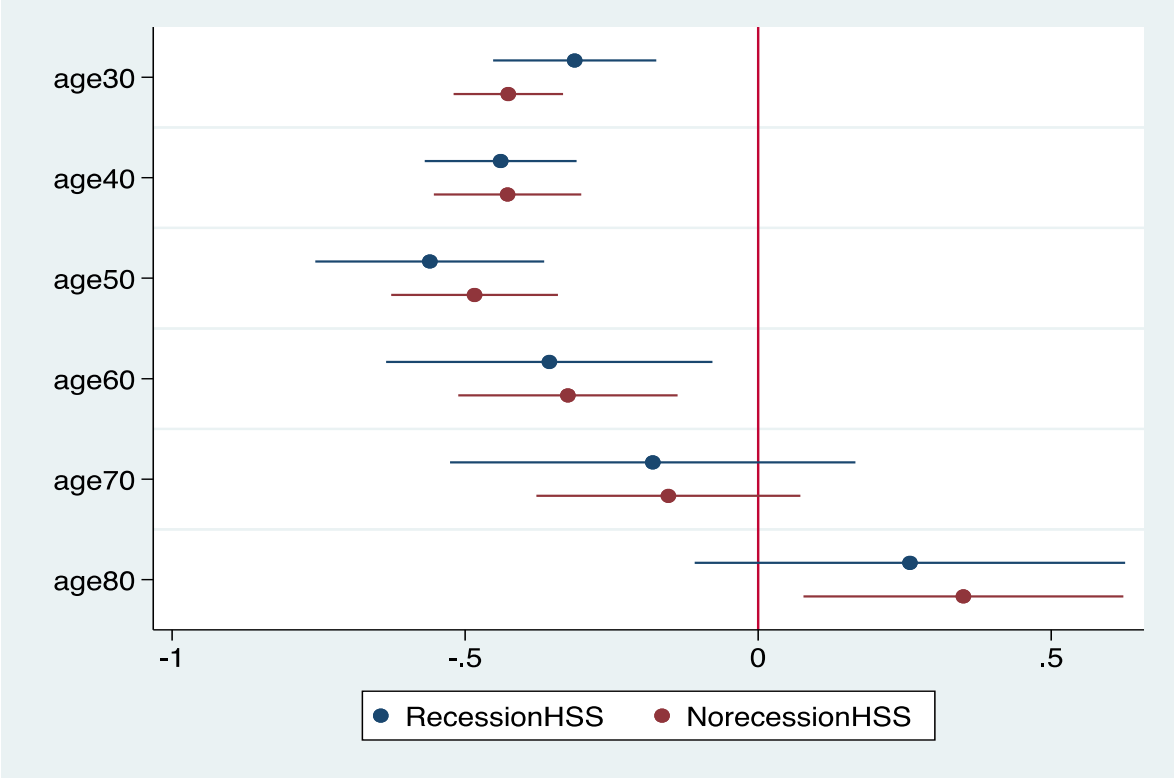
Individual perceptions might reflect the extent to which reforms are making a difference. More specifically, we employ measures of health systems satisfaction and use of services, the latter reflecting improvements in measures of care in old age. The European Social Survey (ESS) is used here to make a comparison across countries and age groups. We show both time trends and a regression analysis. We run a regression of the two variables in the ESS measuring the satisfaction with the health and education system against age groups, to explain the health system, the education system and life satisfaction, and the effect declines with age until the age of 70 when it begins to make a recovery. Estimates include country-specific fixed effects capturing differences in culture and institutions across countries.

Figures A4.18 and A4.19 report the trends in satisfaction level with the health system and education system over 2006–2016, while Figure A4.20 in the Annex focuses on overall life satisfaction. Importantly, Figure 8 shows that there was an increase in health system

satisfaction in all EU countries,[35] except IE, ES and SI. When we turn to education system satisfaction (Figure A4.19), we find comparable trends[36] but ES, IE, SI, SE and the UK reveal either no difference or a reduction in satisfaction with the education system. In contrast, Figure A4.20 shows that in all countries except for IE and ES, there was an increase in life satisfaction between 2006 and 2016. This suggests that there are important long-lasting satisfaction effects of austerity reforms of the economic crisis in terms of reduced satisfaction with essential goods such as education and health, which reflect more generally in life satisfaction.

When we turn to examine the age effects of health system satisfaction in Table A4.5, we find that individuals aged 20 to 50, namely the working age groups, exhibit lower levels of satisfaction than the rest of the population. Such specific age effects are the same for individuals exposed and not exposed to the recessionary period (2006–2010). Consistently, Figure 4.6 shows such effects and suggest a lower satisfaction with health systems after individuals turn 50.

Figure 4.6: Age effects on health systems satisfaction



Source: ESS data

Table A4.6 and Figure 4.7 show, in contrast to Table A4.5, that satisfaction with the education system reveals similar age effects when individuals are interviewed in a recession whereas, when individuals are not interviewed in a recession, satisfaction with the education system is lower among individuals in their 40 and 50s (who are more likely to have schoolchildren) compared to other age groups.

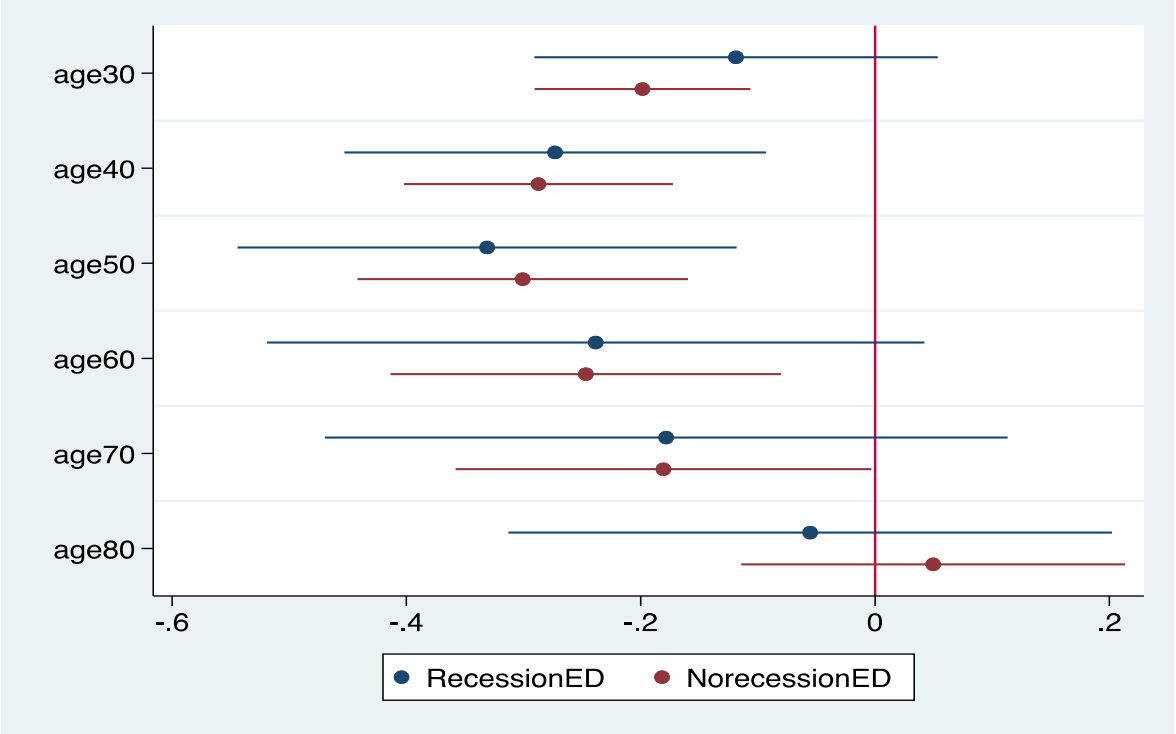
Table A4.7 and Figure A4.21 in the Annex show that a similar pattern to the one observed for satisfaction with public services emerges when examining life satisfaction. There is a

[35] Note that for some countries (e.g. BG), comparison is not possible as data is for 2016.

[36] Note that for some countries (e.g. BG), comparison is not possible as data is for 2016.

clear 'U-turn' effect in the age cohort effects on life satisfaction, which is at its lowest level when individuals are in their 50s.

Figure 4.7: Age effects on education system satisfaction



Source: ESS data

4.4. Micro-econometric analysis on the access to healthcare and formal education services

In this section, we make use of available cross-countries microdata recorded in the 2016 and 2017 waves of the European Union Statistics on Income and Living Conditions (EU-SILC) to compare, across EU-28 countries and age groups, the actual individual probability of accessing healthcare and formal education services.

The 2016 and 2017 EU-SILC waves provide two specific ad hoc modules with information on access to health services and children's health services, respectively. Among all variables provided in these ad hoc modules, only those for which a sufficient share of the sample has non-missing information were used. More specifically, we analyse, for different age classes, the probability of using healthcare services, the probability of paying for healthcare services, the probability of financial burden of medical care, the probability of financial burden of medicines, the probability of affording healthcare services with difficulty and the probability of affording formal education with difficulty.[37]

[37] The variable names and codes used are 'use of health care services' (HC160), 'payment for health care services' (HC170), 'financial burden of medical care' (HS200),'financial burden of medicines' (HS220), 'affordability of health care services' (HC180) and 'affordability of formal education' (HC100), respectively. All information on the use of health care services, which includes all public and private health services which are covered, even partially, by the country's social system, are based on the last 12 months. Medical care is very similar but does not include dental care. With regards to payment for healthcare services or the financial burden of medical care and medicines, only 'out-of-pocket' expenditure which is not covered by public health insurance is taken into consideration. The affordability of healthcare services and

Given that all the chosen variables are provided at the household level, we analyse the degree of intergenerational fairness in access to healthcare and formal education services by dividing the population into three different age classes according to the age of the household's selected respondent. In the first age class, we put all individuals living in a household whose reference person is aged 15 to 34 years old; in the second group, we include all individuals living in a household whose reference person is between 35 and 64 years old; the older class is composed of individuals living in a household whose reference person is over 65 years old.

Unfortunately, given our purposes, no analysis on access to childcare services can be provided on an intergenerational fairness perspective using the EU-SILC specific ad hoc modules. More specifically, all information on childcare services are asked only to households with children that require or would have required specific childcare services. Therefore, all variables on the access to childcare services report, on average, more than 90% of missing values. As a result, if we split the population into different age classes to analyse the degree of fairness across generations, we obtain zero observations for older age classes and very few observations for most countries and specific codes. The main implication of all these missing values is that we cannot provide any micro estimate of the probability of accessing and using childcare services by country and specific age class.

The detailed micro analyses on intergenerational fairness are carried out, for each selected variable, using both bivariate and multivariate probit regressions to estimate specific probabilities for each age class and selected dependent variable. In the case of multivariate regressions, we evaluate intergenerational fairness in the access to health services by regressing a given dependent variable on the access to health or educational services on age classes dummy and controlling for several further characteristics of the household and of the reference person. More specifically, we control for gender (i.e. male and female), citizenship (i.e. local, EU countries, other), household size, household type (i.e.. 1 person household; 2 adults, no dependent children, both adults under 65 years old; 2 adults, no dependent children, at least one adult >= 65 years; other households without dependent children; households without dependent children; single parent household, 1 or more dependent children; 2 adults, 1 dependent child; 2 adults, 2 dependent children; 2 adults, 3 or more dependent children; other households with dependent children; other), health status of the reference person (i.e. good, fair, bad, very bad); quintiles of equivalised disposable income; prevalent household income (i.e. labour, capital, pension transfers), education of the reference person (i.e. primary or pre-primary, lower secondary, upper secondary, tertiary); and reference person suffering from a chronic (long-standing) illness or condition (i.e.. yes or no).

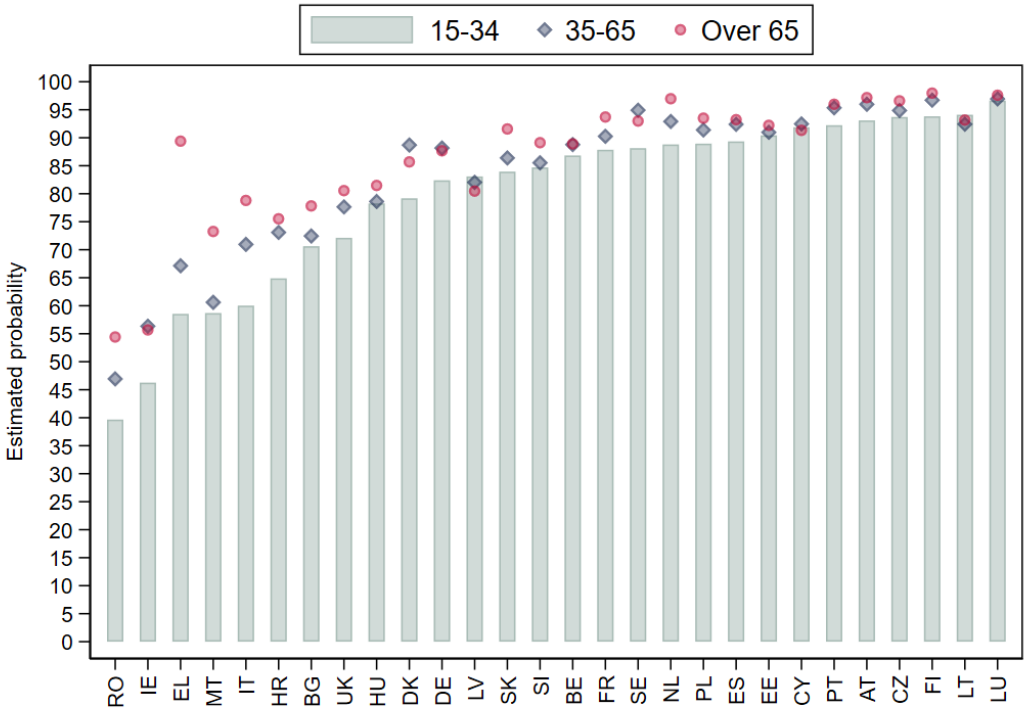
We present below all the estimated probabilities deriving from the bivariate regressions of specific dependent variables and the three age class dummies using graphic illustrations. Moreover, in the Annex, for each regression, we will present both univariate and multivariate estimated probabilities using tables. However, it is worth noting that estimated coefficients are generally robust to the inclusion of all previously mentioned control variables.

Figure 4.8 presents the estimated probability of using healthcare services for each EU country and specific age class. Results show that the age gap in using healthcare services is lower in countries where people have less difficulties in affording healthcare services and where healthcare services are also used by the young generations. However, as the percentage of people who use healthcare services decreases across countries, age differences become greater with higher estimated probabilities for older generations. This is particularly the case of RO, EL, MT and IT. On the opposite side of

of formal education are related to the situation at the moment of payment even if that payment has been reimbursed several months after. Variables HC1880 and HC100 have been re-coded in order to have only two categories: categories with great difficulty, with difficulty and with some difficulty have been collapsed to the category 'with difficulty'; categories fairly easily, easily and very easily have been collapsed to the category 'easily'.

the ranking, we have countries with higher probabilities of using healthcare services regardless of the age class of the reference person.

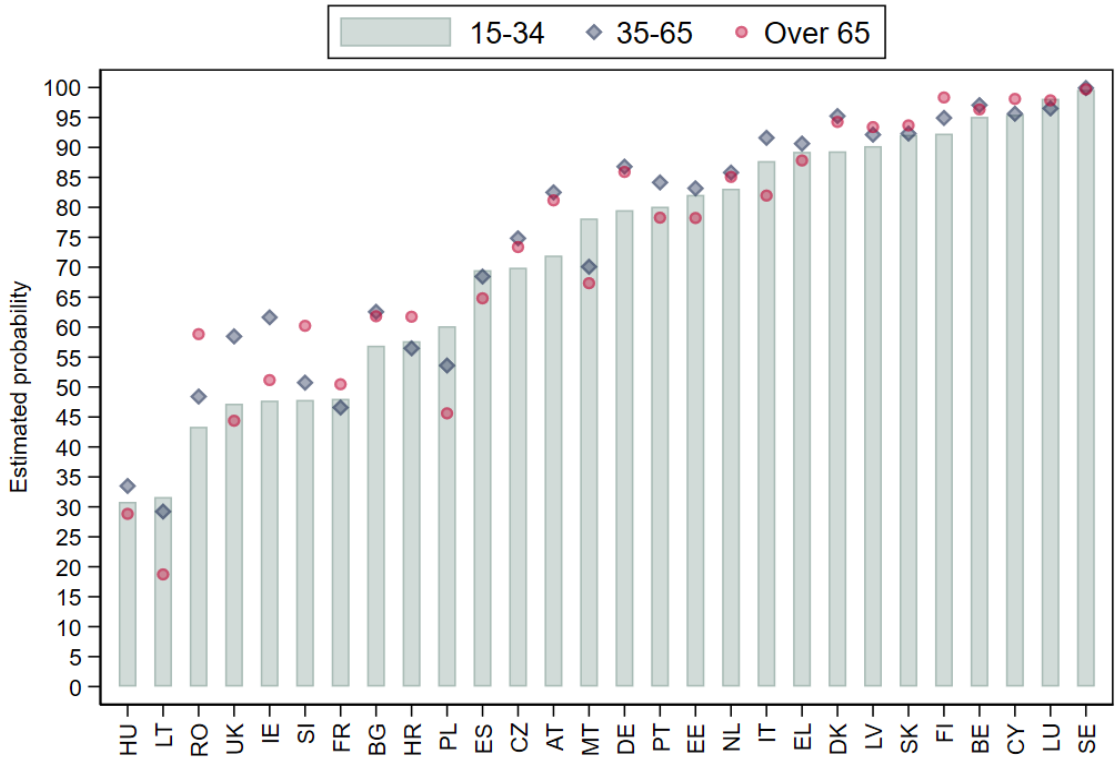
Figure 4.8: Estimated probabilities of using healthcare services in 2016



Source: EU-SILC data

Figure 4.9 presents instead the estimated probability of out-of-pocket payment for healthcare services. As in the case of estimates of the probability of using healthcare services, we show that the age gap in paying for healthcare services is very low where the probability of paying for healthcare is greater. For instance, we have no age differences in SE, LU and CY, which are placed at the top of the ranking with probabilities of around 95%. On the contrary, there are higher differences across generations in LI, RO, the UK, IE and SI. All other things being equal, it very usual to observe that in high-income countries, as SE and LU, a higher share of the population has enough resources to pay for additional healthcare services apart from those provided by the public authorities. However, in many countries the probability of paying for healthcare services is lower for the 15- to 34-year-olds.

Figure 4.9: Estimated probabilities of paying for healthcare services in 2016



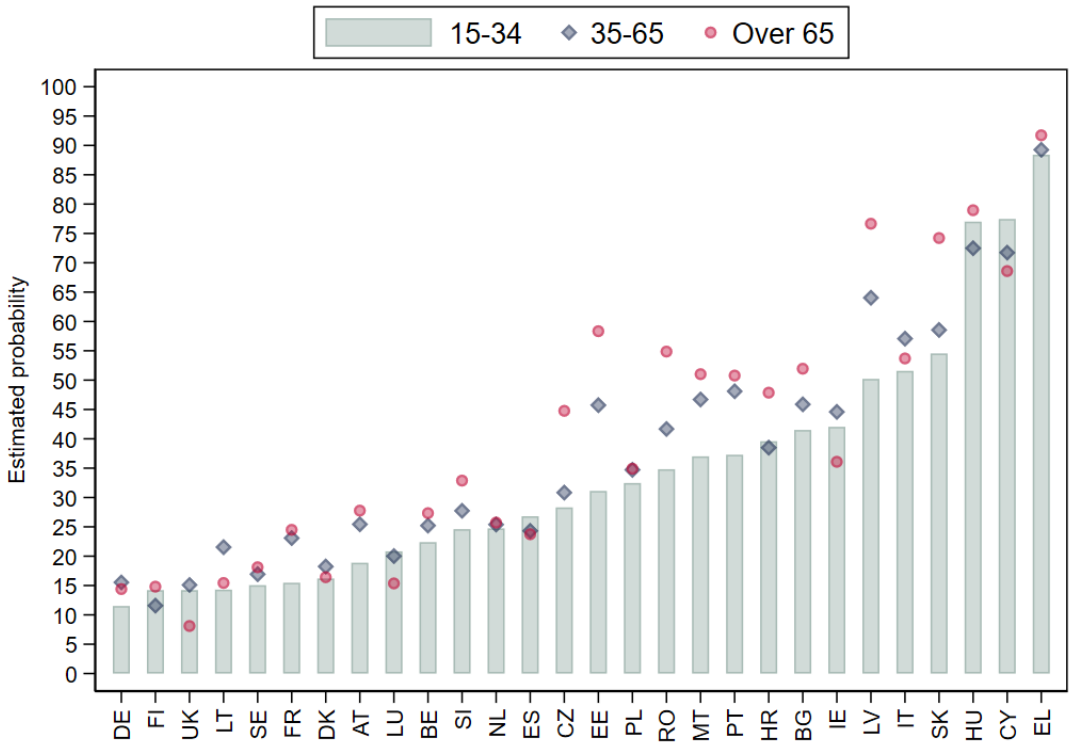
Source: EU-SILC data

Figure A4.22 shows the estimated probabilities of financial burden of medical care, which reflects the perception of the extent to which costs for medical care are a financial burden to the household. The variable gives us information about the need to pay and the consequences of paying out of pocket for medical care services. Compared to all the results presented in the previous figures, there is more variability across generations in the case of financial burden of medical care. More specifically, in most countries, the extent to which the cost of medical care is a financial burden is greater for older generations given that the estimated probabilities are higher for the age class 'over 65' than for other classes and that they are the lowest for the age class 15–34. Two exceptions are IT and CY where the estimated probability of financial burden of medical care is between 90% and 95% for all age classes, and the highest across all EU countries considered. On the opposite side, in the UK, SI and FR the probability of financial burden of medical care is between 5% and 15% for all age classes. It is noteworthy that the supply of private healthcare services and the need of out-of-pocket payment for medical care services have strongly increased in the past few decades in IT, while no such trend can be found in FR (see Section 4.3). This is why a huge difference in the estimated probability of perceiving some kind of financial burden of medical care between IT and FR is found in 2017.

Figure A4.23 presents the estimated probabilities of financial burden of medical goods, which reflect the perception of the extent to which costs for medicines (prescribed and non-prescribed) are a financial burden to the household. Results are quite similar to the case of financial burden of medical care, in terms of cross-country ranking, but the estimated age gap in the financial burden of medicines is even higher than in the case of medical care. In particular, apart from rare cases, the estimated probabilities are considerably higher for older generations (i.e. those aged over 65) even when the financial burden of the age class 15–34 is very low.

Figure 4.10 presents the estimated probabilities of affording healthcare services with difficulty. Results show a great variability across countries, ranging from an estimated probability for the age class 15–34 of around 10% in DE to around 90% in EL. As regards differences across generations, those aged over 65 have higher probabilities of affording healthcare services with difficulty in most countries. This is particularly true in some Eastern European Countries such as CZ, LV, SK and EE. It is worth noting that most of these countries have low levels of health expenditure on long-term care.

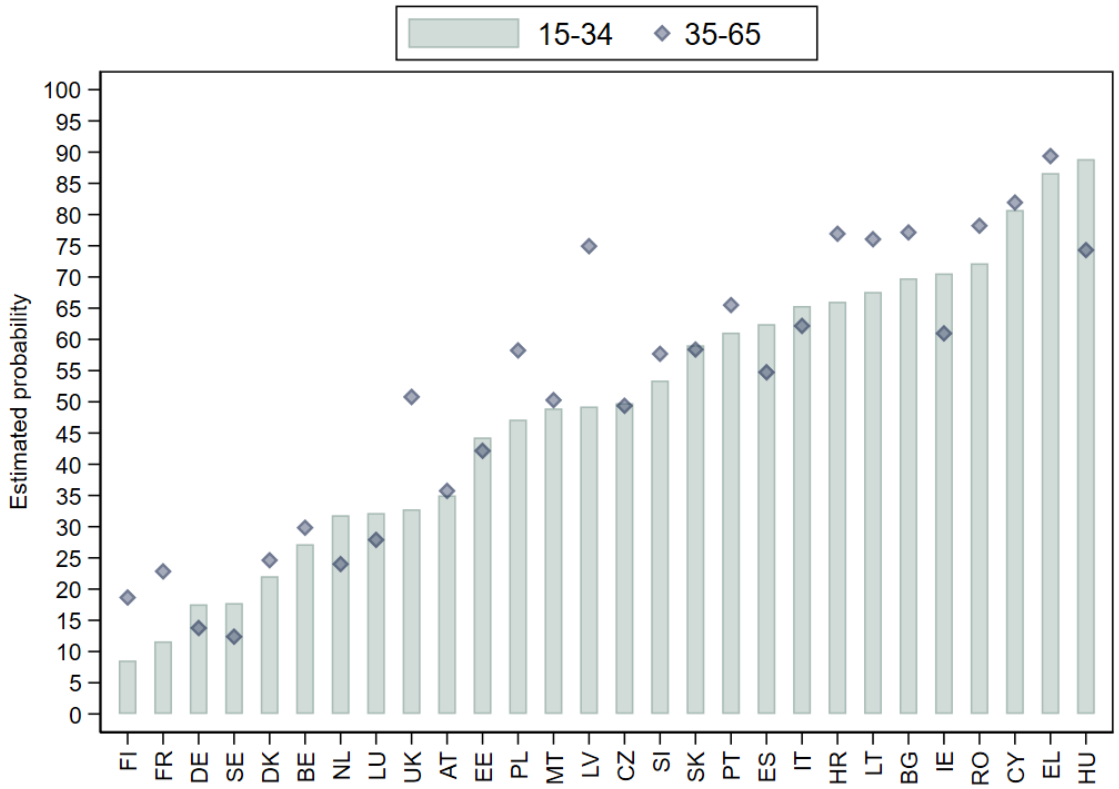
Figure 4.10: Estimated probabilities of affording healthcare services with difficulty in 2016



Source: EU-SILC data

Finally, Figure 4.11 focuses on formal education showing the estimated probabilities of affording formal education with difficulty for all EU countries and for two age classes: 15–34 years old and 35–65 years old. We exclude the age class over 65 given that only a very small share of all selected respondents aged 66 years old or more has no missing values. Figure 28 shows that, in most countries, individuals living in a household whose reference person is aged between 35 and 65 years have a higher probability of difficulty affording formal education. This is because older generations have older children who are, thus, mostly enrolled in tertiary education, which is generally far more expensive than compulsory education. As a matter of fact, countries in which expenditure on tertiary education is higher are generally those with lower estimated probabilities of affording formal education with difficulty for the age class 35–65. In addition, most Northern European countries have lower estimated probabilities for the age class 15–35 too, as they spend a larger share of their GDP on overall educational services. On the opposite side of the ranking, there are HU, EL, RO and CY, where it is less likely for households to afford formal education without any difficulty.

Figure 4.11: Estimated probabilities of affording formal education with difficulty in 2016



Source: EU-SILC data

4.5. The effects of in-kind benefits on intergenerational fairness applying the extended income approach to three major European countries

In the analysis of the influence of in-kind benefits on intergenerational fairness, this study does not adopt the approach of the extended income for all EU countries. In other words, we do not try to assess intergenerational fairness related to in-kind benefits by estimating a monetary amount for these benefits that would be added to the household's disposable income and that would be used in the analyses carried out in Chapters 1 and 2. In fact, the identification and monetisation of costs and benefits could be widely influenced by not unanimously agreed methodological choices, since they require many questionable assumptions. For instance, the monetary value of healthcare might be attributed to each individual interviewed in the EU-SILC by following an insurance-based regression method. However, such imputed values might largely differ according to the specific variables included in these regressions, which would then seriously affect the values attributed to the various age groups. Similarly, a 'monetary approach' would be also biased since it would allow researchers to impute the monetary values of benefits, whereas the financing sources of most of these benefits cannot in fact be disentangled as they are usually financed through general taxation.

However, taking into consideration all the potential methodological issues affecting the extended income approach, this section provides different measures of inequality and

relative poverty which are computed on both disposable and extended equivalised income for three of the major European economies: FR, DE and IT.

The extended income is computed by adding to disposable income the imputed amount of the monetary value of healthcare and educational services. In the case of education, we simply calculate the amount of yearly expenditure per student and we attribute the obtained amount to all individuals who are studying in the year of the survey.

Then, in the case of health expenditure, we use an insurance-based approach to differentiate individuals in terms of their health needs.

Our measure of extended income is thus obtained by adding, to the household disposable income, the imputed value of health and educational expenditure. As in the case of disposable income, the extended income is then equivalised by using the modified OECD equivalence scale. To increase the degree of comparability, all the monetary values presented are expressed in PPP constant 2010 euros.

In the following figures – all included in the Annex – we compare the median income, the Gini coefficient, the percentage of individuals in relative poverty and the Theil decomposition of overall income inequality by age subgroups, using both the disposable income and our computed measure of extended income.

Figure A4.24 compares the median of disposable (panel A) and extended income (panel B) for all three countries included in the analysis and for the two periods considered (2006 and 2017). As expected, the median income increases a lot when moving from the disposable to the extended income. However, while the median disposable income has increased between 2006 and 2017 in all countries, the median extended income has decreased in IT suggesting that the monetary value of in-kind benefits decreased over time in this country.

To evaluate the influence of in-kind benefits on intergenerational fairness, Figures A4.25 and A4.26 compare the equivalised median disposable and extended income for the six different age classes chosen for the analysis in 2006. The results show that the monetary amount of in-kind benefits is particularly important for the youngest age group as – when considering the extended concept of income – this age group's median income approaches the median incomes of older age classes.

The importance for intergenerational fairness of considering the monetary value of in-kind benefits is confirmed in 2017 (Figures A4.27 and A4.28). However, it should be noted that cross-country differences in the median extended disposable and extended income have increased over time (from 2006 to 2017).

Figures A4.29 and A4.30 compare the Gini coefficient on disposable and extended income, respectively. The amount of disposable income inequality is generally higher in IT than in the other two countries and it has slightly increased between 2006 and 2017 in IT and FR.

The ranking is basically confirmed when inequality is computed using the extended rather than the disposable income but is worth noting that the Gini coefficient computed on the extended income is about 10 percentage points lower than that computed on disposable income.

By evaluating the amount of income inequality over different age classes in 2006, we can confirm that in-kind benefits strongly decrease inequality regardless of the age class considered in all the three countries (Figures A4.31). However, it should be noted that in-kind benefits are particularly relevant to reducing income inequality among the youngest age classes in IT. In particular, looking at the Gini coefficient computed for individuals

below 25 years old, it is possible to note that cross-country differences in income inequality strongly decrease in IT after the inclusion of the monetary value of in-kind benefits.

Similar results can be found in 2017 as shown in Figures A4.32 and A4.33 even though, if compared to 2006, the monetary value of in-kind benefits is less effective in reducing income inequality, especially among those aged 45–54, 55–65 or more than 65 years old.

An additional aspect to be analysed is related to the percentage of individuals in relative poverty. Relative poverty is computed for both disposable and extended income as the number of individuals below the 60% of median equivalised income as a percentage of the overall population.

As in the case of income inequality, IT performs poorly in cross-country comparison with the percentage of individuals in relative poverty equal to 20.3% in 2017. For comparison, the same percentage is 16.1% in DE and 13.2% in FR (Figure A4.34).

As expected due to the imputation of in-kind benefits, the effect of using the extended income approach for measuring relative poverty is very important as relative poverty in 2017 falls to 8.2% in IT, 7.5% in DE and 3.1% in FR when the monetary value of in-kind benefits is taken into account (Figure A4.35; note that the poverty line is computed using the extended income).

By looking at relative poverty in 2006 by age class, it can be easily noted that relative poverty, calculated as the number of individuals below the 60% of median equivalised income as a percentage of the overall population, is highest among the youngest and those in the oldest age classes in IT and FR (Figure A4.36).

When the extended income approach is adopted for 2006, relative poverty decreases across all different age classes considered but the age pattern in the three countries does not change significantly (Figure A4.37).

Figure A4.38 presents the age pattern of relative poverty in 2017 for all three countries considered. Compared to 2006, relative poverty has increased for the youngest and decreased for those more than 65 years old. This age-specific time pattern is particularly clear for IT and FR but is less pronounced in DE.

The extended income approach does not significantly change the age pattern found using disposable income to compute relative poverty even though relative poverty is clearly lower when the imputed monetary amount of in-kind benefits is added to disposable income (Figure A4.39; note that the poverty line is computed using the extended income).

Finally, Figures A4.40 and A4.41 present the Theil decomposition of overall income inequality by age subgroups of the population using disposable and extended income, respectively. As clear from the results, only a very small proportion of overall inequality can be attributed to differences between age classes as more than 95% of overall inequality is related to inequality within age subgroups in all countries and in both 2006 and 2017. These results are observed regardless of the measure of income used (disposable income or extended income), i.e. before or after the inclusion in income of the monetary values of healthcare services and formal education.

4.6. Conclusions

This chapter presented detailed information on the extent to which education and healthcare benefits are linked to intergenerational fairness in EU countries. In the first part

of the chapter, cross-country differences in the amount of healthcare and education expenditure, and some of their relevant subcomponents, are highlighted. Subsequently, using 2016 and 2017 EU-SILC ad hoc modules, a microeconometric analysis is performed to provide new insights on age differences in access to healthcare and education services. Finally, the effects of in-kind benefits on intergenerational fairness have been analysed by applying the extended income approach to three major European countries: FR, DE and IT.

The results showed that, as expected, a higher amount of public healthcare expenditure reduces the percentage of households experiencing some extent of difficulty in affording out-of-pocket payment for healthcare services. It is noteworthy, however, that higher public healthcare expenditure is particularly useful to reduce the financial burden of medical care or medicines for older households, the ones who more frequently need medical services, with direct effects on the extent of intergenerational fairness. Among all EU countries, Italian respondents report the highest perceived financial burden of medical care due to out-of-pocket expenses.

A similar result can be found when the extent of intergenerational fairness has been analysed with regard to education. In the vast majority of EU countries, households with a reference person aged 35 to 64 years old are the ones who more frequently have difficulty affording formal education expenditures compared to younger households. This result derives from the fact that individuals aged 25 to 64 years old often have children who are enrolled in tertiary education, which is generally more expensive than compulsory education.

Finally, in the last part of the chapter, inequality and relative poverty have been analysed on both disposable and extended equivalised income in FR, DE and IT. The extended income is computed by adding to the disposable income the imputed amount of the monetary value of healthcare and educational services.

By evaluating the amount of income inequality over different age classes, it appears that in-kind benefits strongly decrease inequality and relative poverty regardless of the age class considered in all the three countries analysed. It is noteworthy, however, that in-kind benefits are particularly relevant to reducing income inequality among the youngest in Italy.

The Theil decomposition of overall income inequality by age subgroups of the population showed that just a small proportion of overall inequality can be attributed to differences between age classes, as more than 95% of overall inequality is related to inequality within age subgroups. This result is observed for both disposable income and extended income (i.e. when the monetary value of healthcare services and formal education is included).

To conclude, specific healthcare and long-term care policies seem to mitigate differences in the access to healthcare services of the elderly and increase the overall amount of intergenerational fairness. However, it should be noted that the amount of resources devoted to healthcare and long-term services has been increasing over time due to the ageing population in most EU countries.

With regards to the link between in-kind benefits and inequality, taking into account in-kind benefits in income clearly reduces overall income inequality in FR, DE and IT. The extent of inequality mitigation deriving from in-kind benefits is mostly related to a reduction of income differences within a specific age class rather than to a direct effect on intergenerational unfairness. This result suggests that inequality is very often related to specific characteristics (e.g. family background, education and occupation) of individuals belonging to a given age class rather than to age differences. However, higher monetary transfers for education might reduce income inequality among the youngest, which is very often related to inequality of opportunity in the access to formal education.

5. What policy recommendations could have been formulated to better support intergenerational fairness during the 2008 financial crisis period? What would have been the impact of such policies, had they been applied?

Summary

This chapter uses microsimulations to analyse the effect that a set of different policies would have had on the intergenerational distribution of disposable income if they had been put in place during the crisis period. We combined 7 policies – reduction in annual indexation of public pensions by 1 percentage point, reduction in annual indexation of public pensions above the median by 2 p.p., an additional 10% income tax on individuals in the highest income decile, universal child benefits, unemployment benefits for 18- to 25- year-olds, social insurance contribution ('SIC') reduction by 50% for low-income earners, and anti-poverty household benefits – into 12 revenue- neutral reform scenarios on a sample of representative EU countries.

It was found that when financed by the simulated pension reductions, the unemployment benefit for young people would have counteracted the relative decrease in disposable income among young adults (18–24 years) observed in Chapter 3. Child benefits, either in combination with reductions in pension indexation or with a top decile additional income tax, would have redistributed income to the youngest generation and their parents. The SIC reduction financed by the tax on high-income earners would have redistributed income from high-income individuals to lower-income individuals, without significantly changing poverty or the income distribution between generations. The means-tested anti-poverty benefit would have redistributed income from the age groups 25–54 and 55–64 to the two youngest generations and, less so, to the two oldest generations while strongly reducing income inequality and poverty across all age groups. In summary, EU governments could have achieved a different intergenerational income distribution, without changing the balance of the public budget.

5.1. Introduction

We answer this chapter's research questions – What policy recommendations could have been formulated to better support intergenerational fairness during the 2008 economic crisis period? What would have been the impact of such policies, had they been applied? – by assessing the impact of a set of 7 policies which can be combined into 12 revenue-neutral reform scenarios, using similar modelling techniques and the same generations and age groups (0–17, 18–24, 25–54, 55–64, 65–75, and 75+ years) as in Chapter 3. These methods allow us to simulate 'what-if' scenarios where the isolated distributional impact of policy reforms can be estimated. We compare the simulated disposable income of different generations before and after the introduction of a policy in a given year, keeping all other effects constant.

From a normative point of view, there is no intergenerational distribution of income and welfare resources which is perfectly fair. Therefore, the aim of this chapter is not to

propose policies which achieve any specifically targeted distribution of income across generations. Instead, the goal is to assess the effect of different potential policies on the intergenerational income distribution and, thereby, to enable policymakers to make more informed decisions on how to influence it. We analyse both actual policy reforms, i.e. reforms which had been implemented by one or more European countries during the crisis, and hypothetical policies and assess whether they would have *maintained* or *reduced* effective changes in the intergenerational income distribution during and in the wake of the 2008 economic crisis.

Chapter 3 showed that young adults (18–24 years) experienced the strongest decrease in disposable income of all age groups – caused largely by a decrease in market income – while the incomes of the two oldest generations (65–74 and 75+ years) increased largely because of rising pension income. Based on these results, we identify 3 policies related to benefit reductions/tax increases and 4 policies related to benefits/contribution cuts which are combined for a total of 12 revenue-neutral reform scenarios. In other words, we identify reform scenarios redistributing resources between generations without changing the overall size of the state budget.

To increase a government's income, we model a reduction in the indexation of pensions by 1 p.p. after 2007, a reduction in indexation of pensions above the median income by 2 p.p. after 2007, and an additional income tax of 10% on individuals in the top income decile. On the benefit side, we model an additional unconditional child benefit (for those over 19 years), an additional unemployment benefit for young people (18–25 years) with no qualifying period, a 50% reduction of social insurance contributions for lower-income earners, and a means-tested anti-poverty benefit for households. The levels of the benefits (expenditure side of the state budget) are determined by the amount of savings generated by the respective reduction in pensions or increase in income tax (revenue side of the state budget). For the SIC adjustment, it is the other way around; here, the level of the SIC reduction is fixed, leaving the number of recipients subject to generated savings.

We analyse the effect of reform scenarios on the real disposable income of different age groups from the individual perspective and the equivalised perspective (see Chapter 3), on income inequality (Gini, S80/S20) and the at-risk-of-poverty (AROP) rate for different age groups in a diverse sample of EU countries: Austria (AT), Bulgaria (BG), France (FR), Greece (EL), Hungary (HU), Ireland (IE), Latvia (LV), Poland (PL), Spain (ES) and Sweden (SE). This sample includes two countries representing the Conservative Welfare State (AT and FR), one country representing the Scandinavian Welfare State (SE), one country representing the Liberal Welfare State (IE), four Central or Eastern European Member States (BG, HU, LV and PL) and two countries from Southern Europe (EL and ES). While BG and SE pursued expansionary fiscal policies throughout the crisis, IE, HU, EL and ES implemented measures for fiscal consolidation. The remaining countries opted for a mixed approach: AT and FR increased public spending in the crisis and consolidated in the aftermath while LV did the opposite (see Bozio et al., 2015; Paulus and Tasseva, 2018).

The next section, Section 5.2, describes the policies and reform scenarios. Section 5.3 discusses the impact of the different reform scenarios on the intergenerational income distribution, income inequality and poverty, and Section 5.4 compares the overall levels of intergenerational redistribution of the different scenarios. Section 5.5 describes limitations and section 5.6 formulates conclusions and policy recommendations.

5.2. Policies and revenue-neutral reform scenarios

The goal of this chapter is to identify and simulate policies which could have *reduced* changes in the intergenerational income distribution in European countries during the economic crisis as well as measures which could have reduced poverty and inequality while *maintaining* the existing intergenerational income distribution and to combine those policies into revenue-neutral reform scenarios (See Annex for further information). To this end, we identify both revenue-generating policies (i.e. cuts to existing benefits and tax increases) and expenditure-increasing polices (i.e. new benefits or tax cuts). The selected taxes and benefits include policies inspired by policies used (in a similar way) by European countries during the recession as well as hypothetical policies.

Taxes and benefits which amplify or decrease changes in the intergenerational income distribution are biased towards one or more age groups. Clear examples of generation-biased policies are pensions and child benefits. Pensions primarily benefit older people who usually have fully or partially left the labour market.[38] Increases and decreases in pension (indexation) payments hence disproportionately influence the income of this age group. Similarly, child benefits are usually paid only for individuals up to a specific age. Other policies are not explicitly targeted at one specific age group but may still influence some generations more than others.

Which policies, then, are likely to have counteracted or maintained the changes in the intergenerational distribution of disposable income in EU countries during the economic crisis? Chapter 3 showed that an increase in pensions via indexation was one of the drivers of the comparatively strong income growth of the two generations in retirement age (see also European Commission, 2017 and Chen et al., 2018). In other words, pension indexation between 2007 and 2014 was one of the policies which *amplified* the unequal growth of income across generations. However, several EU countries, particularly in the Mediterranean countries which were strongly affected by the crisis, also undertook reforms which directly and indirectly reduced pension payments (Busch et al., 2013). For example, in the context of the first austerity package in 2010, EL introduced several different measures to reduce pension payments including abolishing the 13th and 14th monthly pension payment for higher-income pensioners (Leventi et al., 2018, p. 10). Among other reforms, IT, ES and EL raised the pension age for some groups, while PT paused the indexation of all but the lowest pension in 2011 and 2012 (Busch et al. 2013).

One problem with simulating policies across countries is that some policies cannot be transferred to other countries at all (e.g. cutting the 13th and 14th monthly pension payment is an option only available in countries which have such payments in place) and simply copying and pasting them usually has strong and unintended side effects (e.g. while some countries tax certain benefits, others do not or do so at different levels, or some benefits might have an influence on other benefits available in one country or another, thus distorting the outcome of the policy on disposable incomes). To overcome these problems, we opted for simple policies which we simulated 'on top' of the existing tax-benefit system. In other words, we model policies that are applied only *after* all other taxes and benefits are simulated.[39]

In line with the findings of Chapter 3 and the described technical limitations, we identify pension reductions via lower indexation as one revenue-side policy which could have reduced inequalities in the growth of income across generations observed in Chapter 3.

[38] Some countries, e.g. BG and SE, also offer disability pensions for which younger people may also be eligible.

[39] The one exception is pensions. For technical reasons, the simulation allows that pension indexation reductions can be counteracted by automatic stabilisers, for example, if a pension indexation reduction decreases the income of an individual to a sufficient extent to make that person eligible for means-tested benefits like social assistance.

We model two different alternatives of this policy option. The first version is an annual reduction of public pension indexation by 1 p.p. for each year after 2007 (for all pensions). Such a reform is akin to a reduction in indexation of pensions by 1 p.p. *on top* of all other indexations or policy reforms. This means that if, for example, pensions in one country were in fact increased by 2% each year, this policy would reduce the annual increase to 1%. This means that the cumulated pension reductions (since 2007) increase over time.[40] The second option is focused on higher public pensions: an annual reduction of pension indexation by 2 p.p. for each year after 2007 for pensions *above* the median income in that country and year. Again, this policy was modelled on top of all other indexations and its effect cumulates over time.

On the expenditure side, we simulate a universal child benefit for children aged 18 or younger. To make the benefit revenue-neutral, the level of the benefit per child is not fixed but determined by the amount of revenue generated by the pension indexation reduction or tax increase and the number of children in the respective country and calendar year (see Box 5.1). This policy represents an option to reduce inequality in income growth, in countries where the youngest generation experienced a disproportionate decrease in income. The policy is inspired by actual developments, for example, Austria increased its benefit for children in families with three or more children in 2008 and Finland increased a similar benefit in 2009. Furthermore, Slovakia introduced a new supplementary child benefit during the crisis in 2008.

In addition to those two policies, which were inspired by actual policy choices in European countries, we include hypothetical income-generating and expenditure-increasing policies in our analysis. For the revenue side, we follow the recommendation of Chen et al. (2018, p. 4) and simulate an additional income tax of 10% on all income of individuals in the highest income decile. Income tends to increase over individuals' working lives as people gain working experience and climb into higher positions and falls again once they enter retirement.[41] Accordingly, this additional tax is likely to affect primarily older working age groups (25–54 and 55–64 years) and, thereby, decrease their comparatively stronger income increase. However, age is of course not the only factor influencing income growth; there can be high-income individuals among the younger and older generations as well. Therefore, this tax should be expected to be less strongly biased against one or more age groups than, for example, pension reductions. The level of the tax, 10%, was chosen as a simple threshold to illustrate the redistributive effect of the policy.

On the expenditure side, we simulate an (additional) unemployment benefit for individuals between the ages of 18 and 24. The benefit is given to all unemployed individuals in this age group, independent of their duration in unemployment and independent of whether they already receive unemployment benefits or not. The analysis in Chapter 3 confirmed earlier findings (e.g. European Commission, 2017; Chen et al., 2018) that the reduction in disposable income in the 18–24 age group was largely caused by a strong and negative market income effect, related to high levels of youth unemployment. Moreover, the negative market income effect for this age group was only marginally counteracted by automatic stabilisers like unemployment benefits. This is not surprising as unemployment benefits tend to be linked to the level and duration of contributions. Consequently, insurance systems often exclude young people and/or offer them only limited benefits (Leschke, 2015; Chen et al., 2018). Therefore, a targeted benefit for the unemployed in this age group could have softened or eliminated the disproportional reduction in disposable income it experienced. Again, in line with the goal of creating revenue-neutral reform scenarios, the level of the benefit per eligible person depends on how much additional revenue was generated by the countervailing pension indexation reduction or

[40] Mathematically, this means that pension payments for 2009 were divided by 1.01^2, for 2011 by 1.01^4 and for 2014 by 1.01^7.

[41] See, for example, Table 2 in Chapter 1 of this report.

tax increase and the number of unemployed individuals in the relevant age group in the respective country and calendar year.

Thirdly, we simulate a reduction of social insurance contributions by 50% for low-income earners. Again, as income tends to increase over one's working life, this policy should benefit younger individuals in the labour market. Specifically, it should benefit those in the age group 18–24 who are employed. To keep the reform revenue-neutral, the threshold for being eligible for this reduction (i.e. being a low-income earner) is calculated by the amount of resources generated by the pension indexation reduction or tax increase. Starting from the lowest income, social insurance contributions are reduced by 50% until the sum of the reductions is equal to the amount of revenues generated by the countervailing reform. However, in contrast to the other simulated benefits, the level of the benefit is fixed (current SIC rate - 50%), but the eligibility or threshold criteria are flexible: the higher the amount of funds available, the more (lower-income) people benefit from the reduction in social insurance contributions.

Finally, we simulated an anti-poverty benefit for households earning less than 60% of the median equivalised income, i.e. households that are at risk of poverty (AROP). The benefit is distributed across households with each adult in the household receiving 100% of the benefit and each child receiving 50%. A household with two adults and one child would hence receive 250% of the benefit; a household with only one adult would receive 100%. The amount per household is determined by the amount of resources available by the counteracting measures on the revenue side and the number of eligible households. The goal of the benefit is to reduce poverty without targeting any one generation directly. Rather, the benefit supports those groups which are most in need.

5.3. The impact of revenue-neutral reform scenarios

In the following section, the effect of revenue-neutral reform scenarios is analysed. Our analysis compares the original income distribution for a given year (e.g. 2011) with the income distribution of the same year if the described policies had been in place. We focus on the year 2011, as according to the analysis in Chapter 3, the impact of the crisis was at its peak after the subperiod 2009–2011. The results shown are unweighted averages across the nine countries selected for this analysis – AT, BG, EL, HU, IE, LV, ES, PL and SE – for the year 2011. The results for the years 2009 and 2014 are averages for these countries but also including FR.

In addition to changes in the disposable income of different age groups, we consider the effect of the simulated reforms on the at-risk-of poverty (AROP) rate and income inequality measured by the Gini coefficient and the income quintile share ratio (S80/S20) for the year 2011. The AROP threshold is floating, i.e. it changes between the baseline scenario and the reform scenario. All indicators are calculated using equivalised disposable income. While the focus of the analysis is on the redistribution of disposable income between generations, the AROP rate and the income inequality indicators provide additional information to inform policy recommendations.

The section first shows the results of expenditure-side policies financed by pension reductions; its second part shows the results of expenditure-side policies financed by an additional top income tax. As the effect of the latter policies can be expected to generally remain stable over time, results are only presented for the year 2011.

5.3.1. Reform scenarios financed by pension indexation reductions

Child benefit financed by pension indexation reductions

Figure 5.1 shows the average effect of scenarios 1 to 4 on the real disposable income of different age groups from the individual disposable income perspective and the equivalised disposable income perspective. Scenario 1 redistributes resources generated from an annual 1 p.p. reduction in indexation of pensions after 2007 to an unconditional child benefit. Scenario 2 does the same with resources from an annual indexation reduction of pensions above the median income by 2 p.p. The results are not surprising: On the individual level, both scenarios would have led to a significant redistribution of disposable income from the four oldest generations to the youngest generation and, marginally, to the second youngest generation. In 2011, scenarios 1 and 2 would have increased the individual income of the youngest generation respectively by 72.8% and 68.9% and decreased the incomes of the second oldest by 2.6% and 2.2% and of the oldest generation by 2.7% and 2.0% compared to the baseline scenario (2011 without the reforms).

The drastic change for the youngest generation and the comparatively small decrease in the incomes of the oldest generations is not surprising, as children are a comparatively small group with little disposable income. As such, a comparably small income increase in absolute terms results in a massive increase in relative terms. The oldest generations, in contrast, do receive substantial income from pensions and other sources making their income less sensitive.

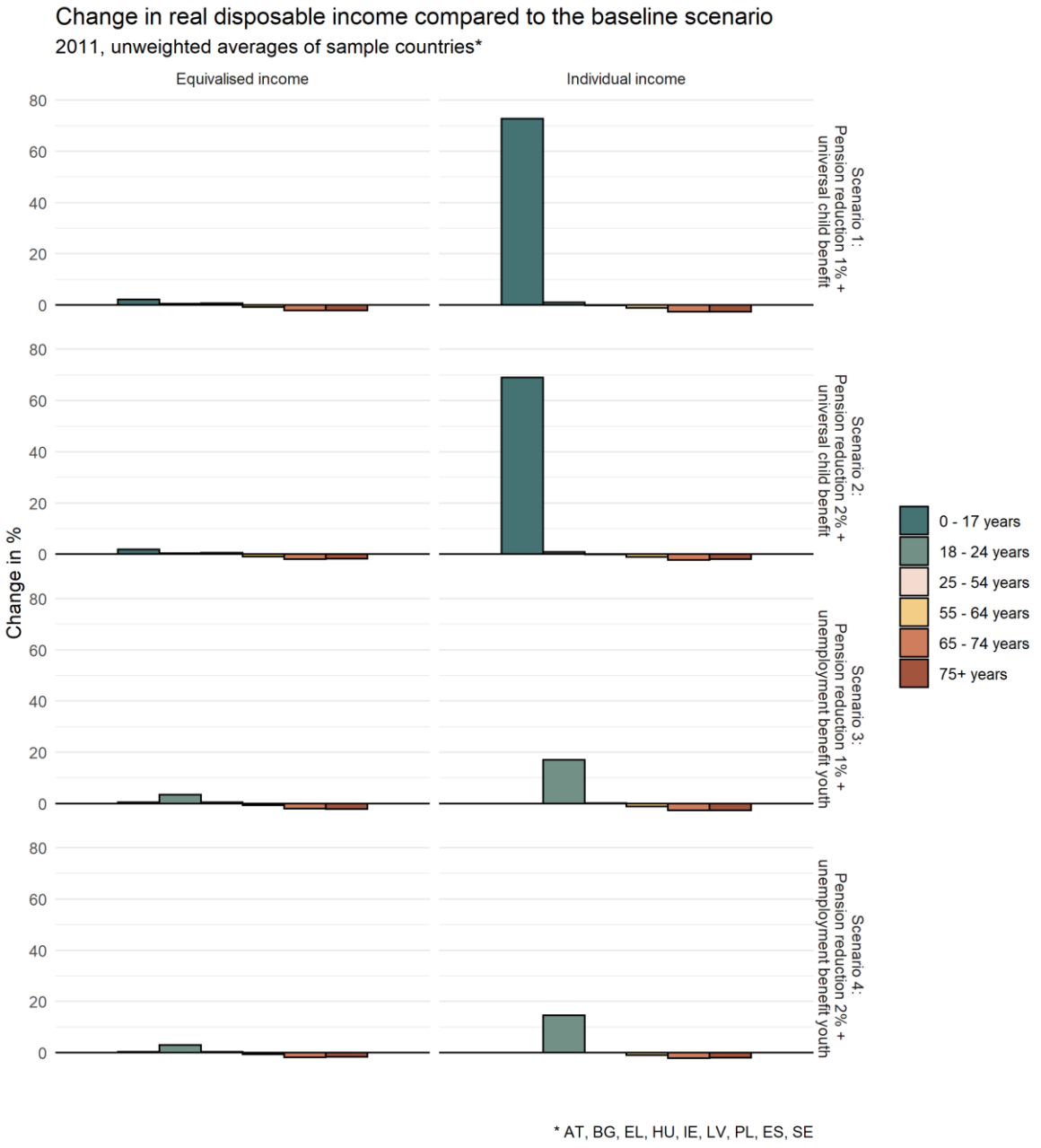
Looking at equivalised income, the situation is more nuanced because the benefit is shared among children and other members of their households. Consequently, the disposable income of the youngest generation would have increased less, while the income of the generations 25–54 and 18–24 – i.e. the age range of most parents – would have increased, too.

Importantly, the differences between scenarios 1 and 2, and hence the differences in the two types of pension reductions in terms of redistribution between generations, would have been small.[42] The pension indexation reduction across the board (scenario 1) would have resulted in a marginally stronger income reduction of the oldest generation, while the reduction of pension indexation above the median income level would have affected the second oldest generation (65–74 years) more strongly (scenario 2). This indicates that people in the age group 65–74 tend to receive higher pensions than those in the oldest age group.[43] Furthermore, the similarly sized increase in the income of the youngest generation (72.8% and 68.9%) shows that both pension reductions would have raised (saved) about the same amount of money.

[42] See also Table A5.1 in the Annex which shows the redistributive effect of each policy individually.

[43] Older individuals (75+) tend to receive lower pensions for several reasons (OECD, 2019). Due to longer life expectancies, women are overrepresented in this age group and women tend to have lower pensions than men. Second, pensions tend to grow slower than market income. Consequently, people who retire later tend to receive higher pensions. Thirdly, some countries do not yet have mature pension systems covering all older people.

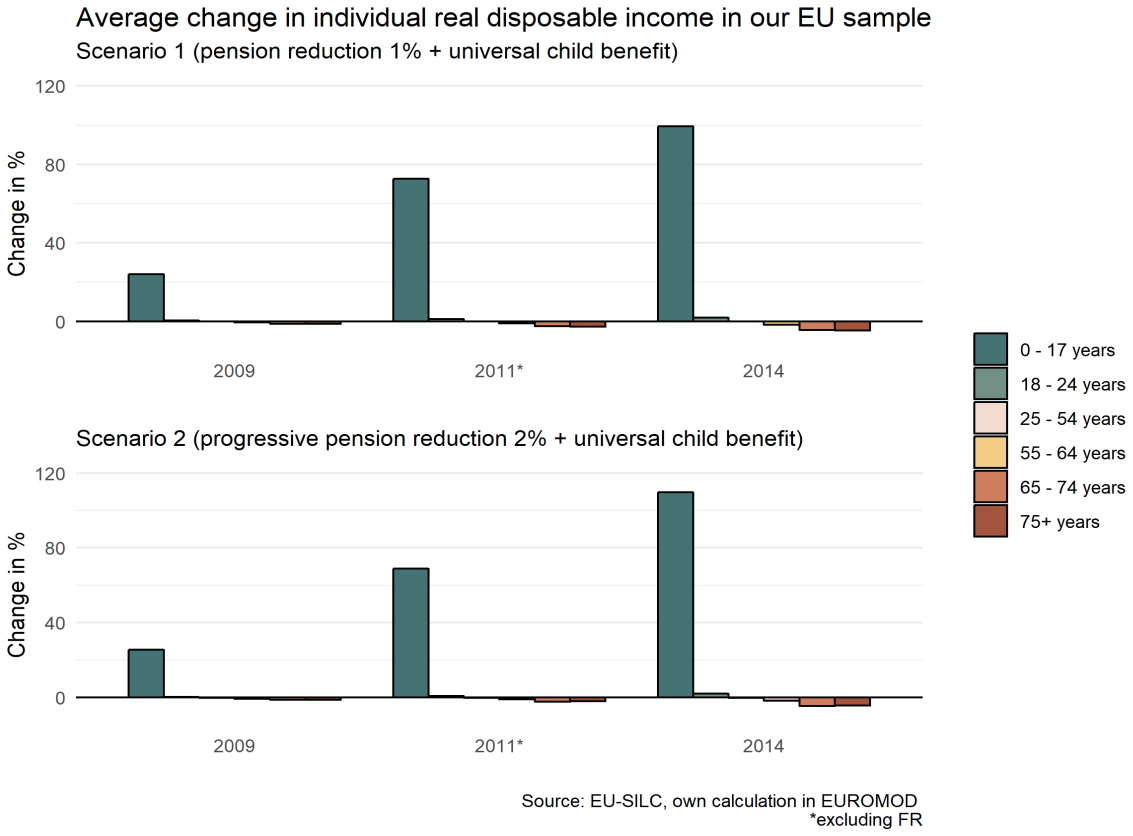
Figure 5.1: The effect of scenarios 1 to 4 on real disposable income across generations in 2011 (reform scenario v baseline scenario)



The effects on poverty and inequality reduction (see Table 5.1 below) would have also been similar, with scenario 2 contributing slightly more to poverty reduction and to a more equal income distribution. Scenario 1 would have reduced the AROP rate for the younger generations (0–17, 18–24 and 25–54), i.e. the share of individuals in those generations with an equivalised income below the AROP threshold, by between 0.6 p.p. and 2.3 p.p., but it would have also *increased* the AROP rate for the two oldest generations by 0.7 p.p. Scenario 2 would have decreased poverty among the younger generations and increased poverty among the oldest generations slightly less (between 1.8 p.p. and 0.3 p.p.). The effect on the total AROP rate, i.e. the share of individuals of all age groups with an equivalised income below the AROP threshold, would have been stronger for the first scenario (-0.7) than for the second (-0.4). Neither reform scenario would have changed the Gini coefficient, but scenario 2 would have reduced the income quintile ratio slightly more (-0.09 v -0.04) than scenario 1.

Finally, Figure 5.2 shows that the amount of redistribution under both scenarios would have increased annually as the reductions in pension indexation cumulate and additional revenue is generated: between 2009 and 2014, the amount of resources redistributed to the youngest age group would have approximately tripled (see also Figure A5.1 in the Annex).

Figure 5.2 The redistributive effect of scenarios 1 and 2 over time (unweighted averages)



In summary, both pension reductions in combination with a newly introduced child benefit would have counteracted the trend of a divergence in the income growth of younger generations, especially children, and the two oldest generations. Thereby, it would have resulted in more equal income growth across generations. The differences between the scenarios in terms of intergenerational fairness are small, but scenario 2 would have reduced overall income inequality and poverty more strongly. Finally, the level of redistribution depends on when the annual reduction in pension indexations would have started and how long it would have continued (temporary v medium-term policy).

Table 5.1: Effect of reform scenarios on poverty and inequality (2011, unweighted averages across AT, BG, EL, HU, IE, LV, PL, ES and SE)

1. Scenario	AROP							Gini	S80/ S20
	0–17	18–24	25–54	55–64	65–74	75+	Total		
Baseline scenario (2011)	20%	22%	15%	14%	10%	13%	16%	0.30	4.81

1. Pension 1 & child ben	-2.3 pp	-0.6 pp	-0.9 pp	-0.0 pp	0.7 pp	0.7 pp	-0.7 pp	0.00	-0.04
2. Pension 2 & child ben	-1.8 pp	-0.3 pp	-0.7 pp	-0.1 pp	0.1 pp	0.2 pp	-0.4 pp	0.00	-0.09
3. Pension 1 & UB < 25	-0.9 pp	-4.3 pp	-0.8 pp	-0.2 pp	0.7 pp	0.7 pp	-0.8 pp	0.00	-0.08
4. Pension 2 & UB < 25	-0.7 pp	-3.2 pp	-0.6 pp	-0.3 pp	0.2 pp	0.3 pp	-0.7 pp	0.00	-0.12
5. Pension 1 & SIC reduction	-0.2 pp	-1.0 pp	-0.7 pp	-0.3 pp	0.3 pp	0.4 pp	-0.3 pp	0.00	-0.04
6. Pension 2 & SIC reduction	-0.0 pp	-0.8 pp	-0.6 pp	-0.4 pp	-0.1 pp	-0.3 pp	-0.3 pp	0.00	-0.09
7. Pension 1 & anti-pov ben	-4.6 pp	-4.9 pp	-3.2 pp	-3.0 pp	-3.7 pp	-4.3 pp	-3.7 pp	-0.01	-0.37
8. Pension 2 & anti-pov ben	-3.3 pp	-4.2 pp	-2.8 pp	-2.9 pp	-3.8 pp	-4.9 pp	-3.2 pp	-0.01	-0.24
9. Tax & child ben	-6.3 pp	-1.8 pp	-2.1 pp	-0.0 pp	0.7 pp	0.7 pp	-1.9 pp	-0.01	-0.41
10. Tax & UB < 25	-0.8 pp	-7.0 pp	-0.9 pp	-0.3 pp	0.8 pp	0.8 pp	-1.1 pp	-0.01	-0.39
11. Tax & SIC reduction	0.3 pp	-0.4 pp	-0.1 pp	-0.1 pp	0.7 pp	0.1 pp	-0.0 pp	-0.02	-0.43
12. Tax & anti-pov ben	-11.7pp	-13.4pp	-9.1 pp	-8.3 pp	-7.7 pp	-9.9 pp	-9.9 pp	-0.04	-1.21

Unemployment benefits for young people financed by pension reductions

Scenarios 3 and 4 would have redistributed income from the two oldest generations to the second youngest generation (Figure 5.1). From the individual-level perspective, the additional unemployment benefit for people between 18–24 years would have increased the disposable income of the second youngest generation (18–24 years) in 2011 by 17% (scenario 3) and 14.5% (scenario 4) respectively. The disposable income of the two oldest generations would have been reduced by 2.6% (65–74 years) and 2.7% (75+ years) under scenario 3 and by 2.2% (65–74 years) and 2% (75+ years) under scenario 4. Looking at equivalised income, the effect on the income of 18- to 24-year-olds would have been much weaker. The increase in income for young adults (18–24 years) would have been reduced to 3.4% (scenario 3) and 3% (scenario 4) as the benefit would have also been shared with the youngest generation (0–17 years) and the prime-working-age generation (25–54 years). Again, the amount for redistribution would have increased annually due to the cumulative effect of the reduction in indexation of pensions. Like all scenarios including annual pension reductions, the amount of redistribution would have increased over time (Figures A5.2 and A5.3 in the Annex).

Both scenarios would have significantly reduced the share of 18- to 24-year-olds with an equivalised income below the AROP threshold: by 4.3 p.p. (scenario 3) and 3.2 p.p. (scenario 4) respectively. Furthermore, both scenarios would have slightly reduced the share of individuals at risk of poverty in the age groups 0–17, 25–54 and 55–64, while slightly increasing it in the oldest age groups. When looking at the entire population, scenarios 3 and 4 would have resulted in the reduction of the AROP rate by 0.8 and 0.7 percentage points respectively, which is similar to scenario 1. Regarding the income quintile ratio, scenario 4 would have achieved a stronger reduction (0.12) than scenario 3

In summary, the combination of an unemployment benefit for young people with pension reductions would have strongly acted against the comparatively strong increase in the income of the oldest generations and the comparatively strong decrease in the income of young adults. Again, the overall level of redistribution in each scenario would have been dependent on the duration of the annual pension indexation reductions.

Reduction in social insurance contributions for low-income earners financed by pension reductions

A reduction in social insurance contributions of low-income earners by 50% financed by reductions in pension indexation would have had the expected effect of redistributing income away from the two oldest age groups (Figure 5.3). The biggest beneficiaries (in relative terms) would have been young adults (18–24 years) followed by the prime-working-age generation (25–54 years). The effect on young adults, however, would have been much weaker than the effect of an unemployment benefit for young people (scenarios 3 and 4): in 2011, the increase in the disposable income of the young adults would have been only 2% (scenario 5) and 1.8% (scenario 6) compared to 17% (scenario 3) and 14.5% (scenario 4).

The effect on the intergenerational income distribution differs significantly when equivalised income is considered. In this perspective, the disposable income of all generations but especially the generation of 18- to 24-year olds would have decreased. This means that at the household level, both simulated pension indexation reductions have a much stronger effect than the SIC reduction for low-income earners even though, at the individual level, the reform is budget neutral. This indicates that young, lower-income individuals who benefit from the SIC reduction tend to live alone or in small households, whereas beneficiaries of pension payments live in comparably larger households. Like all scenarios including annual pension reductions, the amount of redistribution would have increased over time (Figures A5.4 and A5.5 in Annex 5).

Scenario 5 would have reduced the AROP rate for younger and middle-aged individuals (0–64 years) and increased it for older people (65 years and older). In contrast, scenario 6 would have reduced the AROP rate across all generations. Looking at the entire population, both scenarios would have resulted in the same, low reduction of the AROP rate (-0.3 p.p.). The effect on the income quintile ratio would have been stronger for scenario 6 (-0.09) than for scenario 5 (-0.04).

In summary, the combination of pension indexation reductions and a reduction in social insurance contributions for low-income earners would have increased the income of young adults and prime-age workers (at the individual income level), while decreasing the income of pensioners. Thereby, it would have counteracted the observed divergence of incomes between younger and older generations. However, the social insurance contribution reduction would have been much less focused than the unemployment benefit for young people and, hence, would have had a much weaker effect on the income

and the AROP rate of the generation most affected by the crisis – young adults of 18–24 years.

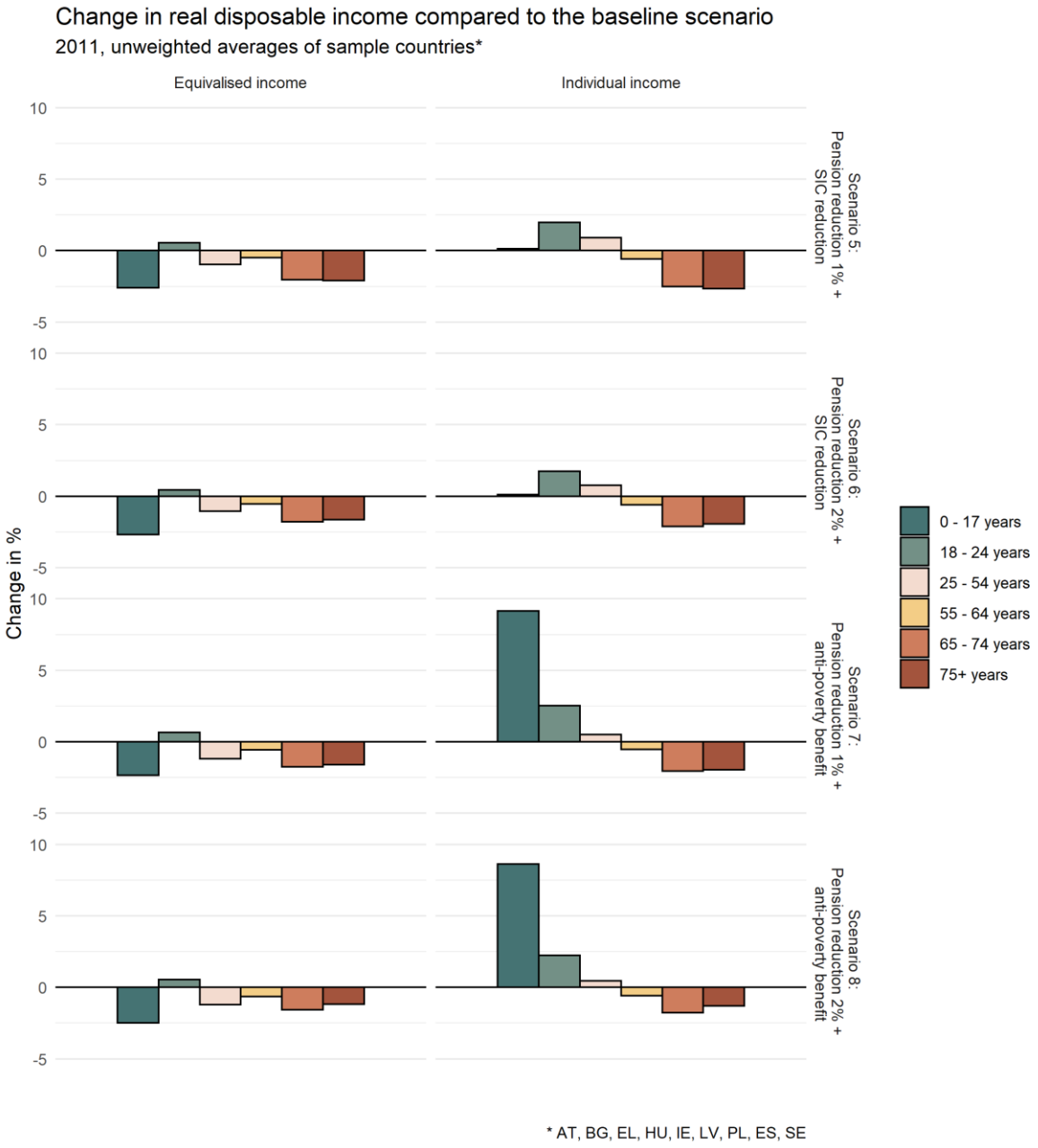
Anti-poverty benefit for households financed by pension reductions

The effects of the anti-poverty benefit when financed by the two simulated pension reductions (scenarios 7 and 8) would have resulted in a redistribution of income from older to younger generations (Figure 5.3).[44] However, the anti-poverty benefit would have also benefited people at risk of poverty in the oldest generations. Thus, while the two oldest generations would have faced the strongest income reduction, the reduction would have been weaker than in scenarios 1 to 6 described above. The income of the youngest generation would have increased the most, followed by young adults. The income of the prime-working-age generation (25–54 years) and of the oldest working-age generation (55–64 years) would have remained essentially the same.

Looking at equivalised income, the extent of intergenerational income redistribution caused by the reform scenarios would have been even smaller: in 2011, no age group would have lost or gained more than 2.7% of their disposable income compared to the baseline scenario. In addition, similar to the reduction of social insurance contributions, most generations would have lost in terms of equivalised income suggesting that mostly smaller households would have benefited from the anti-poverty benefit. Like all scenarios including annual pension reductions, the amount of redistribution would have increased over time (Figures A5.6 and A5.7 in Annex 5).

[44] The anti-poverty benefit is for households earning less than 60% of the median equivalised income. The benefit is distributed across households, with children (= 50%) receiving half of the amount of adults (= 100%).

Figure 5.3: The effect of scenarios 5 to 8 on real disposable income across generations in 2011 (reform scenario v baseline scenario)



Scenarios 7 and 8 would have reduced the AROP rate in all age groups by between 2.8 p.p. and 4.9 p.p. The total AROP rate would have been reduced by 3.7 p.p. and 3.2 p.p. respectively. Furthermore, scenarios 7 and 8 would have reduced the Gini coefficient (-0.01) and the income quintile ratio (-0.37 and -0.24), the strongest reduction in income inequality out of all reforms financed through pension reduction in scenarios 1 to 8.

5.3.2. Reform scenarios financed by an additional income tax

On its own, without a countervailing expenditure policy, the additional income tax of 10% on individuals in the top income decile would primarily decrease the income of the prime-working-age generation (25–54) and older people still active in the labour market (55–64 years) (see also

Table A5.1 in the Annex). Furthermore, in contrast to pension indexation reductions, the effect of the additional income tax can be expected to remain rather stable over time.[45]

Child benefit and additional tax rate

From the individual perspective, scenario 9 (child benefit and additional tax rate) would have resulted in a very large redistribution of income from the generations in prime working age (25–54 years) and the oldest working age generation (55–64 years) towards the youngest generation (Figure 5.4). While the income of those older generations would have decreased by around 2% to 3%, the income of the youngest generation would have more than tripled. The second youngest generation would have benefited slightly with an income increase of about 4%. Looking at equivalised income, the differences in income growth and income reduction would have been less extreme and the distribution would have shifted slightly. The income of the youngest generation would have increased by only around 8%, while the income of 55 to 64-year old people would have decreased by 2%. The income of all other generations would have remained largely the same.

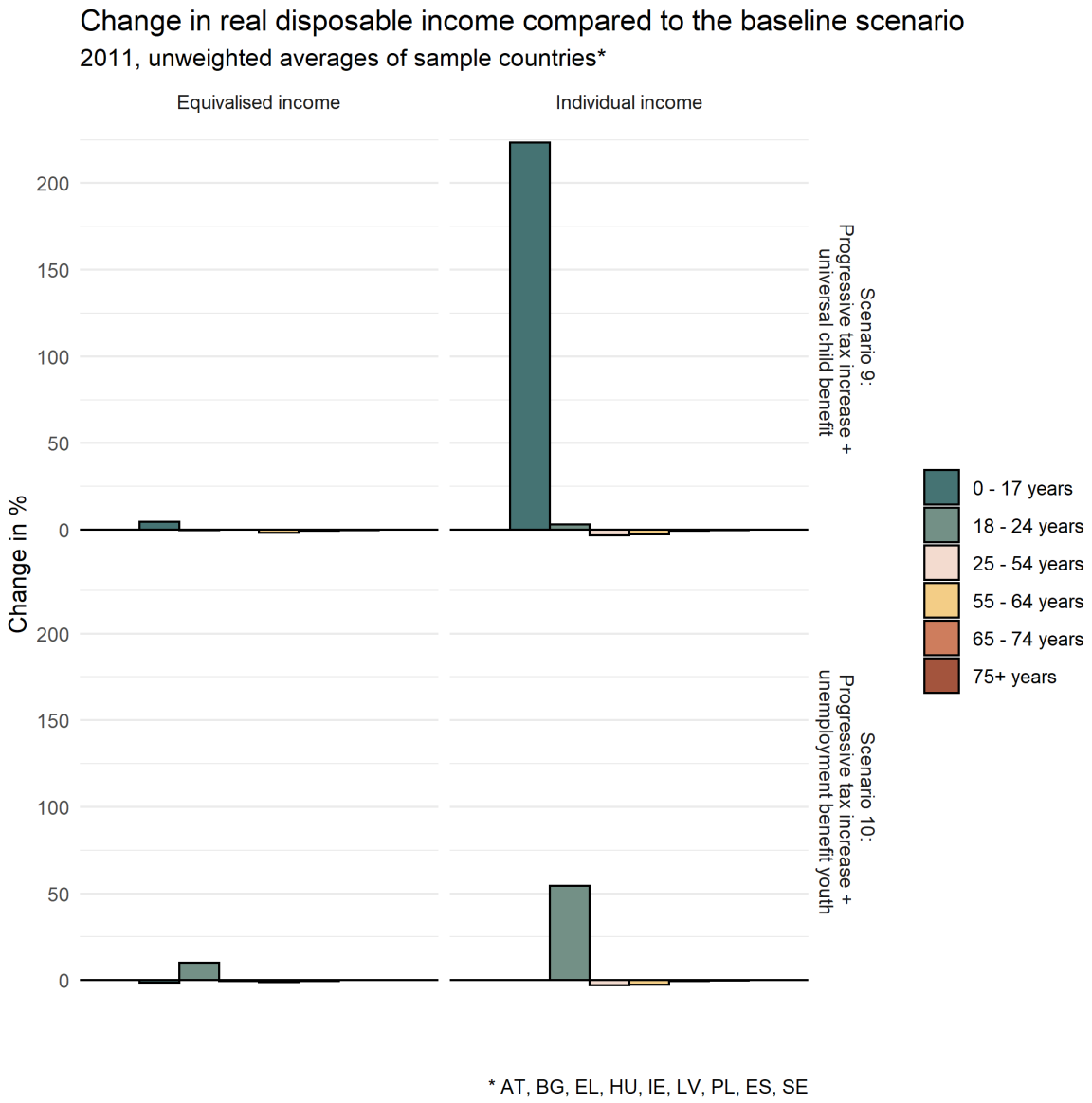
Furthermore, scenario 9 would have resulted in a reduction of the share of children (-6.3 p.p.), young adults (-1.8 p.p.) and prime-working-age individuals (-2.1 p.p.) with incomes below the AROP threshold, while the AROP rate for individuals in the two oldest age groups would have increased slightly (+0.7 p.p.). Overall, the AROP rate would have decreased relatively strongly by 1.9 p.p. The Gini-coefficient (-0.01) and the income quintile ratio (-0.41) would have decreased by more than in most other reform scenarios as well. In summary, scenario 9 is similar to scenarios 1 and 2 (an additional child benefit financed through pension reductions). The primary difference is that scenario 9 redistributes significantly more funds.

Unemployment benefit for young people and additional tax rate

From an individual perspective, scenario 10 (youth unemployment benefit and additional tax rate) would have resulted in a large redistribution of income from the generations 25–54 and 55–64 to the youngest working age generation (18–24 years). The reform scenario would have decreased the income of the former by about 3% and increased the income of the latter by about 55%. The income of the other generations would have been only marginally affected or not changed at all. Looking at equivalised income, the effects of reform scenario 10 would have been weaker and more spread out across generations. Young adults would have still benefited from the strongest income increase, but the effect would have been reduced to about one fifth (12%). The income of the generations 25–54 and 55–64 would have decreased by only 1%, as would the income of the youngest age group. The income of the second oldest generation would have been reduced by less than 1% and the income of the oldest generation would not have changed at all.

[45] The effect of the tax would only change if the income of those in the top-income decile changes. While such changes may occur, they are likely to occur over the medium or long term and may go in different directions across EU countries.

Figure 5.4: The effect of scenarios 9 and 10 on real disposable income across generations in 2011 (reform scenario v baseline scenario)



The combination of an additional income tax rate and an additional unemployment benefit for young people would have had the expected effect of strongly reducing the AROP rate among young adults 18–24 years by 7 p.p.. The AROP rate for children (0–17 years), prime-working-age individuals (25–54 years) and older workers (55–64 years) would have slightly declined, while the rate would have slightly increased for people aged 65 and older (+0.8 p.p.). Overall, the AROP rate would have decreased by 1.1 percentage points, which is more than most scenarios but less than the effect of scenarios 7, 8 or 9. The Gini coefficient and the income quintile ratio would have decreased by 0.1 and 0.39, results similar to those of scenario 9.

In summary, scenario 10 offers an alternative to scenarios 3 and 4 (unemployment benefit financed by pension indexation reductions). The differences between the scenarios are twofold: first, the tax-financed benefit would have been much larger in scope and, correspondingly, the income increase for young adults would have been about four times as high. Second, the tax would have affected mostly older generations still in the labour market (25–54 and 55–64 years) rather than pensioners.

SIC reduction and additional income tax

From the individual perspective, reform scenario 11 (SIC reduction for low-income earners and additional income tax rate on top-earners) would have redistributed income from the generations aged 55–64 and 65–74 to young adults (18–24 years). The income of the latter would have increased by around 3%, while the income of the former would have decreased by about 1% (55–64 years) and 0.5% (65–74 years). The income of the other generations would not have changed. From the household perspective, the same reform would have resulted in a marginal increase of the income of 18- to 24-year-old people. The income of the youngest generation would have decreased by about 3%, while the income of most other generations would have decreased marginally. The fact that, in the household perspective, the income of most generations decreased indicates that the reform would have redistributed disposable income from larger to smaller households.[46]

Scenario 11 would have reduced inequality in disposable income to a similar extent as scenarios 9 and 10 (Gini coefficient -0.02, income quintile ratio -0.43). However, the effect of the scenario on the overall AROP rate would have been zero. This reform would have redistributed income from richer to poorer individuals without, however, helping those most in need.

Anti-poverty benefit and additional income tax

The combination of an anti-poverty benefit and additional income tax on top earners would have redistributed income from the middle of the age distribution to younger and older generations. From the individual perspective, scenario 12 would have redistributed income from individuals aged 25–54 (-1.4%) and 55–64 (-0.8%) to children (+28%), young adults (+9%), younger persons in retirement age (+1%) and the oldest generation (+2%). As such, from the individual perspective, scenario 12 would have been the only reform scenario which benefits the income of younger and older generations at the expense of the generations in the middle ages. Looking at equivalised income, the effects would have been weaker, and the income of children would have decreased by about 3%.

Most importantly, however, this scenario would have resulted in the strongest redistribution of income from high-income to low-income individuals and the strongest reduction in the at-risk-of poverty rate of all reform scenarios simulated in this chapter. This scenario would have reduced the Gini coefficient by 0.04 and the income quintile share ratio by 1.21. Finally, the reform would have more than halved the AROP rate, reducing it by 9.9 p.p. from 16% to 6.1%, with a stronger percentage point reduction for the youngest two generations.

[46] See also the Annex to Chapter 5.

Figure 5.5: The effect of scenarios 11 and 12 on real disposable income across generations in 2011 (reform scenario v baseline scenario)

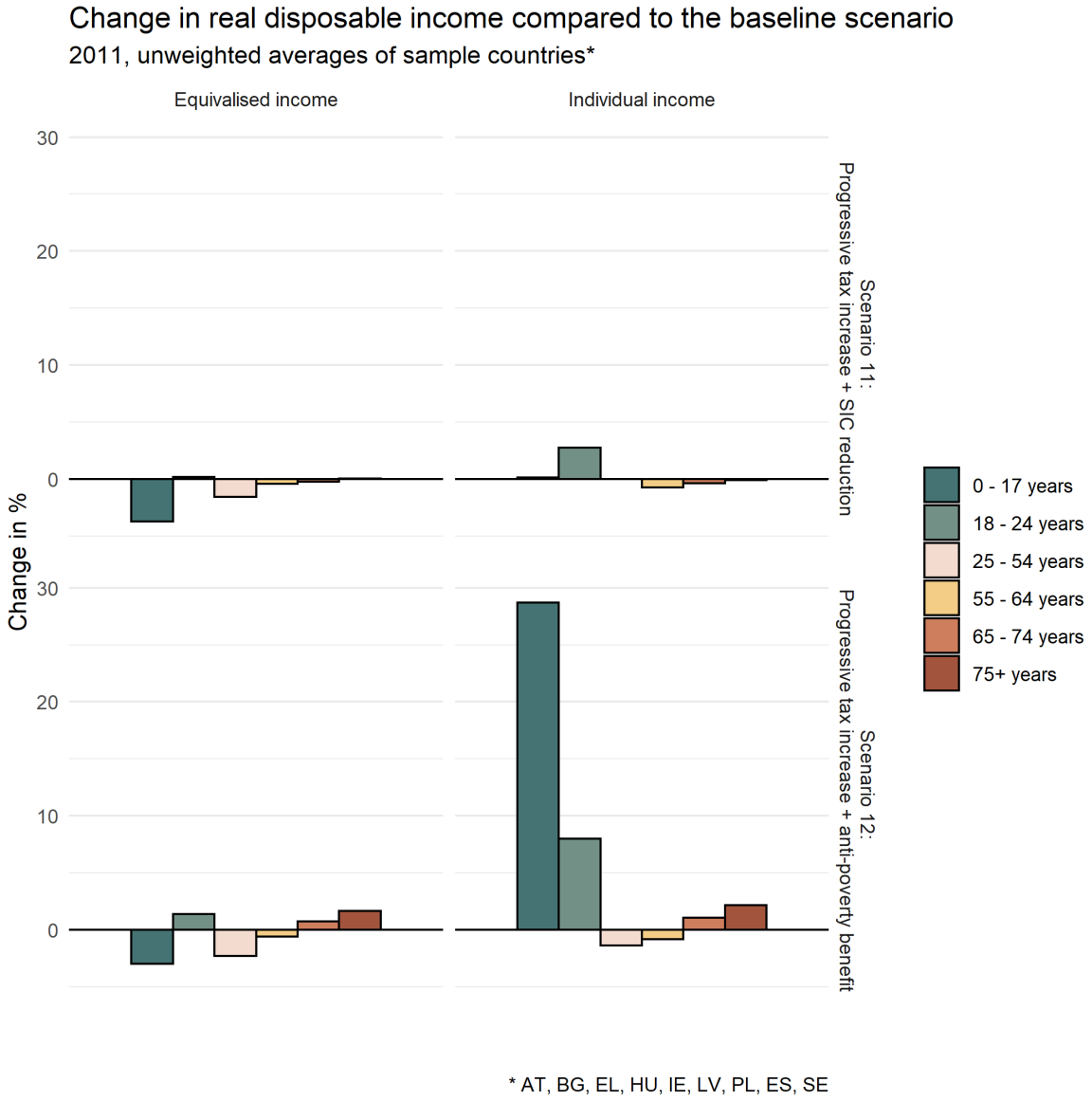
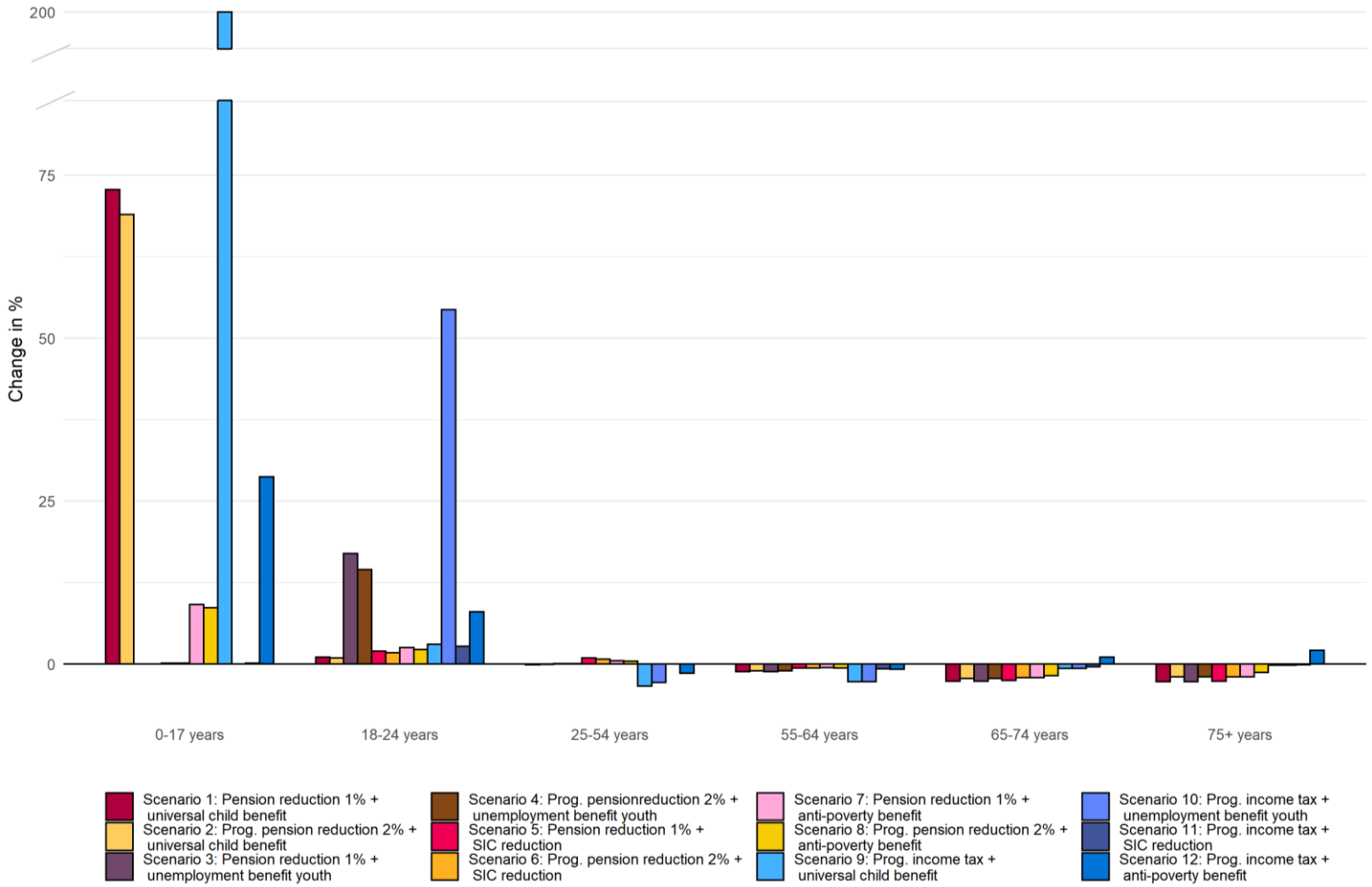
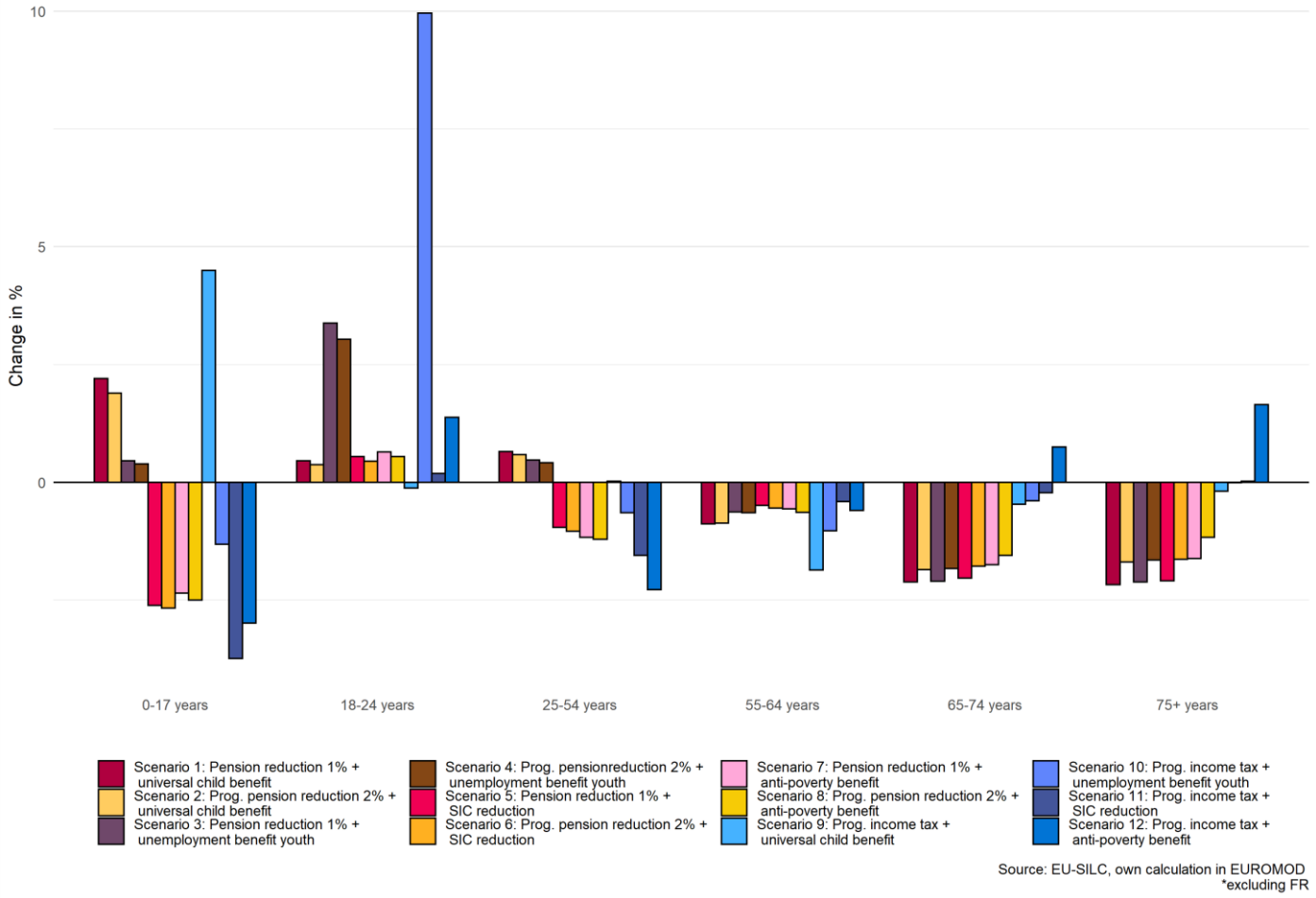


Figure 5.6: Effect of reform scenarios on individual disposable incomes (2011 data)



Source: EU-SILC, own calculation in EUROMOD
*excluding FR

Figure 5.7: Effect of reform scenarios on equivalised disposable incomes (2011 data)



5.4. Comparing the scale of redistribution

Figures 5.6 and 5.7 show the unweighted average (on the sample of examined countries) of the differences in disposable income of all age groups (2011) for the 12 scenarios compared to the baseline scenario (2011 without the reform) from the perspective of individual disposable income and equivalised disposable income. The figures enable a direct comparison of income changes between the scenarios. It is useful to focus on the revenue-side policies, the reduction in indexation of all public pensions by 1% annually, the reduction in indexation of all public pensions above the national median by 2% annually, and the 10% income tax on incomes in the highest income decile, because the revenue side determines the level of redistribution.

As noted above, the differences between the two forms of reduced pension indexations are minor. On average, the reduction of all pensions redistributes slightly more funds than the stronger reduction of pensions above the national median (compare for example the increase in the individual income of the youngest age group caused by scenarios 1 and 2 in Figure 5.6). The redistributive effect of the tax, in contrast, would have been much larger. The additional income tax of 10% on individuals in the top income decile would have raised more than twice the amount of money than four consecutive pension reductions from 2008 until 2011. This is most visible in the effect of the child benefit financed by the tax (scenario 9) compared to the child benefit financed by the pension reductions (scenario 1).

In comparison, Chapter 3 found that from the individual perspective, the real disposable income of children decreased by 5% and the real disposable income of young adults decreased by 22% from 2007 to 2014, while the income of the oldest generation increased by 8% (75+ years) and 14% (65–74 years). On average, the income of all generations increased by 1%. Hence, scenarios 1, 2 and especially 9 would have heavily overcorrected and redistributed significantly more to the youngest age group than required to fully counteract their negative income growth.

Scenarios 3 and 4 would have increased, from the individual perspective, the income of the generation of young adults (18–24 years) by between 14.5% and 17% and decreased the income of the oldest generations by 2% to 3%, bringing both generations closer to the average. Financing the unemployment benefit for young adults with the simulated tax, however, would have also overcorrected income losses of the crises by increasing the income of young adults by more than 50%.

5.5. Limitations

There are some important limitations in our analysis which should be considered when formulating policy recommendations. First, only a limited section of government expenditure and revenue can be adequately modelled with EUROMOD. Among the exclusions are indirect taxes like value-added tax (VAT), a tax that was raised by several European countries like FR, IE, IT, ES and the UK during the economic crisis (see European Commission, 2020). Other sources of government revenue are wealth taxes, estate taxes and corporate taxes. Changes in the level of VAT tend to have a stronger effect on lower-income individuals while wealth-related taxes naturally have a stronger influence on wealthy individuals. Considering that wealth and income tend to be positively related to age (at least up to the age of retirement), we should expect these policies to also influence intergenerational fairness. This also applies to (public) employment, which can have an even stronger effect on individuals' wellbeing, for example, via salary cuts or layoffs.

Second, EUROMOD provides static simulation results omitting behavioural changes which can occur in response to policy changes. For example, reforms to unemployment benefits and social insurance contributions may influence the level of (un)employment and working time, which in turn would affect individuals' incomes.

Finally, relying on EU-SILC cross-sectional data as input data, the simulation analysis cannot distinguish policies meant to address short-term economic shocks, like a temporary increase in unemployment benefits, from reforms meant to address long-term structural problems like pension reforms. The simulation only compares the effect of different policies at one point in time (i.e. in a certain calendar year) independent of the goal the policies are supposed to address. However, by modelling the effect of a lower indexation of pensions for several points in time, we aim to show the cumulative nature of a reduction in indexations. The results show that small but repeated – and thus cumulative – reforms can have significant effects over a limited period of time.

5.6. Conclusions and recommendations

For addressing the research question investigated in this chapter, we analysed the effect of 7 reform policies – two alternatives of pension indexation reductions, an additional income tax on top earners, the introduction of an additional child benefit, the introduction of an unconditional unemployment benefit for young people, a reduction in social insurance contributions for low-income earners and an anti-poverty household benefit – which were combined into a total of 12 revenue-neutral reform scenarios. The scenarios always consisted of one revenue-generating policy (pension indexation reduction, additional income tax) and one policy on the expenditure side (child benefit, unemployment benefit for young people, decrease in social insurance contributions, anti-poverty household benefit). The redistributive scope (amount of the benefits and the low-income eligibility threshold for the social insurance contributions reduction) were determined by the extent of resources raised by the revenue-generating policies.

The annual amount of income generated by the two simulated annual pension indexation reductions – 1 p.p. reduction (vs baseline indexation) for all pensions or 2 p.p. reduction (vs baseline indexation) for pensions above the median income – is cumulated each year. Correspondingly, the level of benefits able to be financed by pension indexation reductions increased over time. The extent of revenue generated by both pension indexation reduction alternatives was about equal. In contrast, the additional income tax generated significantly more funds than the pension indexation reductions, even when compared to the cumulated pension indexation reductions in the year 2014 after seven consecutive years of cuts. The two pension indexation reductions would have primarily decreased the income of the two oldest generations. Pension reduction 1 (1 p.p. reduction across all pensions) would have decreased the income of the oldest two generations equally, while pension reduction 2 (2 p.p. reduction for pensions above the median) would have had a slightly stronger negative effect on the income of the second oldest generation (65–74 years) than on the oldest generation (75+ years). The additional income tax mostly reduced the income of the prime-working-age generation (25–54 years) and of the oldest working-age generation (55–64 years).

The results of the simulations showed that across our sample of countries, from the individual perspective, the child benefit would have significantly increased the income of the youngest generation and, from the equivalised income perspective, the income of children (0–17 years), young adults (18–24 years) and the prime-working-age generation (25–54 years). The unemployment benefit for young people would have strongly increased the income of young adults (18–24 years) on the individual level and, from the equivalised income perspective, also the income of children (0–17 years) and of the

prime-working-age generation (25–54 years). A reduction in social insurance contributions for low-income earners would have primarily benefited young adults (18–24 years) and the prime working population (25–54 years), but the effect on young adults would have been much smaller than that of the unemployment benefit. In addition, the comparison between the individual perspective and the household perspective suggests that this reform primarily benefits small or one-person households. The anti-poverty household benefit would have supported poor households in all generations and, thus, represents a good policy to address poverty without significantly altering intergenerational income distribution.

Which combination of policies then can be recommended? The answer to this question depends largely on the goals of the reform because, as mentioned at beginning of the chapter, there is not one ‘correct’ intergenerational distribution of income.

An additional child benefit, either in combination with pension indexation reductions or an additional income tax, would have redistributed income to the youngest generation (0–17 years) on the individual level and, when looking at equivalised income, to their parents (18–24 and 25–54 years). Those policy combinations can therefore be recommended to countries where the youngest generation lost disproportionately during the crisis. However, if all funds generated by pension reductions until 2011 or by the additional income tax would have been spent on the child benefit, this reform would have overcorrected the income losses, resulting in much stronger income growth for this generation than for other generations in our sample countries. One solution could be to finance the benefit with a smaller tax increase, a pension indexation reduction for a shorter period of time, or to distribute more of the revenue generated by either tax or pension indexations by spreading them across multiple benefits.

A policy suggestion to counteract the divergence in income growth between young adults and older individuals is an unemployment benefit for people aged 18–25. This policy can be financed either with a pension reduction or an additional tax on high incomes. In combination with pension reductions, the reform would have resulted in a strong redistribution of disposable income from the two oldest generations (65–74, 75+ years) to young adults. Combined with a tax on high incomes, the unemployment benefit would have redistributed income from high-income individuals in the age groups 25–54 and 55–64 to low-income individuals in the age group 18–24. However, while the pension reductions would have reduced the diverging income growth between young adults and the oldest age groups observed in Chapter 3, the tax at the simulated level (additional 10% on top-decile income-earners) would have been overcorrected and increased the income of young adults significantly above that of other age groups in all analysed countries.

A reduction of SIC for low-income earners was simulated as an alternative policy to support young adults. However, the analysis shows that such a policy would have resulted in much less redistribution towards the age group 18–24 than the simulated unemployment benefit. Therefore, the unemployment benefit would have been a more targeted policy to redistribute income to young adults. The combination of an additional tax on top income-earners and a SIC reduction for low-income earners redistributes disposable income from higher- to lower-income groups and reduces income inequality with hardly any effect on intergenerational fairness and the least effect on poverty reduction of all expenditure-side reforms. In other words, this scenario can only be used as an approach to achieve a more equal income distribution, while maintaining the current poverty levels across generations.

The simulated anti-poverty benefit combined with pension reductions would have redistributed income from the oldest two generations to the younger generations similar to scenarios 5 and 6 (pension reductions and SIC reductions). The anti-poverty benefit financed by an additional 10% tax on the income of those in the highest income decile

was the only scenario that redistributed income from the middle-age groups (25–54 and 55–64 years) to the younger and older generations. All three scenarios would have had a strong effect on reducing poverty and income inequality. The effect of the anti-poverty benefit would have been strongest in combination with the additional 10% tax on high-income earners.

In summary, the analysis in this chapter shows that EU governments could have achieved a significantly different intergenerational income distribution during the crisis without changing the size of their public budgets. It is important to stress, however, that there is no one-size-fits-all solution: when selecting the appropriate policies, the respective national circumstances need to be considered. First, the country-specific impact of across-the-board benefit cuts like the 1 p.p. annual decrease in pension indexation should be considered. It should be analysed whether such universal cuts could increase the poverty risk among pensioners. In addition, typical cohabitation patterns and intra-family transfers should be taken into account. This chapter reported the results of analysis for both the individual level (individual disposable level) as well as the household level (equivalised disposable income) to provide a comprehensive picture of how benefits ostensibly targeted at one age group or at certain age groups (e.g. children and their parents) can influence the wellbeing of other individuals in a common household. However, the equivalised household income perspective is only a general approximation of the intra-household and intra-family sharing of resources. Therefore, a more detailed knowledge of national contexts may be required to fully gauge the reforms' potential impact on the wellbeing of individuals belonging to an age group other than that of the benefit recipient.

6. What political economy considerations are most relevant in the design of future policy measures to ensure intergenerational fairness?

Summary

This chapter provides a number of normative considerations around intergenerational fairness, as revealed from individuals' attitudes, which in democratic societies influence the preferences of the average individuals in each country. More specifically, we examine differences between various age cohorts' views regarding intergenerational equity, inequality aversion, and more generally the organisations and programmes that accommodate the different intergenerational inequalities which influence intergenerational fairness. The chapter identifies trends in age-group-specific effects of public attitudes related to intergenerational fairness (depicting the age cohort effect of a weighted sample of European Union countries using data from the European Social Survey). The main focus here will be on providing age/cohort influences on a number of attitudes including several dimensions of both general and intergenerational equity as well as attitudes towards the distribution of resources in the economy via the welfare state (pension, childcare, family) as well as, more generally, age/cohort differences in attitudes towards social equality and in inequality aversion across age groups. We contribute to the normative analysis of intergenerational equity, and more specifically the political economy of intergenerational fairness, examining particularly the changes that have taken place during the last decade in this area in Europe since the onset of the economic crisis of 2007–2009. We have identified differences across age cohort groups in attitudes towards relevant dimensions of intergenerational equity which overall suggest that middle-age groups are more likely to be supportive of equitable distributions. Consistently, we find the same age patterns are found when we elicit inequality aversion using wellbeing measures. We identify an age/cohort difference between life satisfaction and satisfaction with democracy and the government (public satisfaction); inequality seems to reduce public satisfaction more intensely for younger age groups. Attitudinal estimates are consistent with intergenerational differences in the demand for support, according to which older-age individuals tend to perceive their standards of living as sufficient, while younger cohorts (who are more likely to be at an age of raising children) tend to believe they do not receive enough support. Finally, we report a negative and significant link between inequality measured using income data and wellbeing. However, this link is even more extreme when we examine the effect of inequality on satisfaction with democracy, and more generally on public satisfaction as opposed to life satisfaction. The effect of income inequality on wellbeing remains significant when we examine inequality rankings as well as the absolute inequality indices.

6.1. Introduction

Intergenerational links refer to the relationships and dynamic exchanges between generations. In this respect, Tobin (1974) refers to 'the guardians of the future against the claims of the present. Their task in managing the endowment is to preserve equity or fairness among generations', now and for the future. However, fairness between generations results from choices that are made in the political arena and not just by the market, which in democratic societies are influenced by the preferences of the population, which reveal normative considerations underpinning intergenerational arrangements. Hence, the preferences of different age cohorts with regards to intergenerational equity, inequality aversion, and more generally welfare programmes designed to accommodate

intergenerational inequalities, are important influences that explain inequality differences across countries and over time. This chapter is devoted to examining them.

To identify the trends and determinants of preferences measured as public attitudes towards different components of intergenerational fairness, we attempt to spell out the recent decades' changes in these attitudes for the 'representative' individual in each age group. Hence, the focus here will not be on examining differences by country. It will be more on examining age/cohort differences in the perception of equity and in the perception of the distribution of resources in the economy via the welfare state (pension, childcare, family) as well as, more generally, on examining age/cohort differences in attitudes towards social equality and in inequality aversion across age groups. This chapter focuses on the empirical political economy of intergenerational fairness, and specifically the changes that have taken place during the last decade in this area since the onset of the economic crisis of 2007–2009 in Europe. The rest of this chapter describes relevant theoretical considerations and provides a brief explanation of the empirical strategy followed. Next, we describe the data, the European Social Survey (ESS), and report the estimates of age/cohort-specific effects on a number of relevant attitudes. The final section discusses the results and conclusions.

6.2. Theoretical considerations

Political economy considerations refer to socioeconomic, political and institutional factors that drive the support or resistance to interventions that can modify intergenerational fairness among others. Given that programmes that improve intergenerational fairness might change the distribution of power and resources among the various age groups, it seems appropriate to examine the differences in their preferences in several domains relevant to this area. Preferences disclosed in ESS contain evidence, by age cohort groups, on how individuals have reacted to their existing economic conditions over the last decade. More specifically, we measure age group (cohort) effects on a series of attitudes, all of which help to understand behavioural and political reactions to changes in intergenerational mobility and inequality (Alesina et al., 2018) as well as preferences for redistribution (Alesina and La Ferrara, 2005). By examining the extent to which differences by age cohort groups differ in their support for a fairer society, it is possible to infer the normative judgements that restrict changes in intergenerational fairness. A rationale for distinguishing preferences by age cohorts is that in ageing societies (Tabellini, 2000), politicians are more likely to seek the votes of elderly people, as these would outvote young people even if everyone turned up to the polls.

There are several potential explanations for the increasing role of older populations in influencing public decisions that have an impact on intergenerational fairness. In most Member States, there are limited political representatives of younger ages, while in many of them there is a larger share of older-age politicians. Reforms to protect pension systems can be considered as an illustration of this phenomenon. Examples include reforms to protect pensions such as a cross-party coalition in Poland overruling a Presidential veto addressing the macro-fiscal sustainability of its pension system through a bridging pensions law restricting early retirement from 2009 (Gora, 2013). One of the drivers of support for intergenerational fairness is the level of education (which we control for in our estimates) as people with a higher level of education tend to have different preferences than those with a lower level of education. As well, the former are more likely to engage with politicians on questions pertaining to intergenerational fairness.

Finally, a new set of studies documents the rise of populist ideologies that question the status quo in many European countries – and specifically the existing intergenerational distribution of welfare services – and question the intake of immigrants in each country.

Algan et al. (2017), using ESS data on Europeans' beliefs and attitudes, show that increases in regional unemployment drive declines in confidence in national and European political institutions. Guiso et al. (2020) use ESS data to show that employment status, income difficulties and exposure to globalisation predict populist vote. Populist parties benefit from economic difficulties as individuals facing insecurity are less likely to vote.

6.3. Empirical strategy

As a first empirical examination, we carry out a regression analysis of individual-level data covering all European countries in the dataset from which we identify the effect of changes in the relevant attitudes to equality. We control for a number of time-invariant variables (gender, ethnicity) and variant variables (education, household size). Our regressions are clustered at the country level, since this is the level at which the changes in relevant institutional reforms (for both cash and in-kind benefits) take place (e.g. new pension reforms, long-term care reforms, cash benefits). Our estimates exploit the cross-country and time-varying changes in conditions influencing age-specific attitudes. Hence, we are interested in comparing the coefficients of the age group variable (Age_{git}) captured with the coefficient γ_g after controlling for a number of other controls (X_{git} , based on the following regression specification and captured by the coefficient (α) where g refers to the country, i to the individual and t to time as follows:

$$y_{it} = \gamma_g \sum Age_{git} + \alpha X_{git} + \epsilon_{it} \quad (1)$$

Our omitted category refers to individuals aged 20 to 29. Age groups have been divided into eight decades and their coefficients should be interpreted relatively to the effect on the omitted age group (i.e. individuals aged 20 to 29). We have estimated our model by using the ordinary least squares (OLS) model, since alternative specifications that account for the measurement scale of the data do not make a difference to the coefficients. However, we have report estimates based on both ordered probit (used when the dependent variable is ordered) and probit models (when the dependent variable is binary). Though its coefficients are nevertheless not immediately interpretable and need to be transformed, they provide consistent estimates that do not differ significantly from OLS estimates.

Economic crisis period effects

In estimating the different models, we have compared the attitudes in our sample with those of the period of the economic crisis in Europe which in this survey we capture in waves 4 in 2008 and 5 in 2010. This is important as it allows us to distinguish the effect of a recessionary period on these attitudes from the effects observed during regular times. However, given that spending cuts followed the recession, our estimates are mainly identifying the 'pure recession effects' and do not go all the way to identify the specific side effects of welfare state consolidation that follow the recession, on individual attitudes. For each attitude examined, we provide a figure where we plot and compare the coefficients of equation (1) on the sample of a recessionary period to a period of no recession. This strategy allows estimating which age groups are more reactive to a recessionary period in relation to the different attitudes examined. It also allows us to control for gender, education and other relevant covariates that might exert an independent effect. That said, the effects should be interpreted as correlations as opposed to causal effects on attitudes. The results help to identify drivers of preferences and not precise estimates of an effect.

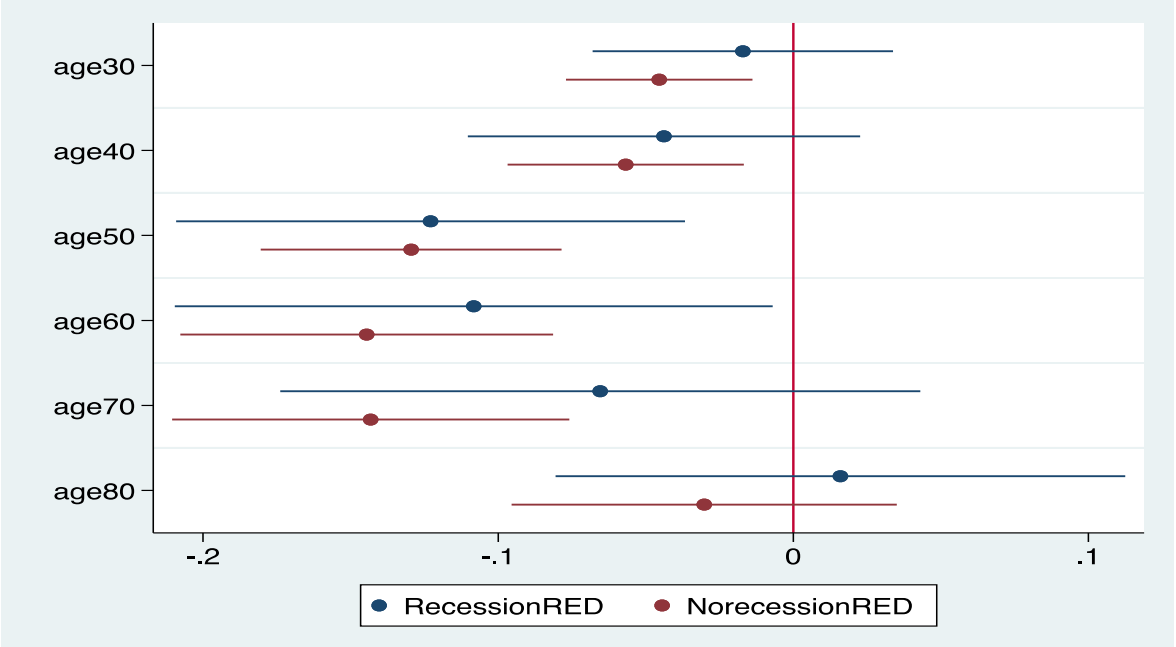
Data

We examine attitudes which proxy European preferences of the average European, drawing on several questions from the European Social Survey (ESS) that measure preferences which can explain the emergence of intergenerational (un)fairness across cohort age groups. We have employed the integrated file 2004–2016 where we have a complete set of countries with some (though limited) country attrition. The ESS is the only survey that contains a large sample of European countries and questions relevant to social mobility, inequality, redistribution and social protection. Although other surveys were considered in an earlier version of the analysis, only the ESS met the minimum standards of standardisation necessary for our analysis in view of examining the last decade's trends in attitudes.

Intergenerational differences in preferences for fairness

We have identified several questions examining attitudes towards equality, inequality tolerance, childcare support and social benefits to reduce inequality, and we have looked at the influence of age groups.

Figure 6.1: Age group effects (relative to reference group of individuals in the 20–29 age group) on attitudes towards inequality (Question: 'The government should reduce differences in income levels', Scale '1 = strongly agrees to 5 = strongly disagrees'). All European Union countries for period 2004–2016



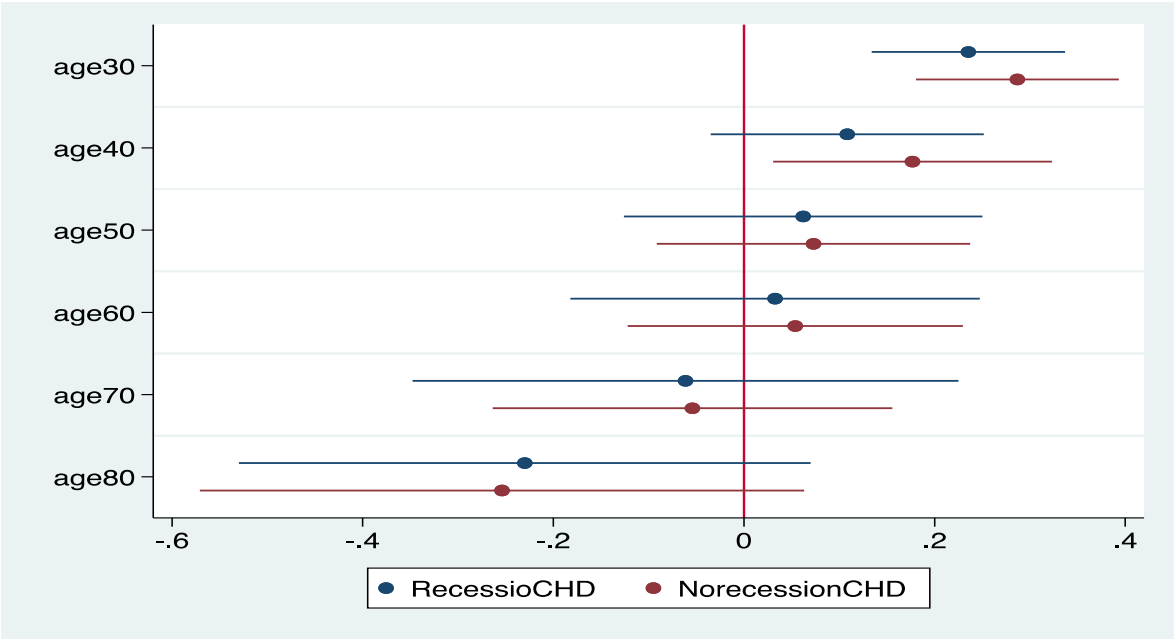
Source: ESS, multiple years

Figure 6.1 reports the age coefficients for the age-group effects on attitudes to inequality across Europe for both the recessionary and the non-recessionary period. Attitudes are measures on a scale of 1 to 5, and hence should be interpreted as the age-group effect

on the average scale. Compared to attitudes of individuals in their 20s (i.e. aged 20 to 29), only individuals over 80 exhibit lower relative support for a redistributive role of the government (this is only observed in recessionary periods). In contrast, individuals in their 50s to 70s exhibit relatively higher pro-equality attitudes. In terms of the effect of the economic crisis, we find that the recession does not change attitudes significantly for individuals under 50, but for individuals over 50, we document higher preferences for equality of income.

Next, we draw on other estimation techniques to examine the age effects on attitudes towards (in)equality estimates of effects of age groups on income inequality preferences for the recessionary period, the period out of the recession and the total sample, using ordered probit. Table A6.1 in the Annex[47] suggests consistent evidence with Figure 6.1 indicating that individuals in their 50s to 70s exhibit the highest preference for equality (they are 12 to 14 percentage points less likely than individuals in their 20s to disagree with the statement that the government should reduce income differences). In contrast, individuals close to or after retirement in older age exhibit a reduction in inequality preferences. Estimates are robust to different regression specifications.

Figure 6.2: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes to childcare subsidies ('Question: Childcare services for working parents are the government's responsibility', Scale from 1 = Entirely individuals' responsibility to 10 = Entirely government's responsibility). All European Union countries for period 2004–2016



Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Attitudes towards childcare subsidies

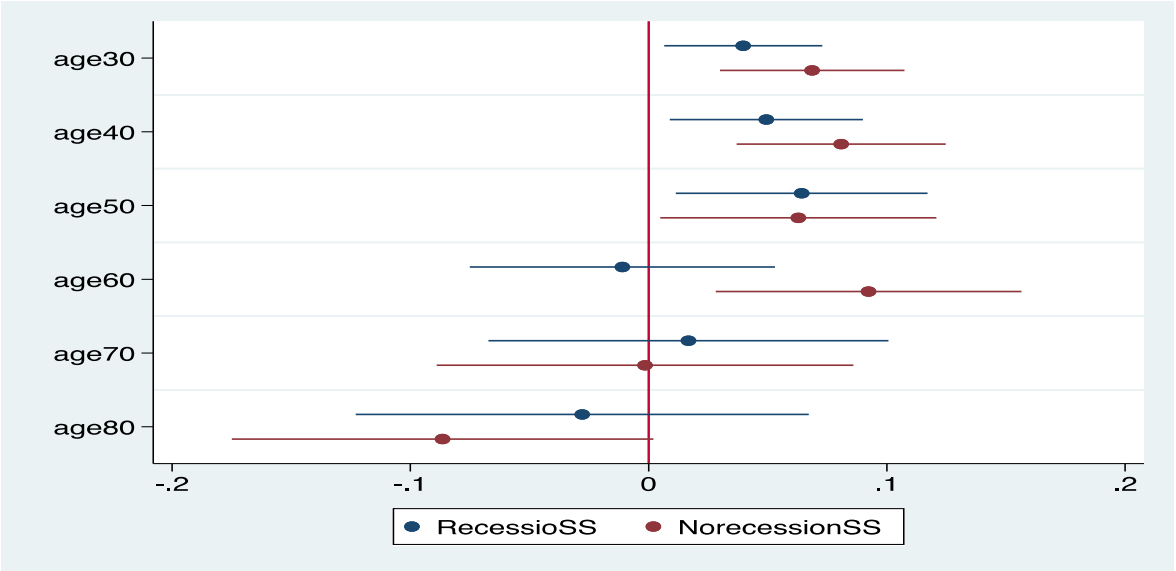
[47] Tables numbered with the prefix A6 are shown in the Annex of Chapter 6.

Figure 6.2 reports a significant age difference in attitudes towards childcare subsidies, indicating that individuals in the 20–60 age groups are more likely than other age groups to agree with the statement that childcare should be a government responsibility, while individuals over 70 are less likely to agree with this statement. However, in this specific question, we do not find evidence of significant age differences between the recessionary period and the non-recessionary period for all age groups studied. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group. Hence, Table A6.2 reports coefficient estimates of equation (1) for the total sample, the recessionary period and an ordered probit model. We document that individuals at the age where they raise children (age 30–50) are more likely to agree with the statement that childcare is the government responsibility than other age groups.

Social benefits/services lead to a more equal society

Consistent with the results for attitudes towards childcare, Figure 6.3 reports the regression age group coefficients in relation to the role of social services on equality, suggesting that individuals over 80 are less likely to disagree (compared to other age groups) that social services have a role in reducing inequality compared to the reference group. The effect of a recession (blue spots) suggests a slight increase of the role of social services for individuals under 70. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group.

Figure 6.3: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards the role of social services (in-kind benefits) (Question: 'Social benefits/services lead to a more equal society', Scale of 1 = strongly agrees to 5 = strongly disagrees). All European Union countries for period 2004–2016



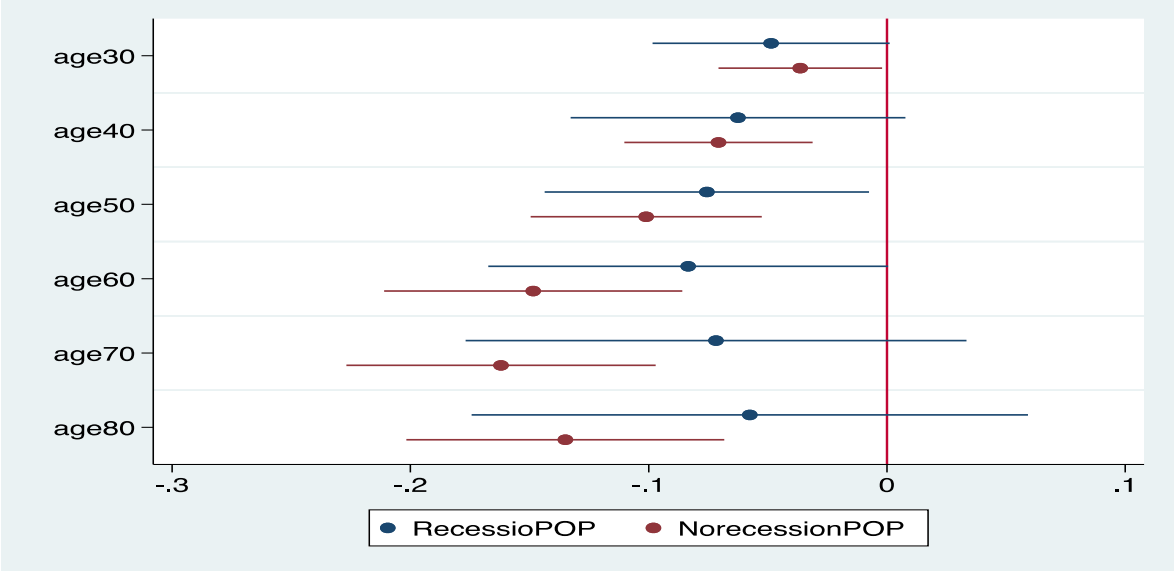
Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Table A6.3 reports the fully fledged regression model for the total sample and the recession and non-recession sample, alongside ordered probit coefficients. The estimates suggest that individuals under 60 are more likely to disagree that social services play a role in reducing inequality. However, while the effect among individuals in the age 50s cohort is unaffected by the recession, the effect among individuals aged in their 30s, 40s and 60s reveals reduced disagreement with the statement that social services lead to a more equal society during the recession. These results show a very small attitudinal response to recessionary periods, the exception being individuals over 80 who experience a different attitudinal response in a recession.

Attitudes towards banning populism and migration

This analysis examines how age influences attitudes towards populism and migration. Figure 6.4 reveals the age effects during regression and non-recessionary periods (based on a regression model). Importantly, we find that in non-recessionary periods, older individuals (as of 60) are more likely to agree than younger age groups with such a ban on political parties. However, during a recession, no such difference between older and younger age groups is observed.[48] Table A6.4 reveals that younger age cohorts are more willing to disagree with a ban on political parties questioning democracy compared other age groups, while individuals over 50 are more likely to disagree with the statement especially in a post-recessionary period). In contrast, when we examine attitudes to controls on migration, we find that only individuals over 80 support the view of reducing the number of migrants in a country. Table A6.4 show that although in Figure 6.4, the age coefficients exhibit a smaller effect size during a recession, the age effects suggest that older individuals are more likely to agree about banning populist parties that question democracy altogether.

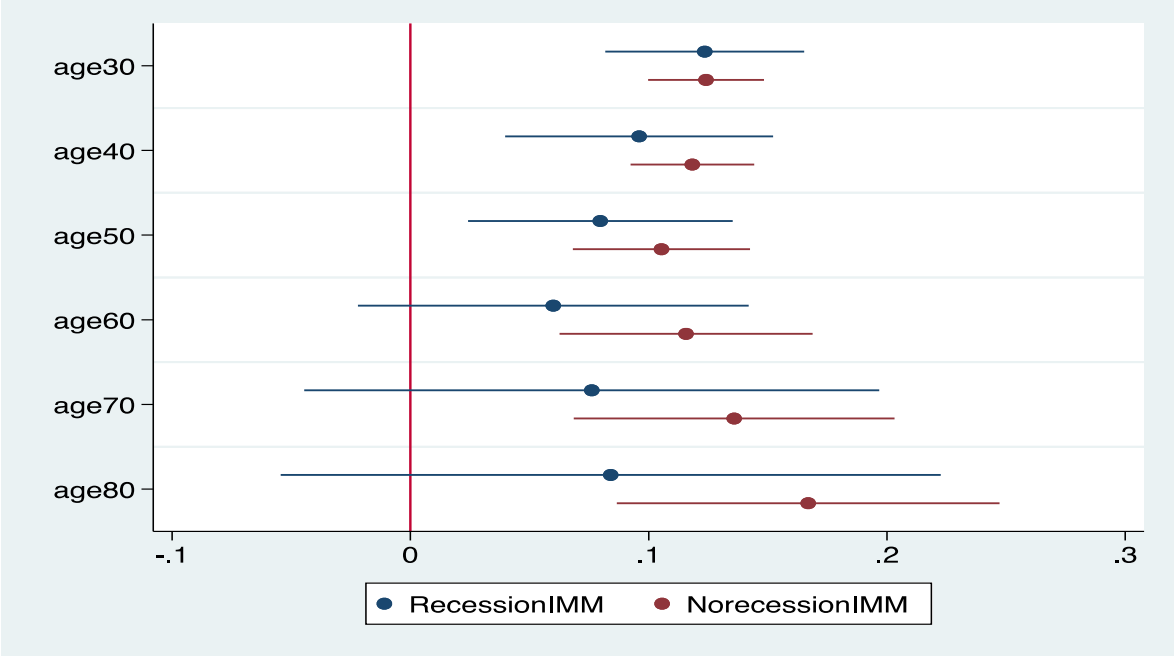
Figure 6.4: Age group effects (relative to reference group of individuals in the 20s age group) on banning political parties questioning democracy (Question: 'Ban political parties that wish to overthrow democracy', Scale from 1 = strongly agrees to 5 = strongly disagrees). All European Union countries for period 2004–2016



[48] Except a difference remaining in a recession between all age groups v those aged 20 to 29.

Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable.

Figure 6.5: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes to migrants (Question: 'Allow many/few immigrants of same race/ethnic group as majority', Scale from 1 = Allow many to come to 4 = Allow none). All European Union countries for period 2004–2016



Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

When we turn to examining attitudes to migrants, we find that there is a more homogenous age effect, which reflects that, during non-recessionary times, individuals over the age of 60 are slightly more likely to oppose migration (Figure 6.5). As well, it seems that the post-recessionary period has been the time when we observe a significant increase in opposition to migration. In contrast, we find that during the recession individuals across all age groups were less likely to oppose migration than during non-recessionary times. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group. Hence, the interpretation is that the experience of a recession might be driving the effect of attitudes rather than the contemporaneous exposure to a recession. However, this is only significant for the over 60s and the effect among younger age groups (ages 30–40) is not significantly different in recessionary and non-recessionary periods.

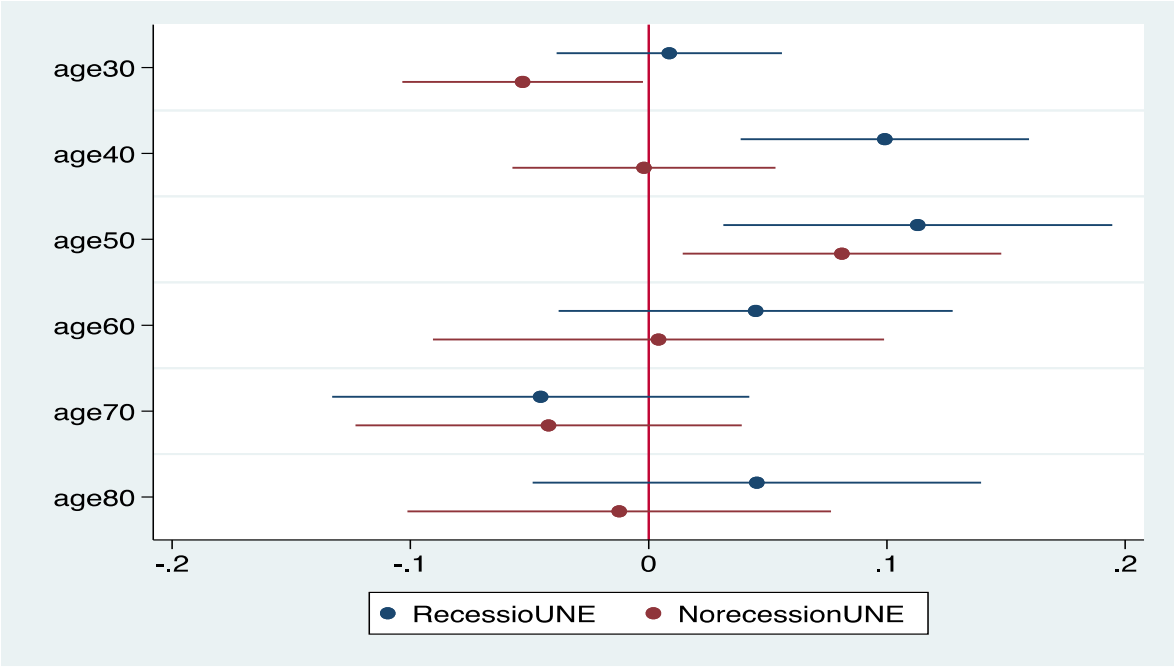
In concurrence, Table A6.5 reports evidence of a linear effect of age on attitudes towards migration, whereby older individuals are consistently more likely to oppose migration than other age groups. However, during a recession we find evidence of a stronger opposition from individuals of a working age 30–50 (than of individuals above 50).[49] Hence, attitudes seem to be different during periods of recession when the availability of benefits may be limited.

Attitudes towards welfare benefits (pensions and childcare support)

[49] With individuals above 50 being still more opposed to migration than people aged 20 to 29.

We identify several measures of welfare benefits at the country level to test the effect of age on attitudes towards such benefits. When we look at unemployment benefits, Figure 6.6 reveals that individuals between 40 and 60 years of age are more likely to disagree than the other age groups[50] with the statement that unemployed people do not try to find jobs. Table A6.7 shows the effect size and reveals that such an effect is more intense during a recession,[51] which is a period where middle- age individuals that lose their job might struggle to find one. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group.

Figure 6.6: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards unemployment ('Most unemployed people do not really try to find a job', on a scale of 1 = strongly agree to 5 = strongly disagree). All European Union countries for period 2004–2016



Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

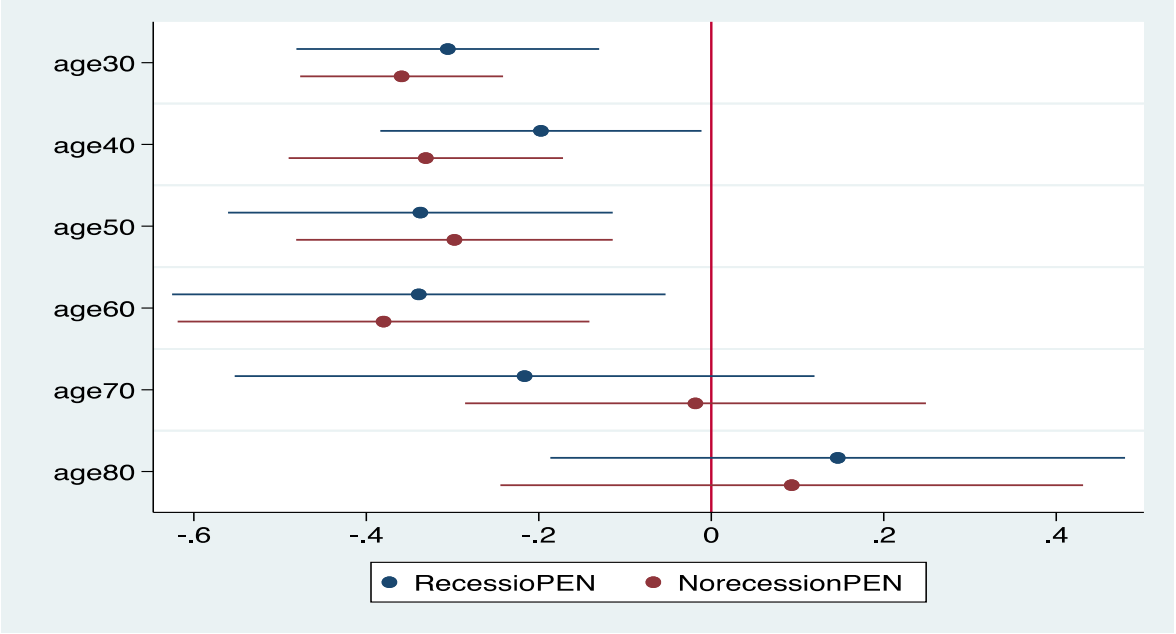
Figure 6.7 shows the age effects on attitudes towards pensions. It shows evidence of a discontinuity around the time people turn 70 when it is more likely that the standard of living of pensioners is not considered good. However, these effects were sharper in non-recessionary periods. This is confirmed by results in Table A6.6, which also show, for most age groups[52] (as can also be seen in the related figure), only limited differences in the age group effects between non-recessionary and recessionary periods.

[50] In non-recessionary periods, people aged 40–49 are, however, slightly less likely to disagree with the statement than people aged 20 to 29.

[51] To be noted though that, during a recession, people above 80 and people in their 60s are similarly likely to disagree with the statement.

[52] Except for people in their 40s and for people in their 70s where the difference between recession and non-recessionary times is bigger.

Figure 6.7: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards standard of living of those of old age (Question: 'The standard of living of pensioners' on a scale of 1 = extremely good to 10 = extremely bad). All European Union countries for period 2004–2016

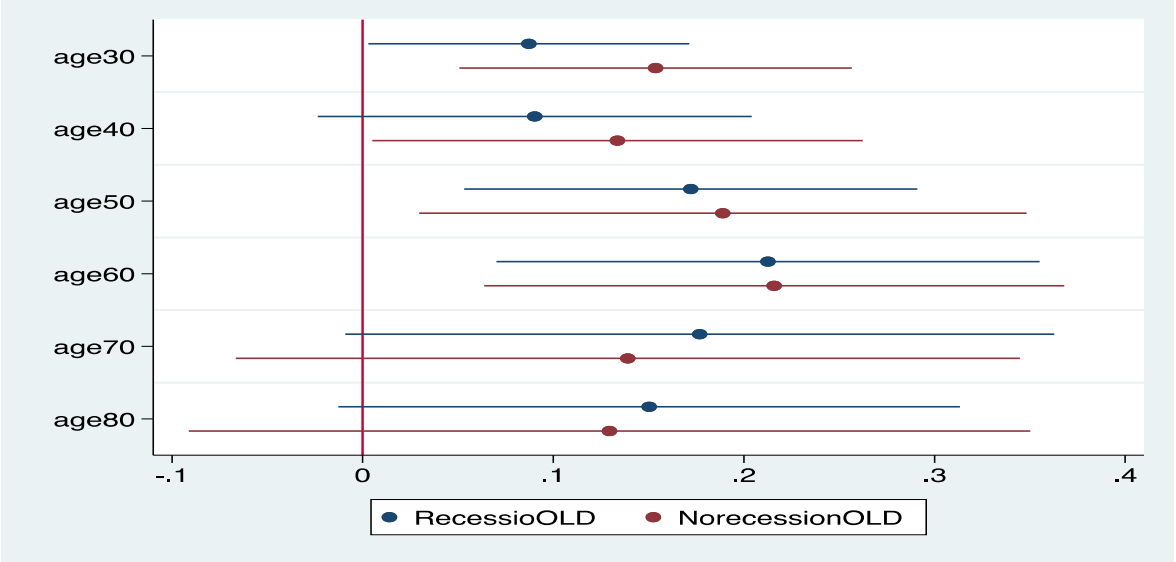


Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Next, Figure 6.8 shows the age effects on attitudes towards the *government's responsibility* in the standard of living of the elderly. It shows that people in their 50s and 60s are the most likely to agree (compared to other age groups) with the statement that the government should be responsible for the standard of living of the elderly. There are little differences in the age group effects (except for people in their 30s) between non-recessionary and recessionary periods. These results are overall confirmed by Table A6.8. The results of Figures 6.7 and 6.8 are different because the latter focuses on the role of the government alone.

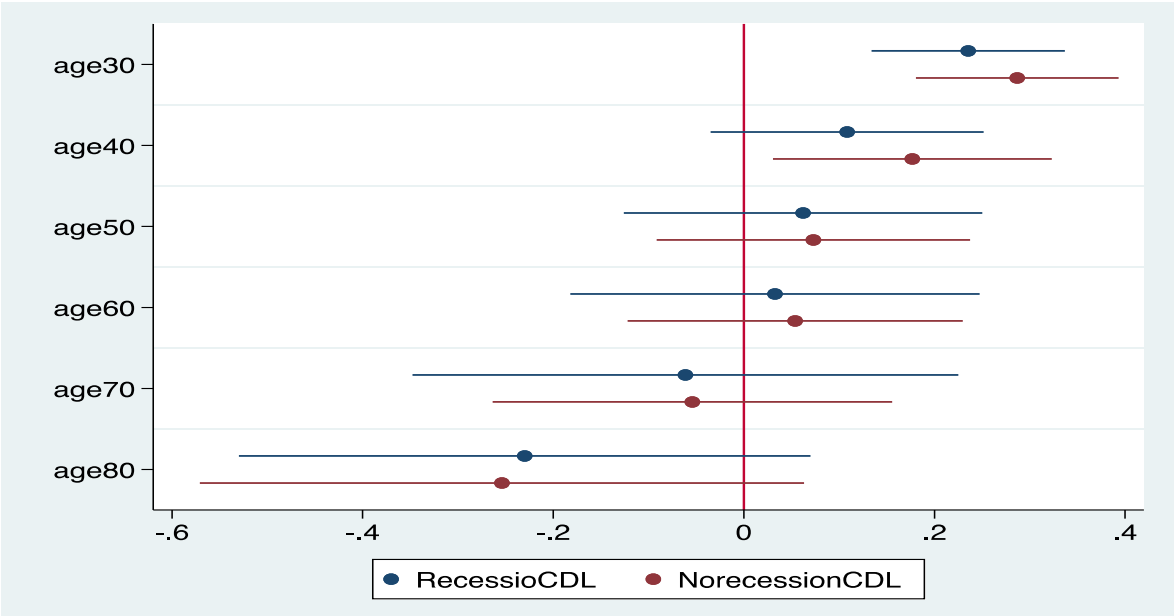
Next, Figure 6.9 shows the age effects on attitudes towards the government's responsibility in the standard of living of children. As expected, we find that individuals who are at an age of raising children (30–50) are more likely to agree among all the age groups with the statement. Indeed, Table A6.9 suggests a significant effect in which younger people (aged 20 to 29) are more likely to disagree, than people at an age of raising children, that the government should intervene in guaranteeing the standards of living of children.

Figure 6.8: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards the government's responsibility in the standard of living of the old age, government responsibility (on a scale from 1 = strongly agree to 5 = strongly disagree). All European Union countries for period 2004–2016.



Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Figure 6.9: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards the role of governments in ensuring the standard of living of children, governments' responsibility (on a scale of 1 = Strongly Agree to 5 = Strongly Disagree). All European Union countries for period 2004–2016

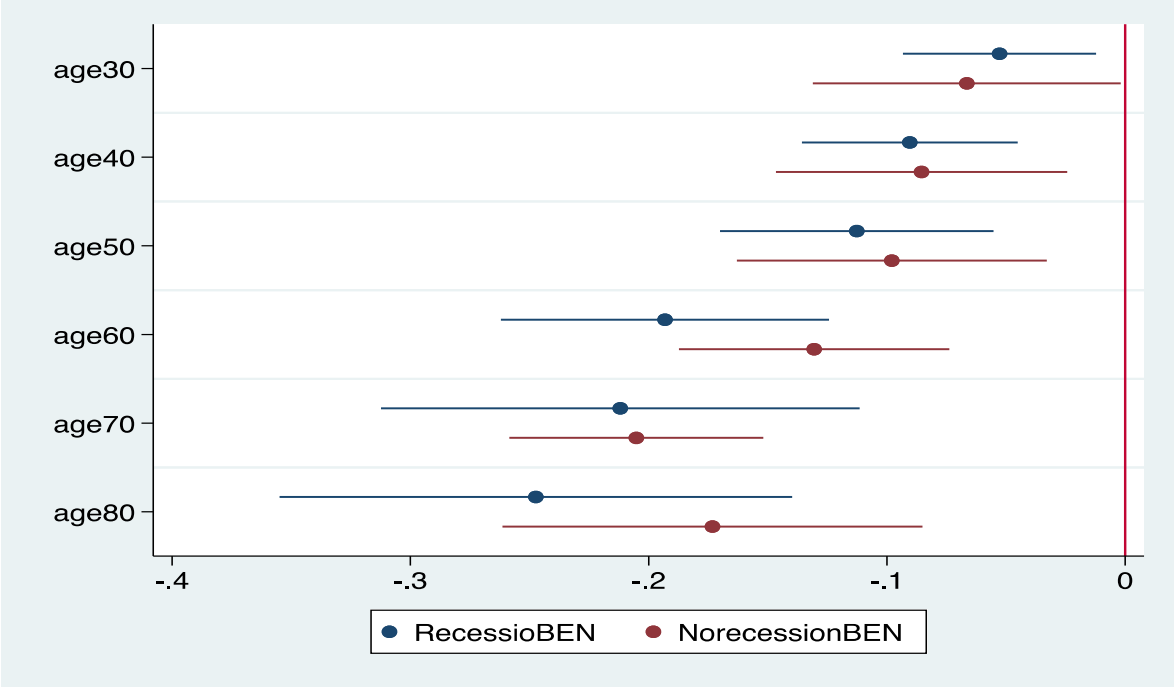


Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable.

Crowding out of people's willingness to care for one another

Figure 6.10 reports evidence of age-group differences in attitudes towards social benefits/services crowding out people's willingness to care for one another. It shows that younger individuals are less likely to believe that supporting individuals with social benefits/services makes people less willing to care for one another, while a crowding out effect is more commonly perceived by older age groups. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group. In concurrence, Table A6.10 reveals evidence of such an effect, which is observed in both recessionary and non-recessionary times.

Figure 6.10. Age group effects (relative to reference group of individuals in the 20s age group) on the perception that social benefits/services make people less willing to care for one another (from 1 = strongly agree to 5 = strongly disagree). All European Union countries for period 2004–2016



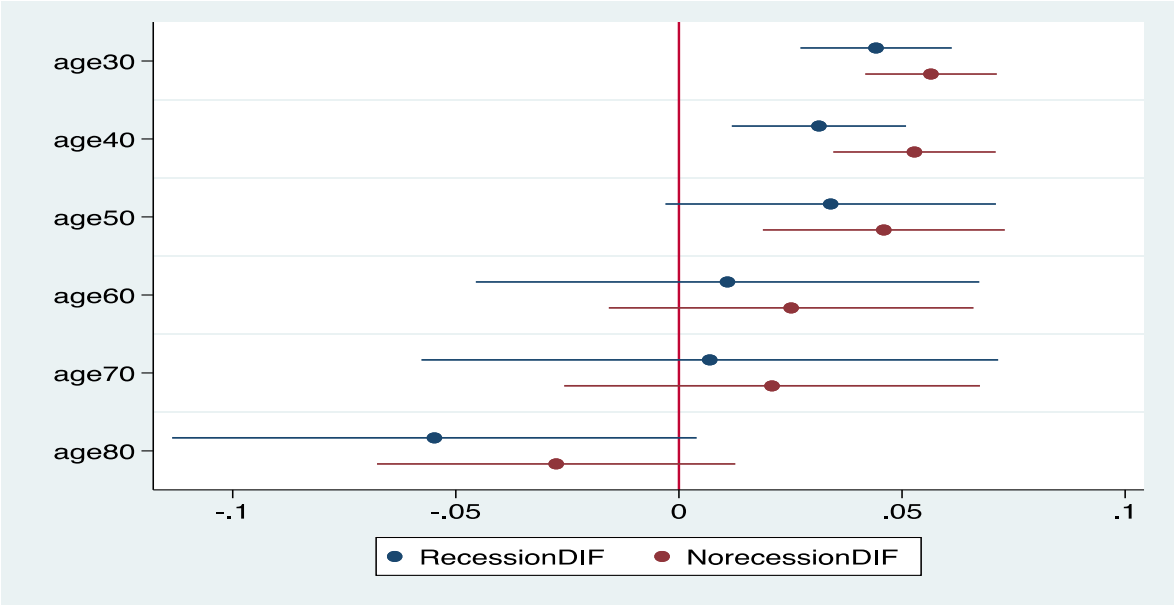
Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Self-reported perceptions of intergenerational fairness

We examine using regression analysis whether individuals perceive that living with their current household income is either difficult or very difficult. As expected, we observe in Figure 6.11 that individuals aged 30–59 reveal higher difficulties than the other age groups, even more when compared to people over 80 (pensioners). There is a discontinuity in the effect size between people in their 50s and people in their 60s. The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group.

However, Table A6.11 shows that this effect – regarding the comparison with individuals in their 20s – is only significant for individuals aged 30–49, which makes sense as they are more likely to have children to support.

Figure 6.11: Age group effects (relative to reference group of individuals in the 20s age group) on perceptions of income difficulties ('Feeling about household's income nowadays' on a scale of 1 = strongly agree to 5 = strongly disagree). All European Union countries for period 2004–2016



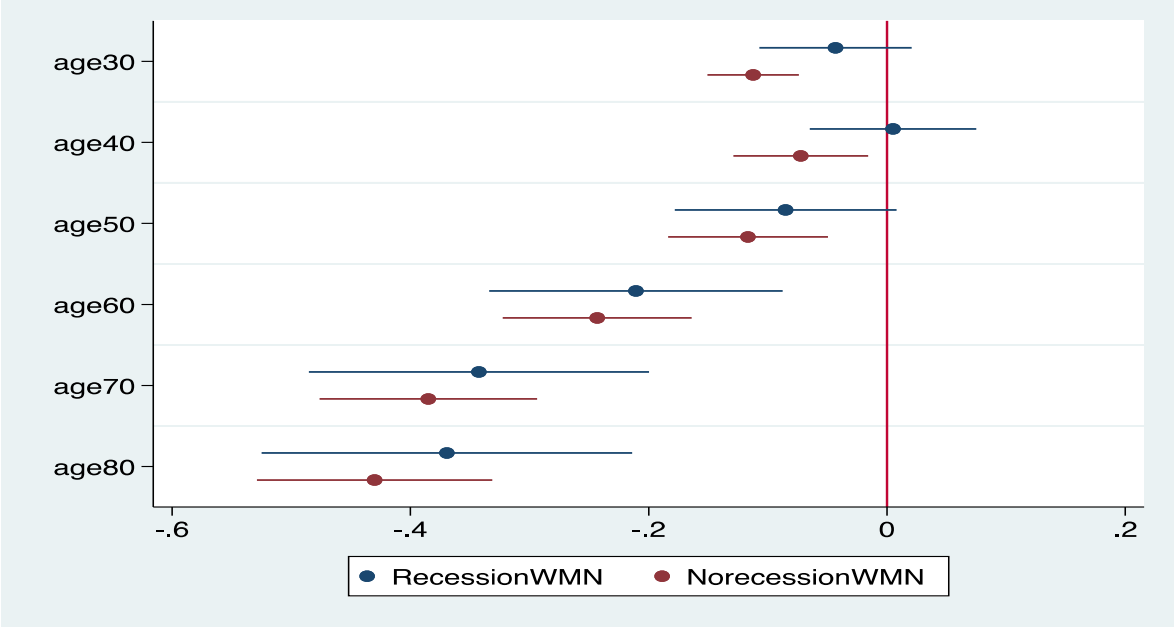
Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Attitudes to the family and gender

We examine a question on attitudes towards family and gender. This question reveals clear cohort effects where older individuals are more likely to agree that women should accept a cut in pay for the sake of the family (see Figure 6.12). The coefficients should be interpreted as usual as a change in the scale 1 (strongly agree) to 5 (strongly disagree), resulting from an individual falling into one specific age group. Hence, a change in 0.4 is about 10% of the difference between a change from 1 and 5. Effects sizes in Table A6.12 suggest a linear age effect,[53] which is observed both in recessionary and non-recessionary times.

[53] Except for people in their 40s, for which the effect seems smaller than for people in their 30s.

Figure 6.12: Age group effects (relative to reference group of individuals in the 20s age group) on attitudes towards gender and the family ('Women should be prepared to cut down on paid work for the sake of the family' on a scale of 1 = strongly agree to 5 = strongly disagree). All European Union countries for period 2004–2016



Source: ESS, multiple years, age coefficient of a regression model on attitudinal dependent variable

Aversion to inequality computed from life satisfaction measures

As a final test, we examined estimates of a measure of inequality aversion by examining how measures of life satisfaction vary with (income) inequality measures and with (income) inequality rankings. We employed the country-specific Gini index and the Gini index ranking retrieved from the OECD, which is regressed on life satisfaction estimates. Given that inequality in Europe might be a public responsibility, we also conducted regressions on measures of satisfaction with democracy and measures of satisfaction with the government respectively. We estimated the effect by age group too. The regression model estimates are as follows:

$$y\_it=\beta\_0+\beta\_1\ \ 〚INE〛\_g+\beta\_2\ X\_it+\epsilon\_it \quad (2)$$

Where y_{it} measures subjective wellbeing in the form of life satisfaction (or satisfaction with democracy or satisfaction with the government), INE refers to an inequality index (Gini or its ranking) of a country g and $\beta_1$reflects the coefficient of the effect of country-specific inequality on life satisfaction, X_{it}reflects other individual specific controls such as age, gender and education; the error term captures the remaining variation. Accordingly, β_1 is the coefficient of interest reflecting a measure of inequality aversion. We examined two different measures of inequality because most inequality indexes do not have cardinal properties and have mainly an ordinal interpretation alone.

Table 6.1 reports inequality aversion estimates using the two measures of inequality and the three wellbeing outcomes described above. For all these estimates, we report a negative and significant link between inequality and wellbeing, with all the effects being statistically significant at 99% (either when the regression is conducted with inequality

rankings or with the absolute inequality indices). However, the association is larger when we examine the inequality effect on democracy, and more generally on public dimensions of wellbeing as opposed to life satisfaction.

Table 6.1: Effect of inequality and inequality rank on satisfaction with life, government and democracy

	(1)	(2)	(3)
VARIABLES	Life satisfaction	Satisfaction with the government	Satisfaction with democracy
INE	-0.125***	-0.386***	-0.927***
	(0.0301)	(0.0334)	(0.0337)
INE – Rank	-1.36e-05***	-1.28e-05***	-1.96e-05***
	(2.84e-07)	(3.12e-07)	(3.18e-07)
Observations	367 189	354 933	353 392

(*) Controls include constant, age, gender and education. Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

Table 6.2 reports the effect of the regression model ('(2)') by age groups. We find that, although the coefficients are not precisely estimated (not statistically significant), they suggest that – consistent with the results on age cohort effects on inequality attitudes – individuals 30 to 50 years of age exhibit a higher inequality aversion independently of the measure of wellbeing used. However, we find some differences when we examine satisfaction with democracy and the government, where we find some significantly negative effects of inequality on public satisfaction among people in their 30s and 40s.

Table 6.2: Age effect of inequality and inequality rank on satisfaction with life, government and democracy (age groups compared to age group 20–29).

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Age 30	Age 40	Age 50	Age 60	Age 70	Age 80
(Life Satisfaction)						
INE	-0.159	-0.351	-0.487	-0.413	-0.293	-0.234
	(0.904)	(0.992)	(1.311)	(1.612)	(1.720)	(1.293)
INE – Rank	-1.03e-05	-1.54e-05	-1.60e-05	-1.82e-05	-1.81e-05	-1.66e-05

	(1.05e-05)	(1.12e-05)	(1.41e-05)	(1.64e-05)	(1.80e-05)	(1.46e-05)
(Satisfaction with the government)						
INE	-0.559	-0.650	-0.488	-0.579	-0.398	-0.837
	(0.788)	(0.774)	(0.935)	(1.001)	(1.086)	(0.924)
INE – Rank	-1.26e-05	-1.64e-05*	-1.14e-05	-1.34e-05	-1.17e-05	-1.66e-05*
	(9.21e-06)	(8.84e-06)	(9.48e-06)	(9.28e-06)	(1.05e-05)	(9.37e-06)
(Satisfaction with democracy)						
INE	-1.122	-1.179	-1.126	-1.236	-1.011	-1.188
	(0.862)	(0.934)	(1.144)	(1.231)	(1.221)	(0.957)
INE – Rank	-1.93e-05*	-2.31e-05*	-1.91e-05	-2.06e-05	-1.75e-05	-1.95e-05
	(1.12e-05)	(1.21e-05)	(1.40e-05)	(1.40e-05)	(1.37e-05)	(1.18e-05)
Observations	60 137	63 201	61 973	55 306	37 668	17 154
R-squared	0.029	0.030	0.023	0.024	0.032	0.027

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

6.4. Conclusions

This section has examined the age-specific cohort influences on attitudes to intergenerational fairness or programme interventions influencing intergenerational fairness such as pensions and childcare. We undertook regression analysis of the age effect as predicting attitudes to several dimensions of programmes related to intergenerational fairness and inequality, as well as satisfaction with the government or with democracy, as well as the effects of inequality on life satisfaction. We estimated a measure of inequality aversion by age cohort using subjective wellbeing data. These estimates have all been provided for a recessionary and non-recessionary period.

Our estimates suggested important differences across age groups in attitudes to equality, where middle age groups (age 30–50) are more likely to be inequality averse (irrespective of the measure of inequality used), and less likely to be satisfied with democracy. The same is true when we use wellbeing estimates as a proxy for inequality aversion estimates and that we then run regressions to look at the effects of inequality indicators on these wellbeing estimates.

When we examine self-reported intergenerational fairness, we find that individuals perceive that living with their current household income is either difficult or very difficult. Yet, individuals aged 30–59 reveal higher difficulties than the other age groups, even more when compared to people over 80 (pensioners). Individuals over 80 show lower relative support for the redistributive role of government (this is only observed in recessionary periods).

Nonetheless, we found some level of self-interest in people's attitudes. Individuals in the 20–60 age groups are more likely than other age groups to agree with the statement that childcare should be a government responsibility. Similarly, individuals in their 50s to 70s exhibit relatively higher pro-equality attitudes and are the most likely to agree (compared to other age groups) with the statement that the government should be responsible for the standard of living of the elderly.

Attitudinal estimates are consistent with political economy explanations according to which older-age individuals (typically retired over 70) tend to perceive their standards of living as good enough and younger cohorts (who are more likely to be raising children) tend to believe they do not receive enough support. These results indicate some level of differences between age groups in the normative consideration of the role of programmes and in inequality perceptions, which seem in some cases to be exacerbated by exposure to a recessionary period.

7. The simulated effects of COVID-19 and emergency redistributive policies on income distribution at the individual and household levels in Italy

Summary

Drawing on a current ongoing research project (conducted over the course of 2020), Chapter 7 focuses on the COVID-19 pandemic crisis and estimates its effects on the income distribution of individuals and households in Italy in 2020. To this aim, using a static microsimulation model based on survey data and administrative data linked together, this research project examined effects of the crisis on income distribution (by deciles) and on income inequality and relative poverty indicators. The analysis was carried out first focusing on workers, i.e. by simulating changes in earnings due to pandemic, and then on households, i.e. on equivalised individuals by observing changes in equivalised incomes. For both units of observations, changes in market incomes (i.e. before public redistribution) and in disposable incomes were compared. This allows estimating the extent of the compensatory effect of the already existing redistributive measures and of the measures introduced or strengthened during the crisis. The effects of the pandemic are simulated under three different scenarios which capture the increasing length of the pandemic (and related emergency policies). According to the microsimulation results, and especially according to scenario C, the pandemic has led to a relatively greater drop in market incomes for those in the poorest quantiles, but the emergency measures introduced by the Italian government have been effective in compensating the worsening of the situation in terms of distribution of income in the population. Moreover, compared with the 'no-crisis scenario', both inequality and poverty indexes largely grew in all scenarios when considering only market incomes whereas, when the compensatory in-cash social benefits were taken into account, the increase in relative poverty was much lower and income inequality even slightly decreased. This evidence clearly signals the crucial role played by in-cash social benefits to mitigate the most serious economic consequences of the pandemic on people's income.

7.1. Introduction and simulation assumptions

The empirical evidence presented in Chapters 1 to 6 of this report does not refer to the current COVID-19 pandemic crisis period because of data limitations. So, to examine the pandemic's consequences on income distribution to some extent, this final chapter looks at the evolution of the income situation in Italy (the first EU country to have seriously been hit by the pandemic as of February 2020). To this end, this chapter presents relevant findings from an ongoing research project by Gallo and Raitano (2020),[54] which are based on microsimulations and assess the consequences on the distribution of market and

[54] This chapter draws on ongoing research by Giovanni Gallo (INAPP and Sapienza University of Rome) and Michele Raitano (Sapienza University of Rome and Fondazione Giacomo Brodolini). Preliminary results of this research, which this chapter is based on, have been presented in an online seminar organised by the Italian Ministry of Economy and Finance on 9 November 2020. See Gallo and Raitano (2020) in the reference list. An updated version of this research – based on slightly different assumptions with respect to those considered in this chapter – has then been published as Gallo G. & Raitano M. (2020), 'SOS incomes: Simulated effects of COVID-19 and emergency redistributive policies on individual and household income distribution in Italy', ECINEQ Working Paper, no. 566.

disposable incomes, of the labour market shock and of the income-support emergency measures introduced by the Italian government in response to the crisis.

The analysis by Gallo and Raitano (2020) presented in this chapter pursues four main aims:
i) to simulate changes in the income distribution in Italy due to the effects of the COVID-19 pandemic crisis, by computing various income distribution indicators; ii) to estimate the compensatory effects on income distribution of the main income-support measures introduced for workers and households for dealing with this crisis; iii) to focus on both earnings distribution among workers (individual-level analysis) and income distribution among equivalised individuals (household-level analysis); and iv) to estimate the effects of the crisis on income distribution under three scenarios characterised by different durations of this crisis, all over the course of the year 2020.

Some papers have estimated the effects of the COVID-19 pandemic crisis on income distribution in Italy (Figari and Fiorio, 2020; Brunori et al., 2020; MEF, 2020), but only focusing on the short-term effects of the lockdown in March and April 2020. Because of data limitations when the research was carried out, these papers made some rough assumptions about the spread of labour market risks among Italian workers regarding, for instance, the share of workers who had to suspend their job activities because of the pandemic. The research by Gallo and Raitano (2020) extends this literature from various perspectives: i) it simulates the effect of the pandemic for the whole year 2020 (instead of for a few months only) under different scenarios; ii) it disentangles the effects of the pandemic on market incomes and on disposable incomes to capture the compensative impact of redistribution – considering both workers and households (i.e. equivalised individuals) as the units of observation; iii) it explores heterogeneous effects of the pandemic and related policies by socioeconomic characteristics of the population; and iv) simulations are based on a unique survey dataset matching IT-SILC 2017 (i.e. the Italian component of the EU-SILC) and on INPS administrative records (AD-SILC 2017, which contains information at the 6-digit ATECO level[55]), allowing researchers to identify exactly the persons working in essential versus non-essential sectors (the decrees established in the lockdown phases identified essential and non-essential workers according to the 6-digit ATECO level).

The microsimulation model is based on EU-SILC 2017 data, inflated up to 2019 through the HICP, and updated according to changes in the tax and benefit system. A specific module is included to compute the amount of the minimum income benefit (Citizenship Income, *Reddito di Cittadinanza*) received by poor households. EU-SILC 2017 data is matched with the administrative records on working spells of the individuals sampled in EU-SILC. This allows researchers to fine-tune some of the EU-SILC income data and to attribute to each worker a 6-digit NACE code corresponding to the activity sector in which they work.

The analyses are run through two different samples, according to the chosen unit of observation. The individual-level analysis concerns 19 139 individuals aged 16–65, non-retired and with a positive gross labour income. The household-level analysis is based on 48 819 equivalised individuals.

Simulations are run according to three scenarios which relate to different durations (all in the course of the year) for the COVID-19 pandemic crisis. An important caveat to note is that these scenarios were designed and conducted over the course of the year 2020 and that, thus, they examined possible durations for the pandemic that turned out, at least for scenarios A and B, to underestimate its actual duration in 2020. They should thus not be considered, at least not scenarios A and B, as an ex post analysis of the effects of the crisis for the full year 2020. Scenario A assumed (at the time) that the negative effects on

[55] The ATECO-2007 classification corresponds to the NACE-REV2 classification.

the labour market only lasted from March to May and that, afterwards, the economy would have come back to the level it would have been at if the pandemic had not occurred. In scenario B, a further reduction in the economy (from June to August) on top of that considered in scenario A was assumed (at the time). Scenario C assumed (at the time) that the pandemic would have disappeared by the end of 2020 and thus extended the negative outcome of scenario B to September and October while also adding a further two months of lockdown in November and December. Accordingly, the scenarios also assumed that the emergency income-support measures introduced in response to the crisis would have lasted respectively until May, August and December.

The microsimulation model also took into account all the tax-related and benefit-related measures which existed before the pandemic (see Box 7.1 below). Furthermore, it simulated entitlement conditions and cash social transfers resulting from the emergency measures introduced as of March 2020, i.e. stopping layoffs for the employees; the extension to all employees of the short-time work allowance (*Cassa Integrazione Guadagni* – CIG); the extension of the duration of the unemployment benefits; the payment of a monthly bonus, EUR 600 in most cases, for the self-employed and parasubordinate workers (henceforth bonus-600);[56] and the introduction of a new minimum income scheme for poor households (*Reddito di Emergenza* – REM).

Microsimulations were aligned to aggregate data delivered by national institutions in the past months. Specifically, based on official data on the spread of the CIG allowance (INPS, 2020), the following assumptions were made: 65% of employees in non-essential sectors (i.e. those stopped by the lockdown) – employees randomly selected by our model according to the sector of activity – receive the CIG during the lockdown months (i.e. March to May in all scenarios and, then, also in November and December in scenario C), while 33% of them receive this allowance in June to August in scenario B and in June to October in scenario C (no further months of CIG after the lockdown are assumed in scenario A). No CIG is received by those employed in essential industries.[57]

Finally, regarding the self-employed, the model assumes zero earnings for those working in non-essential sectors in the lockdown months (i.e. March to May in all scenarios and November to December in scenario C), while in those months the income drops to 25% for those working in essential sectors. Moreover, a further reduction of 25% of income from self-employment for both essential and non-essential self-employed is simulated in June to August in scenario B and in June to October in scenario C. In the following sections, the results for all three scenarios (A, B and C) are presented. However, the explanation provided below on these results will only be based on the comparison between pre-COVID-19 and scenario C since, unfortunately, because of the occurrence of the second COVID-19 wave in Italy from the end of October, this scenario is the most similar to the current macroeconomic situation.

[56] Parasubordinate workers are some categories formally acting as self-employed but usually working as substitutes of employees (i.e. freelance collaborators or professionals; see Raitano, 2018).

[57] Main findings do not change if an assumption of a 15% spread of CIG also occurs among those employed in essential sectors.

Box 7.1: Income support measures introduced because of the COVID-19 emergency in Italy

The Italian government introduced major income-support measures for individuals and households by two decrees: Decree no. 18/2020 issued on 17 March 2020, called '*Decreto Cura*', and Decree no. 34/2020 issued on 19 May 2020, called '*Decreto Rilancio*' (Restart Bill).

Both decrees have introduced a set of measures to protect workers against the forced stopping of work activities and the related income reduction due to lockdown measures aimed to tackle the consequences of the pandemic.

In more detail, the first set of measures concerned the extension of the short-term work allowance, i.e. the wage-compensation scheme for working-time reduction (*Cassa Integrazione* – CIG), to all dependent employees. According to the two decrees, employees have the right to receive the short-term work allowance (covering around 80% of their previous wage up to a maximum amount) for 14 weeks from 23 February to 31 August with a further 4 months which may be paid in September and October 2020. The budgetary cost of such extension of *Cassa Integrazione* amounts to around EUR 20 billion.

Furthermore, lump-sum transfers have been targeted to the various categories of parasubordinate and self-employed workers (also including seasonal workers who had already worked in 2020 before the occurrence of the pandemic). Parasubordinate workers received in March and April a EUR 600 monthly lump sum, while this amount was increased to EUR 1 000 in May for those workers who ended their working activity before 19 May. Self-employed categories included in the public social security system managed by INPS – craftsmen, merchants and agricultural workers; note that other self-employed liberal professionals[58] who have specific professional associations are not enrolled in INPS since they pay social security contributions to private pension funds managed by their association) received a EUR 600 lump sum benefit in March and benefited from measures explicitly devoted to employers and firms in the following months.

Furthermore, lump-sum benefits have also been provided to liberal professionals (e.g. lawyers, architects, accountants) who are enrolled in social security funds managed by their professional association. In detail, a EUR 600 monthly benefit was paid in March and April to all those who had earned no more than EUR 35 000 in 2019 or had earned an income between EUR 35 000 and EUR 50 000 in 2019 and suffered from at least a 33% labour income decrease in the first quarter of 2020 compared to 2019. In May, a EUR 1 000 lump-sum benefit was paid to liberal professionals who suffered from at least a 33% labour income decrease from March to April 2020 with respect to the same period in 2019.

The '*Decreto Rilancio*' also extended the lump-sum benefits to some categories of employees and atypical workers who were excluded from the measures introduced in March. A EUR 600 monthly benefit for April and May had also been paid to domestic workers and seasonal and intermittent employees who had not yet worked in 2020 and to parasubordinate workers active in 2019 but without a working arrangement on 23 February 2020.

In total, the resources assigned to the various categories of atypical, parasubordinate and self-employed workers amounted to approximately to EUR 8.5 billion. Furthermore, a two-month extension of the duration of the NASPI and DISCOLL unemployment benefits was introduced for workers whose benefit expired in March or April 2020. The budgetary cost of

[58] Liberal professionals are self-employed workers who provide a public service which requires specific intellectual skills and an official licence.

this extension is approximately EUR 614 million.

Regarding the minimum income schemes, the '*Decreto Rilancio*' introduced a new means-tested benefit, called Emergency Income (*Reddito di Emergenza* – REM). In order to be eligible for REM, a household must fulfil the following requirements:

- No household member can be a beneficiary of unemployment benefits, CIG, Citizenship Income or any of the lump-sum allowances introduced by the March and the May decrees in response to the COVID-19 emergency.
- They have to be resident in Italy (note, for comparison, that a 10-year residence is requested to be eligible for the Citizenship Income).
- The value of ISEE (the indicator of the socioeconomic status, computed taking into account household income and 20% of wealth, and equivalised through the ISEE-specific equivalence scale) must be lower than EUR 15 000.
- Equivalised household monthly income in April 2020 must be lower than EUR 400; to compute the equivalised amount for larger households a scale assigning 0.4 to adult and 0.2 to minor components over the household head is considered. The maximum amount of the equivalence scale is set at 2.0 (2.1. if there is a household member with a disability).
- Financial wealth in 2019 for a single-person household must be lower than EUR 10 000. That threshold is increased by EUR 5 000 for each household member with a maximum value equal to EUR 20 000.

The Emergency Income was originally paid for a two-month period. Its amount was equal to EUR 400 per month for a single-person household, which was increased for households of more than one person according to the equivalence scale reported above (with the maximum monthly amount for large households being EUR 800). The duration of the REM was then extended by a further three months by two decrees issued in August and November 2020. It is important to note that the Emergency Income is a fixed amount benefit, not a topping-up benefit such as the Citizenship Income, which is instead paid according to the difference between the household's income and a predefined income threshold (for instance, a single person with an income equal to EUR 399 is entitled to receive EUR 400 per month under the Emergency Income instead of receiving only EUR 1 under the Citizenship Income). The estimated budgetary cost of the Emergency Income amounts to approximately EUR 955 million.

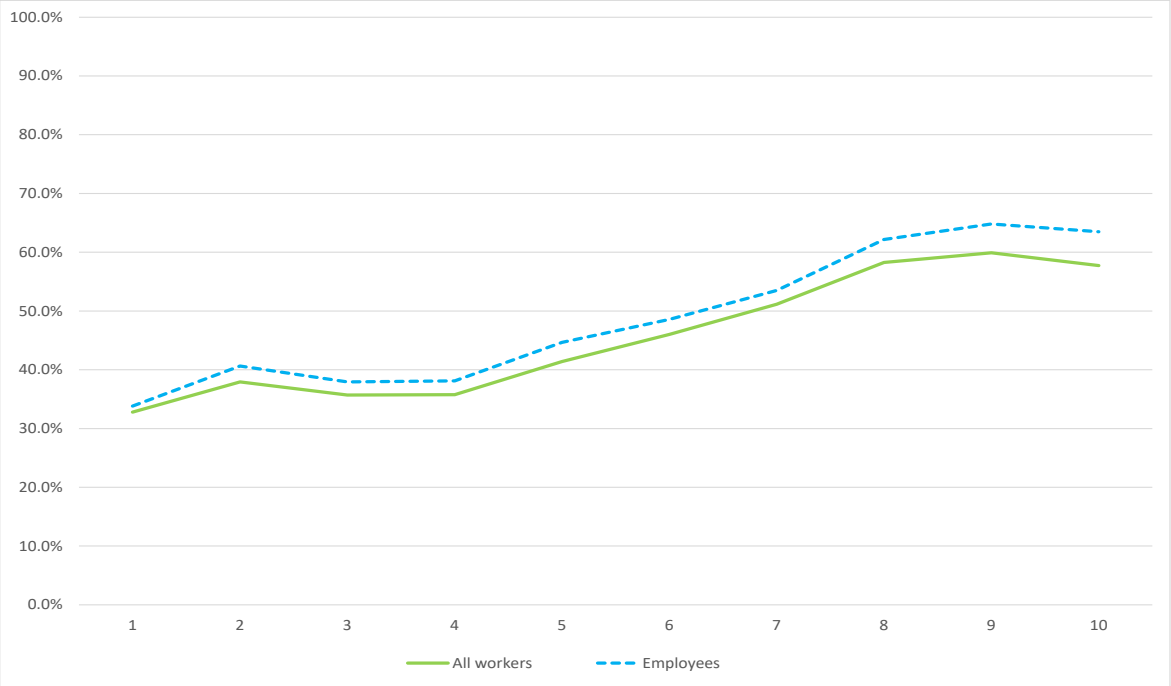
7.2. Results from the individual-level analysis

The following figures show the share of individuals employed in essential and non-essential sectors, as defined according to the 6-digit ATECO classification by the decrees which established the lockdown measures in Italy, according to workers' characteristics (Figure A7.1) and their position along the annual gross earnings distribution (Figure 7.1). Figure A7.1 shows that 54.3% of workers were hit by the lockdown measures and Figure 7.1 shows that a first disequalising effect was due to the divide between essential and non-essential workers, since those whose working activity was mandatorily interrupted by the lockdown lie more frequently in the bottom deciles of the labour income distribution.

It should be, however, noted that some firms belonging to non-essential sectors obtained a derogation to continue their activity and, furthermore, that workers who had the possibility of working from home could continue to work even if they were employed in non-essential sectors (this is the reason why, in the simulations, consistently with official data, at most, 65% of non-essential workers were considered as suspended from their job and, thus, received the CIG allowance).

Individual incomes were assessed using three income concepts: gross annual labour incomes; gross labour incomes plus gross unemployment benefits (which already existed before the COVID-19 crisis); and gross labour income plus gross unemployment benefits plus the emergency measures introduced to support workers' incomes, i.e. the extended CIG and the bonus-600.

Figure 7.1: Share of essential workers (out of the total of essential and non-essential workers in a decile) for each of the earnings deciles



(*) Green line for employees and self-employed, blue lines for employees only.

Source: Gallo and Raitano (2020)

Table 7.1 reports statistics on the change in mean incomes under the three scenarios compared with the pre-COVID-19 scenario. It also reports statistics for each of the scenarios on the size of mean emergency benefits, received by workers relative to their income loss. As explained further above, the scenarios differ according to the assumptions on the duration of the pandemic crisis over the course of the year 2020 and, thus, the mean income loss increases when moving from scenario A to scenarios B and C. As concerns scenario C, we notice that, on average, gross labour (i.e. market) incomes would have dropped by 20% with respect to the 'No-COVID' scenario, whereas the gross income loss would have been reduced to 9.1% when considering total gross income (i.e. including ordinary and emergency income-support measures for workers). The large differences in income losses observed in each of the scenarios between gross market income and gross total income thus signal the cushioning effect of the emergency income-

support measures. Furthermore, Table 7.1 also shows that in scenario C workers receive from ordinary and emergency benefits an amount equal to 12.8% of their 'after-COVID' market income, whereas the corresponding share was 1.5% before the occurrence of the pandemic.

Figure 7.2 provides first evidence of the progressive effect of the emergency benefits, since the ratio between the benefits amounts received by workers and their labour income loss – which is on average 51.3% in scenario C (Table 7.1) – is the highest for the bottom income deciles (reaching more than 225% in scenario C). This ratio then diminishes when moving up in the income deciles while remaining, however, not negligible even for the top income decile (e.g. reaching a bit less than 25% in scenario C for the top income decile). It is important to note here that, in bottom income deciles 1 and 2, the mean amount of the emergency measures exceeds the income loss since, in these bottom income deciles, many workers received the bonus-600 that was paid as a lump sum, independently from the amount of their income loss and from their previous labour income.

Table 7.1: Losses in gross market income and gross total income individual for workers and compensatory effects of public benefits

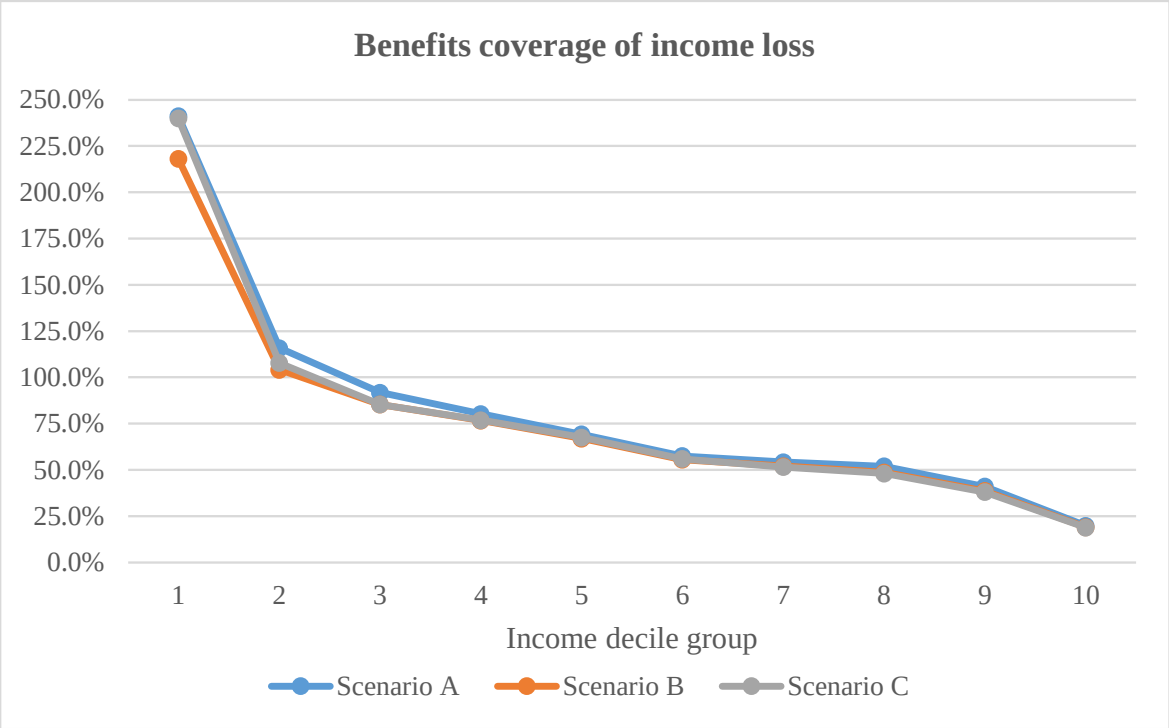
Role of public benefits and changes in mean individual income with respect to the No-Covid scenario

	Benefits/ market incomes	Benefits/ market income loss	Benefits increase wrt No-Covid	Market income loss wrt No-Covid	Total income loss wrt to No-Covid
No-Covid scenario	1.5%				
Scenario A	5.9%	-66.6%	269.1%	-8.1%	-3.4%
Scenario B	7.6%	-57.7%	358.2%	-11.6%	-5.2%
Scenario C	12.8%	-51.3%	600.2%	-20.0%	-9.1%

(*) In this table, 'wrt No-COVID' stands for 'with respect to the No-COVID scenario'.

Source: Gallo and Raitano (2020)

Figure 7.2: Ratio between the amount of the emergency benefits and the market income loss, by income deciles of pre-COVID distribution



Source: Gallo and Raitano (2020)

The analysis then focused on the incidence (i.e. rate) of low labour income among workers, following the definition of working poor according to individual labour incomes used in Chapter 1. To this aim, Gallo and Raitano (2020) defined the relative working poverty line as an amount equal to 60% of the median of individual income before the pandemic; this line is kept constant, i.e. anchored, in the various scenarios but changes according to the income concept that is considered. Table 7.2 shows the incidence of individuals below this relative working poverty line in the three scenarios. Focusing on the total gross income concept also including social benefits, we notice that the rate of the 'working poor' would have increased by 2.9 percentage points because of the COVID-19 effects (from 24.9% to 27.8% in scenario C). As well, as expected, it was mainly workers in non-essential activity sectors that would have experienced this poverty risk (working poverty rate of 34.9% for non-essential workers v 19.3% for essential workers in scenario C). Starting from a much higher level, the rate of working poverty would have increased by 4.9 p.p. for non-essential workers and by 0.4 p.p. for essential workers in scenario C compared to the no-COVID-19 scenario.

However, despite a reduction in incomes, as shown by indicators of income loss and poverty incidence, the emergency measures introduced by the Italian government have been so far able to more than mitigate the rise in earnings inequality due to the effects of the pandemic (Table 7.3). On the one hand, since non-essential workers were more at risk of both being forced to interrupt their job activity and of being relatively less paid than the essential workers (Figure 7.2), inequality in gross labour income would have highly increased because of the pandemic (the Gini on annual gross labour income would have risen from 0.399 to 0.446 in scenario C). In contrast, once emergency benefits were taken into account, inequality would have dropped in comparison to the no-COVID-19 scenario (from 0.397 to 0.388 in scenario C).

Table 7.2: Incidence (rate) of individual relative working poverty risk

Income definition	Scenario	Headcount ratio		
		Work in essential activities		Total
		No	Yes	
Gross individual labour income	Base	31.2%	20.1%	26.1%
	A	38.1%	20.6%	30.1%
	B	43.0%	21.0%	33.0%
	C	59.2%	21.8%	42.1%
Gross individual labour income plus pre COVID-19 transfers	Base	30.0%	18.9%	24.9%
	A	36.6%	19.5%	28.8%
	B	40.6%	19.9%	31.2%
	C	53.3%	20.6%	38.4%
Gross individual labour income plus pre and post COVID-19 transfers	Base	30.0%	18.9%	24.9%
	A	31.0%	18.8%	25.5%
	B	32.0%	19.3%	26.2%
	C	34.9%	19.3%	27.8%

(*) Base stands for No-COVID-19 scenario.

Source: Gallo and Raitano (2020)

Table 7.3: Gini index of inequality of individual earnings

Gross labour income	Base	0.399
	A	0.411
	B	0.417
	C	0.446
Gross labour income plus pre COVID-19 transfers	Base	0.397
	A	0.407
	B	0.412
	C	0.437
Gross labour income plus pre and post COVID-19 transfers	Base	0.397
	A	0.390
	B	0.389
	C	0.388

(*) Base stands for No-COVID 19 scenario.

Source: Gallo and Raitano (2020)

7.3. Results from the household-level analysis

The analysis then focused on equivalised individuals, i.e. computing equivalised individual income dividing household total income by the OECD equivalence scale. The analysis compared disposable income (net of taxes and gross of pre-COVID transfers, e.g. pensions and the Citizenship Income) in the 'No-COVID' scenario to the disposable income for each of the three COVID-19 scenarios for the year 2020. The disposable income in these scenarios was computed by modifying – for all surveyed households – the individual incomes in the COVID-19 scenarios shown in Section 7.2 and by adding to equivalised income the REM, the new emergency means-tested benefit paid to poor

household snot entitled to the Citizenship Income or the other individual-based emergency benefits.

Table 7.4 mirrors Table 7.1 but concerns all 'equivalised' individuals rather than workers only. Here, the income concept is the equivalised disposable income, considered either as excluding (i.e. 'pre') or as including (i.e. 'post') the emergency social benefits introduced because of the COVID-19 crisis. Without including these particular emergency social benefits, the equivalised disposable income would have decreased on average by 18.8% in scenario C. In comparison, the mean loss in the equivalised disposable income would have been limited to -6.0% in this scenario when taking into account (i.e. 'including') these emergency social benefits. On average, the emergency social benefits would have covered 55.9% of the loss in equivalised disposable income and would have represented 13% of 'the equivalised disposable income excluding the emergency social benefits'. Note that, obviously, emergency social benefits are not included in the pre-COVID-19 equivalence income.

Table 7.4: Income loss due to the pandemic and equivalised disposable income, pre- (i.e. excluding) and post- (i.e. including) emergency social benefits introduced because of the COVID-19 crisis

	Emergency measures/ Disposable income excluding emergency measures	Emergency measures/ Disposable income loss	Benefits increase wrt No-COVID	Loss in disposable income excluding emergency measures wrt No-COVID	Loss in disposable income including emergency measures wrt No-COVID
No-COVID	2.8%				
Scenario A	6.8%	-82.9%	117.4%	-7.6%	-2.1%
Scenario B	8.4%	-68.6%	156.8%	-10.9%	-3.3%
Scenario C	13.0%	-55.9%	262.0%	-18.8%	-6.0%

(*) 'Emergency measures' refers to the 'emergency social benefits introduced because of the COVID-19 crisis'

Source: Own analysis based on Gallo and Raitano (2020)

A large role of emergency measures also emerged when the share of individuals with great loss (more than 10%) in their equivalised disposable income is computed (Table 7.5). The share of individuals who would have experienced a major income loss in their equivalised disposable income would have indeed dropped, in scenario C, from 38.8% to 17.7% when the cushioning effect of the emergency social benefits introduced because of COVID-19 was taken into account. Moreover, as also shown for the workers (i.e. for labour income), the ratio between the amount of the emergency social benefits and the loss in equivalised disposable income was much higher for the bottom-income deciles than for the medium- and top-income deciles (Figure 7.3), thus showing that, despite a

large drop in mean incomes (-6.0% as shown in Table 7.4) the income support measures introduced in the pandemic have mostly helped, in relative terms, the individuals most in need.

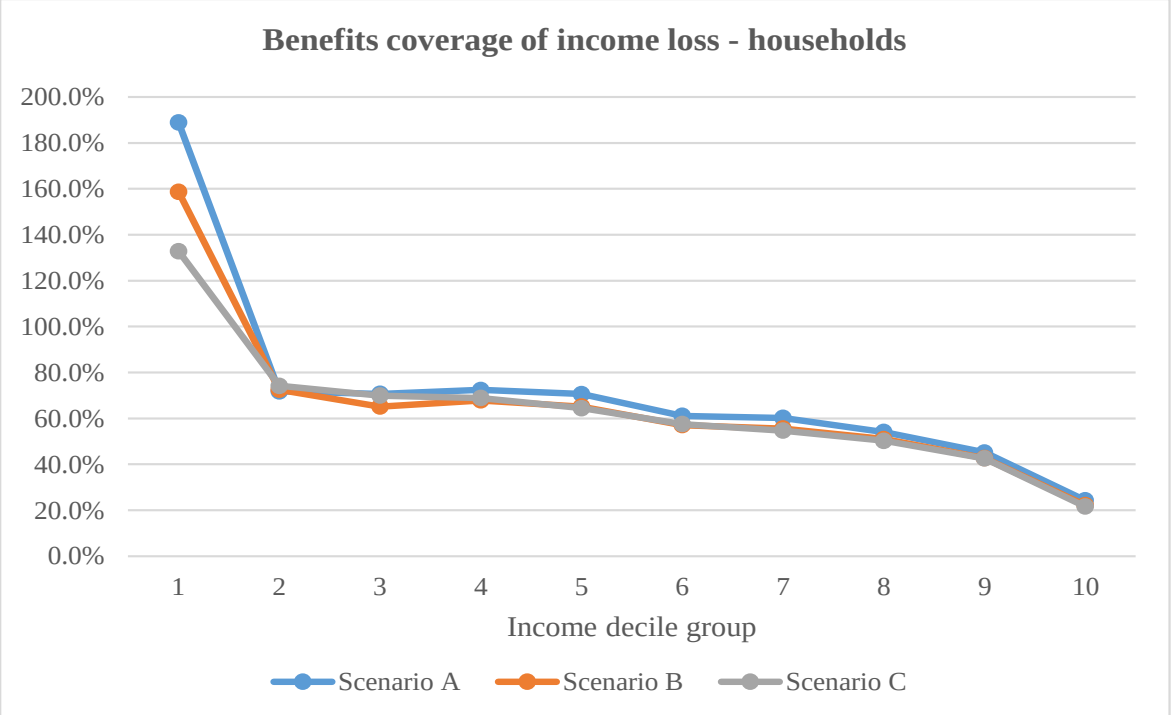
Table 7.5: Distribution of income loss due to the pandemic and equivalised disposable income, pre- (i.e. excluding) and post- (i.e. including) emergency social benefits introduced because of the COVID-19 crisis

Household equivalised disposable income (pre COVID-19 transfers)						
Loss from pandemic	Scenario A		Scenario B		Scenario C	
No loss	12,632,292	49.0%	12,078,944	46.9%	11,841,032	45.9%
Moderate loss	5,899,175	22.9%	5,278,314	20.5%	3,923,318	15.2%
Great loss	7,240,983	28.1%	8,415,192	32.7%	10,008,100	38.8%
Total	25,772,450	100.0%	25,772,450	100.0%	25,772,450	100.0%
Household equivalised disposable income (post COVID-19 transfers)						
Loss from pandemic	Scenario A		Scenario B		Scenario C	
No loss	16,543,489	64.2%	15,279,933	59.3%	15,726,727	61.0%
Moderate loss	7,700,183	29.9%	7,739,887	30.0%	5,488,729	21.3%
Great loss	1,528,778	5.9%	2,752,630	10.7%	4,556,994	17.7%
Total	25,772,450	100.0%	25,772,450	100.0%	25,772,450	100.0%

(*) Moderate loss means an income loss below 10%.

Source: Gallo and Raitano (2020)

Figure 7.3: Ratio between the amount of the emergency social benefits introduced because of the COVID-19 crisis and the loss in equivalised disposable income, by deciles of the pre-COVID-19 equivalised disposable income distribution



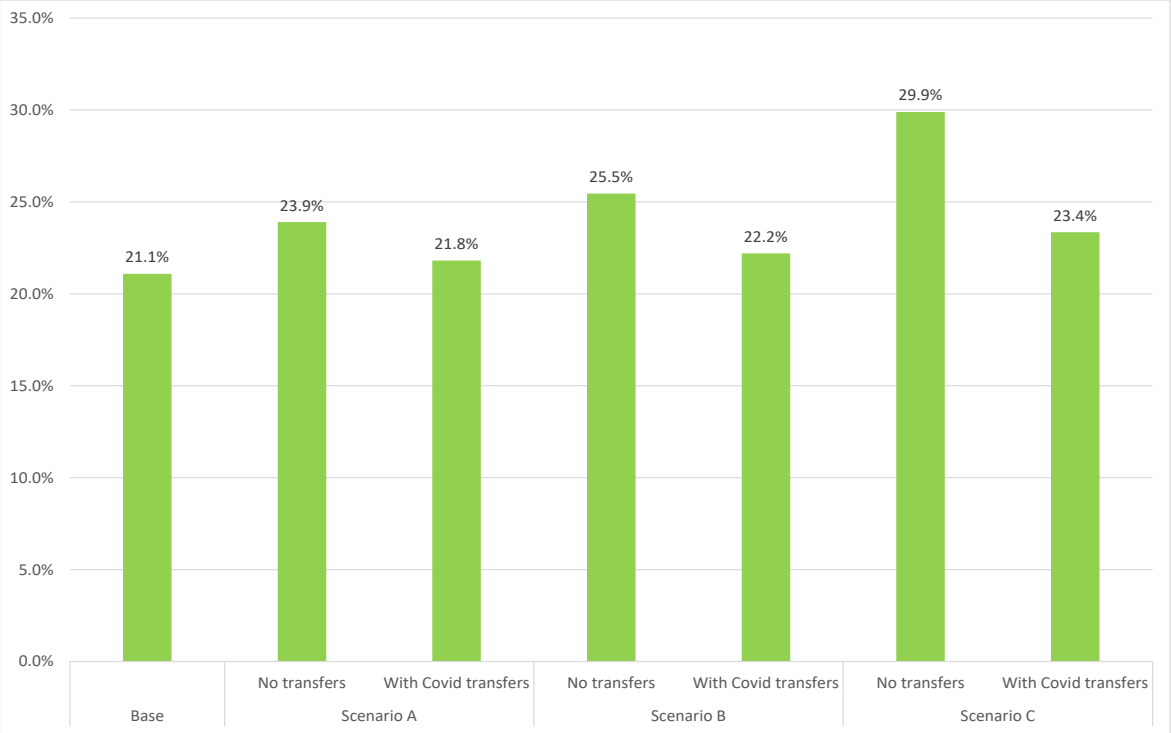
(*) Emergency benefits are not included in the definition of disposable income.

Source: Gallo and Raitano (2020).

However, the worsening of conditions for Italian households is confirmed by the rate of relative poverty (computed through the AROP index, where the poverty line is constant across scenarios and is based on the pre-COVID-19 distribution), which would have increased by 2.3 p.p. in scenario C (from 21.1% to 23.4%; see Figure 7.4) when taking into account emergency social benefits. The increase in the AROP rate, however, would have amounted to 8.8 p.p. (up to 29.9%) if the Italian government had not introduced the emergency social benefits.

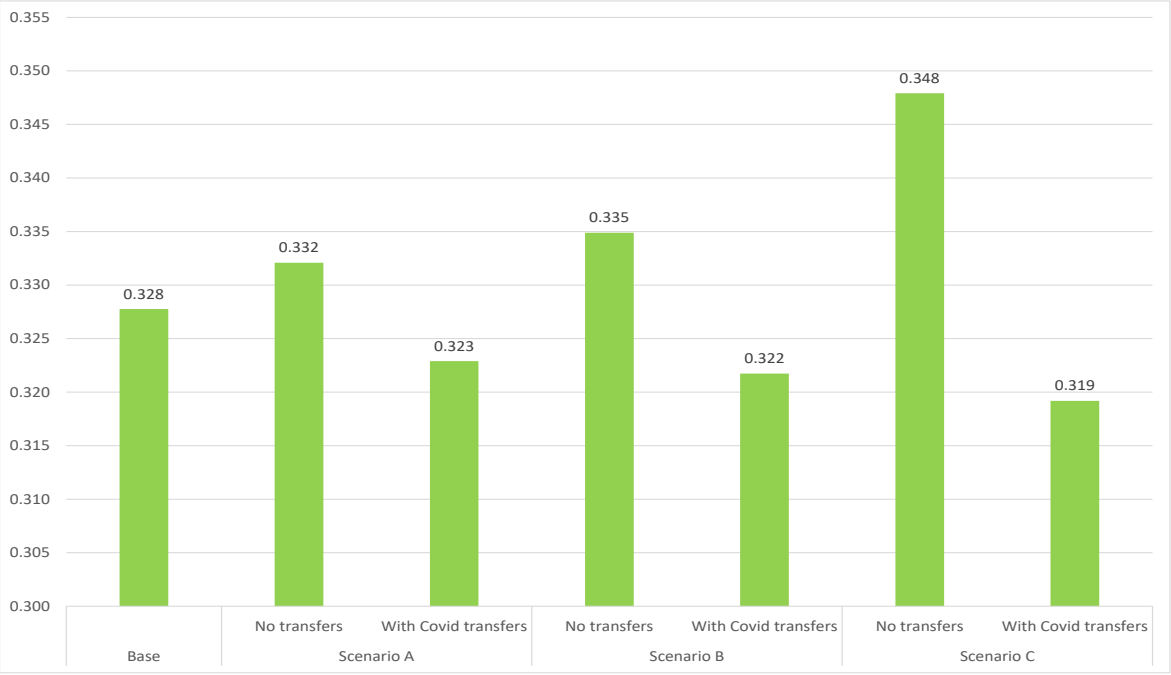
Finally, consistent with the individual-level evidence (non-equivalised income), the introduction of the emergency benefits would have contributed to slightly reduced disposable income inequality when comparing scenario C to the no-COVID-19 scenario (from 0.328 to 0.319; see Figure 7.5). Income inequality would have been highly increased (from 0.328 in the no-COVID-19 scenario to 0.348 in scenario C) if the labour market shock due to the pandemic had not been tackled by extending the CIG to all employees and introducing new income support measures for atypical workers, for the self-employed and for poor households (the measures are described in Box 7.1. above).

Figure 7.4: Incidence (rate) of AROP on equivalised disposable income (AROP rate), pre- (i.e. excluding) and post- (i.e. including) emergency social benefits introduced because of the COVID-19 crisis



Source: Gallo and Raitano (2020)

Figure 7.5: Gini index of inequality of equivalised disposable income, pre- (i.e. excluding) and post- (i.e. including) emergency social benefits introduced because of the COVID-19 crisis



Source: Gallo and Raitano (2020)

7.4. Conclusions

Using a static microsimulation model based on a link between EU-SILC 2018 data and the INPS archives, the effects of the COVID-19 pandemic in Italy in 2020 on incomes along the income distribution and on inequality and poverty indexes have been investigated in this chapter, which draws on Gallo and Raitano (2020). The analysis was carried out on individuals, i.e. by simulating changes in earnings due to the pandemic, and then on households, i.e. by observing changes in equivalised disposable incomes. For both units of observations, a comparison was made between incomes – with versus without the emergency social benefits introduced by the Italian government as of March 2020 because of the COVID-19 crisis – in order to measure these benefits' compensatory effect. The effects of the pandemic were simulated on an annual basis for the year 2020 under three different scenarios capturing an increasing length of the pandemic (and related emergency policies).

The main findings of this analysis showed that the pandemic led to a relatively greater drop in market incomes for those in the poorest income quintiles, but that the emergency measures introduced by the Italian government have been effective in attenuating the steepening of the income distribution due to the pandemic. Moreover, compared with the 'no-COVID-19-crisis scenario', the increase in the poverty rate was largely mitigated when taking into account the emergency social measures. When taking these measures into account, income inequality even slightly decreased. This evidence clearly signals the crucial role played by cash welfare transfers to mitigate the most serious economic consequences of the pandemic.

However, this chapter focused on the effects of the emergency social measures that were in force in 2020, i.e. when extraordinary income support measures as well as further measures sustaining workers' conditions (e.g. stopping layoffs of employees) were in force. Future research is needed to analyse what will happen if the layoffs are not halted and, due to budget constraints, if the Italian government reduces the generosity of emergency income-support measures, even in a macroeconomic context that is worse than before the pandemic.

Conclusions

This report provides original evidence about the relative economic conditions of the different generations in EU countries. To this end, it relies on original analyses and microsimulations meant to answer six research questions using data on individuals, differentiated by age and birth cohort and covering the effects of the economic crisis that started in 2008.

The first chapter presented pros and cons of addressing intergenerational fairness from an age perspective and a cohort perspective. It appears that the age perspective benefits from larger data availability, but that it is unfit to disentangle how much of the intergenerational gaps is due to the different phase of life at which individuals are (i.e. the age effect) or to different conditions at the same age experienced by individuals born in different years (i.e. the cohort effect). By using EU-SILC data, this chapter mainly relied on the age perspective for analysing intergenerational fairness. Yet, the pros of the cohort perspective were also clearly highlighted by using a longitudinal administrative dataset for Italy, which allowed researchers to compare individuals belonging to subsequent generations at the same phases of their working career. Among the key findings of the analysis relying on the age perspective was that it appears that workers aged 15–24 and 25–34 obtain lower labour incomes than prime-aged workers. This intergenerational income gap is reduced, yet not eliminated, thanks to tax redistribution and social transfers like unemployment benefits. This chapter also highlighted the large earnings inequalities that exist between workers of similar age and education, as well as the key role of family composition as a possible buffer against individual labour market risks (as shown by comparing the risks of being low-paid based on individual earnings to being at risk of poverty based on the equivalised income).

The second chapter highlighted the pro-elderly orientation in tax systems and social protection spending across most EU Member States, mainly driven by old-age pensions and to a much lesser extent by other non-elderly benefits and taxes. This is not surprising, considering the essential role of old-age pension systems which is to redistribute income intertemporally over the life cycle. Analyses of the between-age-group redistributive effects shows that the tax and benefit system has a rather moderate effect in reducing between-age-group inequalities. Despite some differences between EU countries, this effect even appears to have declined over time, which was driven by the decrease in the redistributive effects of old-age pensions and of non-old-age benefits. The analyses of the impact of household composition on the tax and transfer systems' redistributive effects showed that a significant part of the transfer systems' redistributive effects takes place within the household through shared living arrangements.

The third chapter analysed whether automatic stabilisers and fiscal consolidation – undertaken in certain Member States in the wake of the 2008 economic crisis – impacted upon different age groups asymmetrically and in what way. Its findings show that the distributional effect of the crisis across generations was remarkably consistent between the 27 EU countries and stable over the analysed 2007–2014 period. On average, across all EU countries, individuals in retirement age were best off after the economic crisis, while young adults (18–24 years) were the worst affected by it. The analysis reveals also that, while market incomes had already declined in the period of 2007–2009, austerity measures aggravated this negative trend between 2009 and 2011. Later on, expansionary policies inverted this trend, with an overall positive policy effect on incomes that went hand in hand with a slow recovery of the economy. Nevertheless, neither the discrete policy changes (policy effect) nor the effects of automatic stabilisers were able to significantly counteract the market income loss for young adults.

The fourth chapter assessed the impact on different generations of changes in public spending on health and education (in-kind benefits). Health spending reduces, in

particular, the financial burden of medical care or medicines for older households. Education spending appears to impact more on the households with a reference person aged 35 to 64 years old, especially through the impact of the costs of tertiary education for their children. The chapter showed also that in-kind benefits strongly decrease inequality and relative poverty. Interestingly, only a small proportion of overall inequality can be attributed to differences between age classes, with more than 95% of overall inequality being related to inequality within age subgroups. Thus, investments in in-kind benefits affect age-related differences indirectly, i.e. by reducing income differences within the specific age classes.

The fifth chapter simulated the effects of a set of seven possible fiscal-neutral policy measures which could have been introduced during the economic crisis period to support intergenerational fairness. These 7 policy measures were combined with revenue measures into 12 revenue-neutral reform scenarios, of which their respective impacts on intergenerational fairness were analysed. The main finding was that an unemployment benefit for young people – financed either by a decrease in pension indexation or by an additional tax on high-income earners – would have reduced the divergence in income growth between young adults and older generations during the economic crisis period. Among the different examined scenarios, it also appeared that a means-tested anti-poverty benefit would have been particularly suitable for strongly reducing income inequality, while benefiting the young generation, which was the generation most hit by this crisis.

The sixth chapter examined differences in political economy considerations regarding equity and fairness between the various generations, based on individuals' attitudes regarding several specific related topics. Key age-related differences are observed in attitudes towards equality (which middle-age groups are more likely to support) and towards inequality aversion (which is also more common among middle-aged individuals). The analysis conducted in this chapter appeared to be consistent with political economy explanations, according to which older-age individuals tend to perceive their standards of living as sufficient while the younger cohorts – who are more likely to be raising children – tend to believe they do not receive enough support from the government.

Finally, relying on ongoing research about Italy, the seventh chapter assessed the effects of the COVID-19 crisis on the incomes of workers and of households in 2020, and of the emergency income-support measures introduced by the Italian government because of it. The effects of the pandemic were simulated on an annual basis for the year 2020 under three different scenarios. The results show that, on average, the incomes of workers and households were significantly reduced because of the pandemic. However, the results also shows that the reduction in disposable incomes was much lower than the reduction in market incomes, thus signalling that the emergency measures introduced by the Italian government in March 2020 had a strong cushioning effect. This cushioning effect especially advantaged the poorest individuals, who have been the most at risk of stopping their working activity because they were more likely to be employed in the industries whose production was stopped by the lockdown measures.

Overall, the report contributes to a deeper understanding of intergenerational fairness, how it evolved in EU countries from the 2008 economic crisis onwards, the impacts of policies implemented after the crisis on different generations, and possible measures to support intergenerational fairness in times of crisis (and which could be implemented in future crises).

The analyses presented in this report were limited by the poor availability of data on individuals' life cycle (lifelong longitudinal data), which would have allowed researchers to compare the situations of individuals belonging to different generations at the same phase of their lives (i.e. the cohort perspective). In the absence of such lifelong longitudinal data, the assessment of policies at a single point in time for all generations might sometimes

lead to the following contradiction: while such an assessment might suggest the need to reduce income inequalities between today's old and today's young people, such a reduction may eventually, however, later impact today's young people once they turn old, by making them then worse off than they are today. Different approaches were provided in the report to contextualise and overcome this possible contradiction.

In light of some of the experimental analyses provided in this report (see the longitudinal comparisons of Italian workers' career patterns in Chapter 1), the development of a harmonised dataset at the EU level reflecting cohort-related differences – which could be, for instance, obtained by harmonising the information provided by national administrative longitudinal datasets – would look promising to enable a thorough and comprehensive understanding of intergenerational fairness in the future.

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