Early estimates of income inequalities during the 2020 pandemic

Statistics Explained

experimental
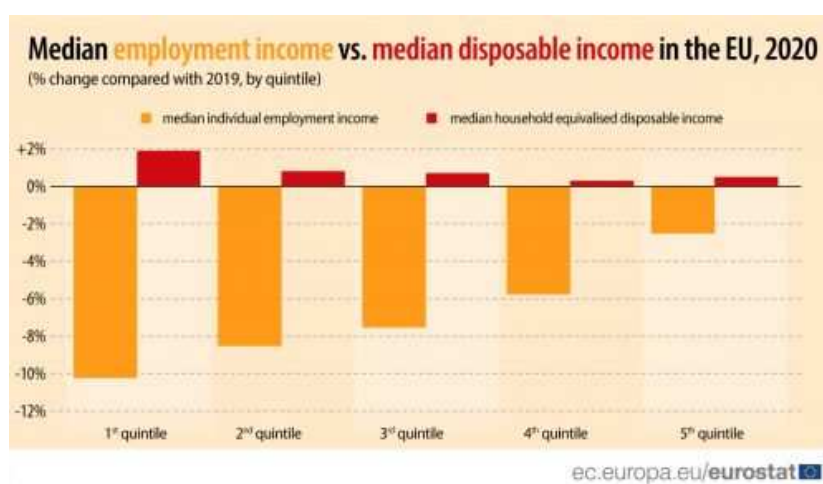
This article presents early estimates on the evolution of income inequalities and poverty in 2020. The results are based on modelling which takes into account both the impact of the labour market evolution on employment income and the effect of social protection schemes put in place by national governments.

The results refers to the yearly change 2019-2020 and are based on microsimulation[1].All figures provided are part of the experimental statistics produced by Eurostat in the frame of advanced estimates on income inequality and poverty indicators .

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[1]Social benefits and taxes are simulated via the EUROMOD tax benefit model. This is maintained, developed and managed by the Joint Research Centre (JRC) of the European Commission, in collaboration with EUROSTAT and national teams from the EU countries

Key findings

The estimated loss in median employment income[2] is around -7.2% at EU level, due mainly to the unprecedented rise in the number of workers absent from work or working reduced hours. These losses are very unequally spread between countries and particularly heavy for the most vulnerable sub-groups of the working population.

Median household income and poverty indicators are estimated to remain stable at EU level in 2020 with **heterogeneity at national level** . The model also shows that losses in earnings are alleviated to a large extent by benefits and taxes and in particular the short-term work schemes put in place by national governments to address the Covid-19 economic challenges. Still the working age population and in particular young workers (16-34) are more likely to experience increases in the at-risk-of-poverty rate.

It is important to note that there is a large heterogeneity across countries and a contrasting evolution across age groups. Flash estimates for half of the countries show a moderate increase in the At-Risk-of-Poverty rate for the working age population (18-64), which is significant in Portugal, Greece, Spain, Italy, Ireland, Slovenia, Bulgaria, Austria and Sweden. For the 65+ age group a consistent decrease is estimated, which is particularly evident in countries such as Bulgaria, Czechia, Estonia, Ireland, Cyprus and Sweden, where the indicator decreases by more than 2 percent. This effect might be due to the relative stability, or even growing trend, of pensions, which were protected against the labour shocks caused by the crisis.

All figures provided are part of the experimental statistics produced by Eurostat in the context of advanced estimates on income inequality and poverty indicators . The results refer to the yearly change 2019-2020. It is important to highlight that the uncertainty of the early estimates is particularly high in the current context and a number of caveats and model assumptions[3] should be considered. For more details see also the methodological note .

The estimates at country level throughout the paper are presented as Rounded Uncertainty Intervals (RUI). This way of communicating the estimation output takes into account the fact that the expected changes cover a possible range of values, associated with uncertainty. By not showing the actual value (the point estimate) we attempt to minimise misinterpretation and misuse due to disregarding the uncertainty of the estimate.

## Despite a sharp drop in employment income in 2020, the median disposable income remains stable at EU level

While the median employment income decreases by -7.2 % in 2020, the disposable income of the working age population remained stable at EU level (see Figure 1). The disposable income takes into account the usual government transfers and taxes as well as temporary policies implemented at national level to cope with the COVID crisis[4]. As it will be shown throughout the article, the simulated benefits related to short-term schemes put in place in the Member States have an important role in the stabilisation of wages and household income.

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[2] It includes wages and self-employment income

[3] Incomplete information and model errors for the estimation of income from work; simulation of losses and compensation schemes for self-employed; over-simulation of benefits related to compensation schemes and assumptions of full take-up of benefits; lack of information on the informal economy and workers who fell outside the safety net of the tax-benefit system.

[4] Income measured at household level is weighted in order to reflect differences in needs for households of different size or composition. The equivalisation consists of applying weights (equivalence values) to the household members. Following the OECD-modified equivalence scale, a weight of 1.0 is applied to the first member of the household aged 14 or more, 0.5 to the second and each subsequent member aged 14 or over, and 0.3 to each child aged less than 14.
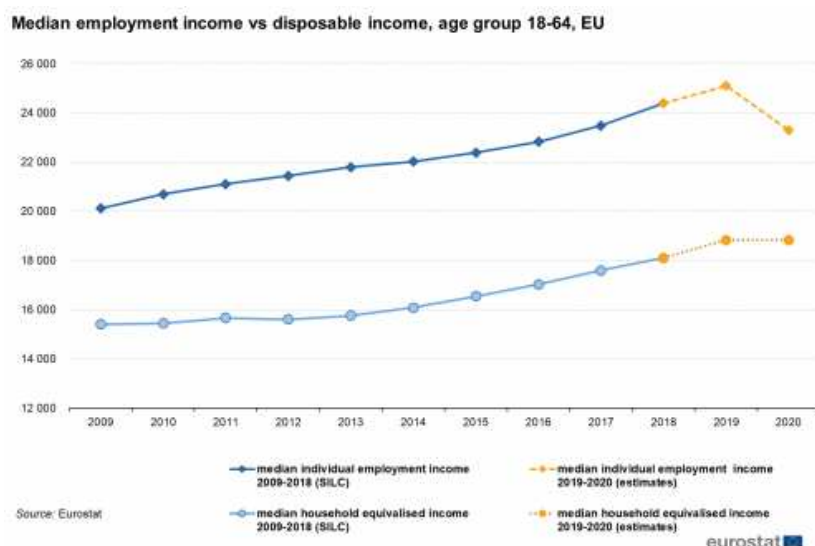
Figure 1: Median employment income vs disposable income, age group 18-64, EU Source: Eurostat

The median income for the whole population registers a slight increase (+0.7%), while a larger increase is estimated for the population aged 65+ (+1.8 %).

Figure 2 presents the expected evolution of the median disposable income by Member State. In about half the Member States (in particular for Austria, Slovenia, Czechia, Latvia, Croatia, Lithuania, Poland, and Romania) an increase is estimated for 2020. The largest decreases were observed in Cyprus, Italy, Belgium and Greece, while for the remaining Member States, the median income is estimated to remain stable compared with 2019.
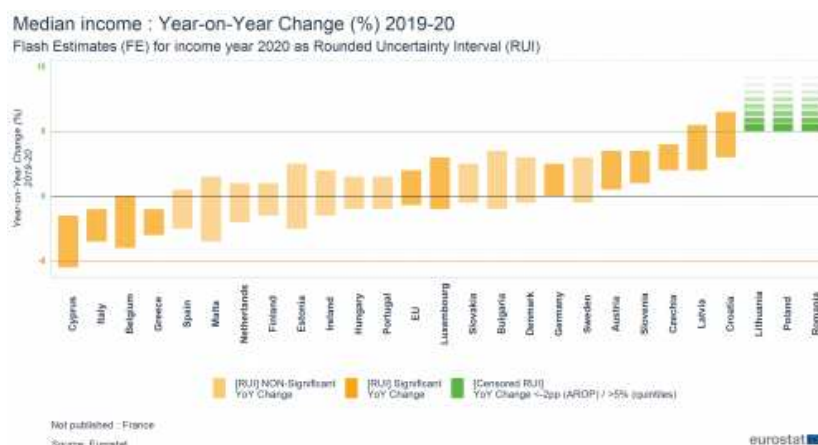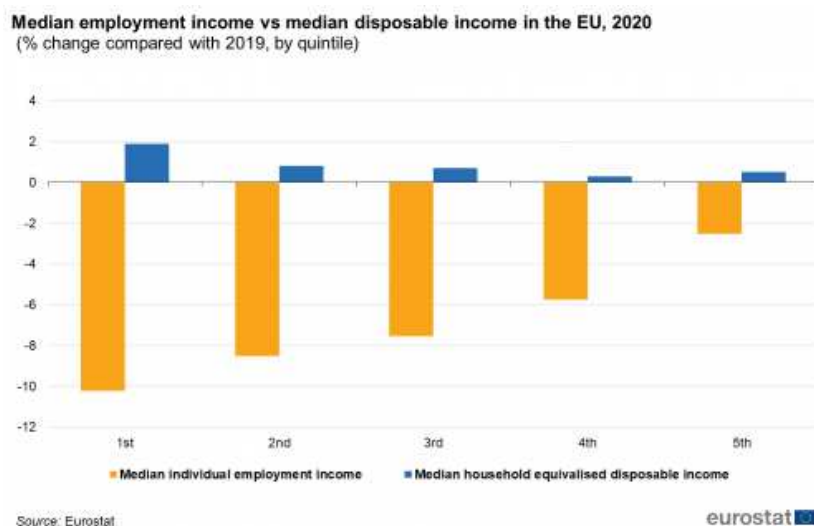

Figure 2: Median income: year on year change (%) 2019-2020 Source: Eurostat

Explanatory note: Extreme values, where the uncertainty interval is entirely beyond a certain threshold, are censored, and an open-ended interval bounded by the threshold is shown instead of the RUI, conveying the message that the changes are relatively large. For more details, see the presentation of the 2019 estimates , section 5. Communicating the FE: magnitude and direction of change using Rounded Uncertainty Interval (RUI) dissemination format.

For a more in-depth insight into the distributional effects of the crisis the Figure 3 illustrates the evolution of (median) employment income versus equalised disposable income at different points of the income distribution. Quintiles are based on people's ranking in terms of their equivalised disposable income. The evolution of the employment income shows that the lower quintiles were most affected by the crisis. The compensatory

effects of the simulated benefits are progressive with a higher increase for the left part of the income distribution.

Despite of the important effect of the crisis on the labour market, all Member States implemented labour and social policies with the purpose of limiting loss of income and preventing workers from losing their jobs. These temporary policies have been simulated via Euromod, and include actions such as wage compensation schemes, transfers from government to firms and households, lump-sum benefits, reduction or exemption in taxes.

Median employment income vs median disposable income in the EU, 2020
(% change compared with 2019, by quintile)

Source: Eurostat

eurostat

Figure 3: Median employment income vs median disposable income in the EU, 2020 (% change compared with 2019, by quintile) Source: Eurostat

Figure 4 indicates the extent to which the losses in income from work[5] have been alleviated due to the short-term schemes implemented across the EU to protect the labour market. In all EU Member States, monetary compensation for reduced working hours or lay-off has been a prime policy tool for the stabilisation of income. The second most important source for compensation of losses is the reduction of taxes. In the chart we can see the compensation share of total income losses by quintile and main components. At EU level, the overall compensation share ranges between about 70 and 85 % across quintiles. The compensation benefits follow a progressive distribution, being higher for lower incomes. Other types of benefits (e.g. pensions, minimum income schemes, children allowances) with very different patterns across countries, can explain the estimated positive change in disposable income.

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[5]It includes wages and self-employment income

Compensation share of total losses by quintile and main components, year on year change, EU, 2020
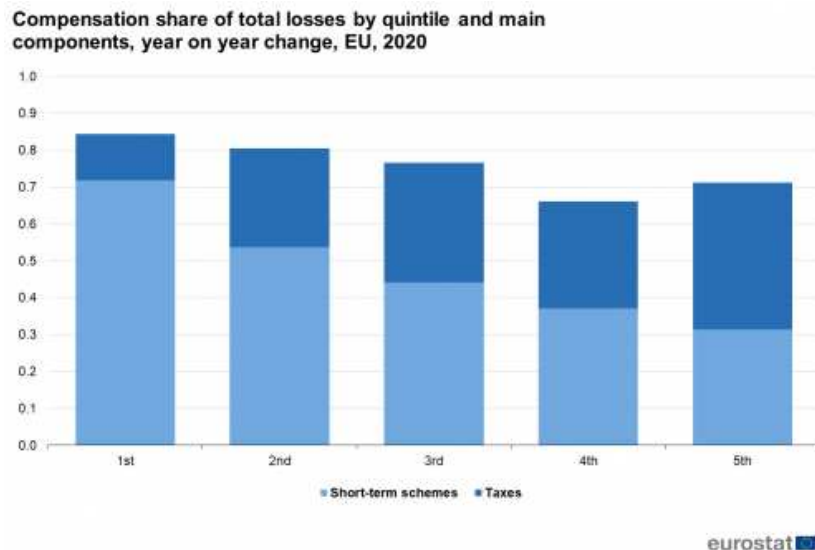
Figure 4: Compensation share of total losses by quintile and main components, year on year change, EUbr>Source: Eurostat

The following charts show the effects of the crisis on some main sub-populations, taking into account the year-on-year change in total employment income before and after the specific compensation schemes implemented by the state. These income components are calculated at individual level so further analysis can be done by specific individual characteristics.

In general, at EU level there are no substantial differences by sex in employment income. As shown in Figure 5, the decrease is similar for both male and female. The blue bars represent the total losses in employment income after the implementation of the compensation schemes. This shows the extent to which the total losses in income from work have been reduced due to short-term schemes or other types of temporary measure implemented across EU countries to protect the labour market. We see an attenuation in losses, which is similar in both groups.

Year on year change by gender, EU, 2020 versus 2019
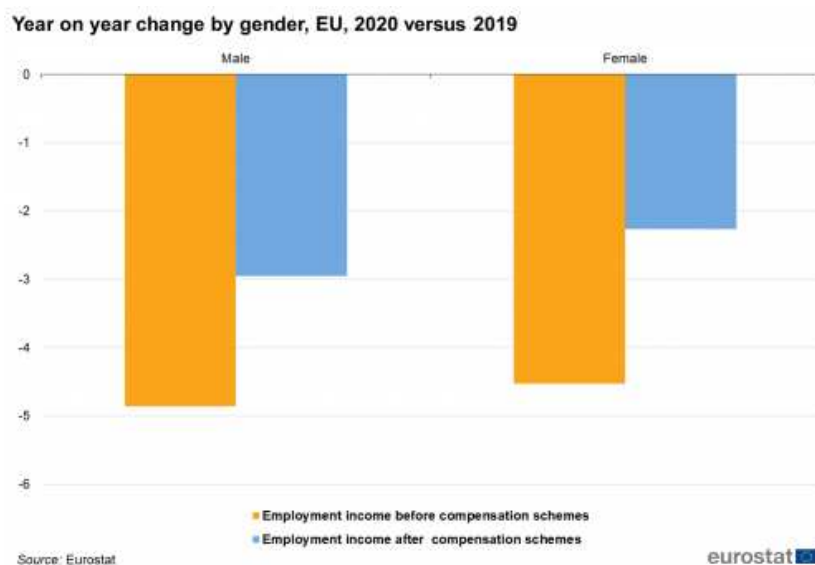
Figure 5: Year on year change by gender, EU, 2020 versus 2019 Source: Eurostat

On the contrary, greater inequalities are estimated across age groups. From Figure 6 we can see that younger workers (16-34) suffered higher employment income losses. In twenty EU Member States, this young age group experienced higher losses in employment income, ranging from -15 % to -2 % compared with 2019. However,

actions implemented in all the Member States to help their workers are estimated also in this case to have reduced the losses.
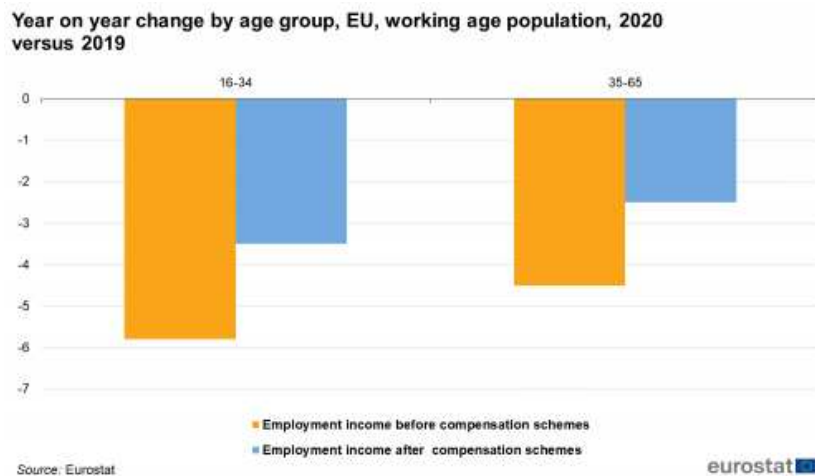
Figure 6: Year on year change by age group, EU, working age population, 2020 versus 2019 Source: Eurostat

We also note large differences across Member States, with the largest reductions in income from employment for Malta, Croatia, Italy, Cyprus and Greece. The employment income losses after compensation schemes (but before taxes) are less pronounced with only eight Member States having losses higher than -5 %.
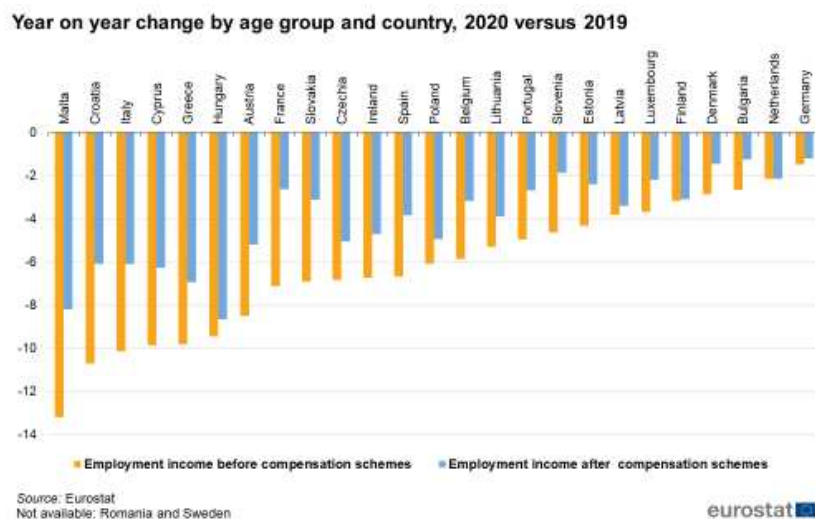
Figure 7: Year on year change by age group and country, 2020 versus 2019 Source: Eurostat

Poverty remains stable at EU level, with a high heterogeneity across countries and different segments of the population

Despite the heterogeneous situation across Member States, at the aggregate level we observe a steady evolution in income poverty, measured by the at-risk-of-poverty rate. As shown in Figure 8, the change in the at-risk-of-poverty rate is estimated to remain stable in 2020.

Figure 8: At risk of poverty (AROP) evolution, EU27, 2004-2020 Source: Eurostat

Figure 9 represents the at-risk-of-poverty rate at country level. About half the Member States do not show particular differences compared with 2019. A statistically significant increase is estimated for Member States such as Spain, Croatia, Italy, Slovenia and Greece while for the other Member States decrease in income poverty can be observed. A deeper analysis of different sub-groups shows substantially different patterns across age groups.
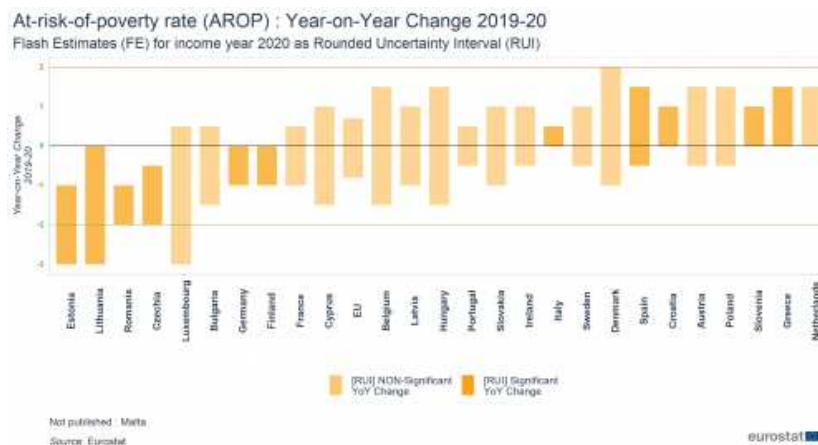

Figure 9: At-risk-of-poverty rate (AROP) Source: Eurostat (educ_ilang)

At-risk-of-poverty rate by age group shows contrasting changes

Figure 10 shows the at-risk-of-poverty rate evolution for SILC (2004-2018) and flash estimates (2019-2020), with the age breakdown in three classes.
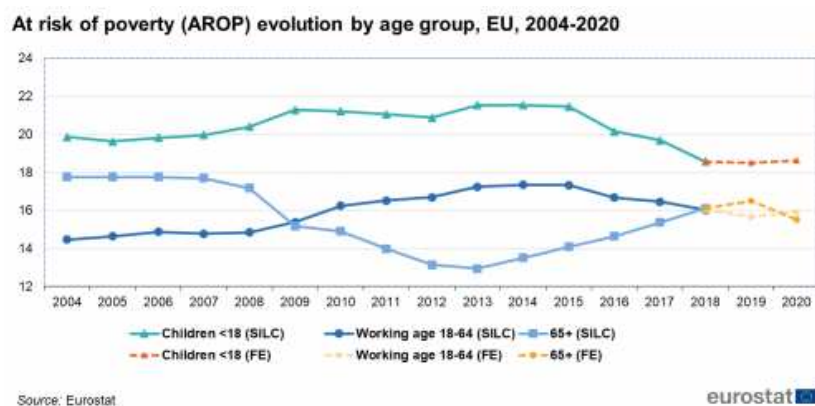

Figure 10: At risk of poverty (AROP) evolution by age group, EU, 2004-2020 Source: Eurostat

While the overall risk of poverty is likely to remain stable in 2020, the age breakdowns highlight more differences: while working age poverty is at some extent stable, there is a significant decrease in the at-risk-of-poverty rate for age group 65+ during the crisis. The evolution during the 2008 crisis showed a similar pattern across age groups. Concerning the working age population (18-64), the at-risk-of-poverty rate shows an increase for about half of the Member States, which is significant in Portugal, Greece, Spain, Italy, Ireland, Slovenia, Bulgaria, Austria and Sweden (see Figure 11).

Concerning the working age population (18-64), the at-risk-of-poverty rate shows a moderate increase for about half of the Member States, which is significant in Portugal, Greece, Spain, Italy, Ireland, Slovenia, Bulgaria, Austria and Sweden (see Figure 11). The evolution of at-risk-of-poverty illustrated in the chart below is measured in relation to the poverty threshold of 2020. Therefore, in the current context it is important to read the evolution of the at-risk-of-poverty rate with that of the poverty threshold . As noted in Figure 2, in Member States such as Italy, Belgium, Spain, Greece and Cyprus the median is estimated to have a significant decrease. This translates for these Member States into a lower poverty threshold in 2020 and therefore, the at-risk-of-poverty rate is more pronounced if we take the 2019 threshold as reference.

Figure 11: At-risk-of-povery (AROP) age group 16-64 Source: Eurostat

It should be noted that the ways in which policies have been implemented in the Member States to limit the impact of the crisis, have an effect on the inequality indicators. Specifically, in Member States such as Luxembourg, Lithuania, or Germany, some compensation schemes have been put in place with specific conditions for households with children. For instance, in some cases the wage compensation rate for reduced worked hours was higher for employees with dependent children; additionally lump-sum child benefit were foreseen in some COVID related policy packages. The effect of such measures is visible for the aforementioned countries, for which the at-risk-of-poverty rate for the age group <18 shows a decrease (see Figure 12).

Figure 12: At-risk-of-poverty (AROP) age group <18 Source: Eurostat

For the 65+ age group a more steady decrease in the at-risk-of-poverty rate is estimated, which is particularly evident in Member States such as Bulgaria, Czechia, Estonia, Ireland, Cyprus and Sweden (see Figure 13). This effect may be due to the relative stability, or, for several countries, to a growing trend in pensions, which were thus protected against the labour shock due to the crisis.

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Figure 13: At-risk-of-poverty (AROP) age group 65+ Source: Eurostat

Source data for tables and graphs

- Download Excel file

Data sources

The data used in this report is based on Eurostat estimations. For microsimulation, the information set that was entered includes the EUROMOD microsimulation model combined with the latest EU-SILC users' database (UDB) microdata file and/or national SILC microdata available at the time of production. This is enhanced with the latest information on labour from the reference period (2020) – the quarter 2 Labour Force Survey (LFS).

EU-SILC further information

- Income, social inclusion and living conditions
- EU statistics on income and living conditions (EU-SILC) methodology

EUROMOD , the European Union tax-benefit microsimulation model, is maintained, developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex and the Joint Research Centre (JRC) in the European Commission, in collaboration with national teams from the EU Member States.

EU-LFS further information For more in-depth information on EU Labour Force statistics in 2020 that were used in our estimations please consult the below links:

- Employment and unemployment (Labour Force Survey) (employ)
- Absences from work
- Labour market transitions

Context

In the current extraordinary context of the Covid-19 pandemic and the related lockdown, it becomes essential to provide earlier information to enable policy makers to assess the first effects on the income distribution in 2020.

All figures provided are part of the experimental statistics produced by Eurostat in the context of advanced estimates on income inequality and poverty indicators . This is the third article that assesses the effects of Covid-19 on income distribution, now including the labour market impact and also the effects of policy measures put in place by governments in order to support households' income and workers most affected by the pandemic.

See also

- Impact of COVID-19 on employment income: advanced estimates
- COVID-19 labour effects across the income distribution
- Flash estimates of income inequalities and poverty indicators for 2019 (FE 2019)

Main tables

- Data in 2020 income estimates

Dedicated section

Experimental statistics on income inequality and poverty indicators

Methodology

Nowcasting methodology in the context of COVID-19

EUROSTAT usually release the flash estimates on the yearly change of the income indicators year N in July/September year N+1. An important advantage of the current methodology of nowcasting is that it incorporates in the simulation detailed microdata on the two main impacting factors:

1. **the effects on the labour market** and particular workers at risk due to the COVID-19 economic shutdown and the reduction of economic activity. Employment income evolution is modelled by Eurostat based on detailed distributional information on the loss of jobs and short-term work schemes from the Labour Force Survey and administrative data collected by Eurostat on the number of beneficiaries of different wage compensation schemes.

2. **the impact of temporary policy measures** introduced in different countries in order to support households' income and workers affected by the COVID-19 economic shutdown. Government transfers are simulated via the EUROMOD tax benefit[6]model , which takes into account the most recent policy changes introduced during the pandemic.

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[6]EUROMOD is a tax-benefit microsimulation model for the European Union and UK that enables researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each country and for the EU as a whole. The implementation of policies is coordinated by the Joint Research Center and national teams.

The update of labour in the standard flash estimates methodology is either based on reweighting or labour transitions at individual level. For the analysis of the COVID-19 effects in 2020, this methodology was modified in order to take into account specific factors to the current crisis.

The first choice was to rely exclusively on individual labour transitions, a methodology preferred in the case of a labour market shock.

Secondly, the information on the labour markets entering the model was extended to include not only transitions into/out of employment, but also workers in some types of partial employment. In the latter category, there are workers who are still employed, but absent or have reduced working hours due to the lockdown. These are often covered by short-time work schemes or similar measures (e.g. partial or temporary unemployment schemes, furlough) put in place or activated by the government in order to preserve jobs across the EU.

Thirdly, we considered it is particularly important to capture infra-annual movements in addition to people undergoing double transitions: e.g. people under temporary schemes, then afterwards becoming unemployed. The individual goes through quarterly transitions and the information is cumulated in a variable that summarises the estimated number of month in employment and/or absence.

Finally, these overall trends are translated in distributional information by assessing the risk of individuals to either lose their job (1) or have reduced working time in quarter 2 (2). We model these probabilities via a logistic regression at individual level for all countries. The main impacting factors used in the model are age group, sex, economic sector, occupation and type of contract (temporary vs permanent). Probabilities are finally imputed in the baseline SILC file using the common labour and demographic characteristics. The baseline SILC file used for this risk analysis has income and labour variables updated to 2019 (the same microdata file used for the flash estimates 2019). The labour information is then updated from 2019 to 2020 based on the aforementioned probabilities. This allows "to distribute" the labour risks for workers and households on different parts of the income distribution.

The update of policies is done via EUROMOD version I3.0+, the European Union tax-benefit microsimulation model, originally maintained, developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex, since 2021 maintained, developend and managed by the Joint Research Centre (JRC) of the European Commission, in collaboration with EUROSTAT and national teams from the EU Member States.

EUROMOD is used to analyse changes in the income distribution within the period of analysis. In the current context, EUROMOD contains most of the discretionary policy measures exceptionally introduced or activated by national government to address the COVID-19 economic challenges, in particular, policies to preserve jobs (wage compensation schemes) and the income support to self-employed.

More detailed information on EUROMOD and its applications is available here[7].

It is also important to note that while this study is still based in broad terms on microsimulation, the standard nowcasting methodology is redeployed in the COVID-19 context based on a series of adaptations and model assumptions. Thus, the level of uncertainty is higher than for standard flash estimates. Data presented should be interpreted in terms of general trends and magnitude and precise figures should not be over-emphasised.

For more details please see here .

Visualisations

- Country profiles

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[7]H. Sutherland and F. Figari, EUROMOD: the European Union tax-benefit microsimulation model. International Journal of Microsimulation, (2013), 6(1), 4-26

External links

EUROMOD Tax-benefit microsimulation model for the European Union

Notes