I. Assessing the cushioning role of tax-benefit systems on households' income in the euro area during the COVID-19 pandemic: a microsimulation analysis

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Abstract: This section analyses the extent to which the tax-benefit systems of the euro area countries have protected household incomes during the COVID-19 pandemic. We make use of EUROMOD, the EU tax-benefit microsimulation model. Detailed aggregate labour market statistics combined with a novel approach to simulate transitions from work into monetary compensation schemes (short-time work schemes, as well as compensation schemes for self-employed) and into unemployment allows us to replicate the labour market conditions observed in the COVID-19 crisis in 2020. The analysis focuses on the role of existing and newly implemented tax-benefit instruments directly affecting household income. These policies include short-term work schemes paid directly to workers and subsidies paid to firms if their amount covers directly part of workers' salaries. The analysis is limited to the effects of the tax-benefit systems on household income and partially disregards behavioural responses and macro-feedbacks, since we only account for the observed changes on the labour market. We find that most of the euro area countries experienced a significant drop in market incomes, with poorer households hit the hardest. However, our findings also suggest that the tax-benefit systems of those countries have been able to absorb a significant share of the COVID-19 shock, offsetting its regressive nature on market incomes. Monetary compensation schemes implemented by euro area countries, often supported by the European instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE), played a key role in cushioning the fall in household income during the crisis ([1]).

I.1. Introduction

The COVID-19 pandemic hit Europe severely in 2020, leading to a large reduction in GDP across all euro area (EA) countries. Households faced an increased risk of unemployment due to lockdown measures and a general reduction in economic activity. Governments tried to withstand the crisis with various policy measures in support of household income. In particular, monetary compensation schemes (short-time work schemes, as well as schemes for the self-employed) compensated employees and the self-employed for the reduction in their economic activity and played a major role in stabilising household incomes and demand, also allowing for a smoother return to economic activity for workers and firms. In this context, the European instrument for temporary Support to mitigate Unemployment Risks in an Emergency (SURE) played a significant role in providing financial assistance to a number Member States, facilitating the implementation of measures to protect workers against the risk of jobs and income loss ([2]).

All this raises the question to what extent have the tax-benefit systems of the EA countries protected and stabilised household incomes during the COVID-19 pandemic?

Both macro- and micro-based approaches are traditionally used to assess the stabilisation properties of tax-benefit systems ([3]). The former employs macroeconomic models to quantify the stabilisation effect of fiscal policy on GDP. Macro-based stabilisation coefficients have the significant advantage of embedding both the direct and indirect (second round) effects of fiscal policy, including behavioural response and macroeconomic feedbacks. On the other hand, macro-based estimates often require a high degree of simplification in the modelling of the fiscal policy rules in place in a certain country and allow

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([2]) For a summary of the use of SURE financial assistance up to late May 2021 and early evidence of its impact, see for instance McDonnell, C. (2021), 'The SURE instrument – key *features and first assessment', Quarterly* Report on the Euro Area, Vol. 20, No. 2, pp. 41-49.

([3]) For an overview on macro-based approaches on the impact of COVID-19, see the Quarterly Report on the Euro Area (QREA), Vol. 20, No. 2 (2021).

for limited distributional analysis. The microeconomic approach typically employs microsimulation models to quantify the stabilisation properties of tax-benefit instruments. This approach allows for a detailed representation of the tax-benefit rules in place in a certain country, including recent policy reforms, and it produces reliable estimates of the cushioning effect of the tax-benefit systems along various dimensions, e.g. the whole income distribution. As a drawback, in its basic form the microeconomic approach disregards second round effects, focusing on the "day after" effect of shocks or policy reforms [4].

In this analysis, we provide a micro-based assessment of the cushioning effect of EA tax-benefit systems on household income in the context of the COVID-19 pandemic. The reasons for the choice of a micro-approach are twofold: first, the importance of distributional considerations when assessing the shock absorption properties of tax-benefit systems; second, the possibility to simulate with a high level of precision the characteristics of tax-benefit systems in EA countries, including the policy responses to the pandemic.

This work makes use of the EU microsimulation model EUROMOD and survey data from the 2018 EU Statistics on Income and Living Conditions (EU-SILC) [5]. The study employs nowcasting techniques to replicate the labour market conditions of 2020 in the underlying EU-SILC data [6], including transitions from work into unemployment and into monetary compensation schemes (e.g., short-term work schemes, monetary support for the self-employed) (see Box I.1 for more details). Then, the analysis compares two alternatives scenarios for the year 2020. The *2020 Baseline scenario* reflects 2020 policies but is based on the labour market characteristics before the COVID-19 pandemic (from the EU-SILC 2018 data) and therefore excludes the massive negative effect of the crisis on employment and income. The *2020 with COVID scenario* takes into account the labour market transitions related to the COVID-19 pandemic [7]. Intuitively, the analysis evaluates the budgetary and distributional effects of the labour market changes caused by the COVID-19 pandemic at constant policies [8]. Differences in market income provide an assessment of the impact of the COVID-19 crisis on earnings. Changes in the various components of disposable income are informative of the shock absorption properties of the tax-benefit systems.

We present results for each EA country and for the EA as a whole, with a specific focus on the stabilisation effect offered by monetary compensation schemes to households' income. The study focuses on the role of existing and newly implemented tax-benefit instruments directly affecting individual incomes. These policies include short-term work schemes paid directly to workers (both, employed and self-employed) and subsidies to firms if their amount covers directly part of workers' salaries [9]. The analysis is limited to the

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[4] In addition to the macro- and micro-based approaches, Mohl et al. (2019) also describe the statistical approach for the computation of automatic stabilisation coefficients. The approach is used in fiscal surveillance and focuses on the extent to which the government budget balance responds to a change in GDP. In particular, automatic stabilisers are identifies as the cyclical components of the government budget balance. Although relevant, this concept is only partially related to the stabilising effect of fiscal policy on household incomes. For further details see Mohl, P., Mourre, G and K. Stovicek (2019), 'Automatic Fiscal Stabilisers in the EU: Size & Effectiveness', *Economic Brief* 042, European Commission, Directorate-General for Economic and Financial Affairs.

[5] EUROMOD is a tax benefit calculator that allow the simulation of tax liabilities and benefit entitlements for private households in each EU Member State. The model is maintained and developed at the Joint Research Centre of the European Commission in collaboration with EUROSTAT and a network of national teams. EU-SILC survey microdata contain information on income and socio-demographic circumstances for representative samples of private households in EU Member States. The use of EUROMOD in combination with EU SILC microdata maximises the consistency and the cross-country comparability of the EUROMOD simulations.

[6] The 2018 EU-SILC data used in the simulations were the latest available data in EUROMOD at the time of the analysis and had to be nowcasted to 2020.

[7] Both transitions, from employment to monetary compensation schemes, as well as from employment to unemployment are simulated in this scenario. The number of transitions simulated is based on statistics available at different level of socio-economic aggregation in each EA Member State. Transitions into monetary compensation schemes is available by sector of activity in most cases. Transition into unemployment is usually available by gender.

[8] The evaluation is performed at constant 2020 policies, hence including the policies implemented in response to the pandemic. The analysis does not build counterfactual labour market scenarios in absence of a policy response to COVID-19. In the baseline scenario no worker is assumed to be receiving COVID-19 related short term work schemes.

[9] EUROMOD scope of simulations is limited to households and, as a rule, subsidies to firms are not simulated. In this sense, firm subsidies whose amount is linked to a loss in turnover are not simulated because of lack of information in our data. Nevertheless, the model simulates as benefits received by the workers those subsidies paid to firms to cover a defined share of salaries of workers. The reason is that in this case the subsidy would be directly and univocally aimed at cushioning the effect of

Table I.1: **Change in market and disposable incomes, 2020 Baseline vs 2020 with COVID-19 (%) − EA countries**

	Market income change (%)						Disposable income change (%)					
	Q1	Q2	Q3	Q4	Q5	TOTAL	Q1	Q2	Q3	Q4	Q5	TOTAL
AT	-12.3	-11.3	-9.6	-9.7	-7.4	-8.9	-1.1	-2.3	-2.1	-2.6	-2.6	-2.3
BE	-8.9	-8.7	-6.7	-7	-6.8	-7.1	-0.1	-0.5	-0.8	-1.4	-2.4	-1.3
CY	-11	-9	-8.8	-7.9	-5.9	-7.5	-1.3	-1.9	-2.8	-2.6	-2.2	-2.3
DE	-4.3	-4.8	-4.5	-4.2	-3.6	-4	-0.6	-0.7	-0.9	-1	-1.3	-1
EE	-7.2	-7.7	-6.1	-5.5	-5.9	-6	-0.2	-1.2	-1.7	-1.9	-3	-2
EL	-14.6	-14.2	-14	-13.4	-14.4	-14.1	-0.1	-2.2	-2.8	-4.1	-7.5	-4.7
ES	-13.3	-11.2	-10.1	-8.9	-6.9	-8.6	-0.5	-1.5	-2.3	-2.6	-3.3	-2.5
FI	-3.1	-1.5	-1.8	-1.4	-1.3	-1.5	0	0	-0.4	-0.4	-0.6	-0.4
FR	-5.9	-4.7	-4.4	-4.5	-3.8	-4.2	1.2	0.5	-0.5	-1	-1.3	-0.6
IE	-21	-26.9	-23.5	-20.3	-18.2	-20	-1.2	-2.4	-4.7	-6.2	-9.6	-6.4
IT	-8.5	-7.9	-7.1	-7.1	-7.1	-7.2	-1.1	-1.5	-1.7	-2.1	-3	-2.2
LT	-6.6	-7.2	-6.5	-5.4	-5.4	-5.7	0.6	0.1	-0.4	-0.4	-2.1	-0.9
LU	-15	-13.5	-10.1	-8.7	-8.3	-9.7	-0.1	-1.2	-0.9	-1.3	-2.5	-1.5
LV	-3	-3.3	-2.9	-2.4	-2.5	-2.6	-0.1	-0.3	-0.2	-0.4	-1	-0.6
MT	-18.2	-20.3	-16.9	-14	-12.9	-14.7	1.1	-2.4	-4	-4.8	-7.4	-4.7
NL	-0.7	-0.8	-0.6	-1.1	-1.2	-1	-0.2	-0.3	-0.4	-0.6	-1	-0.6
PT	-6.4	-5.5	-5.4	-5.1	-6.1	-5.7	-0.9	-1	-1.2	-1.5	-2.4	-1.7
SI	-6.7	-5.7	-5.8	-6.3	-4.8	-5.6	0	-0.4	-0.9	-1.4	-1.3	-1
SK	-6	-3.9	-4.1	-4.1	-3.6	-4	-0.6	-0.1	-0.6	-0.7	-0.9	-0.6
EA	-6.5	-6.2	-5.7	-5.6	-5	-5.4	-0.2	-0.7	-1.2	-1.5	-2.1	-1.4

(1) Quintile groups defined in the baseline scenario.
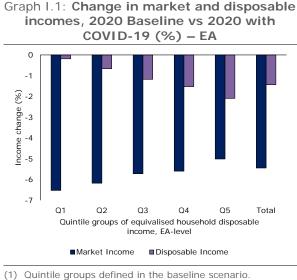*Source:* Authors' calculation using EUROMOD I3.0+

effects of the tax-benefit systems on household income and disregards behavioural responses and macro-feedbacks. For more detailed information on data, methodology and results we refer to Christl et al. (2021), on which this section relies (10).

I.2. The impact of the COVID-19 crisis on household incomes in 2020

First, we analyse the impact of the COVID crisis on household incomes, distinguishing between rich and poor households by separating the effect by income quintile groups. Graph I.1 reports the percentage changes in market and disposable incomes in the EA by quintile groups and for the entire population (11). It shows that market income dropped in total by more than 5.4% in 2020 at the EA level because of the COVID-19 pandemic.

The reduction in market income was regressive (the earnings loss share decreases with rising income), with the poorest quintile experiencing a reduction of more than 6.5% against a 5.0% decrease for the richest quintile. The drop in

disposable income was significantly smaller than the drop in market income (1.4%) and the reduction indicates a progressive pattern, with the poorest quintile losing around 0.2% of disposable income against 2.1% loss for the richest quintile.

Graph I.1: **Change in market and disposable incomes, 2020 Baseline vs 2020 with COVID-19 (%) − EA**

(1) Quintile groups defined in the baseline scenario.
Source: Authors' calculation using EUROMOD I3.0+

These results highlight that tax-benefit systems − comprising the sum of automatic stabilisers and additional policy measures that were introduced during the COVID-19 crisis − were able to partly offset the strong income losses related to the crisis in the EA. This cushioning effect of policy measures seems to be especially strong for low-income households.

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the reduction in economic activity, as it is the case when benefits are directly paid by governments as benefits.

(10) Christl M., De Poli, S., Figari, F., Hufkens, T., Leventi, C., Papini, A. and A. Tumino (2021), 'The cushioning effect of fiscal policy in the EU during the COVID-19 pandemic', *JRC Working Paper on Taxation and Structural Reforms* 2/2021.

(11) The EA-level indicators are built by aggregating at the EA level the raw changes in market (disposable) income and dividing for the aggregated market (disposable) income in the baseline system. The EA indicators by quintile are built using the same logic but aggregating market (disposable) incomes by quintile.

Table I.1 reports the percentage changes in market and disposable incomes for each EA country and the EA as a whole in 2020. Market income dropped in all the countries. Ireland experienced the highest reduction in total market income (-20%), and the Netherlands experienced the smallest (-1%). The high value for Ireland is related to the high share of the workforce experiencing unemployment spells (18%) as well as to transitions to short-term work schemes for employees (12.8% of employees) and the (uncompensated) reduction in self-employment activity (29.8% of the self-employed). The low value for the Netherlands is caused by two circumstances. First, the government paid all employers a subsidy for continuing to pay 100% of wages (in case they suffered a loss in turnover). In this sense, there is no loss in market income associated with the transition from employment to short-term work [12]. Second, there was only a small number of transitions from work into unemployment (0.77%).

The reduction in market income usually shows a regressive pattern, with earning losses in the lower part of the income distribution being larger than those in the upper part. The pattern is less clear-cut in Greece, the Netherlands, and Portugal.

Consistent with the EA-wide results, disposable income drops less than market income in all countries. All EA countries show a reduction in disposable income, with Ireland experiencing the largest drop (-6.4%) and Finland the smallest (-0.4%). The pattern of disposable income change is markedly progressive, with households in the richest quintile always experiencing a greater loss than those at the bottom of the income distribution, as also highlighted in Table I.1. Moreover, several countries experienced an increase in the disposable income of households located in the lower half of the income distribution. In particular, Malta shows evidence of an increase in the disposable income of households in the lowest quintile. France and Lithuania experienced a slight increase in the disposable income of the two lowest quintile groups, while in Finland it remained stable.

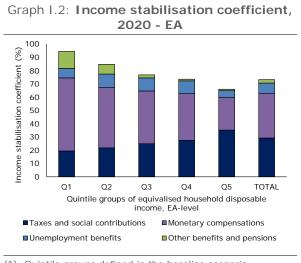## I.3. The cushioning effect of policy measures during the COVID-19 crisis

The impact of COVID-19 on household incomes suggests that the tax-benefit systems of EA countries absorbed a significant share of the shock in market incomes. To analyse this effect in more detail, we calculate the income stabilising coefficient (ISC) following the methodology described in Box I.1. With the ISC for the EA (reported in Graph I.2), it is possible to quantify the stabilisation properties of the tax-benefit systems of EA countries in 2020 and identify of the contribution of each of the fiscal policy instruments of interest.

Graph I.2 shows that euro area tax-benefit systems absorbed as much as 73.3% of the market income shock at the EA level in 2020. Monetary compensation schemes seem to have absorbed the largest share of the shock (33.7%), followed by taxes and social contributions (SCs) (29.2%) [13]. The stabilisation provided by unemployment benefits was significant (7.7%) but smaller than that provided by the monetary compensation schemes. This finding is in line with the smaller number of transitions from work to unemployment compared to transitions from work into monetary compensation schemes. Other benefits (e.g. social assistance, family benefits) and pensions played a relatively minor role in total [14].

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[12] The size of the subsidy for employers depends also on the share of loss in turnovers. Due to lack of data about turnover of firms, we cannot simulate the subsidy and the share of wages supported by the government. Indeed, the monetary compensation scheme for employees in the Netherlands is not simulated in EUROMOD.

[13] Intuitively, a drop in market is followed by a reduction in the amount of taxes and social contribution paid. Therefore, income after taxes and social contributions will vary less than market income. Imagine a market income drop of EUR 1000 in the presence of a flat personal income tax rate of 20% and a flat social contributions rate of 10%. The individual will pay EUR 200 less in taxes and EUR 100 less in social contributions. Taxes and social contributions absorb 30% of the market income shock.

[14] The analysis also highlights that ISC was about 77.6% for people living in households with employment income as primary income source, while it was about 52,0% for those living in households with self-employment income as their main income source.

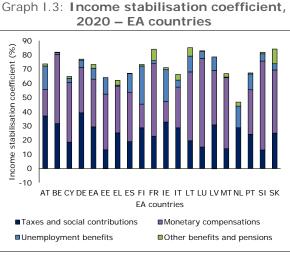Graph I.2: **Income stabilisation coefficient, 2020 - EA**

(1) Quintile groups defined in the baseline scenario.
Source: Authors' calculation using EUROMOD I3.0+

Looking at the distribution of ISCs, it emerges that the degree of stabilisation offered by the tax-benefit systems is higher for lower-income households. It should be noted that the importance of monetary compensation schemes decreases with income, while the stabilisation properties of taxes and social contributions follow the opposite pattern. This result is in line with the existence of upper thresholds or lump-sum components in the amount of the monetary compensation received and with the progressivity of the tax system. In addition, as expected, the importance of other benefits is larger at the bottom of the income distribution because of means-tested benefits.

Graph I.3 reports similar information for each of the EA countries. In order to facilitate readability, the chart does not include information by quintile groups and only focuses on country totals ([15]). The figure shows that the ISCs ranged from 46% in the Netherlands to 85% in Lithuania. Monetary compensation played a major role in most countries, ranging from 62.5% in Slovenia to 14.3% in Ireland. It should be noted that the ISC on monetary compensation schemes is missing in the Netherlands. The government paid employers a subsidy for continuing to pay 100% of wages, but this is not included in the simulation, because the share of the worker's wage covered by the subsidy cannot be determined. A new social assistance benefit for the self-employed introduced in the Netherlands is captured in the category 'other benefits and pensions'. The contribution of

(reduced) taxes and social contributions to income stabilisation is significant too, ranging from 39% in Germany to 13% in Slovenia.

The decomposition of ISC by quintile (not shown) confirms that tax-benefit instruments have stabilised the incomes of poorer households more than richer ones. In France, Lithuania and Malta, the ISC for households at the bottom of the income distribution was actually above 100%, indicating a certain degree of overcompensation for the income loss ([16]). This result is often driven by the presence of generous monetary compensation schemes (often with lump-sum components) that are in some cases exempted from social contributions and/or personal income taxes or are not taken into account in the means-testing of benefits.

Graph I.3: **Income stabilisation coefficient, 2020 – EA countries**

Source: Authors' calculation using EUROMOD I3.0+

I.4. COVID-19 and its impact on poverty and inequality

We also briefly analyse the impact of the COVID-19 crisis on policy-relevant indicators for inequality and poverty. Graph I.4 reports At-risk-of-poverty (AROP) rates (based on disposable income) for the EA countries and the euro area as a whole, differentiating between fixed poverty lines (at the baseline) and floating poverty lines ([17]).
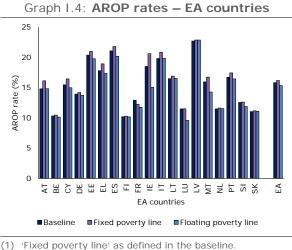

([15]) The full set of ISCs, including decomposition by quintile groups, are reported Christl et al. (2021), *op. cit.*

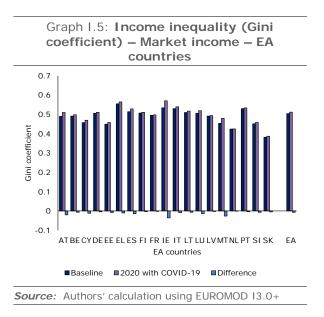([16]) For detailed results, see Christl et al. (2021), *op. cit.*

([17]) The AROP rate is the share of individuals whose equivalised household disposable income falls below 60% of the median household equivalised disposable income. This threshold, known as poverty line, can be floating if scenario-specific or fixed if anchored to the value observed in the baseline scenario. The OECD modified equivalence scale is used to equivalise household

Focusing on fixed poverty lines, EA-level AROP rates on disposable income show a small increase, from 15.8% to 16.2% [18]. AROP rates slightly decline from 15.8% to 15.3% if computed using a floating poverty line.

All EA countries, except France, experienced an increase in AROP rates based on disposable income, ranging from +2.1 p.p. in Ireland to +0.02 p.p. in Luxembourg if computed with a fixed poverty line. By contrast, France experienced a slight decrease in the risk of poverty of around -0.7 p.p. AROP rates remained stable or decreased slightly in the majority of countries when calculated employing a floating poverty line. Nevertheless, because of the drop in median income caused by the adverse labour market transitions, Ireland experienced a significant decrease in the AROP rate in the range of -3.5 p.p. when calculating using a floating poverty line.

Graph I.4: **AROP rates — EA countries**

(1) 'Fixed poverty line' as defined in the baseline.
Source: Authors' calculation using EUROMOD I3.0+

Graph I.5: **Income inequality (Gini coefficient) — Market income — EA countries**

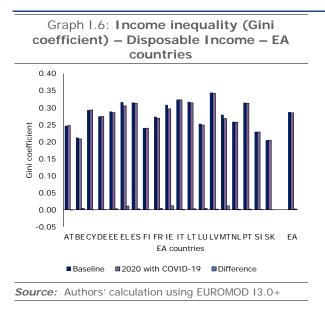**Source:** Authors' calculation using EUROMOD I3.0+

Graph I.5 shows the evolution of the Gini coefficients on market income in the countries analysed and for the EA as a whole [19]. At the EA level, the Gini coefficient of the distribution of market income increases by 0.007. The highest increase is observed in Ireland (+0.036), the smallest in the Netherlands, where no variation was observed.

To account for the impact of the tax-benefit systems of the EA countries on income inequality, Graph I.6 presents the Gini coefficient of disposable income. Contrary to the indicated inequality increase of market incomes, the Gini of the distribution of disposable income decreases by 0.02. In terms of disposable income, most countries show a stable or slightly declining Gini coefficient between the two scenarios analysed. This confirms that during the COVID-19 crisis inequality of disposable income was affected only marginally thanks to the cushioning impact of the tax-benefit systems and the emergency policy measures introduced at national and EU levels.

disposable incomes accounting for differences in household composition.
[18] EA-level AROP rates and Gini coefficients are population weighted averages of the EA countries indicators.

[19] The Gini coefficient measures the level of income inequality in a certain country. Ranging between 0 and 1, low values of Gini coefficients express a more equal income distribution. The higher the Gini, the more unequal the distribution.

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Graph I.6: **Income inequality (Gini coefficient) – Disposable Income – EA countries**

Source: Authors' calculation using EUROMOD I3.0+

I.5. Conclusions

This work´s contribution to the existing literature is twofold. First, to the best of our knowledge, this section contains the first EA-wide assessment of the cushioning effects of taxes and social transfers during the COVID-19 pandemic, including unemployment benefits and monetary compensation schemes (short-term work schemes and compensations for self-employed). Second, from a methodological point of view, the section employs a novel, simplified nowcasting approach to study the consequences of changes in labour market conditions using the microsimulation model EUROMOD.

We conclude that most EA countries experienced a large drop in market incomes during 2020, with poorer households hit hardest. We also find that the tax-benefit systems absorbed a significant share of the COVID-19 shock and were able to offset – in most countries – the regressive nature of the shock on market incomes. Monetary compensation schemes played a major role in cushioning the effect of adverse labour market transitions, although in aggregate terms they represent a minor component of household disposable income. Finally, we provide evidence of increases in AROP rates in 2020 if measured using a fixed poverty line. By contrast, if measured using a floating poverty line, we provide evidence of stable or slightly declining poverty rates across the EA.

 The approach followed in this section represents a novel, simplified application of the nowcasting approach used by EUROSTAT to produce the flash estimates of income inequality and poverty indicators. The approaches differ in two main dimensions. First, while the flash estimates methodology employs model-based individual transition probabilities to identify observations experiencing labour market transitions, we employ statistics available at various levels of disaggregation to simulate transitions for randomly chosen observations until the target number of transitions within each level of disaggregation is reached. Although the extent to which the simulated transitions mimic the reality depends on the level of disaggregation of the statistics, our approach can be easily implemented in EUROMOD and applied to a large range of actual and hypothetical labour market shocks. Second, the simulation of transitions to monetary compensation schemes represents a novelty of EUROMOD I3.0+, which was developed by the JRC in close collaboration with the flash estimates team at EUROSTAT, EUROMOD national teams and the University of Essex ([1]) .

The analysis makes use of the tax-benefit microsimulation model EUROMOD, version I3.0+, relying on data from the 2018 EU-SILC (2017 incomes). EUROMOD allows the simulation of direct tax liabilities and cash benefit entitlements in a comparable way across EU countries. Tax-benefit instruments that cannot be simulated due to a lack of information in the underlying EU-SILC data are taken directly from the microdata. EUROMOD is a static tax-benefit simulator, in the sense that it simulates the day-after effect of policy changes and disregards any potential behavioural response. The model has been validated at both micro and macro level and has been tested in several applications. For a comprehensive overview, see Sutherland and Figari (2013) ([2]).

We use tax-benefit rules in place in 2020. Since the underlying data refer to 2017 incomes, monetary values of market incomes and non-simulated tax and benefit instruments are uprated to the relevant year, making use of specific uprating factors ([3]). In addition, the microdata have been adjusted to account for the significant changes in labour market conditions that occurred during 2020 as a consequence of the COVID-19 pandemic.

We employ statistics on the share of workers experiencing transitions to either unemployment or monetary compensation schemes in an effort to mimic the labour market conditions of 2020 as observed in the underlying EU-SILC data ([4]). Labour market transitions are modelled using two main data sources: administrative data collected by EUROMOD national teams and developers, and data provided by EUROSTAT. Within each degree of disaggregation (gender, sector, self-employed or employees, etc.), workers are randomly assigned into the new labour market status until the target number of transitions is reached.

Methods

The analysis compares two alternative scenarios for the year 2020; one in which labour market transitions to unemployment and/or temporary layoffs did not occur and one in which they occurred, and, hence, monetary compensation schemes are simulated. Holding policies constant, this comparison allows us to focus on the extent to which 2020 policies protected the incomes of the households that underwent these labour market changes.

The following indicators are provided. First, we analyse to what extent market incomes and disposable incomes varied between the 'baseline' scenario (2020 system without labour market changes) and the 'reform' scenario (2020 system with labour market changes).

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[1] For more information on the flash estimates methodology see:
https://ec.europa.eu/eurostat/documents/7894008/11598903/Short-methodological-note.pdf
[2] Sutherland, H. and F. Figari (2013), 'EUROMOD: The European Union tax-benefit microsimulation model', *The International Journal of Microsimulation*, Vol. 6, No. 1, pp. 4–26.
[3] See https://euromod-web.jrc.ec.europa.eu/using-euromod/country-reports.
[4] Data on labour market transition to monetery copmensation schemes only cover the entire year 2020 in some countries. In other countries, they were available only until July-September. For an overview of the information available in each country, see Christl M., De Poli, S., Figari, F., Hufkens, T., Leventi, C., Papini, A. and A. Tumino (2021), 'The cushioning effect of fiscal policy in the EU during the COVID-19 pandemic', *JRC Working Paper on Taxation and Structural Reforms* 2/2021.

Box (continued)

Second, we compute the income stabilisation coefficient (ISC), in the spirit of Dolls et al. (2012) [5].

$$ISC = 1 - \frac{\sum \Delta Y^D}{\sum \Delta Y^M} \qquad (1)$$

Where $\sum \Delta Y^D$ indicates the aggregate (country level) difference in disposable income and $\sum \Delta Y^M$ indicates the aggregate difference in market incomes. The coefficient is reported in percentage terms (ISC*100). Intuitively, it indicates the share of a shock that is absorbed by the tax-benefit system. An ISC=100 indicates no change in disposable income despite a change in market income. An ISC=0 indicates that disposable income changed exactly as much as market income, hence the shock is fully transmitted to disposable income. In addition, we decompose the ISC to study the stabilising properties of various tax-benefit instruments, namely taxes and social insurance contributions, monetary compensation schemes, unemployment benefits, other benefits and pensions.

These indicators are provided for the entire population and by income quintile groups by fixing the quintile to which each household belongs to the 'baseline' value (2020 without labour market transitions). Finally, we provide at-risk-of-poverty (AROP) rate [6] estimates (by fixing poverty lines to their 'baseline' values and by using floating poverty lines) and Gini coefficients.

Caveats

A number of caveats should be kept in mind when interpreting these results. First, our analysis disregards second round and macro-feedback effects. Second, some heterogeneity exists in the time reference and level of disaggregation of the statistics used to simulate labour transitions. Third, we randomly identify workers within sociodemographic groups to undergo labour market transitions. This adds some uncertainty to the distributional findings of the model, especially in the case of transitions to unemployment, because the relevant statistics are only available with a broad level of disaggregation. Ideally, this issue would be alleviated by basing the identification of observations transiting into unemployment (or monetary compensation schemes) on characteristics highly correlated with household income. We hope that the use of more homogenised and up-to-date data, possibly at the individual level and covering 2020 in its entirety, will allow us to tackle these issues in the coming months. Finally, a problem of over-simulation of monetary compensation amounts might arise because of the interaction between EU-SILC data, EUROMOD modelling conventions, and specific-country rules. For instance, in cases where a minimum amount of monetary compensation is determined by law and is based on the minimum wage, we might end up over-simulating the compensation for individuals that in EU-SILC are observed to earn less than the minimum wage. Keeping these caveats in mind, this research offers a first comprehensive insight into the effectiveness of tax-benefit policies in mitigating the impact of the COVID-19 pandemic on household incomes across the EA countries.

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[5] Dolls, M., Fuest, C. and A. Peichl (2012), 'Automatic stabilizers and economic crisis: US vs. Europe', *Journal of Public Economics*, Vol. 96, No. 3–4, pp. 279–294.

[6] According to EUROSTAT, the at-risk-of-poverty rate is the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income after social transfers.