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The rising tide lifts all boats? Income support measures for employees and self-employed during the COVID-19 pandemic

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Abstract
This paper examines the extent to which fiscal policy protected household incomes in the second year of the COVID-19 pandemic in EU countries. Using microsimulation techniques and detailed Eurostat data, we analyse this impact separately for employees and the self-employed. We show that while on average income protection was similar for employees and the self-employed at the EU level, the heterogeneity both between and within countries was much higher for self-employed households in 2021. For employees, both monetary compensation schemes and unemployment benefits played a similar role in absorbing the income shock, whereas for the self-employed it was mainly monetary compensation schemes and much less so unemployment benefits that stabilised their income. Overall, we find that monetary compensation schemes, together with automatic stabilisers, absorbed a substantial part (67%) of the market income shock in 2021, albeit with a reduced cushioning effect compared to the previous year (74%). Monetary compensation schemes alone account for almost a third of this cushioning effect in 2021. Our paper underlines the importance of targeted policies to ensure comprehensive support for vulnerable households amid ongoing economic uncertainties.

Keywords COVID-19 · Self-employed · Income stabilisation · Microsimulation · EUROMOD

JEL Classification D31 · E24 · H24

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1 Introduction

The COVID-19 health crisis and its socio-economic consequences had a profound impact on the economies of many countries around the world, particularly in the EU, where containment measures (including school and workplace closures and travel bans) were significantly intensified (Hale et al., 2021). New and immediate government interventions ranged from health-related measures to direct economic support for businesses and households. One of the most important economic support measures was the introduction of monetary compensation (MC) schemes, such as short-time working schemes for employees or other income support measures for the self-employed, to mitigate the negative impact on households and businesses.

The impact of the COVID-19 pandemic on the labour market was lower in 2021 than in 2020, as higher vaccination rates, more relaxed containment measures and greater ability and flexibility to telework allowed many workers to remain in employment. The number of employees able to work from home increased in 2020 compared to previous years and continued to increase in 2021 (Eurofound, 2022). At the same time, as shown by Scarpetta et al. (2022), the use of monetary compensation schemes decreased significantly in 2021 compared to 2020. Different strategies have been used to modify monetary compensation schemes during the crisis. Some countries have phased them out, others have opted for more targeted support and most have kept their temporary measures unchanged.[1]

The COVID-19 shock and support measures in the EU for employees have been widely discussed in the literature (Almeida et al., 2021b; Christl et al., 2023a). However, the impact of fiscal policy measures on one of the most vulnerable employment groups—the self-employed—has only been analysed in a few countries. This represents a major oversight since, in most of the EU Member States the self-employed account for more than 10 percent of the working population. According to the Labour Force Survey, before the COVID-19 pandemic, the share of self-employed workers in the EU-27 was about 12 percent, reaching from about 22 percent in Greece to about 7 percent in Denmark[2]. This highlights that self-employed are responsible for a big part of the economic activity in the EU Member States. To the best of our knowledge, we are the first to comprehensively analyse the cushioning effects of fiscal policy measures during the COVID-19 pandemic for self-employed across EU Member States.

In addition, we extend the analysis of Christl et al. (2023a) to 2021—the second year of the pandemic, which is much less covered in the literature—to compare the impact of COVID-19-related measures to protect household income with the first year of the pandemic.

In detail, we first look at the impact of these monetary compensation schemes in 2021 and decompose the effect for two different groups, namely employees and the self-employed. The compensation schemes for these two groups differ considerably

[1] Some countries have even made them permanent, but linked eligibility to certain economic criteria, as was already the case in Germany.

[2] See Fig. 10 for more details.

and, with the exception of some EU Member States, this difference in treatment has not been analysed.[3] Given that the self-employed are typically more concentrated in the lower (as well as the upper) part of the income distribution (Schneck, 2020) and more likely to be income poor (Sevä & Larsson, 2015), this is an important aspect when analysing the impact of COVID-19 support measures on income protection.

Second, we analyse the income stabilising effect of monetary compensation schemes for the second year of the COVID-19 pandemic at the EU level and for almost all EU Member States in a comprehensive and comparable way. This is of particular interest as we can compare the impact of these measures, which have been adjusted by policy makers in several countries in 2021, mainly due to the high cost of these measures for national budgets, among other reasons.

Finally, following the approach of Christl et al. (2023a), we use microsimulation techniques to simulate a hypothetical counterfactual scenario in which the COVID-19 support measures for employees and the self-employed are not implemented. By comparing this scenario with the baseline scenario in which the monetary compensation schemes are in place, we are able to assess the impact of the monetary compensation schemes on stabilising household incomes.

The rest of the paper is structured as follows. Section 2 summarizes the institutional setting for self-employed during the COVID-19 crisis and Sect. 3 presents the literature on the impact of COVID-19 on household income in European Union countries. Section 4 describes the data and methodology used. Section 5 presents the results and Sect. 7 gives the conclusions.

2 Institutional setting

The implementation of job retention or monetary compensation schemes during the COVID-19 pandemic revealed significant complexity, both in their design and in their practical application. While three main types of schemes are generally distinguished—short-time work, furlough, and wage subsidy schemes—key differences in their features have led to challenges in categorization. Short-time work schemes traditionally subsidised hours not worked while allowing some working hours, and furlough schemes typically supported workers during a complete suspension of activity (Drahokoupil & Müller, 2021). However, these distinctions blurred during the pandemic as public health restrictions required flexibility to accommodate sector-specific needs. Countries often introduced several schemes concurrently, adapted existing systems, or developed entirely new ones (OECD, 2020; Eurofound, 2021; Drahokoupil & Müller, 2021; Eurofound, 2024a).

Bulgaria, Croatia, Czechia, Hungary, Ireland, and Poland implemented both wage subsidy and short-time work schemes, while Romania and Slovenia introduced all three types: wage subsidy, short-time work, and furlough schemes. Countries such as Denmark, the Netherlands, and Ireland replaced or supplemented existing systems

[3] One of these exemptions is the paper of Graeber et al. (2021) that analyzes these differences in Germany.

with new wage subsidy schemes to allow faster deployment. Belgium, Cyprus, Finland, and Spain primarily used furlough schemes, while Estonia, Slovakia, and Lithuania implemented short-time work schemes. Portugal and Greece adopted both short-time work and furlough schemes to mitigate the effects of the pandemic. In countries like Luxembourg and Austria, existing short-time work schemes were adapted and expanded (Eurofound, 2024a; Drahokoupil & Müller, 2021). These shifts, driven by the urgency of the pandemic, have resulted in schemes that no longer fit neatly into predefined categories but rather reflect a mix of approaches tailored to address varied economic and sectoral challenges.

The coverage and eligibility rules to access the monetary compensation schemes were not the same for employees and the self-employed. Employees on open-ended contracts typically had broader access to monetary compensation schemes, but many countries expanded coverage to include workers with fixed-term contracts, temporary agency workers, and part-time workers (Eurofound, 2024a). In contrast, studies focusing on the self-employed highlight their vulnerability as they typically have less access to unemployment insurance and social safety nets. Graeber et al. (2021), Fairlie (2020), Kalenkoski and Pabilonia (2022) and Blundell et al. (2020a) discuss how the pandemic disproportionately impacted this group. The lack of tailored government support for the self-employed in many countries exacerbated the challenges they faced.

Across the EU, more than a third of countries had mandatory unemployment insurance schemes for self-employed in 2019 (Table 1). In five countries (Austria, Denmark, Germany, Romania, and Slovakia) the self-employed could voluntarily join unemployment insurance schemes and in another four countries (Greece, France, Lithuania and Portugal) the unemployment insurance was limited only to certain groups of the self-employed or had very restrictive conditions. In the rest of the countries, the self-employed were not covered with unemployment insurance.[4]

The self-employed faced stricter eligibility rules for accessing the monetary compensation schemes, with some countries limiting access based on sector (in Bulgaria, Estonia, Ireland, Hungary, and Romania were available only to individuals or businesses that were closed due to public health restrictions) or requiring a certain level of income loss (ranging from 10 to 100%). The self-employed generally received lower replacement rates and shorter durations of support compared to employees, and most schemes were introduced after employee support measures. With a few exceptions, as shown in Table 1, the MC schemes for the self-employed were in place for a five-month shorter period on average, compared to the ones for employees.[5] Replacement of income for self-employed was often flat rate (in Belgium,

[4] However, as Weber and Schoukens (2024) note, some countries might have other provisions for the self-employed in place which are formally not considered as unemployment insure. Such an example could be the bridging benefit in Belgium, which guarantees a flat-rate income replacement for the self-employed closing down their business and ensures health care coverage but does not include specific labour mediation services. Similarly, in the Netherlands, a specific social assistance is available for the self-employed who had to stop their business and/or whose revenues are below a defined minimum subsistence level due to old age or disability.

[5] It is assumed that schemes were accessible from March 2020 to August 2023 (Eurofound, 2024b).

Table 1 Access to unemployment insurance and institutional characteristics of the MC schemes for the self-employed across Member States

Country	Access to unemployment insurance (2019)	Income replacement of MCS	Required income/turnover loss for MCS (%)	Duration of MCS for employees/self-employed (months)	Extended access to social insurance
BE	No	Flat rate	n.a	28/26	OB
BG	No	Flat rate	100	28/13	OB
CZ	Yes	Flat rate	50	22/22	OB
DK	Voluntary	75%	30	15/23	SB, OB
DE	Voluntary	Flat rate	n.a	39/33	SB
EE	No	Flat rate	100	15/20	
IE	Yes	Flat rate	100	25/24	UB
EL	For restricted groups	Flat rate	n.a	24/15	UB
ES	Yes	50–70%	75	42/18	UB
FR	Under restrictive conditions	Flat rate	50	33/27	SB, OB
HR	Yes	Flat rate	n.a	18/3	
IT	No	Flat rate	50	42/42	OB
CY	No	60%	25	15/14	SB
LV	No	50–75%	30	22/22	UB, SB
LT	For restricted groups	Flat rate	n.a	17/17	UB
LU	Yes	n.a	n.a	42/14	UB, OB
HU	Yes	Flat rate	100	6/3	SB
MT	Yes	Sector dependent	n.a	24/24	SB
NL	No	Means-tested	n.a	24/19	
AT	Voluntary	Income dependent	50	37/24	SB, OB
PL	Yes	80%	15	40/40	UB, SB
PT	For restricted groups	Flat rate	40	14/19	SB
RO	Voluntary	75%	100	33/24	UB, SB

Table 1 (continued)

Country	Access to unemployment insurance (2019)	Income replacement of MCS	Required income/turnover loss for MCS (%)	Duration of MCS for employees/self-employed (months)	Extended access to social insurance
SI	Yes	Flat rate	10	21/15	SB
SK	Voluntary	Income dependent	10	21/22	UB, SB, OB
FI	Yes	Flat rate	30	42/17	UB, SB
SE	Yes	75%	n.a	n.a	UB, SB

n.a. information is not available, *UB* unemployment benefit, *SB* sickness benefit, *OB* other benefits (parental, hardship, etc.), *MCS* monetary compensation schemes. Source: for the access to unemployment—an elaboration using EUROMOD; information on the income replacement rates, income loss requirement, duration of the MCS (between March 2020 and August 2023) and extended access to social insurance from Eurofound (2024b, Table 12 in p.39; Figure 22 in p.38; Figure 24 in p.40; and Table 13 in p.41 respectively)

Bulgaria, Croatia, Czechia, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Portugal, Slovenia), while employee schemes were more likely to be income related (Eurofound, 2024a, b).

Apart from the monetary compensation schemes, many countries made some adjustments to the social insurance rules, so that the self-employed were (better) covered by unemployment insurance, sickness benefits or gained (broader) access to other benefits (Table 1). Other important support for the self-employed to continue their business took form of subsidies, deferrals of tax liabilities (PIT, VAT) and social insurance payments, better access to finance.[6]

3 Literature

Numerous national studies across the EU have examined the impact of COVID-19 on household income, with a particular focus on monetary compensation schemes. Agrawal and Bütikofer (2022) highlighted the transformative effect of the pandemic on public economics, while Furceri et al. (2022) raised concerns about its potential long-term impact on inequality. Unlike previous recessions, where cost reduction was the focus, COVID-19 policies primarily aimed to protect household incomes (O'Donoghue et al., 2023).

Several comparative studies focused on 2020. Clark et al. (2021) reported initial spikes in inequality across France, Germany, Italy, and Spain, later offset by targeted compensation schemes indicating a strong mitigating effect. Only two studies offered comprehensive EU-wide analyses: Almeida et al. (2021a) and Christl et al. (2023a), both of which confirmed the significant mitigating effects of monetary compensation on income loss and inequality, though with varying effectiveness across countries.

At the national level, Germany experienced a 3% market income loss in 2020, particularly affecting low-income households, with policy interventions cushioning the blow (Christl et al., 2023b). Italy saw substantial income declines, especially for the self-employed, but emergency benefits reduced the impact (Gallo & Raitano, 2023; Figari & Fiorio, 2020). Spain and France also benefited from public transfers and monetary compensation schemes, which stabilised incomes (Aspachs et al., 2022; Buresi & Cornuet, 2021). In the UK, COVID-19 measures such as the Job Retention Scheme effectively protected household incomes (Brewer & Tasseva, 2021), while government support in Sweden helped mitigate earnings inequality (Angelov & Waldenström, 2023). Similar results were found in Austria (Christl et al., 2022c) and Estonia (Laurimäe et al., 2022). Similarly, Baker et al. (2020) highlight the short-term effectiveness of stimulus payments in the U.S. in alleviating financial stress during crises and highlights the varying impacts across different economic groups.

Studies in several European countries confirm that self-employed were disproportionately affected by the pandemic. Blundell et al. (2020b) highlighted that

[6] For country-specific measures refer to Eurofound (2024b, p.41)

self-employed individuals in the UK faced substantial income losses, with many unable to access government support schemes, particularly in the early stages of the pandemic. Bennedsen et al. (2020) reported that, in Denmark, despite compensation schemes designed for self-employed workers, many experienced severe liquidity issues and were more vulnerable to long-term financial instability. Schneck (2023) showed that in Germany, solo self-employed individuals had lower income resilience, with many struggling to meet a barely adequate household income level. The paper also highlights the varying ability of self-employed individuals to withstand income cuts depending on household structure and additional incomes.

Although several studies provide a robust analysis of income stabilisation due to the pandemic on national and EU levels, only a few studies differentiate between the effects on employees and especially on the self-employed, and mostly focus at a national level. Therefore, with this study, we aim to fill in this gap by providing comprehensive EU-wide analysis for employees and the self-employed, further analyzing to what extent fiscal policy provides income stabilisation in the second year of the pandemic.

4 Methodology and data

4.1 Methodology

The impact of the COVID-19 pandemic on household disposable income can be assessed using EU-SILC data, which are already available for the pandemic years. However, for a more in-depth analysis of the cushioning effect of fiscal policy in absorbing the income shock and for the construction of counterfactual scenarios, it is advantageous to use a microsimulation model for several reasons.

First, we cannot observe the real impact of the pandemic on market incomes in the survey data. In several countries, monetary compensation schemes for employees are reported in SILC as general income. Without the precise information on the amount of monetary compensation paid, we cannot assess the size of the shock of the COVID-19 pandemic on market income, nor the share absorbed by monetary compensation schemes and, consequently, the share absorbed by the rest of the tax-benefit system.

Second, we cannot disentangle the impact of monetary compensation schemes from other benefits in the survey data. Even in countries where monetary compensation schemes are reported separately from market income, these measures are often reported together with other benefits. This prevents us from analysing in detail the role of each component of the tax-benefit system in absorbing the income shock.

Third, the use of microsimulation techniques not only allows us to overcome the limitations of the data issues mentioned in the first two points, but also to create relevant counterfactual scenarios that allow us to answer hypothetical questions, such as what would have happened to our key policy indicators if the government had not intervened by introducing monetary compensation schemes.

We therefore use EUROMOD, the EU tax-benefit microsimulation model. EUROMOD is a static microsimulation model that allows the simulation of tax liabilities and cash benefits in a comparable way across countries.[7]

In this paper, we focus on the policies in place in 2021. We use data from the pre-COVID period to compare scenarios with and without a shock to the labour market. More specifically, we use data from the 2019 EU-SILC survey, which is based on 2018 earnings. To simulate the income distribution in 2021, we use a nowcasting approach. This methodology, first developed by Gasior and Rastrigina (2017), has been extended in the context of the pandemic by Christl et al. (2022b) to take into account monthly changes in labour market status and transitions to monetary compensation schemes.[8] In this way, we can create two main scenarios: a 2021 without COVID-19 and the "real" income distribution of 2021, taking into account the shock to the labour market due to the pandemic.

4.2 Data

Similarly to Christl et al. (2023a), in our underlying EU-SILC data provided by Eurostat, we use detailed statistics on people moved to unemployment and monetary compensation schemes to mimic 2021 labour market conditions.[9] The statistics on changes in employment are based on information from the quarterly Labour Force Survey (LFS), while the statistics on transitions to monetary compensation schemes combine information from the quarterly LFS with monthly administrative data—provided by Member States to Eurostat—on the number of people who entered these schemes. In the context of the COVID-19 pandemic, it is also important to consider the duration of these transitions. For this purpose, Eurostat has also provided information on the number of months spent in unemployment and monetary compensation schemes, as well as the reduction in the share of hours worked.

In order to reproduce the labour market conditions of 2021 in our basic dataset, we also take into account the characteristics of the individuals undergoing transitions. On the one hand, we model transitions from employment to unemployment by gender and educational attainment separately for employees and the self-employed. On the other hand, we model transitions from employment to monetary compensation schemes by sector of activity and gender, also separately for employees and the self-employed. Within each subgroup, individuals are randomly selected into the new labour market status until the target number of individuals is reached. Statistics on the duration of transitions and the characteristics of the workers are estimated by Eurostat on the basis of the quarterly LFS.[10]

[7] For more information on EUROMOD, see Sutherland and Figari (2013) and https://euromod-web.jrc.ec.europa.eu/.

[8] For a description of the tool, see the appendix of Christl et al. (2023a).

[9] These data were provided by Eurostat's Flash Estimate Team. For a full overview of the methodology, see Leulescu et al. (2022).

[10] For more details see Leulescu et al. (2022).

To give a brief overview of the impact of COVID-19 on the labour markets in EU Member States in 2021, Table 2 shows the annual aggregate transition rate from employment to monetary compensation schemes and the average reduction in hours worked, as well as the duration of people in monetary compensation schemes.

The transitions observed vary considerably between EU Member States. In Cyprus and Greece, more than 20% of employees switched to MC schemes, while in countries such as Denmark, Spain or Ireland this figure was close to 5%. In other countries, such as Finland, Hungary, Sweden, Romania and Poland, the share of employees who switched to monetary compensation schemes was less than 3%. This low share can be explained by the fact that in some countries, such as Poland, monetary compensation schemes were gradually phased out in the course of 2021. For the self-employed, the differences between Member States are even greater. In

Table 2 Labour market transitions by EU Member State in 2021

Country	Hours reduction (%)	Months in MCS	EE moved to MCS (%)	SE moved to MCS (%)	EE to unemployment (%)
AT	26.02	3.8	11.16	0.83	1.64
BE	20.92	6.7	7.83	21.89	2.31
BG	19.30	4.9	4.40	1.22	3.74
CY	19.68	3.7	20.42	25.66	1.03
CZ	24.47	2.9	4.34	14.40	3.19
DE	20.04	4.6	8.32	0.72	1.85
DK	11.31	2.9	4.55	4.75	0.73
EE	18.64	3.9	9.68	0.70	3.34
EL	29.70	3.9	28.81	1.34	2.15
ES	21.57	4.8	5.37	4.74	2.31
FI	14.37	3.5	1.12	3.38	1.53
FR	24.31	3.9	13.57	48.13	2.24
HR	15.94	2.5	17.04	4.19	0.68
HU	10.56	1.5	2.60	0.02	2.86
IE	22.18	4.0	5.22	0.05	7.43
IT	31.72	3.9	11.50	1.15	2.62
LT	15.29	4.0	7.66	0.99	1.03
LU	26.22	3.9	7.65	0.08	0.36
LV	21.02	3.7	6.61	17.75	6.74
NL	49.27	4.6	17.23	2.26	2.75
PL	20.46	1.8	0.29	0.73	0.34
PT	22.01	3.9	11.85	7.85	6.64
RO	27.70	4.8	2.26	0.40	0.60
SE	18.33	4.0	2.53	0.39	2.65
SI	14.52	2.5	8.97	13.00	4.62
SK	28.22	6.9	17.42	6.90	4.01

EE stands for employees, *SE* self-employed, *MCS* monetary compensation schemes. Source: Eurostat, based on LFS and administrative statistics

Table 3 Labour market transitions at the EU level in 2020 and 2021

Year	Hour reduction (%)	Months in MCS	EE moved to MCS (%)	SE moved to MCS (%)	EE moved to unemployment (%)
2021	25.48	4.3	8.63	6.94	2.25
2020	23.06	3.7	23.03	25.54	2.38

EE stands for employees, *SE* self-employed, *MCS* monetary compensation schemes. Source: Eurostat, based on LFS and administrative statistics

Belgium and Cyprus more than 20% and in France almost half of the self-employed moved to monetary compensation schemes. In many other countries, such as Hungary, Ireland, Sweden, Romania, Estonia, Germany or Austria, less than 1% of the self-employed did so in 2021.

The reduction of hours in MC schemes also varied between EU Member States. While average hours were reduced by around 15% in Denmark, Finland and Slovenia, the reduction was higher (28% or more) in Italy, Greece, Romania and Slovakia.[11] The average length of stay of workers in monetary compensation schemes in 2021 ranges from 2.5 months or less in Hungary, Croatia and Slovenia to almost 7 months in countries such as Belgium and Slovakia.

At EU level, the share of people moving into unemployment (2.25% in 2021 and 2.38% in 2020), the duration in MC schemes (4.3 months in 2021 and 3.7 months in 2020) as well as the average reduction in hours while in MC schemes (25.48% in 2021 vs. 23.06% in 2020) are very similar between 2020 and 2021 (Table 3). However, the biggest difference is in the share of people moving to monetary compensation schemes. In 2020, around 23% of employees and 26% of self-employed moved to MC schemes, while in 2021 only around 9% of employees and 7% of self-employed did so.

4.3 Scenarios

In our analysis we compare three different scenarios. First, our baseline is a hypothetical scenario in which the COVID-19 pandemic and, therefore, the associated labour market transitions did not occur. Second, a scenario in which we model the labour market transitions that occurred during the COVID-19 pandemic in our micro data, using the external information described in the previous section. This scenario mimics the actual situation of 2021. Third, a hypothetical scenario in which we model the labour market transitions associated with the COVID-19 pandemic, but assume that MC schemes were not in place. As argued by Christl et al. (2023a), this comparison allows us to analyse the cushioning effect of MC schemes on household income, which were the most important policies introduced by EU governments during the COVID-19 pandemic.

[11] The Netherlands is an exception with an average reduction of almost 49%.

Let t be the tax-benefit function, which depends on the tax-benefit system (P) as well as on the labour market condition, LM, including COVID-19-related labour market transitions (LM^{Trans}) or not ($LM^{NoTrans}$). We can then define our three scenarios as follows

- *Baseline (no COVID-19 scenario):* $t(P_{2021}, LM^{NoTrans}_{2021})$.
- *COVID-19 scenario:* $t(P_{2021}, LM^{Trans}_{2021})$.
- *No government intervention scenario:* $t(P^{NoMC}_{2021}, LM^{Trans}_{2021})$.

4.4 Income stabilisation coefficient (ISC)

In this paper we want to analyse the extent to which market incomes and disposable incomes vary between the baseline scenario without COVID-19 and the scenario with COVID-19. To do this, we calculate the income stabilisation coefficient (ISC) in terms of Dolls et al. (2012) and Christl et al. (2023a):

$$ISC = 1 - \frac{\sum_i \Delta Y_i^D}{\sum_i \Delta Y_i^M} = \frac{\sum_i \Delta Y_i^M - \sum_i \Delta Y_i^D}{\sum_i \Delta Y_i^M}, \quad (1)$$

where ΔY_i^D is the change in disposable income and ΔY_i^M is the change in market income for individual i. The coefficient is expressed as a percentage (ISC*100). Intuitively, it indicates the proportion of a shock that is absorbed by the tax-benefit system. ISC=100 indicates no change in disposable income despite a change in market income, and ISC=0 indicates that disposable income changes by exactly the same amount as market income, i.e. the shock is fully transmitted to disposable income.

The standard approach in the literature is to calculate the ISC for the whole population, as usually only a theoretical or real negative shock to market income is observed. However, in 2021 some households experienced a positive change in market income due to transitions from unemployment to employment. For this reason, we exclude households with individuals who moved into employment and calculate ISCs only for households with a negative shock to market income.

In addition, we provide a decomposition of disposable income into separate tax and benefit components. This allows us to analyse the role of each component in stabilising household disposable income due to pandemic-related labour market transitions. We decompose the ISC into parts attributable to taxes and social contributions (SICs), MC schemes, unemployment benefits and other benefits and pensions:

$$ISC = \frac{\sum_i \Delta Y_i^M - \sum_i \Delta Y_i^D}{\sum_i \Delta Y_i^M} = \frac{\sum_i \Delta T_i - \sum_i \Delta UB_i - \sum_i \Delta MC_i - \sum_i \Delta OB_i}{\sum_i \Delta Y_i^M}, \quad (2)$$

where T_i are taxes and SICs paid by individual i, MC_i are monetary compensation (for employees and the self-employed) received by individual i, UB_i are unemployment benefits and OB_i are other benefits including pensions.

The ISC and its decomposition are provided for the whole population—affected by a negative shock to market income—and for income quintile groups as defined in the baseline on the basis of equivalised disposable income. ISCs are also calculated for employee and self-employed households. Self-employed households are defined as those whose self-employment income is higher than their employee income.

5 Results

5.1 Income stabilising coefficients in 2021

Figure 1 shows the income stabilisation coefficient at EU level by income quintile and in total. Overall, fiscal policy in 2021 absorbed 67% of the shock to market income, or in other words, 67% of the fall in market income was cushioned by European tax and benefit systems, resulting in a smaller fall in disposable income compared to market income (one third instead of a full transmission). The stabilising effect was greater at the bottom of the income distribution, especially in the first quintile (83%). As one moves up the income distribution, the dampening effect becomes weaker—around 62% for the top income quintile.

At EU level, taxes and social contributions were the main instruments responsible for this cushioning effect (26.4 pp). With lower taxable income (and with progressive tax systems), people paid less in taxes and social contributions. The other two important instruments were monetary compensation schemes (22.1 pp) and unemployment benefits (18 pp). Compared to the previous year of the pandemic, the relative income stabilising effect of monetary compensation schemes has almost halved, while that of unemployment benefits has doubled. This relative impact is not due to the share of people moving to unemployment (which remained stable in both years), but to the significantly lower share of workers moving to MS schemes in 2021 compared to 2020 (see Table 3). Other benefits and pensions played a minor role overall, but as they mainly include targeted social assistance, they were more important for people in the first income quintile.

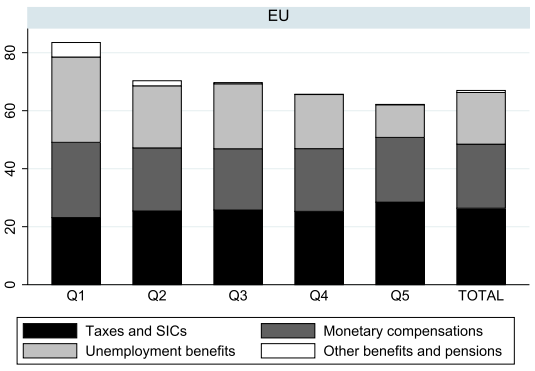


Fig. 1 Income stabilising Coefficient by quintiles in 2021, EU. Note: Income quintiles are based on the baseline (no-COVID-19 scenario) distribution of equivalised disposable income. The equivalent income is calculated based on the modified OECD scale. Source: EUROMOD calculations based on EU-SILC data

Looking at the ISC by country, we find strong heterogeneities in the overall cushioning effect of fiscal policy across EU Member States. As shown in Fig. 2, the ISC varies from 97% in Denmark and almost 90% in the Netherlands to less than 60% in Spain, Hungary and only 45% in Poland. In particular, the monetary compensation schemes played an important role in cushioning the COVID-19 shock in 2021 in Bulgaria, Denmark, the Netherlands and Slovakia. In Finland, Hungary and Spain, on the other hand, MC schemes were less important in protecting household income.

To better identify the role of government intervention, we compare the tax-benefit system in 2021 with a hypothetical 2021 without monetary compensation schemes, following the approach of Christl et al. (2023a). At the EU level, the income cushioning effect of the tax-benefit system with monetary compensation schemes was 67.1%. Without government intervention, the ISC would have been only about 49%, i.e. about 18 percentage points lower. Although earlier decomposition of the ISC by the different instruments (Fig. 1) showed that the MC schemes were responsible for absorbing 22.1 percentage points of the shock to market incomes, the simulation of the alternative scenario without monetary compensation leads to a slightly lower share (18 pp). In the absence of MC schemes, this difference is additionally absorbed by the existing automatic stabilisers, i.e. tax and benefit systems. This result suggests that monetary compensation schemes continued to play a crucial role in protecting household incomes in the EU in 2021.

However, there are important differences between EU Member States in this respect, as shown in Fig. 3. In Bulgaria, Denmark, Greece, France, Croatia, the Netherlands and Slovakia, government interventions were very important in absorbing the shock to household income caused by the COVID-19 pandemic. In these countries, the ISCs are more than 40 percentage points higher than in the no government intervention scenario. In contrast, the difference with and without

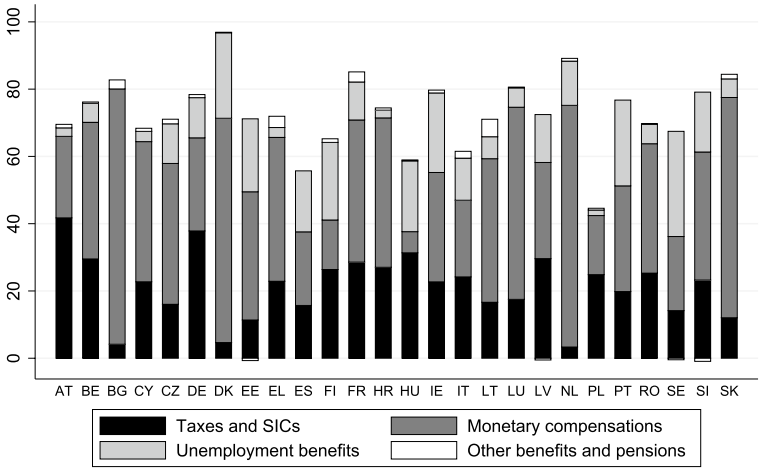


Fig. 2 Income stabilising Coefficient by EU Member State in 2021. Source: EUROMOD calculations based on EU-SILC data

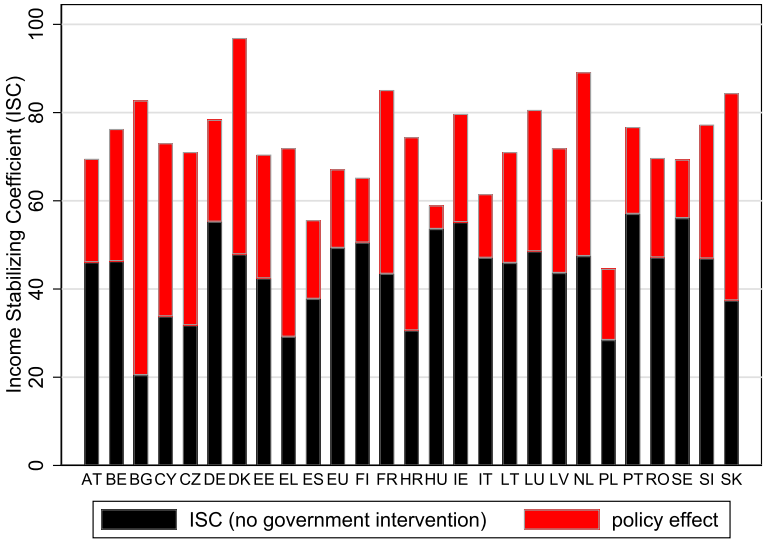


Fig. 3 Income stabilising Coefficient without government intervention by EU Member State in 2021. Note: The policy effect is defined as the difference between the baseline scenario and the no government intervention scenario. Source: EUROMOD calculations based on EU-SILC data

COVID-19-related government intervention is very small in countries such as Hungary, where monetary compensation schemes were very rarely used in 2021 (see Table 2).

5.2 Income stabilising coefficients for employees and self-employed in 2021

Fiscal policies for the self-employed are typically different from those for employees. For example, as highlighted by Jara Tamayo and Tumino (2021), unemployment insurance coverage rates are significantly lower for the self-employed than for employees. In addition, during the pandemic, many governments introduced financial compensation schemes for the self-employed that differed significantly from those for employees. Christl et al. (2023a) and Müller et al. (2022) give an overview of the differences in these schemes across all EU Member States. In total, around 20 EU Member States have introduced monetary compensation schemes for the self-employed, ranging from very similar measures to those for employees, such as compensation of a certain percentage of earnings, to standard one-off payments for the self-employed.

Figure 4 shows the ISC for employees and self-employed by income components for all EU Member States in 2021. The average across EU countries is very similar for both groups (see first two columns on the left). Households with employee income as the main source of income had an ISC of 67%, while for the

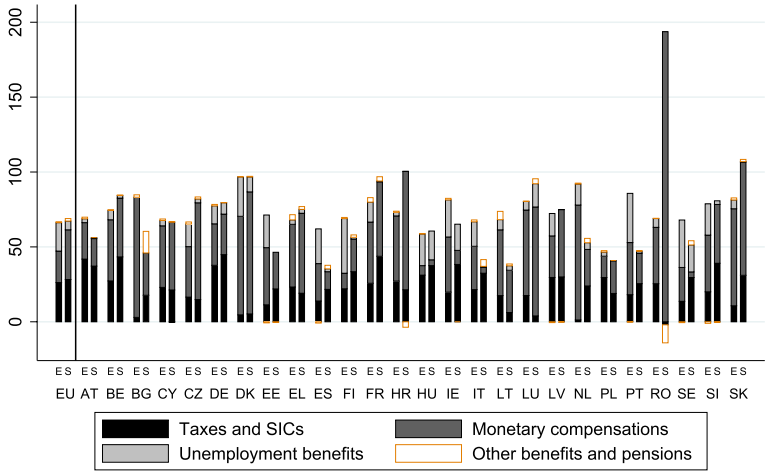


Fig. 4 Income stabilising Coefficients for employees (E) and self-employed (S) at the EU level and by EU Member State in 2021. Note: E stands for employees, S for self-employed. The results for Romania have to be interpreted with caution, since the number of self-employed moving to monetary compensation is very small. Source: EUROMOD calculations based on EU-SILC data

self-employed the average ISC was around 69%.[12] The stabilising effect of taxes and SICs was also very similar for both groups (26–28 pp), but we find significant differences with regard to the other income components. While both MC schemes and unemployment benefits played an important role in absorbing the shock to employee income (21 pp and 19 pp respectively), self-employment income was mainly stabilised by MC schemes (33 pp). Unemployment benefits absorbed only 6 pp of the shock to self-employment income, on average, reflecting the low coverage of unemployment insurance for this type of worker.[13] However, in a few countries that cover the self-employed under unemployment insurance (i.e., Hungary, Ireland, Sweden, Denmark), the ISC of unemployment benefit was similar to the one of employees or even absorbed more of the income shock in the case of Luxembourg.

At the Member State level, in the Netherlands, Portugal and Lithuania the average ISC for employees is more than 30 percentage points higher than the ISC for self-employed. The opposite is true for Croatia and Slovakia. In most other EU Member States, the difference between the ISC for employees and the ISC for self-employed is within a range of around 20 percentage points, indicating that the two groups have been treated differently by the tax-benefit systems, but within a certain threshold.

Although the average ISC for employees and self-employed are very similar at EU level, we found a high heterogeneity across countries and some outliers.

[12] Christl et al. (2022a) show that in 2020 the ISC for employees was about 25 pp higher than for the self-employed in the euro area in 2020. If we restrict the analysis to the Euro area, we also find that the ISC for employees (79) is higher than the one for self-employed (64), but only by 15 pp.

[13] As shown in Table 1, not in all countries the self-employed had access to unemployment insurance (or the unemployment insurance is voluntary, or restricted to certain groups of self-employed, which can result in very low coverage). Hence, in several countries, the ISC of unemployment benefit for self-employed was is equal to 0.

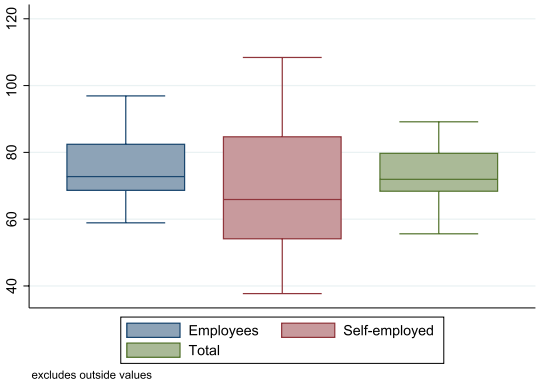


Fig. 5 Distribution of ISC for employees and self-employed across EU in 2021. Note: The graph shows the medium value (middle line of each box), the interquartile range (75th percentile and 25th percentile, colored box) as well as the upper and lower adjacent value. Source: EUROMOD calculations based on EU-SILC data

Fig. 6 Distribution of Income stabilising Coefficients for individuals by EU Member State in 2021. Note: The interquartile range (IQR) measures the spread of the middle half of the data (i.e. from the 25th to the 75th percentiles). The red dashed line is the median value of the ISC across EU Member States for employees, the blue dashed line is the median value of the ISC across EU Member States for self-employed. For Romania, the number of self-employed moving to monetary compensation is too small to get valuable information about the distribution of ISCs. Source: EUROMOD calculations based on EU-SILC data

Therefore, we also provide measures of variability, such as the median and interquartile range (IQR) of ISCs across countries.

In 2021, the median ISC was around 72%, which is higher than the average ISC, indicating a left-skewed distribution. This means that in the median country, 72% of the loss of market income was cushioned by the tax-benefit system in 2021 (Fig. 5). In other words, for a loss of 100 euro in market income, the median household lost only 28 euro in disposable income thanks to government support. For households with employment as their main source of income, the median ISC was 73%, while for households with most of their income from self-employment, this cushioning effect was much smaller, at around 66% (which is lower than the average ISC for this group). Furthermore, the interquartile range (coloured boxes) across countries is much higher for the self-employed than for employees. This means that the

differences between countries in terms of protection are much more varied for the self-employed than for employees.

Looking at country-specific results, Fig. 6 shows the distribution of individual ISCs across the EU Member States. With the exception of countries such as Austria, Finland, Luxembourg and Sweden, the inter-individual variation measured by the IQR is much higher for the self-employed, indicating that income protection varies much more between households with self-employment income as their main source of income compared to those with employment income as their main source.

This finding is related to the specific differences in compensation schemes for the self-employed compared to employees. While standard compensation schemes for employees are often related to the income earned before the economic shock, schemes for the self-employed were often paid in the form of lump sums. As a result, low-income self-employed often benefited greatly compared to their pre-shock income, while higher-income self-employed often suffered a significant reduction in their disposable income.

5.3 Income stabilisation coefficients—2020 versus 2021

In this section we compare the changes in the ISC between 2020 and 2021. It is important to stress that the differences in the ISC between these two years may be due to differences in the characteristics of certain policy measures, such as monetary compensation schemes, but also to differences in the COVID-19 shock or other parameters. For example, without changing the policy measures in place, the ISC could be different because of differences in (i) the type of transition (i.e. the replacement rate is different for transitions to unemployment or monetary compensation), (ii) the size of the shock (i.e. the number of months and hours lost when moving to monetary compensation) and (iii) the characteristics of the individuals and households changing their labour market status.

First, we look at the income stabilisation coefficients at the EU level by quintile. Table 4 shows that the overall ISC at EU level was 7.4 percentage points higher in 2020 (74.4%) than in 2021 (67.0%). In both years, the stabilisation coefficients were highest for the first quintiles (89.2% in 2020 and 83.5% in 2021) and gradually decreased with income (around 20 percentage points lower for the fifth quintile). In

Table 4 Income stabilising coefficients by quintiles in 2020 and 2021, EU

Year	Quintiles					
	1	2	3	4	5	TOT
2020	89.2	81.7	78	74.7	68.9	74.4
2021	83.5	70.3	69.7	65.7	62.2	67.0
Difference	5.7	11.3	8.3	9.1	6.7	7.4

Income quintiles are based on the baseline (no-COVID-19 scenario) distribution of equivalised disposable income. The equivalent income is calculated based on the modified OECD scale. Source: EUROMOD calculations based on EU-SILC data, Christl et al. (2023a) calculations for 2020

the first quintile, the ISC decreased the least, by 5.7 percentage points, while in the second and higher quintiles the decrease was at least 6.7 percentage points. This result shows that the average protection of household income was lower in the second year of the COVID-19 pandemic, but the disposable income of poorer households was largely maintained in 2021. This is a first indication that policy measures may have been slightly more targeted in the second year of the COVID-19 pandemic, also because in many countries measures were limited to the sectors most affected by restrictions, which were often lower-income sectors.

However, the picture is more varied across EU countries (Fig. 7). Countries to the left of the dotted line, such as Bulgaria, Sweden or Greece, show an increase in ISCs in 2021 compared to 2020. In contrast, countries to the right of the dotted line, such as Spain, Austria and Hungary, had significantly lower ISCs in 2021 compared to 2020. This is also due to the fact that monetary compensation schemes were less used in 2021 compared to 2020. Nevertheless, most countries are close to the 45 degree line, meaning that there was little change from 2020 to 2021.

In addition, we compare the cushioning effect of each instrument of the tax-benefit system (i.e. income taxes and social contributions, monetary compensation schemes, unemployment benefits and other benefits) between 2020 Christl et al. (2023a) and 2021 (Fig. 1). We find that the stabilising effect of taxes (including social security contributions) remains similar (around 28%), while that of monetary compensation schemes decreases (from 37 to 22%). The decrease in the ISC of monetary compensation is most likely related to the reduced number of people moving to monetary compensation schemes and the implied relative importance of transitions to unemployment.

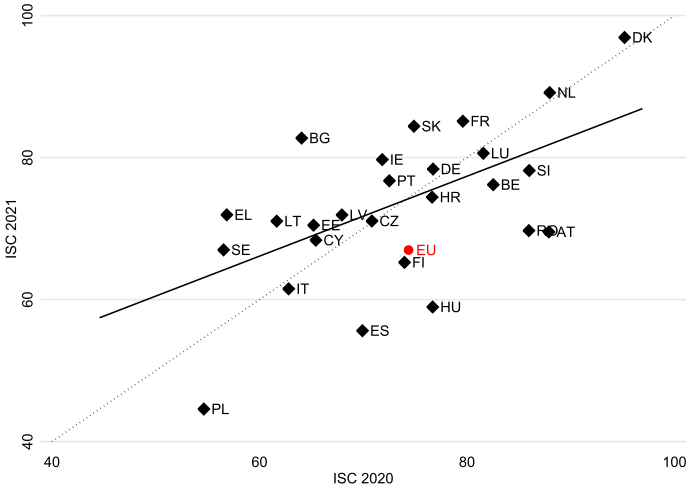
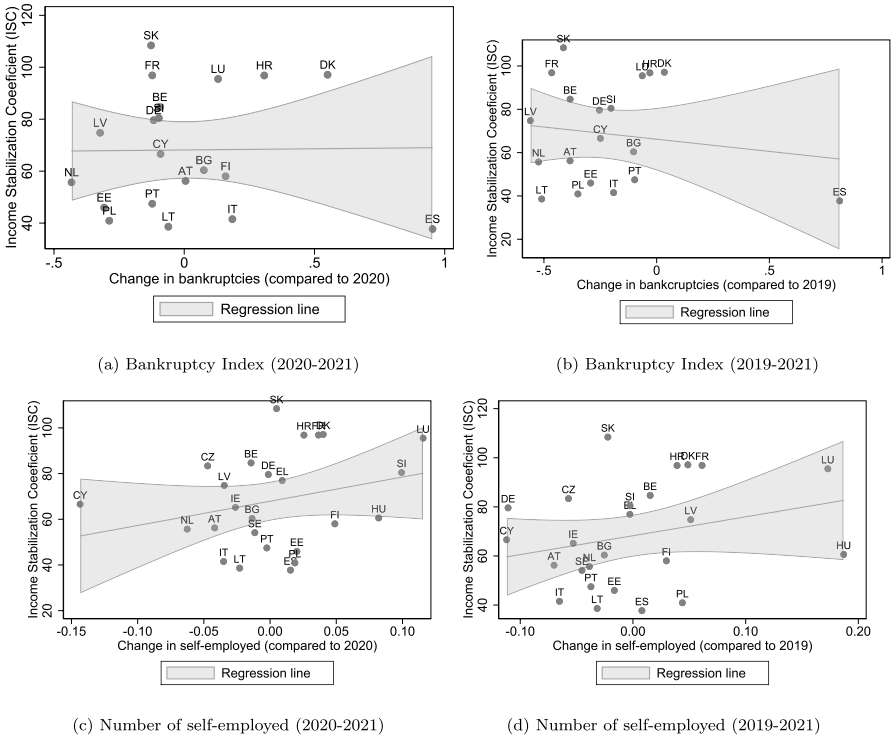


Fig. 7 Income stabilisation coefficient by EU Member State in 2020 and 2021. Note: The solid line indicates the linear regression of ISC 2020 on ISC 2021. The dotted line shows the 45-degree line. Source: EUROMOD calculations based on EU-SILC data, Christl et al. (2023a) calculations for 2020



(a) Bankruptcy Index (2020-2021)

(b) Bankruptcy Index (2019-2021)

(c) Number of self-employed (2020-2021)

(d) Number of self-employed (2019-2021)

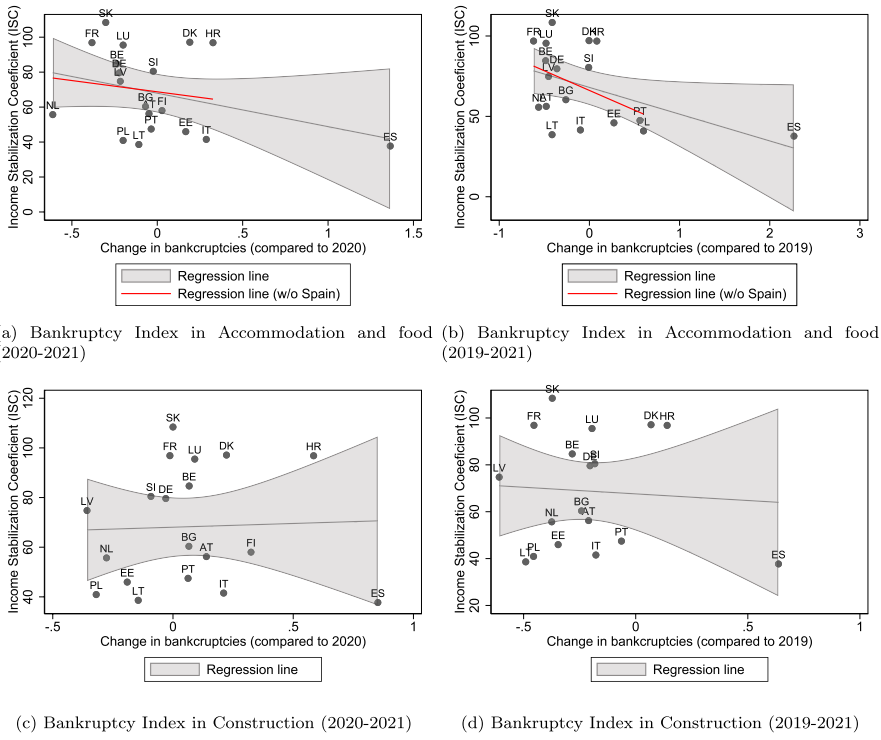
Fig. 8 Income stabilization coefficient for self-employed and business closure

6 Discussion of results

Our analysis has shown that there was quite some heterogeneity in the income protection of the self-employed during the COVID-19 pandemic, both between and within countries. Little is known in the literature about the consequences of these income support measures for the self-employed. To the best of our knowledge, there is no evidence yet on whether the policy objective of these support measures—to prevent (small) business closures and to protect vulnerable people (who are often self-employed)—was really achieved. In this chapter we try to explore the differences in income protection across countries and look for possible correlations with macroeconomic variables related to business closures.

We, therefore, use two proxies for enterprise deaths. First, we use Eurostat's bankruptcy index. Bankruptcies are defined as the number of legal units that have started the bankruptcy procedure by filing a judicial declaration. A declaration may be provisional and does not always imply the cessation of an activity. In other words, it monitors the number of corporate insolvencies declared in a country.[14] Then, we use

[14] We are missing some countries because data for all EU countries will only be available from 2021.



(a) Bankruptcy Index in Accommodation and food (2020-2021)

(b) Bankruptcy Index in Accommodation and food (2019-2021)

(c) Bankruptcy Index in Construction (2020-2021)

(d) Bankruptcy Index in Construction (2019-2021)

Fig. 9 Income stabilization coefficient for self-employed and business closure by sector of activity

information on the number of self-employed from the Labour Force Survey (LFS) in the analysis. While the bankruptcy index also includes large firms that were heavily subsidised during the COVID-19 pandemic (Lalinsky & Pál, 2022; Kozeniauskas et al., 2022), the number of self-employed focuses only on the self-employed group.

Figure 8 highlights the simple correlations between the income protection of the self-employed (measured by the ISC) and the change in bankruptcies or the change in the number of self-employed during the COVID-19 pandemic. There is no correlation between the overall change in bankruptcies and the ISC during the crisis, only a very small negative correlation between the ISC and the change in bankruptcies during the whole pandemic period (2021 compared to 2019). It is worth noting that during the first two years of the COVID-19 pandemic, bankruptcies typically even decreased, due to generous government support for businesses, which helped them to avoid declaring bankruptcies. Only in Spain and Denmark was the bankruptcy index higher in 2021 than before the pandemic in 2019.

However, looking more closely at the self-employed, we observe some weak empirical patterns. First, we can see that the ISC in 2021 is positively correlated with the change in the number of self-employed in a country, both over one year

Table 5 Correlation coefficients and significance levels

	Change in bankruptcies			
	ACCO		CONS	
	(2020–2021)	(2019–2021)	(2020–2021)	(2019–2021)
ISC for self-employed	−0.328*	−0.472**	0.062	−0.066
Observations	18	18	18	18

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; CONS stands for construction, ACCO for accommodation and food service sector

(2020–2021) and compared to pre-pandemic (2021–2019).[15] This suggests that government support for the self-employed may be linked to their retention in the labour market. Note that these correlations are not statistically significant.

As the COVID-19 pandemic hit some sectors of the economy more than others, in a next step we try to look more closely at the sectors most affected by COVID-19, such as construction and hotels and restaurants. Unfortunately, we only have information at the sectoral level, while the number of self-employed by sector is not available. Again, we will examine the change in bankruptcies between 2020 and 2021 to see if a higher ISC had an impact compared to the previous year. In addition, we will look at the change compared to the pre-pandemic level (2019).

Figure 9 highlights the correlation between the ISC and the change in bankruptcy declarations in these two sectors. While there is no correlation for construction, there is a fairly strong correlation for accommodation and food service sectors, suggesting that countries with stronger income protection for the self-employed have seen less change in bankruptcies than countries with less income protection.

To see if this correlation is significant, we calculate the correlation coefficients between our measures (ISC and bankruptcies), and we check if the correlation coefficients are significantly different from zero. Table 5 shows that the correlation coefficient for all four measures and the ICS for the self-employed is clearly negative. The coefficients are clearly negative for hotels and restaurants, while they are close to zero for construction. It is worth noting that both coefficients for changes in hotels and restaurants are significantly different from zero, indicating a significant negative relationship between income protection for the self-employed in a country and the increase in the number of bankruptcies in this sector in a country.

Further research is needed to make causal claims about the economic consequences of income protection for self-employed during the COVID-19 pandemic. However, we find preliminary (weak) evidence that the stronger the protection of the self-employed within a country, the smaller the decrease or the larger the increase in the number of self-employed. Overall, we find no correlation between the overall change in bankruptcy filings and income protection for the self-employed.

[15] This positive correlation is also observed when looking at the change in self-employed between 2023 and 2019 (see Fig. 11).

However, when we drill down further, we find a significant negative relationship between bankruptcy filings in the hotels and restaurants sector (one of the sectors most affected by the COVID-19 pandemic) and a country's income protection. In economic terms, we find evidence that stronger protection helped to prevent bankruptcies, at least in the hotels and restaurants sector.

7 Conclusion

Fiscal policy measures, and in particular monetary compensation schemes for employees and the self-employed, differed significantly across EU countries during the COVID-19 pandemic. To the best of our knowledge, we are the first to analyse the cushioning effect of these policy measures and how they differed for these two groups in 2021. We also analyse the decline in household income and the cushioning effect of policy measures, in particular monetary compensation schemes, in 2021 by combining microsimulation techniques with detailed COVID-19 labour market data from Eurostat.

We show that, despite differences in monetary compensation schemes for employees and the self-employed, the average income stabilisation effect for both groups was quite similar. However, in countries such as the Netherlands, Lithuania and Portugal, it was at least 30 percentage points higher for employees, while the opposite was true in Croatia, Slovakia and Romania. Across countries, the variation in income stabilisation coefficients was typically much greater for the self-employed than for employees.

Although the average income stabilisation coefficient was similar for employees and the self-employed, the impact of the different measures differed, not least because the self-employed are less often covered by the unemployment insurance. For employees, both monetary compensation schemes and the unemployment benefits played a similar role in absorbing the income shock (21 pp and 19 pp respectively), while for the self-employed, it was mainly the MC schemes (33 pp) and, to a lesser extent, unemployment benefits (6 pp) that stabilised their income.

From a policy perspective, these results highlight the importance of extending unemployment insurance coverage to the self-employed in countries where this insurance is not applicable or offered on voluntary or restrictive grounds, in order to provide more robust protection against future income shocks and to reduce reliance on ad hoc measures that may be difficult to implement effectively.

Preliminary evidence suggests that greater income protection for the self-employed is associated with a smaller decrease in self-employment. While there seems to be no overall association with bankruptcy declarations, there is a significant negative association in the accommodation and food service sector, suggesting

that stronger income protection may have helped to prevent bankruptcies in this sector.

In addition, we show that not only the variation between countries, but also the variation within countries in income stabilisation for the self-employed is much higher than for employees. This difference can be attributed to the specific design of compensation schemes for the self-employed, which were often independent of initial income (e.g. lump sums). This type of design implies that low-income self-employed benefited more from MC schemes relative to their pre-shock income, while higher-income self-employed experienced larger reductions in disposable income.

Our results underline the importance of monetary compensation schemes also in the second year of the COVID-19 pandemic. A hypothetical scenario without monetary compensation measures shows that tax-benefit systems would have cushioned only about half of the income shock in the EU in 2021, compared to 67% with monetary compensation schemes. Most of the absorption in 2021 comes from personal income taxes and social contributions (26 pp), followed by temporary monetary compensation schemes (22 pp) and unemployment benefits (18 pp).

Compared to 2020, in 2021 there is a decrease in the overall cushioning effect (from 74 to 67%) and in particular in monetary compensation schemes, and an increase in the role of unemployment benefits. The decrease in the cushioning effect was smaller for the lowest income groups, suggesting that the schemes may have been slightly more targeted in the second year of the pandemic. This is in line with the adjustment of MC schemes in many countries, where in 2021 these measures were often limited to the sectors most affected by the restrictions, which were often low-income sectors. Thus, the overall stabilising effect at the EU level was progressive, cushioning the shock for lower income households more than for richer households.

Additional figures and tables

See Figs. 10, 11.

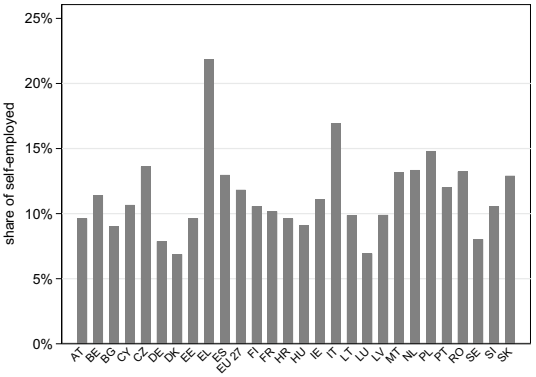


Fig. 10 Share of self-employed workers across the EU Member States

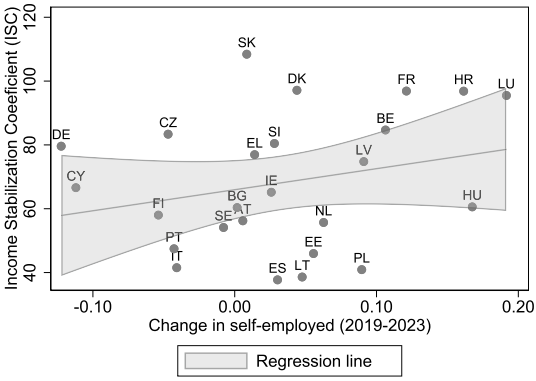


Fig. 11 Income protection and change in self-employed (2019–2023)

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Data Availability The data supporting the findings of this study are available from Eurostat, but there are restrictions on the availability of these data. However, data are available from the authors upon reasonable request and with the permission of Eurostat.

Declarations

Conflict of interest The authors declare that they have no Conflict of interest with regard to the publication of this article.

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