



Pandemic Policy and Individual Income Changes across Europe

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Pandemic Policy and Individual Income

Changes across Europe*

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Abstract

We use data from the COME-HERE panel survey collected by the University of Luxembourg to assess the effects of COVID-19 policy responses on disposable incomes in France, Germany, Italy, Spain and Sweden between January 2020 and October 2021. Policy responses are measured by the Stringency and Economic Support Indices from the Oxford COVID-19 Government-Response Tracker. Controlling for the evolution of the pandemic itself, we find that the income cost of greater stringency measures is borne only by the most economically-vulnerable, while government economic-support measures have a positive effect across the income distribution.

Keywords: COVID-19, Income losses, Lockdown policies, Economic support policies.

JEL Classification Codes: I18, I32, H24.

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1. Introduction

The COVID-19 pandemic has presented an ongoing challenge to health systems and economies across the world. Governments have introduced a variety of measures to help limit the diffusion of the virus and protect population health, while at the same time ensuring at least a certain degree of continued economic activity. While vaccination and confinement measures have helped tackle the number of confirmed cases (see Haug *et al.*, 2020, for a machine-learning statistical model quantifying the efficacy of over 6,000 different types of government interventions in curbing the spread of the virus), we do not yet have a complete picture of the cost of restrictive pandemic policies on individuals' economic and psychological wellbeing.

A fast-growing literature has documented the cost of the pandemic and confinement measures on labour-market outcomes (job loss, earnings and working hours), finding that these were larger for women (Adams-Prassl *et al.*, 2020; Belot *et al.*, 2021; Cortes and Forsythe, 2020; Farré *et al.*, 2022; Montenovo *et al.*, 2022), the younger (Beland *et al.*, 2022; Belot *et al.*, 2021; Benzeval *et al.*, 2020; Montenovo *et al.*, 2022), the poorer (Bottan *et al.*, 2020; Belot *et al.*, 2021; Cajner *et al.*, 2020) and the less-educated (Adams-Prassl *et al.*, 2020; Beland *et al.*, 2022; Cortes and Forsythe, 2020; Guven *et al.*, 2020).

The labour-market consequences of the pandemic, via wages, hours of work and unemployment, feed through to household incomes. With the relative scarcity of individual-level income data over the pandemic, less work has focused directly on the movements in household incomes, which include the above labour-market rewards, but also government transfers, housing income and so on. Brewer and Gardiner (2020), using real-time survey data from a sample of 6,000 British individuals, find that 33% of respondents reported a fall in household income between January and May 2020. In Immel *et al.* (2022), 16% of respondents to the 'Corona-BUND-Study' (a German longitudinal survey conducted between June and November 2020) experienced income losses between February and June 2020, but only 6% between June and October 2020. Immel *et al.* (2022) create a synthetic measure of "socio-economic strain" by combining these income changes with a set of variables measuring "financial concerns", "discontinuation of employment", "burden due to public restrictions" and "burden due to contact restrictions". Their cross-section regressions suggest, as for the job-loss

literature above, that the economic consequences of the pandemic weighed more heavily on women, the younger, the self-employed and the poorer. In a similar vein, the analysis of German Socio Economic Panel data in Grabka (2021) underlines that the self-employed reported the largest drops in household disposable equivalent incomes between 2019 and 2021. Using the earlier waves of the same micro-data as we do here, Clark *et al.* (2021) track the inequality in equivalent household disposable income between January and September 2020, and find that relative inequality followed a hump-shaped path. Menta (2021) finds a similar pattern in various indicators of income poverty over the same period.

Although a number of patterns appear in the household-income data from individual-level surveys run during the pandemic, comparatively little is known about how income was affected by government pandemic policy. The most-plausible contributions to date come from microsimulation analyses. Brunori *et al.* (2021) and Figari and Fiorio (2020) use respectively the IRPET MicroReg tax model and EUROMOD, and report that lockdown reduced household incomes in Italy, although these income losses were attenuated by government economic support. Similar conclusions have been reached in Ireland (O'Donoghue *et al.*, 2021), the UK (Brewer and Tasseva, 2021), Australia (Li *et al.*, 2022) and in the EU zone (Almeida *et al.*, 2021; Christl *et al.*, 2020; Cantó *et al.*, 2022). Cantó *et al.* (2022) simulate the effects of changes in equivalent household income by pre-pandemic income quintile groups in Belgium, Italy, Spain and the UK using EUROMOD, and find that a one-month lockdown on its own produces larger losses in gross income for those at the bottom of the income quintile distribution. However, government income-support measures more than compensated for this inequality, with the final drop in equivalent household disposable income being larger for those at the top of the income quintile distribution. This is consistent with the conclusions of other microsimulation work (Almeida *et al.*, 2021; Brunori *et al.*, 2021; Figari and Fiorio, 2020).

Our objective here is to build on the above work and assess the extent to which government pandemic policies affected household equivalent income over time. We do so using individual information on over 8,000 Europeans from the University of Luxembourg's COME-HERE quarterly panel survey from April 2020 to October 2021, combined with national policy indicators from the Oxford COVID-19 Government Response Tracker of lockdown stringency

and the generosity of economic support measures. Holding the evolution of the pandemic itself constant, we evaluate the effect of arguably-exogenous variation in the governmental policy responses to COVID-19 on income changes in France, Germany, Italy, Spain, and Sweden over the course of 2020 and 2021.

We find that more-stringent confinement measures (as captured by the Stringency Index) have no effect on average equivalent household disposable income, but with evidence of considerable heterogeneity: greater Stringency significantly reduces the income of women, the younger, and those who had equivalent pre-COVID household income below the poverty line in January 2020. The cost of lockdowns in terms of income losses is then mostly borne by the economically-vulnerable. The economic support measures (from the Economic Support Index) have, on the contrary, a homogeneous effect: a one-standard deviation (SD) higher index score is associated with a rise in income of 2.3 percent. These conclusions are robust to a battery of robustness checks, addressing, among others, the sensitivity of our results to the baseline specification.

Our results here contribute to the literature in a number of ways. To the best of our knowledge, we are the first to investigate the impact of two sets of pandemic policies (lockdown and economic support) on movements in equivalent household disposable income using cross-country harmonised survey data collected during the pandemic. In addition, by controlling for the evolution of the pandemic and using panel regressions, the estimated coefficients on pandemic policy can arguably be read as causal. Last, our conclusions regarding equivalent household incomes are in line with the literature on individual labour-market outcomes: it is those who were the most economically-vulnerable pre-pandemic (women, the younger, and those in poverty) who suffered the most from policy stringency over the course of 2020 and 2021. They can also partly explain the change in income inequality observed over the first year of the pandemic in Clark *et al.* (2021).

The remainder of the paper is structured as follows. Section 2 describes the data and the empirical strategy. Section 3 then discusses the effects of government policy responses to COVID-19 on changes in income, presents a number of robustness checks, and identifies the groups who were most affected by the pandemic policies. Last, Section 4 concludes.

2. Data and empirical strategy

2.1. Data

Our data comes from the COME-HERE survey collected by the University of Luxembourg. The survey was conducted with Qualtrics to cover representative samples in France, Germany, Italy, Spain and Sweden by gender, region, and age. Ethics approval was granted by the Ethics Review Panel of the University of Luxembourg. Respondents are asked to complete an on-line questionnaire that takes approximately 20 minutes. This dataset collects information at the individual and household level, and is longitudinal. Seven waves of data were collected at roughly three-month intervals from the beginning of the pandemic to the end of 2021: late April, early June, early August, and late November 2020, and early March, early June and late October 2021. At least three more waves are planned to take place in 2022.

More than 8,000 individuals responded to the first survey, and were then invited to take part in all subsequent waves. Over 85% of Wave-1 respondents participated in at least one other survey wave, 30% participated in all seven and 47% in at least six. The survey includes detailed information on individuals' living conditions and mental health during the pandemic, as well as identifying recent changes and events that might have affected their lives. Standard sociodemographic characteristics such as age, gender, education, labour force status, and country and region of residence were also collected. For more information, see Vögele *et al.* (2020).

In each wave, respondents reported the level of their household disposable income two to three months prior to the survey using the following bands: “0 to 1250 Euros”, “1250 to 2000 Euros”, “2000 to 4000 Euros”, “4000 to 6000 Euros”, “6000 to 8000 Euros”, “8000 to 12500 Euros” and “>12500 Euros”.¹ Respondents were then asked whether their current household disposable income had changed since that date, and if so what their current income was as a percentage of the previous income figure. These relative income figures were reported using the following categories in the 2020 waves: “>100%”, “75-99%”, “50-74%”, “25-49%”, “1-

¹ The reference periods for this prior household income figure are as follows: January 2020 (in Wave 1), April 2020 (Wave 2), May 2020 (Wave 3), September 2020 (Wave 4), January 2021 (Wave 5), April 2021 (Wave 6) and June 2021 (Wave 7).

24%”, “0%”. In the 2021 waves these were rather reported using a continuous scale of integer values (from 0% to 200%). To make the income changes comparable across waves, we have grouped the 2021 continuous figures into the 2020 bands. By combining this income information, we can reconstruct the profile of a household’s disposable income from January 2020 (here considered as the pre-COVID-19 income level) up to October 2021.

The unit of reference for income used in the survey, for both levels and the changes, was the household as a whole (“taking [...] all household members living with you”). However, resources at the individual level for a given household income will depend on family size, taking into account that there are economies of scale from living together. The traditional approach in the literature on measuring individual wellbeing is to transform household income into equivalent income via an equivalence scale. This equivalent income is then assigned to each individual in the household as a measure of her command of economic resources. We equalise household income using the square root of family size. Under the assumption that family size remains the same between the income reference period and the interview date (which seems plausible, given the short recall time-window), the percentage changes in household income reported by COME-HERE respondents can then be interpreted as changes in equalised household income. All of our empirical analyses will be at the individual level.

2.2. Empirical Strategy

We model the relationship between income changes and pandemic policies using the following equation, estimated via OLS:

$$Income\ Change_{ijt} = \alpha SI_{jt} + \beta ESI_{jt} + \gamma X_{it} + \mu_i + \lambda_t + COVID_{jt} + \epsilon_{ijt}. \quad (1)$$

As noted above, the recent changes in disposable income reported by respondent i at time t in country j are banded. We take the mid-point of each band to construct $Income\ Change_{ijt}$, the recent percentage change in equalised disposable income, which then takes on the values of -100, -88, -63, -38, -13, 0, and 20, referring to current income (as a percentage of previous income) figures of “0%”, “1-24%”, “25-49%”, “50-74%”, “75-99%”, “No change”, and “>100%”. We assign an arbitrary percentage income rise figure (20%) to the category

“>100%”.²

In Equation (1), SI_{jt} and ESI_{jt} are respectively the Stringency Index and the Economic Support Index, from the Oxford COVID-19 Government Response Tracker produced by the Blavatnik School of Government at the University of Oxford.³ The Stringency Index is composed of the nine following sub-indices, measuring various aspects of containment policies: “school closing”, “workplace closing”, “cancellation of public events”, “restriction on gathering”, “public transport closing”, “stay-at-home requirements”, “restriction on internal movement”, “restriction on international travel” and “public information campaign”. The Economic Support Index has only two components: “income support” and “debt relief”. The “income support” element measures the extent to which governments provide their citizens with direct cash payments, universal basic income, or income support for people who lost their job or cannot work. The “debt relief” part pertains to governmental decisions to freeze the financial obligations of households (such as their loan repayments). Both the Stringency and Economic Support indices are rescaled to range from 0 to 100. The higher the value of the Stringency Index, the more stringent is the country’s lockdown-style policy response to COVID-19. Equally, higher values of the Economic Support Index reflect countries spending more to attempt to counterbalance the adverse economic effects of COVID-19 borne by individuals.

As the data producers explain (Hale *et al.*, 2021), the indices do not track the effectiveness of the government response to limit the spread and negative economic consequences of COVID-19: they rather provide synthetic measures of the strictness of the different containment policies (SI_{it}) and economic support policies (ESI_{it}) that can be used for cross-country comparisons over time. In our main regressions, SI_{jt} and ESI_{jt} are the average values of the Stringency and Economic Support Indices over the two weeks prior to the interview

² Fewer than 6 percent of survey respondents report rises in household income. The robustness checks show that our results are unaffected by the use of a different percentage-rise figure here (see Figure A1).

³ This project involves over one hundred students and staff members of the University of Oxford from every part of the world, who collect data from public sources to produce indices measuring policy responses to COVID-19 at the national level. The indices are updated daily (for more details see www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker#data).

date,⁴ and are standardised (Mean = 0, SD = 1).

We will estimate two versions of Equation (1): with and without individual fixed effects (μ_i). In the former, the variable X_{it} will only include variables that vary over time at the individual level: partnership status and labour-force status. In the pooled version, X_{it} includes in addition age and its square, the log of equivalised monthly household disposable PPP-adjusted income in January 2020, and dummies for gender, education, and country of residence.⁵ All regressions control for macro trends via the wave dummy variables, λ_t . The standard errors in Equation (1) are clustered at the $SI_{jt} * ESI_{jt}$ level.

The causal interpretation of the policy effects may have been easier had we used an event-study or difference-in-differences strategy. However, these approaches often focus on particular periods, individuals and policies. As such, the external validity of natural experiments is often limited. We use the SI_{jt} and ESI_{jt} indices as we wish to estimate the average effects of a set of pandemic policies over a two-year period for the entire population of the five European countries in our survey. Given that we prioritise the external validity of our analysis, in order to produce a complete picture of the relationship between income changes and pandemic policies, we discuss the exogeneity of SI_{jt} and ESI_{jt} in more detail. The causal interpretation of α and β , the estimated coefficients on SI_{jt} and ESI_{jt} , requires that the latter be exogenous. As in most empirical work, we need to consider potential omitted variables. Although both indices depend on Government decisions, and are thus arguably orthogonal to individual characteristics, they are not random as they are responses to the COVID-19 pandemic, and the country and wave dummies may only partly capture the way in which the pandemic evolves within a country. We address this issue by introducing a variable, $COVID_{jt}$, that tracks the pandemic's evolution within country j . As noted in Clark and Lepinteur (2022), there are a number of plausible candidates for $COVID_{jt}$, such as the stock and flow of COVID-19 cases and deaths (averaged over the previous two or four weeks). We follow Clark and

⁴ Our results continue to hold if we use average index values over the previous month or the exact value at the date of interview, as shown in the robustness checks.

⁵ In an alternative specification, we use family size and the log of the total household disposable income instead of the log of equivalised household disposable income: the results are not affected by this choice.

Lepinteur (2022) and introduce the average number of daily deaths over the past four weeks (per 100,000 inhabitants) as this is the best predictor of both policy indices (although the results turn out to be similar when using the other pandemic-evolution measures mentioned above).

Our COME-HERE sample consists of 31,383 observations on the 6,152 respondents who were present in the first wave and at least one of the six other waves collected in 2020 and 2021, and who provided valid information on both household income changes and the socio-demographic variables. The descriptive statistics for this sample appear in Appendix Table A1. French, German, Italian and Spanish residents account for 20 to 23% of the sample, while Swedish respondents represent only 12% of the observations, reflecting the different country population sizes. 20% of the observations come from the first wave, with smaller figures for the following waves. As in any longitudinal survey, there is attrition resulting in fewer respondents in more-recent waves. Although we restrict our analysis to individuals who are observed at least twice in the survey (37% of whom appear in all seven waves), the robustness checks will address the question of how any residual attrition affects our estimates. Women and the higher-educated (those with a qualification from post-Secondary education) make up just under half of the sample.

Regarding our dependent variable, the average change in household equivalent income is negative, at -6.3 percent. We may wonder if the size of household-income losses depends on how we construct the income-change variable. Table 1 presents the distribution of the original banded income changes in our analysis sample by wave. Almost all respondents report either no change or a fall in their household disposable income, with there being more losses in April 2020 than in the other waves. However, as there is no upper bound to the “>100%” category, we may underestimate the size of income gains by assigning a figure of only +20% here. For the average income change in the analysis sample to be zero, the average income gain for the 1,344 observations with “>100%” would have to be +175% relative to income a couple of months earlier: this seems improbably high.

Figure 1 plots the evolution of the Stringency and Economic Support Indices in the five COME-HERE countries from April 2020 to October 2021. The points here are the average index values across the interview dates at each wave (where the value taken by the indices on

any day is itself an average across the two weeks prior to the interview date). The Stringency Index in almost every country was U-shaped in 2020, falling after the first COVID-19 wave and the end of the first lockdowns in Europe (from April to August 2020) but then rising again with the second COVID-19 wave and the reintroduction of lockdowns (from August to November 2020). Unsurprisingly, the exception is Sweden, where there were no lockdowns: here the Stringency Index was fairly stable during 2020 with the lowest average value among COME-HERE countries. The Stringency Index fell in all countries in 2021, but with some evidence of a new rise in France towards the end of October 2021.

The right-hand panel of Figure 1 reveals a more nuanced evolution in the Economic Support Index. This index remained high and stable in Spain throughout the sample period, while it progressively moved to higher levels in Italy and lower levels in France and Germany. The Economic Support Index in Sweden is hump-shaped. These movements correspond to the key economic responses summarised by the International Monetary Fund's policy tracker (see www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19). The economic support measures in Spain were introduced as early as the beginning of March 2020 – with a total government expenditure figure of 71 Billion Euros (6.2% of Spanish GDP) by June 2021.⁶ These Spanish measures included less-stringent conditions for unemployment-benefit eligibility, higher sick pay for COVID-19 infected workers, supporting the self-employed who were affected by the economic downturn, the introduction of a new means-tested minimum income scheme, and subsidising new rental programs for economically-vulnerable renters. Governments in the other COME-HERE countries implemented similar kinds of economic-support schemes, but either somewhat later (Italy and Sweden) or which became increasingly targeted over time (France, Germany and Sweden).

3. Household income changes and COVID-19 policy responses

3.1. Main Results

Table 2 presents a number of different specifications of regressions relating the changes in

⁶ Data from www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19, accessed on 15th December 2021.

equivalent household disposable income at each wave to the stringency of COVID-19 policy responses and the economic-support measures. The analysis sample here is that described in Appendix Table A1. Columns (1) to (3) introduce the Stringency and Economic Support indices, first separately and then jointly in a version of Equation (1) with only dummy variables for wave and country. We then add the 4-week average daily deaths per 100,000 inhabitants variable in column (4), and the remaining individual controls X_{it} in column (5). Last, column (6) presents the full model in Equation (1), including individual fixed effects.⁷

In column (1), the point estimate suggests that a one standard-deviation (SD) higher Stringency Index is associated with an income drop of 0.5 percent, although this estimated coefficient is not significant. The effect of the Economic Support Index in column (2) is of the opposite sign, much larger in size (a one-SD higher index value being associated with a 2.5 percent increase in income) and significant. Introducing both indices at the same time in column (3) does not change the conclusions from columns (1) and (2).

The introduction of pandemic evolution, as the average number of daily deaths over four weeks, in column (4) does not affect the point estimates on the two indices. Columns (5) and (6) then show that, holding the evolution of the pandemic constant, the indices are orthogonal to both observed and time-invariant unobserved individual characteristics.

In our preferred specification in column (6) of Table 2, the Stringency Index continues to have no effect on disposable income, while a one-SD higher Economic Support Index produces an income gain of 2.3 percent. This latter estimate is sizeable: it corresponds to about half of the income gain from the transition from unemployment to employment (the full set of estimated coefficients from Table 2 appear in Appendix Table A2).

Last, we ask whether the effects of the Stringency and the Economic Support Index on income changes are interdependent. With lockdown-style measures taking a toll on the economy as a whole, the return to economic-support measures in terms of household income may be larger in periods of greater stringency. We thus re-estimate Equation (1) adding an interaction term between the two indices. When we do so, the Economic Support Index

⁷ The (pooled) results in the first four columns of Table 2 are almost identical if individual fixed effects are introduced into the analysis.

continues to attract a positive estimated coefficient that is significant at the 1% level, but the point estimates on both the Stringency Index and the interaction are insignificant (these results are available upon request).

3.2. Robustness Checks

We now turn to a number of sensitivity tests, which are carried out on the fixed-effect specification in column (6) of Table 2. These appear in Table 3, the first column of which reproduces the baseline estimates for comparison purposes. A first issue in panel data is non-random attrition, with those who drop out of the sample perhaps being also systematically more likely to experience income losses (or gains). Attrition in the COME-HERE sample is indeed non-random, being negatively correlated with age and education and positively correlated with income losses. We thus calculate weights to reduce the influence of ‘oversampled’ respondents via Inverse Probability Weighting (IPW). The point estimates turn out to be unaffected by the use of IPW weights in column (2) of Table 3. We have also considered cross-sectional weights that guarantee national representativeness in terms of age, gender and region of residence: the results in column (3) are again comparable to those in the baseline.

The baseline specification used the average values of the Stringency and Economic Support Indices over the two weeks prior to the interview date. This period may be either too long or too short. More-recent values may better capture the effect of current policies on current income, while averages over a longer period will pick up influences on both current and past income. Columns (4) and (5) therefore introduce policy index values at the interview date and then their average value over the 30 days prior to the interview. There is no substantial change in the estimated coefficients on the policy variables.

Since the recent changes in disposable income reported by COME-HERE respondents are banded, an ordered logit model with individual fixed-effects may be considered as more appropriate than a linear model. We show in column (6) that the results are qualitatively similar when using the ‘Blow-up and Cluster’ (BUC) model, an ordered logit model for panel data developed by Baetschmann *et al.* (2015).

Household income losses are more frequent than gains in our sample, column (7) considers

a dummy variable for income losses. The estimated coefficients from the conditional logit model estimation in column (7) are consistent with all of the previous results: greater Stringency does not affect the probability of income loss, whereas a one-SD higher Economic Support Index reduces this probability.

Last, we ask whether the (arbitrary) use of the value “20” for income rises is important. Figure A1 plots the estimated coefficients on the policy variables in our main specification when we assign values of 0 to 250 percent for income rises, by steps of ten percent. The results are stable: the Stringency Index never attracts a significant estimate, and that on the Economic Support Index is always positive and significant (and rises somewhat with the value that is assigned to the income-rise category).

3.3. Heterogeneity Analysis

The estimated coefficients in Table 2 refer to the *average* effects of COVID-19 policy responses on income changes. It is however possible that these policies affected certain groups of individuals differently. To check, we re-estimate Equation (1), interacting the Stringency and Economic Support Indices with various individual-level indicators. To ensure that these latter are not themselves affected by the pandemic and the policy responses, we only consider pre-determined characteristics for this heterogeneity analysis: dummies for being a woman, young (defined as 50 or less: 50 is the median age of the estimation sample in Wave 1), in poverty (*i.e.* with equivalised household disposable income below 60% of the median of the national estimation samples) in January 2020, and employed, self-employed or retired in January 2020.⁸

The results appear in Table 4, where the top panel refers to the Stringency Index. The overall insignificant effect of stringency above turns out to hide a number of significant effects. Stringency produces more-negative income changes for women, the young, and those who were already in poverty in January 2020:⁹ this last conclusion is in line with microsimulation

⁸ We also considered dummies for tertiary education and living with a partner in January 2020, but found no significant results.

⁹ We may worry that there is mechanically less variation in banded changes in household income for “High Income” individuals: the higher the initial income, the greater the absolute income drop needed to produce a certain percent change. We have replicated the heterogeneity analysis with the probability of reporting an income loss as the dependent variable — this does not mechanically depend on the initial income level. Consistent with

results (see, for example, Cantó *et al.*, 2022). The last column of Table 4 refers to labour-force status. The effect of stringency on the omitted labour-force category, the unemployed and non-retired inactive, is negative (at -1.285 in the first row). Perhaps as expected, the greatest losers from stringency are the self-employed (at -3.1). The net effect of more Stringency is positive only for retirees: this might capture the pooling of resources with other family members due to family reunifications during the pandemic (as argued in Posel and Casale, 2020).¹⁰ The broad conclusion from the top panel of Table 4 is then that the cost of more stringent lockdown-style measures on equivalent household disposable income is mostly borne by the economically-vulnerable.

The heterogeneity of this effect of the Stringency Index may help us to understand the U-shaped evolution of income inequality observed by Clark *et al.* (2021) during the first year of the COVID-19 pandemic. As shown in Figure 1, the Stringency Index was at its highest level in April 2020. Rising income inequality at the start of the pandemic is consistent with policy-stringency having a greater effect on income drops for those whose pre-pandemic incomes were already relatively low. In parallel, the most-vulnerable groups benefited from greater income gains than the rest of the population following the lower stringency values in the Summer of 2020, which is also when the income inequality documented in Clark *et al.* (2021) fell.

On the contrary, Economic Support benefited everybody equally (and here our results are different to those in the microsimulation literature). In the bottom panel of Table 4 there is almost no evidence of heterogeneity, with the one exception (at the 10% level) being a somewhat smaller benefit for the employed in column (4), although the net effect of support for this group continues to be positive and statistically-significant at the 1% level.

4. Conclusion

This paper has investigated the relationship between equivalent household disposable

the estimates in Table 4, the results (available upon request) suggest that “High Income” respondents in January 2020 were partially insured against income losses due to Stringency. The probability of income loss of these respondents is also less affected by the economic support measures.

¹⁰ We can indirectly check this by looking at the location from which individuals answered the survey at different waves. The retired in the sample are more likely to have changed this location by over 1km when stringency rises, in line with family reunification.

income and pandemic policy responses across five European countries, using seven waves of panel data between January 2020 and October 2021. Holding the evolution of the pandemic itself constant (via the 4-week average daily death rate), greater stringency in lockdown-style measures had no average effect on income. There is however considerable heterogeneity, with stringency significantly reducing the incomes of the more economically-vulnerable. This heterogeneity may partly explain the change in income inequality during the pandemic in Clark *et al.* (2021). On the contrary, there is a well-defined positive effect of economic support on income that holds across all groups in society.

Our results have a number of policy implications. First, although lockdown policies aimed to reduce the spread of COVID-19 and prevent health-system collapse, we find that they affect the distribution of income: this should enter into the discussion of the pros and cons of lockdown stringency.

On the contrary, economic-support measures have been shown to be systematically effective in reducing household income losses. While government responses to the COVID-19 emergency have focussed on the minimisation of casualties, spread of the virus, and the maintenance of health systems below full capacity, these containment strategies have affected individuals' economic and social lives. All of these impacts should appear in cost-benefit analyses of pandemic policy (as in Layard *et al.*, 2020).

There are number of caveats to these results. We first acknowledge that these conclusions come from rich Western European countries only. Second, we have been able to identify the intensive margin of lockdown policies, but not the extensive margin of what would have happened in the absence of any restrictions whatsoever. Last, we have concentrated on the costs and benefits of pandemic policy in terms of current household income. A fuller evaluation of the suitability of lockdown and economic-support policies would also take in their wider consequences: for example, in terms of the effect of lockdowns on mental and physical health, and the future fiscal consequences of the very substantial Government borrowing that has mitigated the current income consequences of COVID-19.

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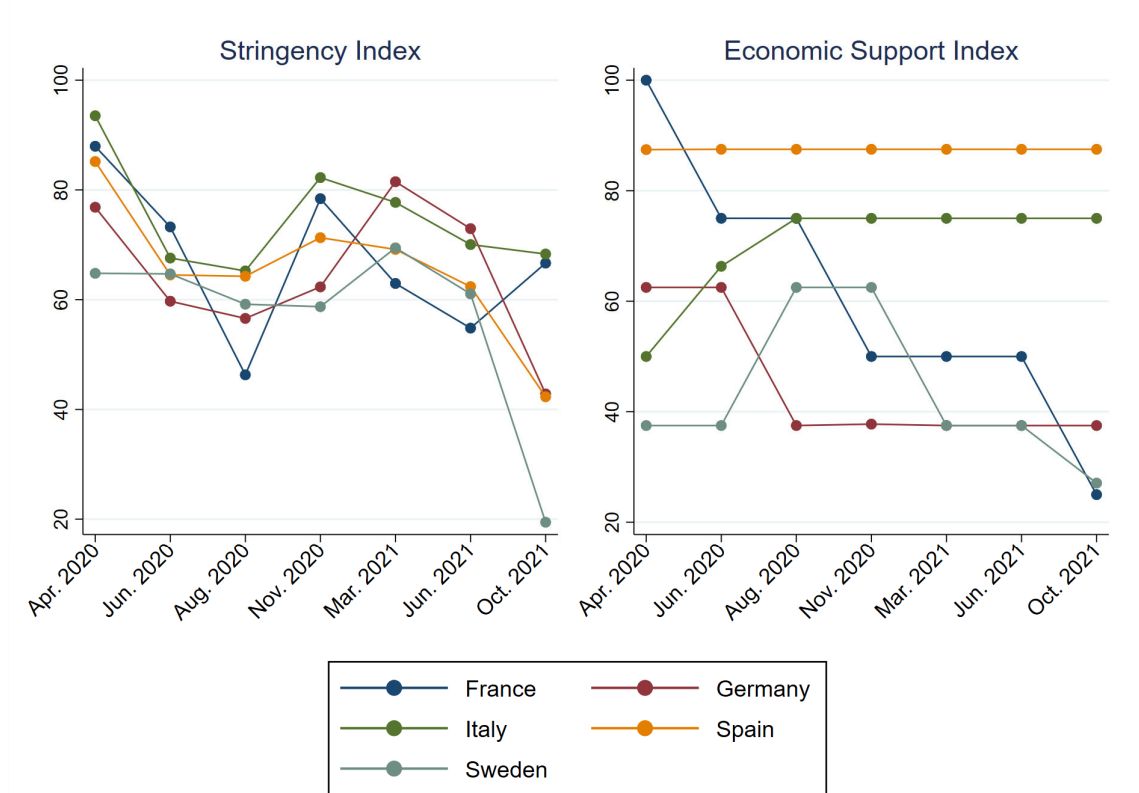
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Figures and Tables:

Figure 1: The Stringency and Economic Support Indices by Country and Wave



Notes: The dots refer to the average values of the indices across the various interview dates in each of the four 2020 waves and three 2021 waves of the COME-HERE survey, by country of residence. The index values come from the Oxford COVID-19 Government Response Tracker of the Blavatnik School of Government.

Table 1: The Distribution of Equivalent Household Income Changes, by Wave

	Interview date						
	April 2020 (1)	June 2020 (2)	August 2020 (3)	November 2020 (4)	March 2021 (5)	June 2021 (6)	October 2021 (7)
Reference income date:	January 2020	April 2020	May 2020	September 2020	January 2021	April 2021	June 2021
Current income relative to reference income:							
0%	1.4%	0.6%	0.8%	0.7%	0.2%	0.3%	0.3%
1-24%	3.8%	2.6%	3.5%	2.9%	0.8%	0.7%	1.1%
25-49%	4.5%	2.2%	2.9%	2.3%	1.1%	1.0%	1.1%
50-74%	10.6%	4.6%	4.7%	4.2%	1.9%	2.2%	2.0%
75-99%	13.7%	7.6%	7.4%	6.4%	4.7%	4.5%	4.4%
No change	62.7%	79.1%	76.4%	80.2%	86.7%	85.7%	84.2%
>100%	3.2%	3.3%	4.3%	3.4%	4.6%	5.6%	6.8%
<i>Observations</i>	6152	4323	4974	5025	3576	3797	3536

Note: The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey; there are 31383 observations (6152 individuals) in total.

Table 2: Policy Indices and Equivalent Household Income Change –
Pooled and Panel Results

	Household Income Change (in percentage)					
	(1)	(2)	(3)	(4)	(5)	(6)
Stringency Index	-0.545 (0.489)		-0.297 (0.391)	-0.341 (0.403)	-0.313 (0.392)	-0.326 (0.356)
Economic Support Index		2.513*** (0.425)	2.490*** (0.433)	2.499*** (0.440)	2.492*** (0.435)	2.273*** (0.426)
<i>Evolution of the Pandemic</i>	No	No	No	Yes	Yes	Yes
<i>Individual Controls</i>	No	No	No	No	Yes	Yes
<i>Individual FE</i>	No	No	No	No	No	Yes

Notes: These are linear regressions. The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey; there are 31383 observations (6152 individuals) in each column. The Stringency Index and Economic Support Index are all standardised over the estimation sample. Standard errors in parentheses are clustered at the Stringency Index*Economic Support Index level. All regressions include wave and country dummies. The cross-sectional controls are age and its square and gender (all measured at Wave 1), relationship status, the log of equivalent household disposable income in January 2020 in PPP, and dummies for education and labour-force status. In the panel regression in column (6), we only retain relationship status and labour-force status. *, **, and *** respectively indicate significance levels of 10%, 5% and 1%.

Table 3: Policy Indices and Equivalent Household Income Changes –

Robustness Checks: Panel Results

	Household Income Change (in percentage)						P(Loss)
	Baseline (1)	IPW weights (2)	XS Weights (3)	Indices at Interview date (4)	Indices 30- day avg. (5)	BUC Estimator (6)	Cond. Logit (7)
Stringency Index	-0.326 (0.356)	-0.281 (0.364)	-0.343 (0.398)	-0.141 (0.360)	-0.497 (0.410)	-0.079 (0.100)	0.101 (0.122)
Economic Support Index	2.273*** (0.426)	2.348*** (0.459)	2.273*** (0.504)	2.313*** (0.422)	2.149*** (0.430)	0.241*** (0.075)	-0.229** (0.106)

Notes: There are 31383 observations (6152 individuals) in each column. Columns (1) to (5) are linear regressions. The ‘Blow-Up and Cluster’ (BUC) ordered logit results in column (6) and the conditional logit results in column (7) refer to the log of the odds ratio. The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey. The Stringency Index and Economic Support Index are all standardised over the estimation sample. Standard errors in parentheses are clustered at the Stringency Index*Economic Support Index level. All regressions include wave dummies and individual fixed-effects. The time-varying controls are relationship status and labour-force status. Column (1) repeats the baseline estimates. Columns (2) and (3) use respectively inverse-probability attrition weights and cross-sectional weights. Columns (4) and (5) replicate the baseline specification using the Stringency and Economic Support Indices at the interview date and four-week average value prior to the interview date. The dependent variable in column (6) is a dummy for having experienced any household income loss. *, **, and *** respectively indicate significance levels of 10%, 5% and 1%.

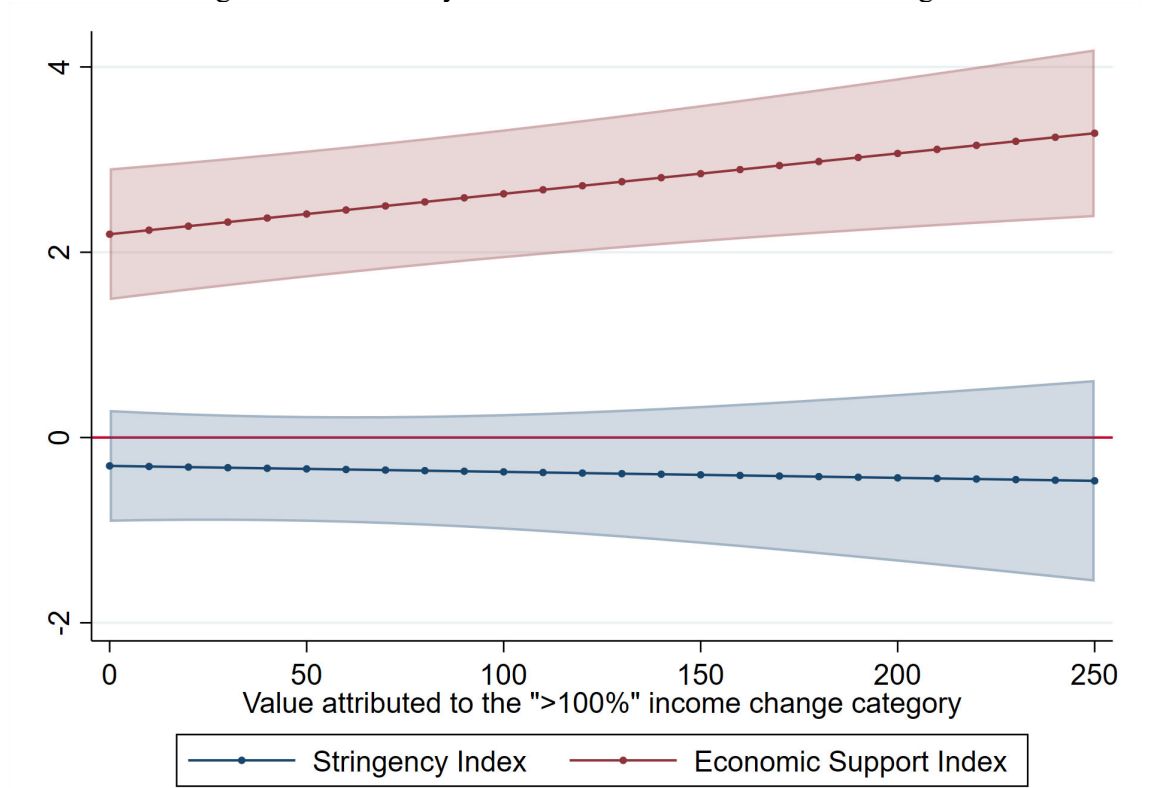
Table 4: Policy Indices and Equivalent Household Income Changes –
Individual Heterogeneity Analysis: Panel Results

	(1)	(2)	(3)	(4)
Stringency Index	-0.076 (0.348)	0.358 (0.383)	-0.152 (0.341)	-1.285** (0.565)
<i>Stringency interacted with:</i>				
Female	-0.527** (0.217)			
Young		-1.500*** (0.450)		
Poor			-1.064*** (0.398)	
Employed				0.483 (0.473)
Self-Employed				-1.820 (1.152)
Retired				2.522*** (0.656)
Economic Support Index	2.128*** (0.390)	2.367*** (0.369)	2.267*** (0.379)	2.959*** (0.428)
<i>Econ. Support interacted with:</i>				
Female	0.297 (0.238)			
Young		-0.243 (0.538)		
Poor			-0.139 (0.514)	
Employed				-0.907* (0.512)
Self-Employed				-2.011 (1.621)
Retired				-0.563 (0.679)

Notes: These are linear regressions. The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey; there are 31383 observations (6152 individuals) in each column. The Stringency Index and Economic Support Index are all standardised over the estimation sample. Standard errors in parentheses are clustered at the Stringency Index*Economic Support Index level. The panel controls are relationship status and labour-force status. *, **, and *** respectively indicate significance levels of 10%, 5% and 1%.

Appendix:

Figure A1: Sensitivity to the Value of Positive Income Changes



Notes. The points in the graph represent the estimated coefficients on the standardised Stringency Index and the Economic Support Index from Equation (1), with different values being attributed to the top income-change category of the dependent variable. The shaded areas represent the 90% confidence intervals.

Table A1: Descriptive Statistics – Estimation Sample

	Mean	SD	Min	Max
Household Income Change (in pp)	-6.30	20.33	-100	20
<i>Pandemic measures:</i>				
Stringency Index	67.89	13.36	19.4	93.5
Economic Support Index	64.65	20.86	25.0	100
Average daily deaths per 100 000 (4- weeks)	0.356	0.345	0	1.263
<i>Individual characteristics:</i>				
Log Eq. Household Income (Jan. 2020)	7.31	0.44	5.21	9.36
Family size	2.77	1.31	1.0	11
Age	50.48	15.74	18	93
Female	0.48		0	1
Partnered	0.62		0	1
Primary education	0.19		0	1
Secondary education	0.38		0	1
Tertiary education	0.43		0	1
Employed	0.56		0	1
Self-Employed	0.06		0	1
Unemployed and Out of the Labour Force	0.09		0	1
Retired	0.27		0	1
<i>Wave:</i>				
W1: April 2020	0.20		0	1
W2: June 2020	0.14		0	1
W3: August 2020	0.16		0	1
W4: November 2020	0.16		0	1
W5: March 2021	0.11		0	1
W6: June 2021	0.12		0	1
W7: October 2021	0.11		0	1
<i>Country of residence:</i>				
France	0.23		0	1
Germany	0.20		0	1
Italy	0.22		0	1
Spain	0.23		0	1
Sweden	0.12		0	1
<i>Observations</i>	31,383			
<i>Individuals</i>	6,152			

Note: The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey.

Table A2: Policy Indices and Equivalent Household Income Changes –
Pooled and Panel Results with All Controls

	Equivalent Household Income Change (in percentage)					
	(1)	(2)	(3)	(4)	(5)	(6)
Stringency Index	-0.545 (0.489)		-0.297 (0.391)	-0.341 (0.403)	-0.309 (0.391)	-0.328 (0.357)
Economic Support Index		2.513*** (0.425)	2.490*** (0.433)	2.499*** (0.440)	2.480*** (0.437)	2.279*** (0.425)
Average Daily Deaths (4-weeks)				0.170 (0.289)	0.053 (0.271)	0.037 (0.246)
Female					-1.468*** (0.307)	
Age					0.097* (0.051)	
Age-squared					-0.000 (0.000)	
Partnered					-0.982*** (0.309)	-0.006 (1.018)
Secondary education					-0.072 (0.277)	
Tertiary education					0.012 (0.272)	
Employed					-0.863 (0.658)	4.873*** (1.877)
Self-employed					-7.780*** (1.111)	0.644 (2.315)
Retired					2.643*** (0.788)	2.227 (1.368)
Equivalentised monthly household income in January 2020 (in logs - PPP)					2.418*** (0.243)	
<i>Wave and Country FE</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Individual FE</i>	No	No	No	No	No	Yes

Notes: These are linear regressions. The sample here is respondents from the four 2020 waves and the three 2021 waves of the COME-HERE survey; there are 31383 observations (6152 individuals) in each column. The Stringency Index and Economic Support Index are all standardised over the estimation sample. Standard errors in parentheses are clustered at the Stringency Index*Economic Support Index level. *, **, and *** respectively indicate significance levels of 10%, 5% and 1%.