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## Living with reduced income: An analysis of household financial vulnerability under COVID-19

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**EM 21/20**

**Living with Reduced Income: an Analysis  
of Household Financial Vulnerability  
Under COVID-19**

Catarina Midões and Mateo Seré

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# Living with Reduced Income: an Analysis of Household Financial Vulnerability Under COVID-19\*

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## Abstract

The COVID-19 crisis has led to substantial reductions in earnings. We propose a new measure of financial vulnerability, computable through survey data, to determine whether households can withstand a certain income shock for a defined period of time. Using data from the ECB Household Finance and Consumption Survey (HFCS) we analyse pre-existing financial vulnerability in seven EU countries. We find that income support is essential for many families: 47.2 million individuals, out of the 243 million considered, cannot afford three months of food and housing expenses without privately earned income. Differences across countries are stark, and those born outside of the EU are especially vulnerable. Through a tax-benefit microsimulation exercise, we then derive household net income when employees are laid-off and awarded the COVID-19 employment protection benefits enacted in the different countries. Our findings suggest that the COVID-19 employment protection schemes awarded are extremely effective in reducing the number of vulnerable individuals. The relative importance of rent and mortgage suspensions in alleviating vulnerability is highly country dependent.

**JEL:** D14, E27, J65

**Keywords:** vulnerability, household finance, microsimulation, COVID-19

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# 1 Introduction

The COVID-19 outbreak has brought on, alongside a major health crisis, dramatic economic shocks to European countries. Governments around the continent are taking different measures to face the pandemic while preserving jobs and incomes. This paper analyses households' pre-existing vulnerabilities to an income shock and assesses the degree of protection awarded to employees, in different European countries, by COVID-19 employment protection schemes.

Financial vulnerability has received considerable attention lately, and especially after the 2008 crisis. The concept is defined broadly as the likelihood that an economic shock will result in a substantial decline of individual well-being. Risk of or uncertainty about falling into hardship is the key component that differentiates vulnerability from a state of, for example, poverty (Hoddinott and Quisumbing 2010 and Whelan 1993).

To measure financial vulnerability, the literature uses both objective and subjective approaches. Objective measures are independent of the individual's opinion and may be self-reported or obtained from an external source. Examples include possession of financial assets, amounts in savings accounts, access to credit, or having health insurance. Subjective measures instead are based on perception and self-reported, usually through surveys. An example of the latter is Lusardi et al. (2011) who examine US household financial vulnerability by asking how confident individuals are that they could come up with \$2,000 in 30 days to face an unexpected need.

In this paper, we use an objective measure. Instead of asking individuals whether they would be able to cope with a hypothetical shock, we assess whether they can cover their usual basic expenditures under a hypothetical shock. In particular, we analyse whether households can afford basic expenditures if deprived of their privately earned income, resorting, instead, to a combination of their savings and publicly provided income such as pensions and public transfers.<sup>1</sup> We firstly consider only food and utilities as basic expenditures and then extend this basket to include mortgages and rents on main residences, for individuals who own no other residence<sup>2</sup>.

We build on Midoes (2020), which provides an estimate of the number of households that could not afford basic expenses without privately earned income. The paper simulates a scenario where households can resort to bank savings, public transfers, pensions and 50% of their gross privately earned income to face expenses. This percentage of privately earned income is meant to represent living with a COVID-19 unemployment benefit. Here, instead, we simulate net incomes obtained under the actual COVID-19 unemployment protection schemes enacted by each country, and assess whether individuals can afford basic expenditures.

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<sup>1</sup>By privately earned income, we refer to income other than pensions and public transfers. It encompasses salary income, self-employed income, rental income, income from financial assets and regular private transfers.

<sup>2</sup>For food expenses we consider average monthly expenditure on food and beverages at home. Utility expenses comprise average monthly expenditure on utilities, specifically electricity, water, gas, TV and internet.

We analyse 7 countries: Austria, Belgium, Finland, France, Germany, Italy and Portugal. We calculate financial vulnerability using Wave 3 of the ECB Household Finance and Consumption survey (HFCS), conducted in 2017.

We find a high degree of financial vulnerability across the different countries analysed: without their privately earned income, 18.2 million individuals (or 7% of the population considered) would not be able to cover one monthly of expenditures with food and utilities. In a three months horizon, 31.2 million, or 13% of the population of the countries considered, would not be able to cover those expenses. When we add rent and mortgages on the main residence, almost 20% become vulnerable at the 3 month mark.

This highlights the need for income support even for short-term shocks. Pensions and public transfers are a fundamental source of income for households who receive them in several countries, substantially reducing the number of vulnerable individuals. For example, 32.1% of the Finish population would not be able to cover for food and utilities in a three months horizon if they had to resort exclusively to their bank deposits, but, once pensions and public transfers are considered, this percentage is only 9.6%. Belgium and France are similar. On the contrary, in Italy and Portugal, pre-existing pensions and particularly public transfers are not especially effective in reducing vulnerabilities.

We find that individuals born outside the European Union are 1.8 times more at risk of not being able to cover for their expenses under a 100% privately earned income shock. A similar situation can be observed for households with children and with lower educational level: children are 1.4 times more at risk of being vulnerable than the rest of the population, and those with secondary education or less are 1.38 more at risk than those with tertiary education.

Our results highlight the importance of unemployment benefits: 5.9% of individuals in households affected by a loss of employee income, without income support, are unable to cope with food and utilities in a three months horizon. Once all COVID-19 unemployment benefits enacted by the different countries are considered, only 1.1% of individuals affected cannot cover for these expenses. By expanding the basket to include rent and mortgages on the main residence, the numbers are respectively 10.5%, and 2.1% once the COVID-19 unemployment benefits are awarded.

This vulnerability characterization is useful for economic research and public policy, being simple and readily available from survey data covering consumption and savings. It can help identify groups of individuals more vulnerable to income shocks, distinguishing, for instance, between employees and the self-employed. It can also be used to describe by how much households will have to reduce savings to keep basic consumption constant.

The rest of the article is structured as follows. In Section 2 we summarize the literature on financial vulnerability and the rationale for our specific measure. Section 3 describes the data and methodology, giving details on our financial vulnerability measure. Section 4 presents results, firstly describing the vulnerability of the population to a shock to privately earned income, and, secondly, the vulnerability of the population to a shock to employee income, with and without COVID-19 employment protection

schemes. Section 5 discusses how different policies could further reduce vulnerability. Section 6 concludes.

## 2 Related literature

The measure of vulnerability used in this paper is based on the idea that when deprived of their labor and capital income, individuals resort to a combination of savings and remaining sources of income (publicly provided) to cover for basic expenses. Yet this is not the only way people can face an economic shock. Arguably, they can adapt their consumption patterns, by, for example, reducing their demand for certain types of goods (Hamermesh 1982) or increasing their home production of goods (Aguiar and Hurst 2007). Although individuals might adapt their consumption when faced with a financial shock, their ability to do so is constrained. Many households have “consumption commitments”, for instance, in what pertains to housing, that are costly to adjust, especially in the short-term. Indeed, most homeowners do not move during unemployment spells and have mortgage or rent payments commitments (Chetty and Szeidl 2007).

Another reason why changes to consumption might not come about immediately is that individuals have consumption habits. Models of habit formation state that the instantaneous utility function of individual  $i$ , having habit forming preferences  $u(c_i, x_i)$ , depends not only on current consumption  $c_i$ , but also on the habit level  $x_i$ . In particular, this type of models assumes that only the component of consumption over and above the habit level, i.e.,  $c_i - x_i$ , contributes to utility (Naik and Moore 1996). Hence, any change in consumption from the habit level is perceived as a gain or a loss (Günther and Maier 2014).

The housing expenses we consider are costly to adjust and so can be basic utilities. These expenses, together with food - excluding restaurants -, might be somewhat adjusted, given intertemporal substitution of consumption, yet the elasticity of substitution is expected to be below one. Thus, individuals whose savings are insufficient to keep past consumption levels are vulnerable in the sense that they are more likely to experience larger decreases in welfare.<sup>3</sup>

To meet ordinary living expenses under income shocks, households might also rely on resources other than bank savings, pensions and public transfers; namely, they might resort to consumer credit. This, however, comes at a cost (interest) and can in itself be taken as a measure of financial vulnerability. And even if some families do take out loans to afford housing expenses (Andersen et al. 2020), Horvath et al. (2020) shows that in the United States, since the onset of COVID-19, new supply of credit to risky borrowers is limited. In the presence of liquidity constraints, another important resource to consider are loans or gifts from family and friends, which can, likewise, ensure minimum levels of consumption. While these loans are typically short-term and in low amounts (Long 2020), they do provide an additional buffer. Such formal and informal credit could be acknowledged explicitly in future research to better

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<sup>3</sup>See Browning and Crossley 2009 for further details on how households in temporarily constrained circumstances cut back on expenditures, and how they spend marginal dollars of unemployment benefits.

assess short-term financial vulnerability.

Precautionary savings in cash are another resource not explicitly considered. Our analysis overall considers only households which have a bank account, as these households are less likely to use cash as an important source of savings (Kendall 2010).

As a sensitivity analysis, we kept only households which have a bank account, but allocated cash to individuals above 18, according to the percentage reported in Esselink and Hernández (2017) as having precautionary cash savings in the country. We added such cash savings to their household available savings. In all the EU countries covered, less than 40% of the population keeps cash outside of a bank account. In most countries, the percentage is below 36%. Furthermore, according to Esselink and Hernández (2017), those who do keep cash outside of bank accounts keep relatively low amounts: 23% state having less than 100€, 22% between 100€ and 250€ and 19% between 250€ and 500€. Our estimates, as a result, remained very similar, and are not shown. Yet, it should be noted that such question is necessarily sensitive, with individuals more likely to omit and underestimate cash holdings.<sup>4</sup>

### 3 Data and methodology

Our analysis uses the ECB Household Finance and Consumption Survey (HFCS), a cross national survey covering household assets, liabilities, income and consumption.

We use Wave 3, released in March 2020 and carried out in 2017. Income and expenses are uprated to 2020 through inflation. The survey is representative of households residing in 21 EU countries. Weights provided ensure the number of households matches the total number of households in the country. The survey provides information on all individuals within each household sampled.

We determine which households in the sample cannot afford their typical expenses with certain types of resources (e.g., only with their bank deposits), as explained below, and count the number of individuals living in such households. We then extrapolate to the countries' population by weighing each individual within a household by that household's weight.

Data has been multiple imputed by the ECB to correct for non-response. The HFCS data thus consists of 5 implicates - datasets with small differences between them. Following the HFCS methodology, we resort to averages across the 5 implicates. We calculate, on each implicate, the weighted number of individuals living in households which cannot afford expenses, and report the average number across the

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<sup>4</sup>We used the cash saving brackets by country provided by Esselink and Hernández (2017) to decide on amounts allocated. Cash savings were allocated randomly among individuals aged 18 or above, in percentage of the countries' cash holders. Individuals randomly selected as storing savings in cash were then randomly assigned to a bracket of precautionary savings in cash, replicating country percentages, and allocated the midpoint of the interval. Individuals assigned to the bracket "above 1000" were assigned 1500 euros.

five implicates.<sup>5</sup> Table 1 in the annex presents summary statistics of our sample.

### 3.1 Determining whether households can afford expenses

To determine whether a household can afford expenses, we divide the resources a household has available in  $m$  months (pooled resources of all household members) by a basket of expenses in  $m$  months (pooled expenses of all household members). If the ratio is below one, we say that the household cannot afford expenses.

We thus construct a dummy variable  $vulnerable_h^m$  which, for each household  $h$  in an  $m$ -month time horizon, is a simple indicator function:

$$vulnerable_h^m = 1 \left\{ ratio_h^m = \frac{pooled\_resources_h(m)}{pooled\_expenses_h(m)} < 1 \right\} \quad (1)$$

We will work with several versions of the denominator  $pooled\_expenses_h(m)$ . A first version aims to capture vulnerability by considering the most basic expenses: those with food at home and with utilities (comprising electricity, water, gas, telephone, internet, and television). A second version includes rents and mortgages on the household main residence. For the latter, we consider loans contracted to purchase, construct, refurbish or renovate the household's main residence. We change the denominator in this way only for households which own no other residential properties. The objective is to capture only the most vulnerable individuals, who would not have an alternative residence in case they were not able to face housing expenses. Some of the individuals we exclude might also have no alternative residence if their properties are for instance rented out, so the exercise is conservative. A scenario where properties beyond the main residence are considered is provided in Section 5.2

The numerator  $pooled\_resources_h(m)$  always considers household bank deposits. We change it in an additive way, adding different household resources, while keeping the denominator fixed, and thus identify fewer and fewer households not able to afford expenses. In section 4.1, as household resources, we consider (beyond bank deposits) public pensions, unemployment benefits and other (pre-COVID-19) public transfers, and liquid assets beyond deposits. Separately, in section 4.2, we determine whether households can afford expenses when individuals are deprived of salary income and when they are deprived of salary income but awarded COVID-19 employment protection income.

Given HFCS data only covers gross income, in Section 4.2, we derive net incomes through the EUROMOD microsimulation model. EUROMOD is a static model that calculates country-specific social insurance contributions, income taxation and means-tested cash benefits to obtain market incomes. It simulates cash benefit entitlements and direct tax and social insurance contribution liabilities, on the basis of the tax-benefit rules in place and information available in the underlying datasets (see Suther-

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<sup>5</sup>More information on the sampling design, weighting and multiple imputation is available in the ECB HFCS Wave 3 Methodological Report.



land (2001) and Kuypers et al. (2017)). We build on Boone et al. (2019) to convert HFCS data into a EUROMOD database to obtain disposable income.

## 4 Results

### 4.1 Vulnerability without unemployment protection schemes

Considering the seven countries of our sample, Austria, Belgium, Finland, France, Germany, Italy and Portugal, we estimate that 31.2 million of individuals - or 12.8% of their population - are financially vulnerable when we consider food and utilities in a three months horizon, meaning that they would not be able to afford those expenses for three months without privately earned income.

In Figure 1 we plot, for each country, the percentage of vulnerable individuals, and how the availability of resources beyond deposits decreases vulnerability.

There are stark country differences. In Portugal and Italy, after considering deposits, pensions and public transfers, 21.5% and 17.8% of the population could not afford food and utilities if they were deprived of their privately earned income. This is more than double the proportion of vulnerable population in Austria, where just 4.9% would fall in that category. The role played by public transfers is also very heterogeneous across countries: while in Finland they seem crucial, reducing the percentage of vulnerable individuals by more than 8 percentage points (from 24.0% when we consider deposits and pensions to 9.6% when we consider all public transfers), in Italy they are not a meaningful buffer for families which currently receive them (the percentage of vulnerable population goes from 18.2% to 17.8%).

Figure 1: Percentage of vulnerable individuals in a three months horizon, considering food and utilities, resorting to deposits and different sources of income

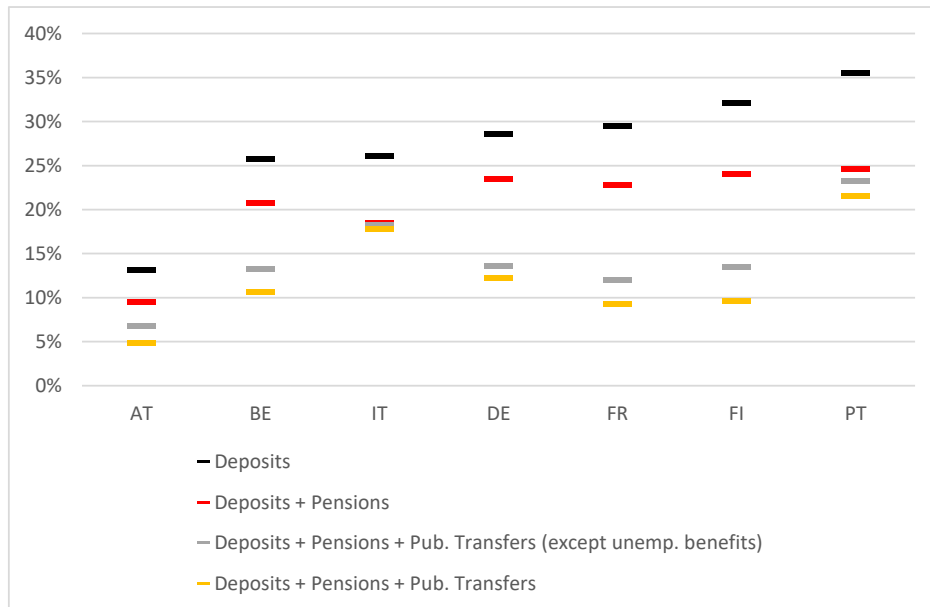
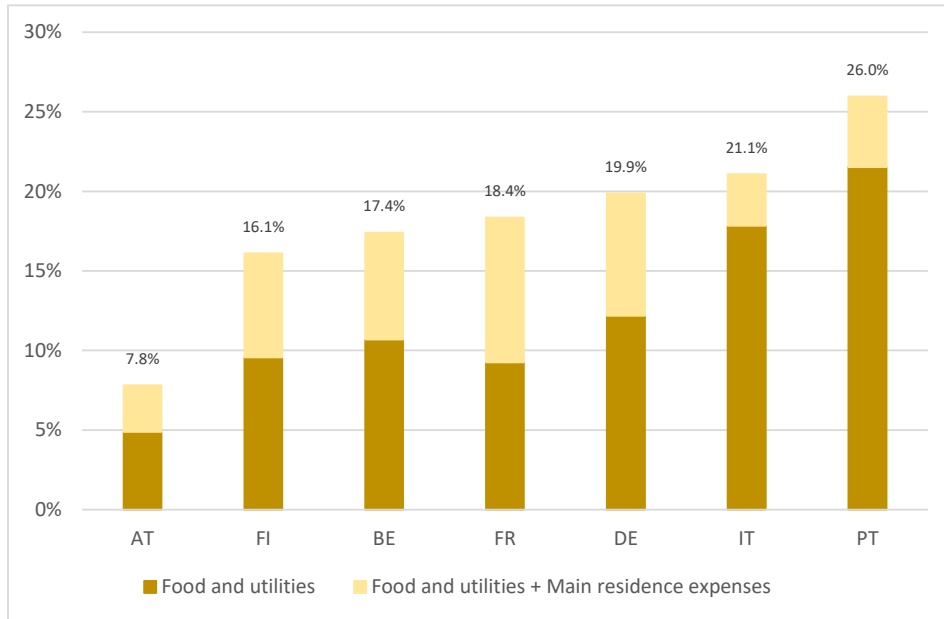


Figure 2 presents our results when we include housing expenses. Both rent and mortgages expenses substantially increase the number of vulnerable individuals: considering deposits, pensions and public transfers, 47.2 million, or 19.4% of the population analysed, are vulnerable when we add rents and mortgages to the basket of basic expenses. The impact of housing expenses is more severe in some countries such as Germany and France (in the former, the percentage of vulnerable individuals jumps from 12.2% to 19.9% and in the latter it doubles, from 9.2% to 18.4%). As highlighted in Midoes (2020) and discussed in more detail in Section 5, this suggests that rent and mortgage suspension can be an effective policy to alleviate household vulnerability in some countries.

Figure 2: Percentage of vulnerable individuals in a three months horizon when rent and mortgages are added to food and utilities.



#### 4.1.1 Vulnerability by specific groups

In this section we briefly discuss how three subgroups of the population are more likely to be vulnerable: immigrants, individuals with low educational level and households with children. Results are presented in Table 2.

**Immigrants:** Individuals born outside of their country of residence and particularly outside of Europe are more at risk of not being able to cover for their food, utilities, and housing expenses (columns 1 and 2 in Table 2).

For individuals living in their country of birth, the probability of not being able to cover for such expenses for three months without any privately earned income is 20%, while for those born elsewhere in the EU and outside of Europe, it is 33.2% and 29.8% respectively. That is, individuals born elsewhere in the EU are in average 1.5 times more at risk, while individuals born outside the EU 1.7 times more at

risk.

The difference is accentuated in some countries: in Italy, those born outside of the EU are 2.6 times more at risk; in Austria, 2.4, and in Belgium, 2.3 times.

**Households with children:** Children are always more likely to live in vulnerable households, regardless of the country considered. The probability that a child aged 12 or below lives in a household unable to cover for three months of expenses without privately earned income is 30%, a risk 1.5 times larger than for the remaining population. In Italy, children are 1.5 times more at risk and in Germany 1.4 times, followed by Portugal at 1.25 (see column 4 in Table 2). This echoes Lusardi et al. (2011) and Hasler and Lusardi (2011), which find having children is associated with higher self-reported measures of financial fragility by households.

**Education:** Considering all countries in our sample, individuals living in households where the highest educated individual has only up to secondary education, are more likely to live in vulnerable households. In Italy, individuals with secondary education or lower are 1.4 times more at risk than those with tertiary education. In Germany, they are 1.3 times more at risk and in Portugal, 1.25 times (column 4 of Table 4.1).

## 4.2 Vulnerability under COVID-19 unemployment benefits

In this section we consider whether households can afford expenses when they are deprived of salary income (only of salary income, instead of all privately earned income as in the preceding section) and when deprived of salary income but awarded COVID-19 support measures as enacted in each country. We restrict our sample to households where at least one individual has been in employment throughout the previous year <sup>6</sup>. We first assess vulnerability through the number of individuals in households unable to afford basic expenses without salaries. We compare this scenario to one in which individuals are receiving COVID-19 unemployment benefits. In both cases, our final income metric is net income, obtained through the microsimulation model EUROMOD.

Besides applying income taxation, in the scenario where individuals are not receiving salaries, they also receive means-tested social benefits to which they would be entitled under reduced income. We awarded COVID-19 benefits to all employees accruing a yearly salary income of at least twelve times the minimum wage, as they are more likely to have been in full employment the previous year and thus entitled to coverage.<sup>7</sup>

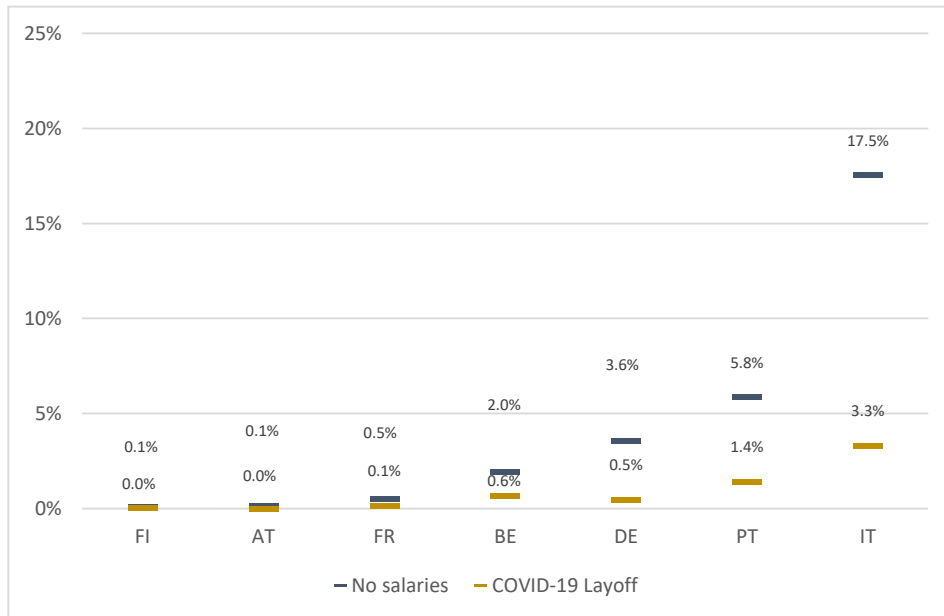
For an affected household, i.e., where someone accrues salary income, household net income differs between the scenario with no salaries and the scenario with no salaries but with COVID-19 employment protection benefits because of two types of individuals: i) individuals who, instead of accruing their normal employee income above the minimum wage, now receive a part of it as defined in the COVID-19 policies

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<sup>6</sup>Percentual results are in percentage of individuals living in such households.

<sup>7</sup>Although the specific criteria for eligibility change from country to country.

Figure 3: Percentage of vulnerable individuals with and without COVID-19 layoff, in a three months horizon, considering food and utilities



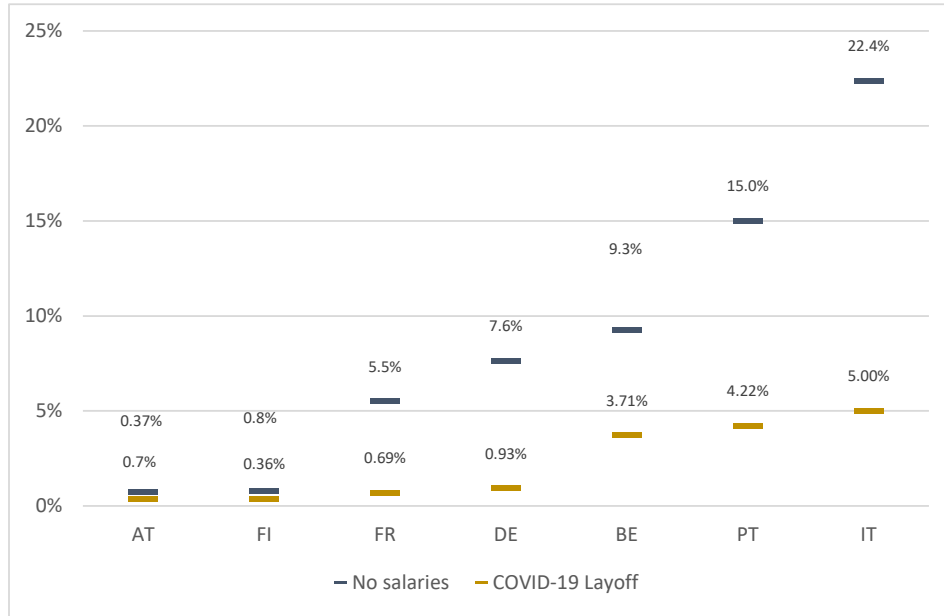
and ii) individuals who reported an employee income below the minimum wage who now receive a zero employee income under our simulations.

We find that, considering food and utilities only, at the three months mark, the situation is not too dire overall: only 5.9% of affected individuals are vulnerable at this point. This number camouflages important country differences, specifically, that in Italy, 17% of affected individuals are vulnerable. Figure 3 shows the percentage of vulnerable individuals when salaries are removed and when COVID-19 unemployment benefits are subsequently added, by country.<sup>8</sup> For all countries the situation improves substantially when we add COVID-19 benefits. In Italy, there is a drastic reduction to only 1.13% of vulnerable individuals. For all the other countries, less than 1% remain vulnerable. While we estimate that 9.6 million people in the countries considered could not afford food and utilities, only 1.7 million would not be able to once COVID-19 unemployment benefits are awarded.

When we consider rents and mortgages as part of basic expenses, the percentage of vulnerable individuals increases to 10.5%. Nonetheless, the COVID-19 employment protection benefits reduce the percentage of vulnerable individuals to 2.1%. As Figure 4 shows, the benefits are again quite effective at reducing vulnerabilities across all countries. In Italy, Portugal and Belgium where vulnerability is highest at baseline, we estimate only 5.0%, 4.2% and 3.7% of those affected are vulnerable at the three month mark. Rent and mortgages suspension, as a complementary policy to the COVID-19 layoff, are analyzed in more detail in Section 5 yet this result already sheds light on the role these expenditures play.

<sup>8</sup>In addition Table 4 contains our results for 1, 3, 6 and 12 months.

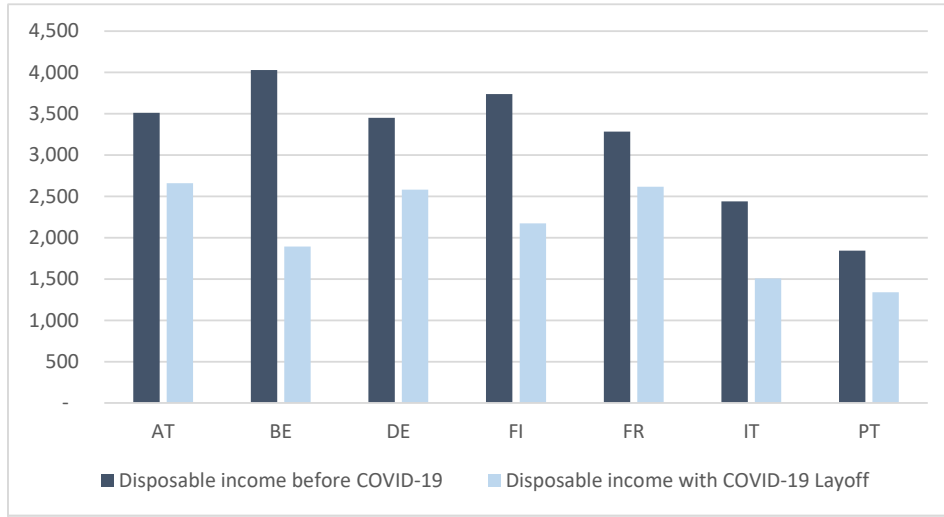
Figure 4: Percentage of vulnerable individuals with and without COVID-19 layoff, in a three months horizon, considering food and utilities and rent and mortgages on the main residence



In a scenario where employees are not receiving their salary, suspending rents and mortgages on main residences would reduce the number of vulnerable people by 8.2 million.

Percentages are informative to make cross-country comparisons, but it is also relevant to assess in absolute numbers where individuals are located. Even if in Italy only 2.5% of the individuals considered are vulnerable under the COVID-19 layoff scenario, it is the country with the highest absolute number of vulnerable individuals: 969 thousand. France, where only 0.85% of those affected are vulnerable, nonetheless follows, with 360 thousand. These vulnerabilities result both from a lack of savings and from reduced income directly. How income, on average, is reduced, can be seen in Figure 5, where we present mean disposable household income before COVID-19 layoff (that means, assuming individuals receive their normal salary) and after we eliminate their usual salary income but award them COVID-19 benefits, for households affected (those who receive employment income). While in countries like France and Portugal average incomes with COVID-19 layoff are only 25% lower, Belgium stands out, with average household income under the COVID-19 layoff scenario being less than half the status quo average household income.

Figure 5: Average household disposable income for households earning salary income, before COVID-19, and with COVID-19 layoff but no other salary income (in €).



### 4.3 Liquid assets as a buffer

To face expenses in the short-run, households might resort not only to deposits but also to other liquid assets, which can be easily sold. Besides deposits, households can resort to their mutual funds, bonds, non self-employment private businesses (though their liquidity is more conditional on economic circumstances), shares and managed accounts.

The prevalence of these assets across EU countries, though quite variable, is generally low, particularly for lower income and lower wealth individuals. Since we are focusing on individuals who, without deposits, would not be able to cover for the most basic expenses for three months, we are analysing a quite low wealth (in deposits) group, but a low-wealth group generally. In its majority, the group considered holds assets only in the form of deposits and on occasion real estate, a quite illiquid asset.

Thus, when we consider liquid assets beyond deposits as a resource to cover expenses, the percentage of vulnerable individuals decreases only very slightly. In certain countries where these other liquid assets are more prevalent, specifically in Finland, the percentage of individuals unable to cover for 3 months of expenses with liquid assets is 8 p.p lower than when resorting to deposits alone. If Finnish households have available deposits, pensions and public transfers, adding other liquid assets reduces the vulnerable by only 0.7 p.p. Indeed, once we consider households might use not only deposits or all liquid assets, but also pensions and public transfers, using all liquid assets instead of other deposits leads to only residual reduction in the number of vulnerable individuals. After Finland, the reduction ranges from 0.1pp in Austria and Portugal to 0.5pp in Germany.

## 5 Policy discussion

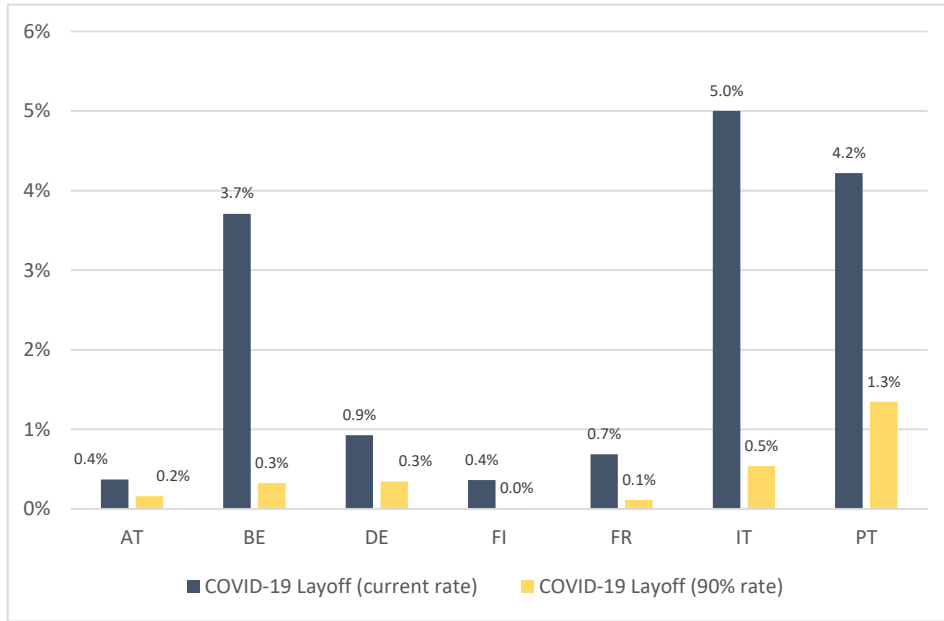
To conclude, we discuss the effectiveness of two key policies to protect the most vulnerable: i) The introduction of a more generous COVID-19 unemployment benefit and ii) Rent and loans suspension.

### 5.1 Effects of a more generous COVID-19 unemployment benefit

With the exception of Finland, - where the unemployment benefit is a daily fix amount-, the unemployment scheme covers a percentage of salaries, varying between 60% (in Portugal) to 90% (in Austria). By allowing for a higher income replacement rate, countries try to protect jobs and mitigate the economic shock by sustaining consumption levels (Schnitzer. et al 2020). In this section we analyse the impact on households' vulnerability if, in all countries, the unemployment scheme covered 90% of salaries. Our main results are presented in Figure 6.

As explored in section 4.2, the percentage of vulnerable individuals is already low when considering country-specific coverage rates. Setting a rate of coverage of 90% of salaries amounts to increasing coverage. This increase has a more noticeable effect in Italy and Portugal, where the percentage of vulnerable was still above 2.5% with current rates. Nonetheless, there are also meaningful reductions in countries with an already extremely low percentage of vulnerable individuals: in France, Finland and Belgium. In our microsimulation exercises, individuals were vulnerable both because the reduced monthly income is not enough for basic expenditures, and because of low savings. For most households, their monthly income becomes insufficient to cover for expenses under the layoff scheme not because they were deemed ineligible to receive it under our exercise, but because the proportion of income ensured, together with savings, is insufficient. In Portugal and Italy, 62% and 58% of individuals vulnerable at the 3-month mark are in households where all individuals were either deemed eligible for the COVID-19 support (accruing more than the minimum wage) or unaffected (because they did not accrue any employee income). In France, 80% of vulnerable individuals are in such households. In Belgium, Germany and Austria, all individuals deemed vulnerable are in this situation. The vulnerable individuals identified in our simulations do not come from gaps in coverage generated by our procedure, but from the coverage itself not being sufficient for expenses. The results we now find, where there is an important reduction of vulnerability under a more generous layoff scheme, are a reflection of this. The results of Section 4 showed Belgium with the lowest percentage of vulnerable individuals after Austria when we considered deposits, pensions and pre-existing public transfers. However, once the COVID-19 layoff is considered, Belgium only performs better than Italy and Portugal. This is because the Belgian COVID-19 income support is amongst the least generous (as detailed in Figure 5 on the previous section).

Figure 6: Percentage of vulnerable individuals with the current COVID-19 layoff and with a replacement rate of 90% of salaries, in a three months horizon, considering food and utilities and housing expenses



## 5.2 Effect of rent and loan suspensions

In previous sections we considered mortgages and rents together. In section 5.2.1, we discuss the relative effectiveness of rent and loan suspension policies to protect the most vulnerable, policies enacted in several European countries (Anderson et al. 2020). We consider the effects of these policies on their own, but also in tandem with COVID-19 unemployment benefits. While measures of this type have not been enacted in all the countries and access to these benefits is not straightforward (Anderson et al. 2020), it is worth estimating the percentage of vulnerable individuals once all possible alleviation mechanisms are in place. As we have done so far, we only consider rents and mortgages on main residences, and only for individuals who own no other residences. We did not consider other types of loans, since we were limiting ourselves to a strict definition of “basic expenses”. In Section 5.2.2 we instead consider all rents and loan payments (mortgage debt and non-mortgage debt) of households. In that case, we estimate the percentage of individuals who might have to default on their loan payments or suspend non-primary residence loan payments if deprived of salary income or receiving COVID-19 unemployment benefits. Against that baseline, we see whether the suspension of rents and mortgage loans on main residences (the typical typology of COVID-19 payment suspension policies) is enough to meaningfully decrease those vulnerable to default.



### 5.2.1 Effect of a suspension of rent and mortgages on the main household

The upper panel of Figure 7 presents our results when rent and mortgages suspension on the main residence are put in place. In Figure 7 we can see the percentage of vulnerable individuals under the no salaries scenario when we consider expenses in food and utilities, rent and mortgages, at the three-month mark, detailing how much each expense contributes to overall vulnerability. In Germany and Italy, expenses with rent explain a larger part of vulnerability than mortgages. For example, in Italy, the percentage of individuals who would not be able to cover expenses considering food and utilities, rent, and mortgages is 22.3%. This percentage would be reduced by 3.4 p.p. if a rent suspension was enacted. By contrast, it would only be reduced by 1.5 p.p. if instead mortgages were suspended. We observe the opposite in countries such as Belgium and Portugal. In these countries, while rent suspension would only reduce the percentage of vulnerable individuals by 1.6 p.p. and 3.1 p.p., mortgages suspension would reduce it by 6 p.p. and 6.4 p.p. respectively.

When we analyse these policies under a scenario where individuals are receiving the COVID-19 layoff (Figure 7b), in Portugal, rent and mortgage expenditures play a similar role. In Italy, rent remains more relevant and in Belgium, mortgages remain more relevant.

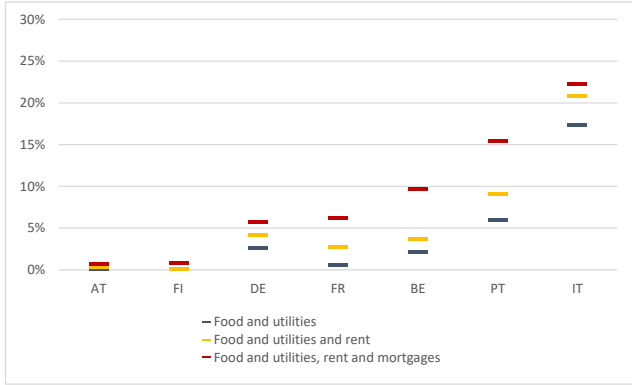
Rent and mortgage suspensions thus can be an effective support for vulnerable households. In most countries, both under a non-salaries scenario and under COVID-19 benefits, mortgages play a more relevant role. Yet, in Italy, rent is more relevant, while in France, they are equally important. This highlights the need to develop country-specific policies for alleviating vulnerability.

### 5.2.2 The role played by all rents and loans

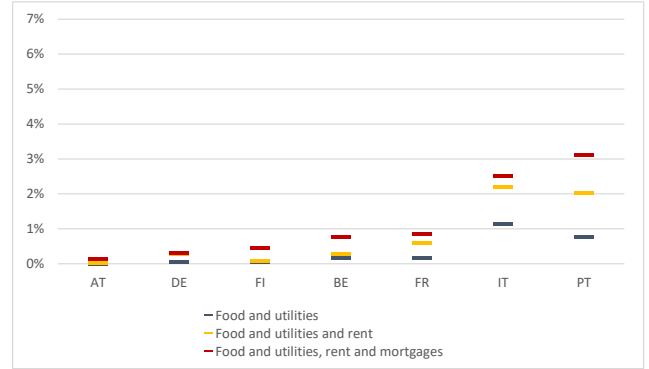
The percentage of individuals who, deprived of salary income, would not be able to cover for food, utilities, and all their rent and debt payments, are presented in the lower panel of Figure 7.

When individuals are deprived of their salaries, considering all rents and loans instead of only those on the main residence, the percentage of vulnerable individuals increases most meaningfully in Portugal (from 15% to 19.2%) and in France (from 5.5% to 9.4%). In Italy and Belgium, the increase is between 1.6 and 2.5 p.p., while in Austria and Germany, it is below 1 p.p..

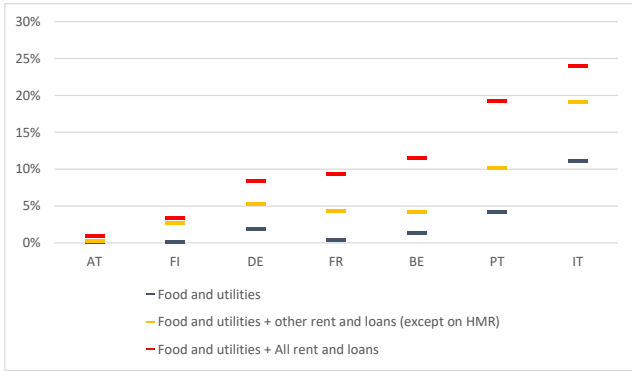
Figure 7: Effect of mortgages and rent suspension



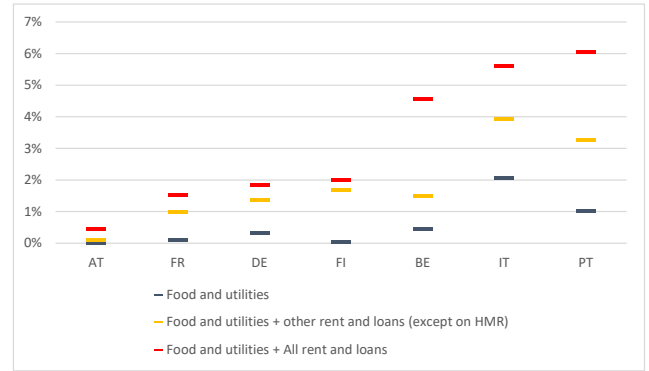
(a) Percentage of vulnerable individuals **without** COVID-19 layoff, in a three months horizon, considering food and utilities and housing expenses (by component)



(b) Percentage of vulnerable individuals **with** COVID-19 layoff, in a three months horizon, considering food and utilities and housing expenses (by component)



(c) Percentage of vulnerable individuals **without** COVID-19 layoff, in a three months horizon, considering food and utilities and all rents and loans



(d) Percentage of vulnerable individuals **with** COVID-19 layoff, in a three months horizon, considering food and utilities and all rents and loans

Once we award individuals COVID-19 unemployment benefits, the percentage of vulnerable individuals with this extended basket of expenses ranges from 0.5% in Austria to 6.1% in Portugal.

In section 4.2, we commented on how household main residence rent and mortgage suspensions substantially decreased the number of individuals unable to face their monthly expenses with food and utilities. Here, we observe that these measures not only allow some families to cover for food and utilities, but could also allow them to repay their other commitments as usual. As Figure 7c shows, when families are deprived of salary income, the suspension of household main residence rent and mortgages would mean 10.1% of affected individuals in Portugal might not be able to cover for food, utilities and all remaining rents and loans, a substantial decrease from the 19.2% unable to cover for a basket including all rents and loans together. In Belgium, there is a reduction of 7.3 p.p. and in France, of 5 p.p.. Overall, the suspension of household main residence rents and loans would mean a reduction of 2.6 p.p. in the individuals

who cannot cover for food, utilities and their usual monthly rent and debt payments.

In the scenario where individuals receive COVID-19 unemployment benefits the number of individuals potentially defaulting on their commitments is necessarily lower, but also here, household main residence commitments suspensions are useful (Figure 7d). Indeed, they allow for a reduction of 3.1 p.p. of at risk individuals in Belgium, 2.8p.p. in Portugal and 1.7p.p. in Italy. Overall, the suspension would mean a reduction of 0.8 p.p. of potentially defaulting individuals.

## 6 Discussion and concluding remarks

While we still do not know how long the economic recession induced by the COVID-19 pandemic will last, this paper intends to provide evidence on how sensitive individuals are to this type of shock and on the effectiveness of the enacted mitigation policies.

Public pensions, a source of income unaffected by COVID-19, are essential to cover basic expenses for many of the households who receive them. The effect of other public transfers is more heterogeneous. They have little effect beyond pensions in reducing the number of vulnerable individuals in some countries, namely Portugal and Italy, but play an important role in France, Belgium and Germany. Even with pensions and public transfers, a large number of individuals depend on household privately earned income to cover for their most basic expenses in the very short term: 18.2 million individuals, or 7%, of the population of the seven European countries analysed, cannot cover for one month of food and utilities by resorting to their deposits, pensions and public transfers. In a three months mark this number increases to 31.2 millions: 13% of the population analyzed.

We find stark differences across countries: in Austria, France and Finland, the percentage is below 9.5%, while in Italy and Portugal it is 17.8% and 21.5% respectively.

In all countries, we observe a significant drop in the number of vulnerable population when we award them COVID-19 unemployment benefits. When we consider net incomes and the dependence on employee income specifically, we find significant differences across countries. Employees in Austria, Finland, Belgium and Germany are less vulnerable to a labour income shock than employees in Italy and Portugal. The employment protection schemes awarded are extremely effective in decreasing these numbers, particularly in Italy. Indeed, considering food and utilities, only 3.3% of those affected remain vulnerable at the 3 month mark when receiving the designed subsidies, implying a reduction of almost 15 percentage points. A sizeable reduction is also observed in Portugal where the vulnerable population decreases from 5.8% to 1.4%.

There are two reasons for the greater effectiveness of the schemes in countries like Austria and France than in, for example, Portugal. The first is that, in the former two countries, only 2.1% and 2.5% receive, under the scheme, an income below basic expenses, while in Portugal, 12.7% do. The difference in the generosity of the support results in a more effective public transfer in the former two countries, just as

with non-COVID-19 public transfers. The second reason is the pre-existing differential in savings - French and particularly Austrian households can cover for their expenses from deposits alone for a longer period of time.

An important reduction in the percentage of vulnerable individuals can be achieved by providing a more generous layoff scheme. Considering only food and utilities, and setting a rate of coverage of 90% of salaries, implies 187 thousands of individuals falling into vulnerability, which represents around 0.1% of the total population analyzed. This number is considerably smaller than the 1.7 million individuals falling into vulnerability under the current layoffs schemes of each country.

Rent and mortgage suspensions are more effective in some countries than in others. Countries like Portugal, Belgium and France can achieve an important reduction in their vulnerability through these measures, while in Italy, they should be coupled with COVID-19 unemployment benefits to bring about a meaningful reduction. If Italy applies the COVID-19 layoff, it would have the same percentage of vulnerable individuals as Portugal when just rent and mortgages suspension are applied.

Importantly, even when considering the suspension of all loan repayments in tandem with the layoff, there is still a larger percentage of individuals in Italy and Portugal unable to keep the remainder of their usual monthly expenses, than in the rest of the countries without any such measure. Taken jointly, the differential between countries remains. When analysing vulnerability under income support and suspensions, we should bear in mind that these measures are not analogous. A loan repayment suspension is only a suspension, entailing payments in the future. In the short-term, it might serve the same purpose as income support - reducing vulnerability - yet, since it entails repayment in the future, it is comparatively less effective in fueling future consumption, a possible public policy goal.

Countries with wider fiscal space can enact more generous policies. The layoff schemes in Austria or Finland are more generous than the Portuguese. Households in these countries, per our results, are the most robust to overall income shocks, being able to sustain expenses from deposits alone for longest. As a result of differing fiscal space, rather counter intuitively, it is in the countries where individuals least require income support for basic needs that states make available substantially more generous subsidies. As per Eurostat, Finland also experienced some of the lowest dips in industrial production vis-a-vis the same months of 2019. These differentials in suffered impact, household finance, and public finance, underlie the different perceptions of urgency about the crisis and different eagerness for concerted EU-financing of support policies.

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Table 1: Summary statistics

	AT	BE	DE	FI	FR	PT	IT
Median monthly gross income (in €)	3,436.2	3,625.2	3,345.0	3,393.7	2,691.7	1,463.5	2,083.4
Median total deposits (in €)	12,724	10,857	7,700	5,000	6,709	3,000	5,000
Median deposits in sight accounts (in €)	1,276.2	1,641.0	1,800.0	3,000.0	1,000.0	1,064.0	1,072.0
Median deposits in savings accounts (in €)	13,380.8	15,185.4	10,000.0	10,000.0	7,000.0	10,000.0	10,000.0
Deposits / (food + utilities) (mean)	45.7	53.2	41.3	42.0	34.0	34.8	20.8
Deposits / (food + utl. + rent + mort.) (mean)	38.1	45.2	33.1	34.4	26.9	32.0	19.6
Deposits / (gross income) (mean)	9.2	11.2	14.5	7.6	12.4	14.7	14.8
Mean disposable income (before covid)	3,109.9	3,214.4	2,578.6	2,949.0	2,785.2	1,396.0	2,091.8
Mean disposable income (with layoff)	2,627.8	2,149.5	2,025.9	2,105.5	2,446.0	1,085.8	1,628.6
Sample (individuals)	6,414	5,370	11,251	24,818	32,799	15,079	19,366
Sample (households)	3,072	2,329	4,942	10,210	13,685	5,924	8,156
Sample (individuals in households with salaries)	4,544	3,346	7,938	18,923	23,052	10,689	10,915

**Note:** results computed at the household level.

Table 2: Relative risk by country of birth, educational level, and age.

	Relative risk, born elsewhere in the EU	Relative risk, born outside EU	Relative risk, secondary or lower	Relative risk, 12 or below
AT	2.40	2.43	1.16	1.21
BE	1.33	2.31	1.18	1.08
DE	1.92	1.74	1.29	1.36
FI	1.47	1.43	1.20	1.15
FR	1.25	1.49	1.19	1.21
IT	2.08	2.56	1.44	1.46
PT	0.98	1.60	1.25	1.25

**Note:** Vulnerability is measured at the three month mark, resorting to deposits, pensions and public transfers. “Relative risk, born elsewhere in the EU” is the ratio between the percentage of vulnerable individuals born elsewhere in the EU and the percentage of vulnerable individuals born in the country. “Relative risk, born outside the EU” is the ratio between the percentage of vulnerable individuals born outside the EU and the percentage of vulnerable individuals born in the country. “Relative risk secondary or lower” is the ratio between the percentage of vulnerable individuals living in households where the highest educated person has at most secondary education, and the percentage of those in household where the highest educated has achieved tertiary education. “Relative risk 12 or below” is the ratio between the percentage of individuals 12 or below who live in vulnerable households and the percentage of those aged 13 or above who do.



Table 3: Additional details on the COVID-19 unemployment benefits simulated

Fiscal response	
Austria	Percentage of salary coverage ranges from 80% to 90% of previous net monthly earnings, according to their level. If gross monthly earnings of the previous month were above 5,370 €, there is no public compensation.
Belgium	Percentage of salary coverage is 70% of gross salaries, with a minimum of 1,591.72 € (national minimum wage) and a maximum of 2,074.80 €, and subject to income taxation of 15%. An additional 5.32 € per day are awarded to individuals.
Finland	33.66 € per day, gross, are awarded to individuals, plus an additional daily subsidy of up to 10 €, according to the number of children in the household.
France	Percentage of salary coverage is 70% of gross salaries, with a minimum of 1219 € (national minimum wage) and a maximum of 5485.5 €.
Germany	Percentage of salary coverage is, during the first four months, 60% of net income, or 67%, if there are children in the household. For benefit calculation, monthly gross wages are capped at 6,900 €. Between the fourth and seventh month it increases to 70% and after the seventh month to 80%.
Italy	Percentage of coverage is 80% of gross salaries. If salary is below 2,159.48 € contribution is capped at 939.89 €; if it is above, contribution is capped at 1,199.72 €
Portugal	Percentage of coverage is 66% of gross salaries with a minimum of 635 € (national minimum wage) and a maximum of 1,905 €

Sources: Anderson et al. 2020 and European Commission 2020.

Table 4: Estimated number and percentage of vulnerable individuals in households accruing salary income (at one, three, six and twelve months) when deprived of salaries and when awarded COVID-19 layoff benefits, for a basket of food and utilities, and a basket of food and utilities, rent and mortgages

(a) Austria

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	7,838	7,838	7,838	15,281	21,963	44,047	62,888	71,463
With layoff	0	0	0	5,827	7,312	22,073	28,994	35,222
Without salaries	0.1%	0.1%	0.1%	0.3%	0.4%	0.7%	1.1%	1.2%
With layoff	0.0%	0.0%	0.0%	0.1%	0.1%	0.4%	0.5%	0.6%
Observations	4,544	4,544	4,544	4,544	4,544	4,544	4,544	4,544

(b) Belgium

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	78,568	150,379	286,917	491,333	235,974	712,135	1,095,138	1,757,590
With layoff	33,068	49,883	230,617	266,963	87,144	285,463	445,014	564,326
Without salaries	1.0%	2.0%	3.7%	6.4%	3.1%	9.3%	14.2%	22.8%
With layoff	0.4%	0.6%	3.0%	3.5%	1.1%	3.7%	5.8%	7.3%
Observations	3,346	3,346	3,346	3,346	3,346	3,346	3,346	3,346

(c) Germany

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	928,515	2,113,261	4,142,438	6,707,723	2,405,772	4,532,011	7,707,629	13,269,392
With layoff	133,054	272,374	622,145	802,865	365,147	548,882	1,013,972	1,340,357
Without salaries	1.6%	3.6%	7.0%	11.3%	4.1%	7.6%	13.0%	22.4%
With layoff	0.2%	0.5%	1.0%	1.4%	0.6%	0.9%	1.7%	2.3%
Observations	7,938	7,938	7,938	7,938	7,938	7,938	7,938	7,938

(a) Finland

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	1,827	2,991	3,272	9,416	11,342	29,557	49,917	74,849
With layoff	873	1,828	2,270	2,270	6,167	13,631	25,755	41,534
Without salaries	0.0%	0.1%	0.1%	0.3%	0.3%	0.8%	1.3%	2.0%
With layoff	0.0%	0.0%	0.1%	0.1%	0.2%	0.4%	0.7%	1.1%
Observations	18,923	18,923	18,923	18,923	18,923	18,923	18,923	18,923

(b) France

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	104,986	215,637	396,695	729,029	869,591	2,332,955	3,733,395	5,550,351
With layoff	21,866	60,426	76,962	122,124	129,875	291,514	447,911	594,736
Without salaries	0.2%	0.5%	0.9%	1.7%	2.0%	5.5%	8.8%	13.1%
With layoff	0.1%	0.1%	0.2%	0.3%	0.3%	0.7%	1.1%	1.4%
Observations	23,052	23,052	23,052	23,052	23,052	23,052	23,052	23,052

(c) Italy

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	4,010,568	6,743,355	9,975,795	14,452,892	5,050,221	8,599,383	12,446,091	16,533,112
With layoff	996,631	1,254,103	1,413,459	1,697,866	1,550,897	1,908,014	2,302,375	2,890,525
Without salaries	10.4%	17.5%	25.9%	37.6%	13.1%	22.4%	32.4%	43.0%
With layoff	2.6%	3.3%	3.7%	4.4%	4.0%	5.0%	6.0%	7.5%
Observations	10,915	10,915	10,915	10,915	10,915	10,915	10,915	10,915

(d) Portugal

	Food and utilities				Food and utilities, rent and mortgages			
	M1	M3	M6	M12	M1	M3	M6	M12
Without salaries	1,827	2,991	3,272	9,416	11,342	29,557	49,917	74,849
With layoff	873	1,828	2,270	2,270	6,167	13,631	25,755	41,534
Without salaries	0.0%	0.1%	0.1%	0.3%	0.3%	0.8%	1.3%	2.0%
With layoff	0.0%	0.0%	0.1%	0.1%	0.2%	0.4%	0.7%	1.1%
Observations	10,689	10,689	10,689	10,689	10,689	10,689	10,689	10,689