Who is discriminated most in the EU? An analysis of the Covid-19 compensation fund

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ABSTRACT
The European Union has set up a fund in order to compensate countries for damages resulting from Covid-19 that hit the economies in an asymmetric way. We argue that payments should be based only on relative damages, expressed as losses relative to GDP, and any distribution mechanism implying that damages in the countries are treated differently is discriminatory. Hence, we compute the compensation payments if the resources of the fund are spent according to the relative loss in GDP. Finally, we compare the compensations relative to the losses in GDP, resulting from the application of that principle, with those obtained by distributing the funds as suggested by the Council of the European Union. Our results provide evidence of discrimination by the EU Covid-19 compensation package.

I. Introduction
The number of Covid-19 cases worldwide has exceeded 171 million by 31 March 2021 and the GDP growth rate for the seven largest economies amounted to — 5.6–5.6% on average for France, Germany, India, Japan, the United Kingdom and the United States, while GDP rose by 4.9% in China as of the third quarter of 2020 (cf. Statista 2021). The European Union (EU) has decided to set up a compensation fund, the Recovery and Resilience Facility (RRF), to compensate the economies of the EU for damages that resulted from the Covid-19 pandemic that hit the countries asymmetrically. According to the Council of the EU about 312 billion euros in prices of 2018 are to be distributed as compensation payments that need not be paid back. The suggested distribution mechanism states that 70% of the fund is distributed according to the weighted average unemployment rate of a country from 2015 to 2019 and 30% are distributed according to the weighted relative loss of GDP. For details see Council of the European Union (2020, 46–49), or Greiner and Owusu (2021).

According to the EU, the RRF fund is not only intended to compensate for COVID-19 losses, but, it is also an instrument to fund the green transition and to contribute to a long-term sustainable growth. However, we argue that the relative loss in GDP should be the only criterion according to which the payments are distributed since the compensation fund has been created in order to compensate the damages resulting from the Covid-19 pandemic. When resources are distributed according to criteria unrelated to that exogenous shock, such as the unemployment rate before the shock, this implies that the damages in the countries are treated unequally, i.e. the relative loss of 1 euro in country A is treated differently than that of 1 euro in country B. Hence, equal situations are treated unequally implying (horizontal) inequality and, thus, discrimination of citizens in the EU.

A possibility to determine the compensation payments is to make them proportional to the relative losses in GDP caused by Covid-19, as suggested by Heinemann (2020). The use of that criterion can be justified by models for fiscal insurance systems that posit that payments are guided by fluctuations in growth. However, it must be stated that it is difficult to imagine an insurance system that does not only insure idiosyncratic risks, but makes payments in the case where every insured is hit by the shock. Nevertheless, this
principle can be applied to the determination of compensation payments.

We proceed as follows. In section 2, we define discrimination and show how the resources of the fund are distributed according to the relative losses in GDP. Section 3 computes the compensations for the EU 27 and we compare our outcome with that suggested by the Council of the EU. Section 4 summarizes and concludes.

II. Theoretical background

The distribution according to the damages could be done either proportionally to the absolute loss of GDP per capita or in accordance with the loss in GDP relative to the level of GDP. Since a focus on the absolute loss of GDP per capita neglects that richer economies can bear higher damages, we resort to the relative loss of GDP as the criterion according to which the resources of the compensation fund are distributed.

Other concepts would be feasible, too. However, we argue that all should be such that they only consider damages caused by Covid-19 and any criteria not related to that shock lead to an unequal treatment of the damages and, thus, to discrimination. Before we compute the distribution, we give a formal definition of our notion of discrimination.

Definition Discrimination is given if the payments to individual countries are based on criteria such that the relative damages, i.e., losses in GDP relative to GDP, are treated differently in the countries. Negative (positive) discrimination of a country is given when the compensation payments relative to the damages before compensation are lower (higher) than in the case where the distribution is based on a concept that treats the relative damages equally.

Next, we determine the compensation payments and consider an economic union consisting of $n$ sovereign states that are hit by an asymmetric shock. The notation is as follows:

$S_i^v$: damage before compensation in country $i$, $i = 1, \ldots, n$, measured by the reduction of the GDP, with $S^v = \sum_{i=1}^n S_i^v$.

$Z$: total fund distributed to the economies where each country receives $Z_i$, $i = 1, \ldots, n$, with $Z = \sum_{i=1}^n Z_i$.

$S_i$: damage in country $i$ after compensation, $i = 1, \ldots, n$.

$Y_i^v$: GDP in country $i$ before the shock, $i = 1, \ldots, n$.

All variables are nominal and measured in euro and $S_i^v < Y_i^v$. Further, no country receives a compensation that exceeds its damage, i.e., $Z_i \leq S_i^v$. If the damage in a country falls short of the compensation it received following the principle that resources are distributed proportional to the relative loss in GDP, that economy is fully compensated.

The next proposition summarizes our distribution mechanism.

Proposition Assume that the payments $Z_i$, $i = 1, \ldots, n$, are determined according to the losses in GDP relative to GDP before the shock. Then, they are obtained as

$$Z_k = \min \left\{ Z \left( \frac{s_k^v}{\sum_{i=1}^n s_i^v} \right), s_k^v \right\}, \quad k = 1, \ldots, n,$$

with $s_i^v = S_i^v / Y_i^v > 0$, $i = 1, \ldots, n$, damages relative to GDP before compensation. The damages after compensation are given by

$$S_k = \max \left\{ \left( \frac{s_k^v}{\sum_{i=1}^n s_i^v} \right) \left( Y_k^v \sum_{i=1}^n s_i^v - Z \right), 0 \right\}, \quad k = 1, \ldots, n.$$

Proof: Distribution of $Z$ according to the relative loss in GDP implies $Z_k / Z = s_k^v / \sum_{i=1}^n s_i^v$ and $Z_i / Z_m = s_i^v / s_m^v$. Further, $Z_k \leq S_k^v$, $\sum_{i=1}^n Z_i^v = Z$ must hold. Inserting $Z_k$ in $S_k = S_k^v - Z_k \geq 0$ gives the second expression.

III. The Covid-19 compensation fund

In this section, we compute the compensation payments for the 27 EU Member States according to the proposition in section 2. GDP before Covid-19
Figure 1. Ratio of total losses relative to GDP.

Table 1. Losses before compensation, $L_i^L = -S_i$, compensations according to relative losses in GDP, $Z_i$, EU compensations, $Z_i^{EU}$, and the difference, $\Delta = (Z_i - Z_i^{EU}) / L_i^L$.

| Country      | $L_i^L$ | $Z_i$   | $Z_i / L_i^L$ | $Z_i^{EU}$ | $Z_i^{EU} / L_i^L$ | $\Delta$ |
|--------------|---------|---------|---------------|------------|---------------------|---------|
| Belgium      | -62,117,863 | 24,201,666  | -0.390        | 5,025,271  | -0.095               | -0.295  |
| Bulgaria     | -4,735,406   | 4,735,406   | -1.000        | 6,268,706  | -1.324               | 0.324   |
| Czechia      | -24,441,712  | 20,248,885  | -0.828        | 7,071,676  | -0.289               | -0.539  |
| Denmark      | -13,875,030  | 8,231,171   | -0.593        | 1,551,746  | -0.112               | -0.481  |
| Germany      | -272,336,988 | 14,649,685  | -0.054        | 25,619,175 | -0.094               | 0.04    |
| Estonia      | -1,674,487   | 1,674,487   | -1.000        | 969,515    | -0.579               | -0.421  |
| Ireland      | -6,290,337   | 3,277,811   | -0.521        | 989,186    | -0.157               | -0.364  |
| Greece       | -24,669,116  | 24,669,116  | -1.000        | 17,773,895 | -0.720               | -0.28   |
| Spain        | -249,820,761 | 37,235,729  | -0.149        | 69,528,050 | -0.278               | 0.129   |
| France       | -328,567,000 | 25,130,815  | -0.076        | 39,377,074 | -0.120               | 0.044   |
| Croatia      | -7,618,906   | 7,618,906   | -1.000        | 6,296,831  | -0.826               | -0.174  |
| Italy        | -288,254,862 | 29,881,758  | -0.104        | 68,895,833 | -0.239               | 0.135   |
| Cyprus       | -1,990,086   | 1,990,086   | -1.000        | 1,006,170  | -0.506               | -0.494  |
| Latvia       | -2,002,779   | 2,002,779   | -1.000        | 1,963,088  | -0.980               | -0.02   |
| Lithuania    | -715,370     | 715,370     | -1.000        | 2,224,690  | -3.110               | 2.110   |
| Luxembourg   | -3,350,802   | 3,350,802   | -1.000        | 93,526     | -0.028               | -0.972  |
| Hungary      | -13,227,357  | 13,227,357  | -1.000        | 7,175,838  | -0.542               | -0.458  |
| Malta        | -1,591,121   | 1,591,121   | -1.000        | 316,474    | -0.199               | -0.801  |
| Netherlands  | -69,005,496  | 15,801,103  | -0.229        | 5,962,324  | -0.086               | -0.143  |
| Austria      | -41,312,447  | 19,278,919  | -0.467        | 3,462,169  | -0.084               | -0.383  |
| Poland       | -21,393,246  | 7,456,200   | -0.349        | 23,856,987 | -1.115               | 0.766   |
| Portugal     | -29,226,930  | 25,422,102  | -0.870        | 13,910,387 | -0.476               | -0.394  |
| Romania      | -16,215,493  | 13,491,217  | -0.832        | 14,248,020 | -0.879               | 0.047   |
| Slovenia     | -4,578,956   | 4,578,956   | -1.000        | 1,777,322  | -0.388               | -0.612  |
| Slovakia     | -9,998,990   | 9,998,990   | -1.000        | 6,329,994  | -0.633               | -0.367  |
| Finland      | -14,011,957  | 10,806,740  | -0.771        | 2,065,805  | -0.149               | -0.622  |
| Sweden       | -17,138,740  | 6,701,823   | -0.391        | 3,289,248  | -0.192               | -0.199  |

Source: Own computations, Council of the EU (2020, 50). Absolute numbers in millions of euros.
The second column in the table shows the total loss in GDP through Covid-19 (sum of losses in 2020 and 2021). The third column gives compensations calculated according to the relative losses in GDP. Our distribution mechanism ensures that no country is compensated more than its loss in GDP. Therefore, we have computed the compensation such that any excess of compensation over losses ($L_i^r$) for a particular country is redistributed to other countries according to their relative losses in GDP.

Column 4 depicts the ratio of compensation payments to losses in GDP before compensation. One sees that 12 out of the 27 EU countries are fully compensated, i.e. $Z_i/L_i^r = -1$, namely Bulgaria, Estonia, Greece, Croatia, Cyprus, Lithuania, Latvia, Luxembourg, Hungary, Malta, Slovenia and Slovakia. All other countries with $|Z_i/L_i^r| < 1$ are not fully compensated.

Column 5 and 6 give the compensations according to the Council of the European Union (2020, 50), $Z_i^{eu}$, and the relation to the losses, $Z_i^{eu}/L_i^r$, respectively. We notice that Bulgaria, Lithuania and Poland receive funds that exceed their losses in GDP.

To ascertain the extent of the discrimination due to the EU computation of the compensations, we recall the definition in section 2. Negative (positive) discrimination of a country is given when the compensation payments relative to the damages before compensation are lower (higher) than in the case where the distribution is based on a concept that treats the relative damages equally.

Hence, we compare the EU compensations with the compensations based on relative GDP losses in column 7. The ratio of compensations to losses according to EU criteria is greater than the ratio of compensations to losses according to relative GDP losses for Bulgaria, Germany, Spain, France, Italy, Lithuania, Poland and Romania. Hence, these countries are positively discriminated. Conversely, Belgium, Czechia, Denmark, Estonia, Ireland, Greece, Croatia, Cyprus, Latvia, Luxembourg, Hungary, Malta, Netherlands, Austria, Portugal, Slovenia, Slovakia, Finland and Sweden are negatively discriminated against, because the EU compensations relative to the losses are less than the compensations relative to losses if we compute them according to relative losses in GDP.

Figure 2 provides a graphical view of the comparison of the compensations relative to losses for the two distribution mechanisms (EU compensations and compensation according to relative losses in GDP).

There is a limited number of papers which studies the EU RRF. Fuest (2021) pointed out that the mechanism used by the EU to determine the compensations is not geared towards redistribution in favour of countries which were mostly affected by the corona crises. This reinforces the major argument in this paper. In Heinemann (2020), the compensations were computed according to the relative loss in GDP and according to a combination of relative losses in GDP and a rise in unemployment due to Covid-19. However, his computations do not consider the GDP losses in 2021. Greiner and Owusu (2020) resorted to sacrifice theories to compute the compensations of the RRF funds. Like Heinemann (2020), their computation was based only on GDP losses in 2020. Since
the affected countries are not expected to recover before 2022, it seems reasonable to include GDP losses of 2021 in the computations. Our study, therefore, captures the total losses due to Covid-19 and, hence, provides a more realistic analysis regarding how the RRF grants should be distributed.

IV. Conclusion

We have shown how the payments of the EU Covid-19 compensation fund are determined when they are distributed in accordance with the relative loss of GDP and we compared the outcome to that proposed by the Council of the EU. Other distribution mechanisms would be feasible as well; however, each should only focus on the damages caused by that pandemic. Otherwise, losses are treated differently implying (horizontal) inequality and, thus, discrimination.

Our analysis has demonstrated that the proposal by the Council of the EU is largely discriminatory. The results demonstrate that 19 out of 27 EU countries have been negatively discriminated against whilst the others have been positively discriminated against. Secondly, distributing the funds according to the criteria suggested by the EU implies that some countries will receive more compensations than the damages they incurred as a result of the Covid-19 pandemic.

A shortcoming of our analysis is that it neglects contributions of the countries to repay the compensation fund. We do so because that has not yet been determined and is subject to future negotiations. The Bundesrechnungshof (2021) has calculated the net positions (Table 1, p. 13) assuming that the repayments are done according to the expected share in the common EU budget from 2021 to 2027.

As regards future research, it will be interesting to determine the actual net positions and to analyse whether the RRF will have contributed to sustainable development, as argued by the EU, or whether it just represents a flash in the pan. The latter may be expected because structural problems that have existed for decades in some member states are not tackled by the RRF.

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