THE 2020 TERRITORIAL IMPACT OF COVID-19 IN THE EU: A RHOMOLO UPDATE

STYLIANOS SAKKAS, FRANCESCA CRUCITTI, ANDREA CONTE, AND SIMONE SALOTTI

- The Covid-19 crisis started in the EU at the beginning of 2020. The economic activity rebounded in summer, but there was another setback in late 2020 as the pandemic resurgence prompted a new round of containment measures.
- In 2020, the Rhomolo model was used to simulate the potential economic impact of Covid-19 across EU regions for the launch of NextGenerationEU (European Commission, 2020).
- This Policy Insight reports new territorial results based on up-to-date information on the effects of the crisis in the EU economies in 2020.
- The results, in line with the latest country-level Eurostat official statistics, suggest that there is considerable regional heterogeneity in the impact of the Covid-19 crisis with clear implications for the policies to be put in place for recovery.

1. Introduction

The COVID-19 pandemic is causing an unprecedented health and economic crisis worldwide. As a result, global economic growth sank at -3.5% in 2020, with the EU recording an even lower -6.1%. As of June 2021, most world economies are expected to return to positive growth rates by the end of the year, although caution is advised due to the uncertainty surrounding the developments of the pandemic.

In response to the crisis, the European Commission launched the Recovery Plan for Europe in May 2020, now referred to as NextGenerationEU. Among other things, the proposal was accompanied by a contribution on the impact of the crisis across EU regions based on RHOMOLO simulations and consistent with the Commission's spring forecast 2020 (Conte et al., 2020).

RHOMOLO is the dynamic spatial general equilibrium model developed by the JRC together with DG REGIO. It is routinely utilised for policy impact assessments on the regional economies of the EU. Moreover, it is a useful tool to study the effects of macroeconomic shocks, including the one caused by an event such as the Covid-19 pandemic and the consequent health-related measures taken by governments worldwide.

The Recovery Plan constitutes the largest stimulus package ever financed through the EU budget. The resources of the 2021-2027 multi-financial framework and those of NextGenerationEU together account for a total of €1.8 trillion of funding.

NextGenerationEU is a €750 billion temporary recovery instrument aiming at repairing the economic and social damage caused by the Covid-19 pandemic. Its centrepiece is the Recovery and Resilience Facility, with €672.5 billion in loans and grants available to support reforms and investments undertaken by EU Member States. The latter are working on their recovery and resilience plans to access the funds channelled through the Facility.

Quantifying the territorial/regional economic impacts of the pandemic is essential for all the European policy makers who are now deciding how to maximise the economic benefits of the money channelled through the various instruments created by the European Commission to counteract the consequences of the crisis.

Besides these policy measures, the sectoral structure and the trade integration in global value chains of the EU regional economies play a key role for their economic performance, and contribute to determine the response to the crisis and, eventually, the territorial distribution of its economic impact.

The results presented in this Policy Insight are based on a RHOMOLO analysis carried out by using the most up-to-date macroeconomic data available in order to devise a scenario mimicking as much as possible the real consequences of the Covid-19 crisis in 2020. The version of the model used here covers 230 EU NUTS 2 regions plus 37 NUTS 2 regions of the UK,

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disaggregating all economies into 10 NACE Rev.2 sectors.*

In particular, we use latest available data at the country/sector level from Eurostat as well as updated information from the AMECO database. We employ a combination of supply and demand shocks to simulate the effects of the crisis.

2. Modelling assumptions

Following standard practice in macroeconomic modelling, we construct a scenario mimicking the effects of the Covid-19 crisis by introducing multiple adverse shocks at the same time. One important difference with the previous RHOMOLO analysis on the Covid-19 crisis (Conte et al., 2020) lies in the asymmetric nature of the shocks. Thanks to the availability of country-specific information, all the shocks of the current analysis reflect the specific national economic conditions as depicted by the latest available macroeconomic data for 2020.

We assume that the macroeconomic transmission channels associated with the Covid-19 crisis are both of demand and supply nature. Table 1 summarizes the set of both types of shocks under consideration.

Table 1: COVID-19 shocks (EU-averages)
Supply shock
Labour supply shock. 1.9% reduction in workforce
Demand shocks
Uncertainty shock. The risk premium increases by 200bps
Reduction of private consumption in the following sectors: G-I (-9.4%); and R-U (-5.7%)
Reduction of exports to the rest of the world (-9.5%)

Our simulation strategy is as follows. We assume that the baseline year *t*, is 2019. In *t+1*, the economy is hit by country-specific pandemic shocks so to get an average output loss in 2020 of 6% at the EU level.

The shocks are calibrated so that the ranking of countries in terms of output loss is in line to the best possible extent with the official Eurostat national statistics for 2020. This was achieved by retrieving country-level information on the 2019/2020 change in the following macroeconomic variables: final household consumption, employment (used for the labour supply shock), and foreign trade with the rest of the world (ROW) from the AMECO database. These data are used as proxies of the demand and supply shocks introduced in the model.

As for the private consumption shock, we choose to shock only sectors G-I (Retail Trade, Transport, Accommodation and Food Service Activities) and R-U (arts and recreation) as they were the most affected by the pandemic irrespectively of the country.

The spatial and sectoral configuration of the model allows unravelling the regional/territorial impact of the crisis based on these scenario assumptions.

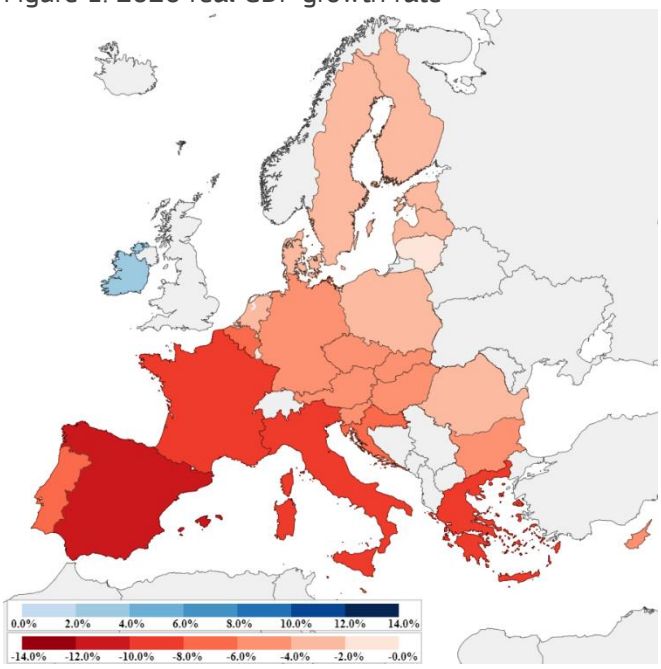
The policy impact of this research

The main results of this Policy Insight are included in the Employment and Social Developments in Europe (ESDE) report (European Commission, 2021) published by DG EMPL in which they are also used as inputs for further economic analysis on the determinants of regional vulnerability of the Covid-19 crisis.

3. Main results

Figure 1 reports the latest values for 2020 real GDP growth rate published by Eurostat to be used as a benchmark for the RHOMOLO results. Notice that Ireland is the only EU country with positive GDP growth in 2020, despite the Covid-19 crisis.

Figure 1. 2020 real GDP growth rate

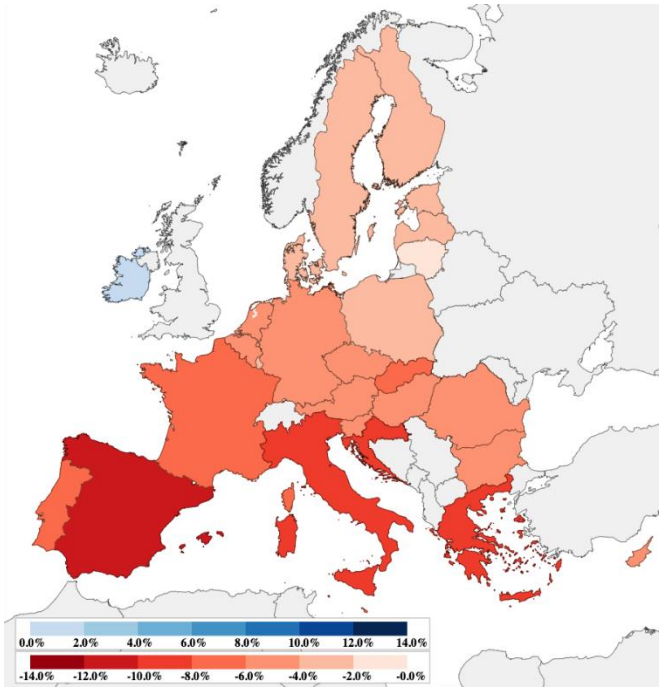


Source: Eurostat (TEC00115).

* A detailed description of the RHOMOLO model can be found in Lecca et al. (2018).

We now turn to the RHOMOLO results obtained using the shocks described above. Figure 2 reports the country-level results which are close to the Eurostat statistics shown in Figure 1. The results are reported as percentage deviations from a hypothetical baseline scenario without Covid-19 crisis.

Figure 2. Simulated national GDP impact of the crisis in 2020



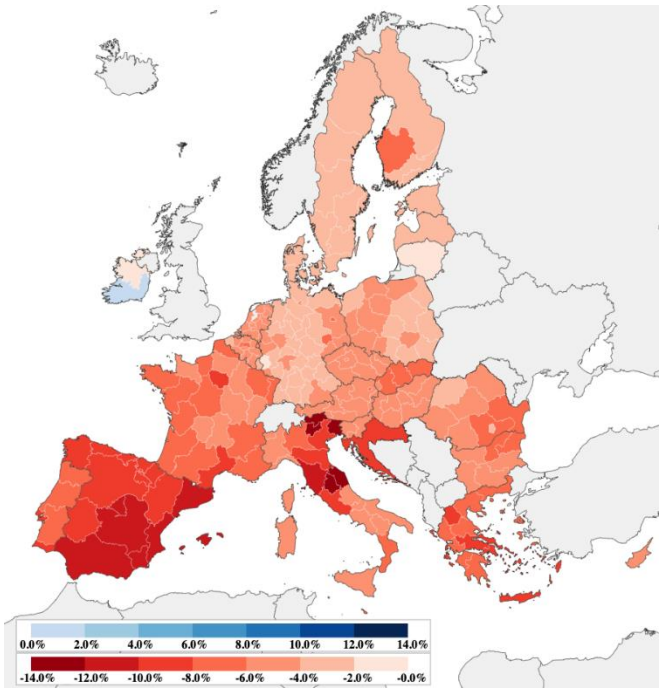
Source: RHOMOLO simulations.

Figure 1 and Figure 2 are very similar to each other, demonstrating that the calibration of the modelling shocks results in an economic impact which is comparable to the one observed in the EU economies in 2020.

However, the value added of RHMOLO lies in its regional dimension. As Figure 3 shows, the different initial endowments and economic characteristics of the regions lead to a heterogenous response to the negative shocks designed to mimic the effects of the Covid-19 crisis.

According to the modelling results, there is considerable within-country variation in terms of GDP impact of the Covid-19 shocks, which is particularly evident in countries such as Spain, Italy, France, Greece, Portugal and Finland.

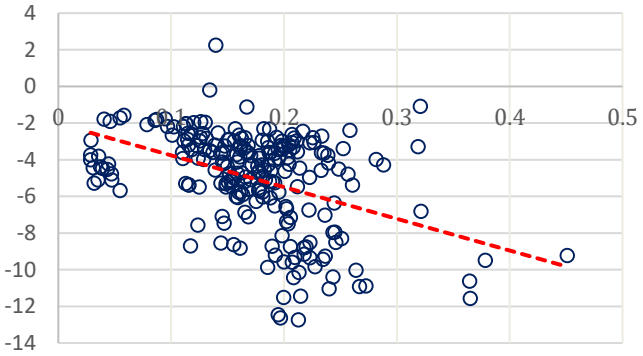
Figure 3. Simulated regional GDP impact of the crisis in 2020



Source: RHOMOLO simulations.

The GDP losses are highly correlated to drops in employment. In order to explore further the impact on employment of the current crisis, we present an additional piece of evidence on what drives the GDP and employment losses related to the Covid-19 crisis. Figure 4 plots the changes in regional employment (on the vertical axis) against the initial regional value added shares of sectors G-I (Wholesale and retail trade, transportation, and accommodation).

Figure 4. Correlation between changes in employment (vertical axis) and initial G_I employment shares (horizontal axis)



Source: RHOMOLO simulations.

4. Conclusions

This Policy Insight investigates the economic impact of the Covid-19 crisis at the regional level in the EU

using the spatial dynamic general equilibrium model RHOMOLO. The analysis relies on the latest available macroeconomic data on GDP, consumption, and labour supply to construct a scenario capable of simulating the potential effects of the crisis with the aim of being consistent with the latest available Eurostat data.

The combination of asymmetric adverse shocks and the specific characteristics of the various regional economies of the EU results in a wide regional heterogeneity of the GDP impact of the crisis. This bears important implications for the EU policy makers designing recovery plans and measures to support the economies which were hit hard by the economic shocks related to the Covid-19 pandemic and the resulting lockdown measures.

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Read more

Conte, A., Lecca, P., Salotti S. and Sakkas S. (2020). The territorial economic impact of COVID-19 in the EU. A RHOMOLO Analysis. Territorial Development Insights Series, JRC121261, European Commission.

European Commission (2020). Identifying Europe's recovery needs. SWD(2020) 98 final. Brussels, 27.5.2020.

European Commission (2021). Employment and Social Developments in Europe. Towards a strong social Europe in the aftermath of the COVID-19 crisis: Reducing disparities and addressing distributional impacts. Luxembourg: Publications Office of the European Union. Doi: 10.2767/57771

Lecca, P., Barbero, J., Christensen, M.A., Conte, A., Di Comite, F., Diaz-Lanchas, J., Diukanova, O., Mandras, G., Persyn, D., and Sakkas, S. (2018). RHOMOLO V3: A spatial modelling framework. JRC Technical Reports JRC111861, EUR 29229 EN, Publications Office of the European Union, Luxembourg.

RHOMOLO

Dynamic Spatial CGE Model for EU regions

Territorial Data Analysis and Modelling team (TEDAM)
https://ec.europa.eu/jrc/en/rhomolo/team

Main author: Stylianos Sakkas
mailto:stylianos.sakkas@ec.europa.eu