



**DEPARTMENT OF INTERNATIONAL AND
EUROPEAN ECONOMIC STUDIES**

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

**WHICH CRISIS SUPPORT FISCAL MEASURES
WORKED DURING THE
COVID-19 SHOCK IN EUROPE?**

EVI PAPPA

ANDREY RAMOS

EUGENIA VELLA

Working Paper Series

22-17

July 2022

Which crisis support fiscal measures worked during the COVID-19 shock in Europe?*

Evi Pappa[†] Andrey Ramos [‡] Eugenia Vella[§]

July 1, 2022

Abstract

We build a new database by classifying the COVID-19 fiscal measures for twelve EU countries into seven spending categories and examine how the different support packages affected the economy. On average, fiscal measures supported the output recovery without generating significant inflationary pressures. This finding masks substantial heterogeneity: *Assistance to small and medium enterprises and specific sectors* contributed significantly to stimulating the economy and to maintaining inflation. *Direct pandemic spending and unemployment benefits and measures to sustain employment levels* generated sizeable output multipliers and had no inflationary costs. Conversely, *universal help* only had positive effects on inflation and *transfers to households* did not do much apart from affecting confidence.

Keywords: COVID-19 crisis, fiscal measures, multipliers, sentiment, transfers, assistance to SMEs, inflation.

JEL Classification: C23, E62.

*We are grateful to José Manuel Claros and Kostas Mavrigiannakis for excellent research assistance. The research has received funding under a contract with DG Internal Policies of the Union Directorate A (project: “Phase out of the crisis support measures: How successful are Member States in moving from broad support measures towards more targeted support?”). The opinions expressed do not represent the contracting authority’s official position.

[†]Universidad Carlos III de Madrid, email: ppappa@eco.uc3m.es

[‡]Universidad Carlos III de Madrid, email: anramosr@eco.uc3m.es

[§]Athens University of Economics and Business and Fundació MOVE, email: evella@aueb.gr, corresponding author

1 Introduction

Background. In response to the record-breaking COVID-19 recession, many governments adopted unprecedented fiscal stimuli (see Figure 1) and, as a result, the most acute impacts of the crisis were averted. While fiscal policy is widely accepted as an effective countercyclical policy tool, little is known about its effectiveness in a crisis environment with widespread lockdown policies and infections ongoing. Even less is known about the effectiveness of different fiscal policy tools in such an environment. Our research addresses this challenge.

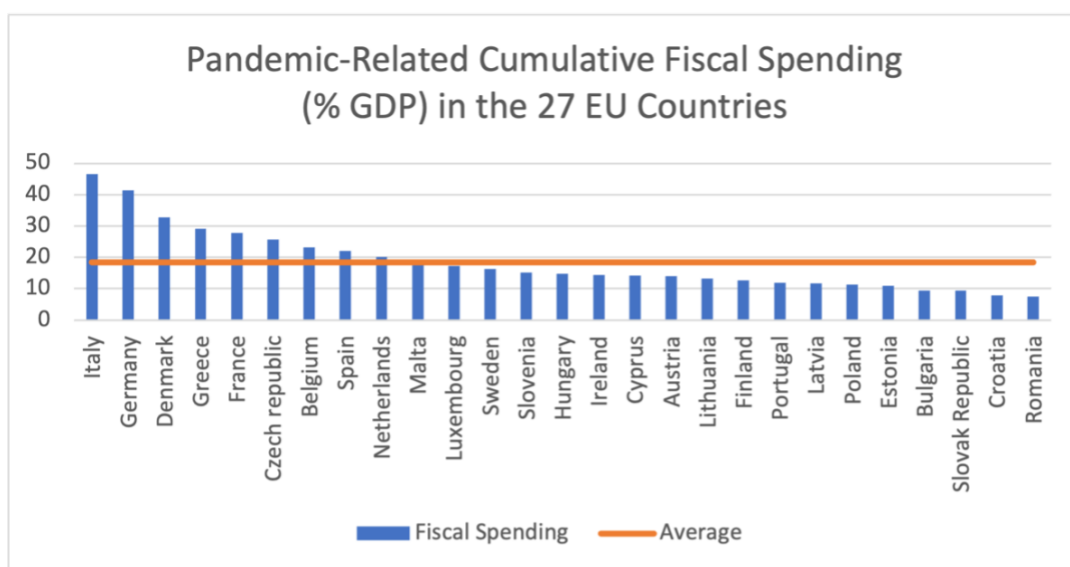


Figure 1: Pandemic-related cumulative fiscal spending (% GDP) in 27 EU countries, from October 2020 to July 2021.

Source: IMF Fiscal Monitor database of country fiscal measures in response to the COVID-19 pandemic. The GDP share of each measure in every quarter is calculated using data for 2020Q3 GDP to avoid changes caused by GDP variations.

Contribution. By building a novel dataset, we provide evidence on the impact of the COVID-19 fiscal measures in 12 EU countries on quarterly GDP growth, changes in consumer confidence and changes in inflation. We analyze which of the different types of fiscal responses adopted had merit in mitigating output losses and in restoring sentiment and which measures contributed to increased inflationary pressures.

Methodology. We construct a unique database on fiscal spending categories during the COVID-19 crisis, using mainly three sources: (a) the Fiscal Monitor database of country fiscal measures in response to the COVID-19 pandemic by the International Monetary Fund (IMF), (b) the European Commission (EC) report on European COVID-19 measures, and (c) the report about COVID-19 policy measures of Bruegel, a Brussels-based think tank in economics. We also use national sources for some countries to overcome data availability problems when, for example, the IMF database provides only the measure but not the associated expenditure amount. The database includes the EU countries for which we found the relevant information.

The novelty of our work lies in collecting and classifying the individual measures taken in 12 EU countries (i.e., “Additional spending”, “Deferred revenue”, “Below the line measures”, “Guarantees”, “Quasi-fiscal operations”) into the following categories of fiscal measures, according to their function: (1) Assistance to small and medium enterprises (SMEs) and specific sectors; (2) Measures targeted to transform the economy; (3) Pandemic spending (e.g. on healthcare); (4) Transfers to households; (5) Unemployment benefits and measures to sustain employment; (6) Universal help; (7) Other COVID-19 government spending.

Using a Generalized Method of Moments (GMM) approach, we estimate output, sentiment and inflation multipliers in our panel and test whether the fiscal response choice made a difference for the economic and sentiment recovery in Europe. To control for the evolution of the pandemic, we also include in our regressions an index of the strictness of the lockdown measures and the number of fatalities due to COVID-19 per million inhabitants.

Descriptive Statistics. All countries but Bulgaria spent more than half of the exceptional fiscal measures on *assistance to SMEs and specific sectors*. Regarding *fiscal measures to transform the economy*, the case of Spain clearly stands out (17%), followed by France and Poland (both around 11%). In the category of *spending caused by the pandemic*, mention should be made of Romania, Bulgaria and Finland (close to 17%, 15% and 12%, respectively). All countries in the sample devoted part of the extra spending to finance *unemployment benefits and measures to sustain employment rates*. Bulgaria

shows the highest share (26%), followed by Portugal (21%) and Poland (19%). Against the general perceptions, transfers to households were not widely used. The highest shares are observed in Bulgaria and Finland (close to 18% and 6%, respectively). Other eight countries only allocated below 2% of total expenses to this spending category. Finally, in the category of *universal help*, we have a very high share in Denmark (close to 40%), whereas the shares for other economies are well below 15% and for some economies like Italy, Poland, Spain, Sweden and the Netherlands the universal help measures were null. Overall, most countries in our sample shifted over time fiscal measures towards assistance to SMEs and specific sectors.

Results. The results of our econometric analysis suggest that, on average, fiscal measures were successful in pacing the path of recovery without generating significant inflationary pressures. For the EU countries considered, the output multiplier of total exceptional spending related to COVID-19 is below one and, on average, the adopted fiscal packages do not seem to have induced significant inflationary pressures.

However, there is substantial heterogeneity regarding the different fiscal measures: The multipliers associated with assistance to SMEs and specific sectors are in line with the aggregate spending multipliers. By contrast, we obtain output multipliers larger than one for (i) direct pandemic spending, and (ii) unemployment benefits and measures to sustain employment levels. For transfers to households, the estimated output multipliers are not statistically significant but confidence multipliers are. Therefore, even if transfers did little to regain economic losses, they were important in backing up consumer sentiment.¹ Finally, *universal help* only had positive effects on inflation and no real effects.

Policy Implications. Our research provides guidelines for a successful fiscal response in times of crisis. Assistance to SMEs, direct pandemic spending and unemployment benefits and measures to sustain employment are the fiscal tools that seem to have stimulated output without carrying inflation costs.

¹Using the ECB Consumer Expectations Survey, [Georgarakos and Kenny \(2022\)](#) find that improving perceptions about the adequacy of fiscal interventions incentivized spending, equally strongly for consumers who received government support and for those who did not.

Related Literature. Recent studies that quantify the macroeconomic effects of fiscal actions in response to the COVID-19 pandemic using fiscal announcements or aggregate fiscal data also suggest that the measures helped the economies recover (e.g., [Gourinchas et al. \(2021\)](#), [Chudik et al. \(2021\)](#) and [Deb et al. \(2021\)](#)). In this body of research, [Gourinchas et al. \(2021\)](#) conclude that fiscal policy prevented a large increase in firm failures by halving the failure rate, but it was inefficiently targeted. Using detailed regional variation in economic conditions in U.S. data, [Auerbach, Gorodnichenko, McCrory and Murphy \(2021\)](#) recently document that the effects of government spending were stronger during the peak of the pandemic recession, but only in cities that were not subject to strong stay-at-home orders.

[Guerrieri et al. \(2022\)](#), using a theoretical framework, suggest that fiscal policy can display a smaller multiplier in the case of the COVID-19 shock but suggest that the insurance benefit of fiscal transfers can be enhanced. [Faria-e Castro \(2021\)](#) finds, in a nonlinear Dynamic Stochastic General Equilibrium (DSGE) model, that the COVID-19 pandemic shock changes the ranking of policy multipliers in the United States. Unemployment benefits are the most effective tool to stabilize income for borrowers, while liquidity assistance programs are the most effective if the policy objective is to stabilize employment in the affected sector. In a Heterogeneous Agents New Keynesian (HANK) framework, [Bayer et al. \(2020\)](#) quantify for the U.S. economy the impact of a rise in fiscal transfers in the presence of the COVID-related lockdown. For the short run, they find large differences in the transfer multiplier: it is 0.25 for unconditional transfers and 1.5 for conditional (on recipients being unemployed) transfers. Overall, they conclude that the transfers reduce the output loss due to the pandemic by up to 5 percentage points. The theory in [Auerbach, Gorodnichenko and Murphy \(2021\)](#) predicts that pandemic fiscal stimulus has weaker economic effects on impact, as households are unable or reluctant to spend on services that potentially pose health risks. But as restrictions are removed and consumers become less reserved, there is a surge in spending and therefore in inflation.

Relative to the existing literature, we focus on EU countries and provide evidence on the effectiveness of different fiscal measures not only in terms of output growth, but also in terms of consumer confidence, an important factor for demand recovery. Moreover, to the best of our knowledge, we are the first to report estimates on the inflationary effects

of the different fiscal measures adopted.

Outline. The rest of the paper is organized as follows. Section 2 lays out the data on COVID-19 fiscal measures, Section 3 discusses the empirical methodology and Section 4 presents the main findings. Finally, Section 5 concludes.

2 COVID-19 Fiscal Measures in European Countries

In this section, we first describe how we built our database with the different public spending categories in EU countries during the pandemic. Then, we compare countries to see which measures each one adopted and we also analyse how the various fiscal measures evolved in each country over time.

2.1 Construction of the Database

We build a novel database with series for 2020Q2, 2020Q3, 2020Q4, 2021Q1 and 2021Q2 using mainly three sources: (a) the Fiscal Monitor database of country fiscal measures in response to the COVID-19 pandemic by the IMF, (b) the EC report on COVID-19 measures, and (c) the report of Bruegel on COVID-19 policy measures.² The data includes the discretionary measures that supplement existing automatic stabilizers that governments have announced or taken in selected economies in response to the COVID-19 pandemic (as of September 27th, 2021).

Let us briefly discuss the IMF Fiscal Monitor database mentioned above, since we follow its classification of expenditure types. The database summarizes key fiscal measures announced or taken by governments in response to the COVID-19 pandemic (as of September 27th, 2021). The database categorizes different types of fiscal support since January 2020, focusing on government discretionary measures. The IMF data is organised on the basis of the following categories:

1. Above the line:

- Additional spending or foregone revenues (tax cuts) in health and non-health sectors

²See <https://www.bruegel.org/publications/datasets/covid-national-dataset/>. We also use national sources for some countries to overcome data availability problems when, for example, the IMF database provides only the measure but not the associated expenditure amount (see the data methodology in Annex A of our companion policy paper (Pappa and Vella (2022))).

- Accelerated spending / deferred revenue (mostly tax deferrals)

2. Below the line support:

- Equity injections, loans, asset purchases or debt assumptions
- Contingent liabilities: guarantees and quasi-fiscal operations (financial schemes used during the pandemic)

The novelty of our work lies in collecting and classifying the individual measures taken in EU countries (i.e., “Additional spending”, “Deferred revenue”, “Below the line measures”, “Guarantees”, “Quasi-fiscal operations”) into the following types:

1. **Assistance to small and medium enterprises (SMEs) and specific sectors:** fiscal measures targeted to the firms or self-employed that suffered losses due to the pandemic;
2. **Fiscal measures targeted to transform the economy:** fiscal measures to promote investment activities, particularly in the areas of environmental sustainability and digitization;
3. **Spending caused by the pandemic:** fiscal measures to face the direct effects of the pandemic (e.g., on healthcare);
4. **Transfers to households:** fiscal measures designed to help households.
5. **Unemployment benefits and measures to sustain employment levels:** cost of short-time work schemes and measures to maintain jobs;
6. **Universal help:** fiscal measures, mostly tax cuts, to support businesses, employees, and households;
7. **Other:** all COVID-related fiscal measures that do not belong to the previous categories.

The EU countries included in our sample are: Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Italy, Netherlands, Poland, Portugal, Romania, Spain, and Sweden. Note that for Portugal we only have data for June 2021, while for

Poland we could only use the last quarter as we encountered several issues with the data of the previous quarters. Therefore, we omit these two countries in the econometric analysis of Section 3. Data construction is discussed in detail in Annex A of [Pappa and Vella \(2022\)](#) and the full database is available upon request.

2.2 Cross-Country Comparison

Next, we compare countries to see which measures each one adopted. Figure 2 shows the percentages of each expenditure type in total public expenditure related to COVID-19 for a subset of EU countries for which such data is available. As can be seen, each country adopted different types of fiscal measures.

All countries but Bulgaria spent more than half of the exceptional fiscal measures on “assistance to SMEs and specific sectors”. For Italy and Germany, the corresponding fraction is more than 80%. Regarding “fiscal measures targeted to transform the economy”, the case of Spain clearly stands out (17%), followed by France and Poland (both around 11%). For the other economies in our sample, the figures tend to be close to or below of 4% or null. In the category of “spending caused by the pandemic”, the cases of Romania and Bulgaria stand out (close to 17% and 15%, respectively). Most other countries are close to or below of 10%, with the exception of Finland (12%). All countries in the sample have engaged part of the extra spending to finance “unemployment benefits and measures to sustain employment rates”. Bulgaria shows the highest figure (26%), followed by Portugal (21%) and Poland (19%).

Against the general perceptions, the numbers we report in Figure 2 suggest that transfers to households were not widely used during the pandemic in the countries of our sample. The highest shares are observed in Bulgaria and Finland (close to 18% and 6%, respectively). The other eight countries that have used transfers as a fiscal measure only allocated below 2% of total expenses to this spending category. Finally, in the last category of “universal help”, we have a very high figure in Denmark (close to 40%), whereas the figures for other economies are well below 15% and for some economies like Italy, Poland, Spain, Sweden and the Netherlands the universal help measures are null.

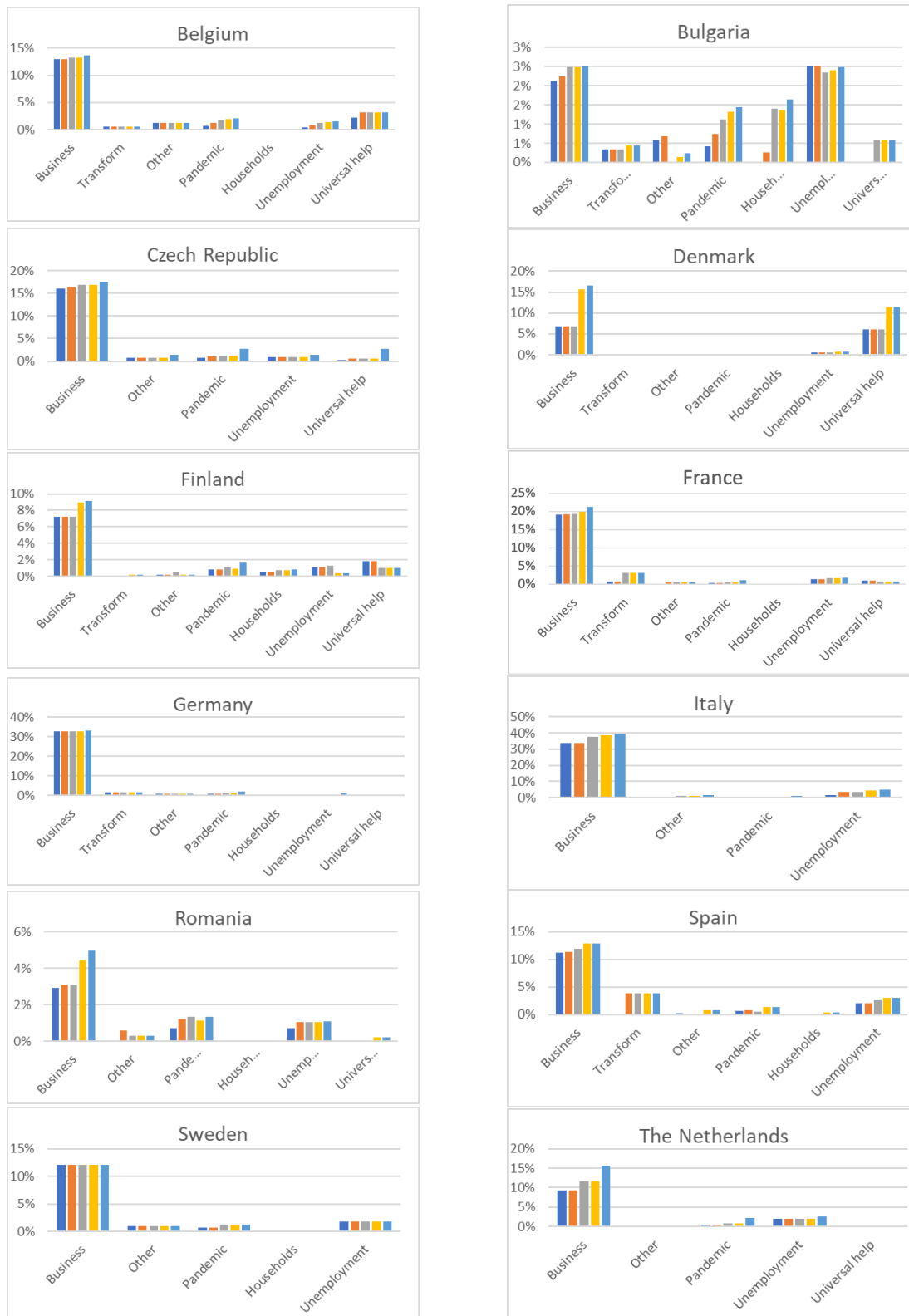
In Figure 3, we examine the quantitative evolution of the same COVID-19 expenditure types (% GDP) over time (2020Q2-2021Q2) for countries with available information.

Most countries shifted over time fiscal measures towards assistance to SMEs. In more detail, we observe the following: Belgium and Italy increased assistance to SMEs and unemployment benefits over time, while Bulgaria adjusted upwards pandemic spending and transfers to households. The Czech Republic increased all expenditure categories in 2021Q2; Denmark adjusted upwards assistance to SMEs and universal help in 2021Q1 and 2021Q2; France increased assistance to SMEs and measures to transform the economy; Germany and Sweden show a stable picture; The Netherlands and Spain adjusted upwards assistance to SMEs, unemployment benefits and pandemic spending; Romania increased mainly the assistance to SMEs. In the next section, we evaluate the effectiveness of the various measures in stimulating the economy and consumer sentiment.



Source: Authors' own calculations based on the constructed database (see Section 2).

Figure 2: Cross-country comparison of COVID-19 expenditure types (% total, cumulative data in July 2021)



Note: The graphs plot spending for assistance to SMEs and specific sectors (“Business”), measures to transform the economy (“Transform”), direct expenditures related to the pandemic (“Pandemic”), transfers to households (“Households”), unemployment benefits (“Unemployment”), universal help, and other expenditures (“Other”). The first column (blue) corresponds to 2020Q2, the second (orange) to 2020Q3, the third (grey) to 2020Q4, the fourth (yellow) to 2021Q1 and the fifth (cyan) to 2021Q2. Source: Authors’ own calculations based on the constructed database (see Section 2).

Figure 3: Evolution of the COVID-related fiscal measures (% GDP, cumulative data)

3 Econometric Methodology

In this section, we lay out our econometric methodology and other data sources. Our goal is to test whether the fiscal choice in response to the pandemic makes a difference for the economic and sentiment recovery and whether it matters for inflationary pressures in the economy.

In the empirical exercise, we estimate the multiplier effect of a change in spending as a percentage of GDP on the dependent variable of interest up to h periods ahead, where $h \in \{1, 2, 3\}$. Estimation of the multiplier impacts is based on the following equation:

$$\sum_{j=1}^h y_{i,t+j} = \alpha_{i,h} + \sum_{j=1}^h \sum_{l=1}^p \gamma_{l,h} y_{i,t+j-l} + \beta_{1,h} \sum_{j=1}^h \Delta SPEND_{i,t+j-1} + \beta_{2,h} X_{i,t} + \epsilon_{i,t}, h \in \{1, 2, 3\}. \quad (1)$$

where i and t denote countries and periods, respectively; $y_{i,t+j}$ is the variable affected by the fiscal measures (GDP growth, confidence change, or CPI change); $\Delta SPEND_{i,t}$ represents the change either in total COVID-19 spending (% GDP) or in a specific COVID-19 spending component (% GDP); $X_{i,t}$ is a set of controls used to control for endogenous movements in the dependent variable. These controls include the stringency of the lockdowns index, the number of fatalities due to COVID-19 per million of inhabitants, and quarter fixed effects.³ Additionally, in the regressions for CPI change, we include oil prices and long-run interest rates as controls. In all the regressions, we control for the lagged value of total spending, aiming to capture differences in the total level of spending among the countries in our sample.⁴

The coefficient of interest is $\beta_{1,h}$ measuring the multiplier effect, up to h periods ahead, of an increase in the corresponding spending category (% GDP) on the dependent vari-

³As König and Winkler (2021) show, including time fixed effects decreases the significance of the stringency indicators. For that reason, we consider each time in our specifications the controls that allow us to obtain the best fit of the model.

⁴We considered also other controls such as the current account to GDP ratio, trade openness, industrial production, and tourism flows. However, these variables were not relevant for our main findings, so we decided to leave them out of the empirical analysis due to the reduced sample size. We also tried employment growth as the dependent variable but results did not generally turn out statistically significant (see the Online Appendix available at <https://sites.google.com/view/evella/research>).

able. Notice that since our data includes fiscal measures that were either announced or actually implemented, we allow in equation (1) for a different timing between the dependent variable and the main independent variable, which refers to COVID-19 government spending.

Equation (1) includes p lags of the dependent variable to capture the typical dynamics that appear when regressing macroeconomic variables. By construction, the unobserved panel level effects are correlated with the lags of the dependent variable, creating a problem of endogeneity and inconsistency of the traditional panel data estimation methods. To overcome this problem, we use the [Arellano and Bond \(1991\)](#) method, which is a Generalized Method of Moments (GMM) estimator, to determine how many lags of the dependent variable are valid instruments and how to combine these lagged levels with first differences of the exogenous variables into a large instrument matrix.⁵ Given the scarce degrees of freedom with the available data, we estimate equation (1) separately for each variable of interest and category of spending.

Data sources. Data on fatalities and the stringency index comes from [Ritchie et al. \(2020\)](#). Consumer confidence index data, seasonally adjusted, is taken from the consumer surveys conducted by the Directorate General for Economic and Financial Affairs.⁶ For inflation, we use the Harmonised Index of Consumer Prices (HICP) from Eurostat. For oil prices, we consider the Europe Brent Spot Price from Thomson Reuters. Long-run interest rates are from the Monetary and Financial Statistics (MEI) by the OECD. Our quarterly sample for estimation starts in 2020-Q2 and ends in 2021-Q2.

4 Results

In this section, we first present our estimation results for the effects of COVID-19 fiscal measures on output growth and on changes in sentiment. We then discuss the impact

⁵In what follows, for each dependent variable considered we present results for the specifications that maximize the efficiency of the IV estimator.

⁶Available at: <https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys>.

of the same measures on inflation. Finally, we present some diagnostic and robustness checks.

4.1 COVID-19 Fiscal Multipliers

Output. Table 1 reports estimation results for equation (1) when the dependent variable is output growth.⁷ For the EU countries considered, the output multiplier of total COVID-19 spending is statistically significant at all horizons considered and, on average, its value is below one (in the range of 0.33-0.46). This result is in line with [Deb et al. \(2021\)](#), who find an average fiscal multiplier of 0.2 for a sample of 52 countries, using daily data of announcements for fiscal policy interventions in 2020. Assistance to SMEs generates significant and positive multipliers that are lower than one. This evidence squares well with the results presented in [Gourinchas et al. \(2021\)](#) according to which assistance to SMEs was inefficiently targeted. For transfers to households and universal help (i.e., fiscal measures, mostly tax cuts, to support businesses, employees, and households), output multipliers are not statistically significant. For the fiscal measures to transform the economy, the output multiplier is below one and is statistically significant (at the 10% level) only for $h = 1$. By contrast, we obtain sizeable multipliers exceeding one for spending caused by the pandemic and for unemployment benefits and measures to sustain employment levels ($h = 1$ and $h = 3$).

Confidence. Next, we examine in Table 1 estimation results for the consumer confidence index as the dependent variable in equation (1).⁸ Total spending appears to affect positively confidence in the short-run. When we look at the specific categories, it is direct pandemic spending and transfers to households that have prolonged significant and sizeable effects on economic sentiment. For example, an increase of 1% in pandemic spending increases cumulatively confidence by 5.75 points three quarters after the initial impact.

⁷To maximize the efficiency of the IV estimator, in this set of regressions we have included fixed effects for 2020Q2 in terms of controls.

⁸In terms of controls, in this set of regressions we have included fixed effects for 2020Q2 and the number of COVID-19 fatalities per million of inhabitants.

Inflation. The impact of the COVID-19 shock on inflation entails both downward pressures, such as the collapse in consumption due to the lockdowns, but also upward pressures, such as the reduction in production, the disruptions in supply chains and the fiscal measures implemented. In Table 1, we report the results from estimating equation (1) with changes in the CPI as the dependent variable.⁹

The results indicate that assistance to SMEs has a negative but mild impact on inflation, which is statistically significant at all horizons considered. This result seems to point to the fact that assistance to SMEs helped to ease supply shortages. This finding seems also to be the driver of the small negative effects found for total spending after two and three quarters. By contrast, universal help spending had positive and larger effects on consumer inflation. For the other spending categories, the estimated multipliers are not statistically significant.

To sum up, assistance to SMEs has significantly contributed to stimulate the economy and to maintain inflation. Unemployment benefits and measures to sustain employment were very stimulative and had no inflationary costs. On the other hand, transfers to households did not do much apart from affecting a bit confidence. Universal help actually only had positive effects on inflation and no real effects, so we can conclude that it has been really a bad measure.

⁹In terms of controls, in this set of regressions we have included fixed effects for 2020Q2, long-run interest rates and oil prices. Note that the oil prices and long-run interest rates have the expected signs (positive and negative, respectively) and are statistically significant. Since our data stops in 2021Q2, the results on the upward pressures on inflation are not contaminated by the increase in energy prices that started in 2021Q3. Nevertheless, to control for possible pressures coming from the price of energy we included the electricity prices for household consumers as an additional control but results (available upon request) were not affected. Data is available at https://ec.europa.eu/eurostat/databrowser/view/nrg_pc_204/default/table?lang=en.

Spending category	GDP growth			Confidence change			CPI change		
	$h = 1$	$h = 2$	$h = 3$	$h = 1$	$h = 2$	$h = 3$	$h = 1$	$h = 2$	$h = 3$
Total spending	0.372*** (0.000)	0.335*** (0.000)	0.464*** (0.000)	0.142* (0.058)	0.062 (0.483)	0.028 (0.745)	-0.012 (0.121)	-0.026** (0.049)	-0.032*** (0.002)
Assistance SMEs	0.230** (0.021)	0.045 (0.702)	0.520*** (0.000)	0.055 (0.608)	-0.094 (0.484)	-0.052 (0.642)	-0.038*** (0.000)	-0.046** (0.040)	-0.061*** (0.000)
Transform	0.851* (0.062)	-0.045 (0.957)	0.402 (0.756)	0.358 (0.642)	0.421 (0.722)	-0.410 (0.599)	0.071 (0.304)	-0.050 (0.162)	0.146 (0.189)
Pandemic spending	0.730 (0.505)	-1.297 (0.580)	6.214*** (0.000)	2.109 (0.179)	2.104 (0.537)	5.754** (0.042)	0.239 (0.417)	-0.238 (0.372)	-0.273 (0.548)
Transfers	-2.183 (0.279)	0.353 (0.593)	-0.074 (0.929)	1.292 (0.666)	2.589** (0.022)	3.112* (0.069)	0.096 (0.833)	-0.014 (0.938)	0.337 (0.133)
Unemployment	1.658* (0.096)	0.340 (0.639)	3.900*** (0.002)	0.303 (0.782)	-0.126 (0.905)	0.616 (0.768)	-0.015 (0.878)	0.190* (0.069)	-0.098 (0.598)
Universal help	-0.237 (0.237)	-0.119 (0.630)	0.460 (0.616)	0.007 (0.983)	0.178 (0.534)	-0.714 (0.273)	0.127*** (0.000)	0.092** (0.014)	0.204** (0.011)
Observations	60	60	60	56	56	56	60	60	60
Number of countries	12	12	12	12	12	12	12	12	12
Lags	2	2	2	2	2	2	2	2	2
2020-Q2 Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Stringency	NO	NO	NO	NO	NO	NO	NO	NO	NO
Fatalities	NO	NO	NO	YES	YES	YES	NO	NO	NO
Interest rates	NO	NO	NO	NO	NO	NO	YES	YES	YES
Oil price	NO	NO	NO	NO	NO	NO	YES	YES	YES

Notes: The table contains the estimated cumulative multipliers associated to each spending category, in individual regressions, for GDP growth, confidence change, and CPI change based on equation (1). P-values of the significance tests are in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels, respectively. Observations begin in 2020Q2 and end in 2021Q2. There are 56 observations in the regressions for confidence due to lack of data for Romania after 2020Q3. All the regressions include as a control the total spending as percentage of GDP.

Table 1: Multiplier effects of COVID-19 fiscal measures on output, sentiment and inflation, controlling for the effects of total COVID-19 government spending

Spending category	Order	GDP growth		Confidence change		CPI change				
		$h = 1$	$h = 2$	$h = 1$	$h = 2$	$h = 1$	$h = 2$			
Total spending	$m = 1$	0.030	0.002	0.013	0.038	0.037	0.045	0.009	0.018	0.022
	$m = 2$	0.088	0.253	0.941	0.072	0.648	0.405	0.048	0.116	0.125
Assistance SMEs	$m = 1$	0.039	0.001	0.010	0.021	0.014	0.035	0.014	0.016	0.024
	$m = 2$	0.160	0.030	0.836	0.128	0.122	0.391	0.047	0.070	0.120
Transform	$m = 1$	0.048	0.002	0.007	0.030	0.008	0.021	0.003	0.013	0.023
	$m = 2$	0.289	0.044	0.779	0.128	0.171	0.247	0.083	0.381	0.275
Pandemic spending	$m = 1$	0.035	0.001	0.023	0.027	0.018	0.011	0.004	0.013	0.015
	$m = 2$	0.293	0.039	0.940	0.119	0.444	0.327	0.061	0.198	0.115
Transfers	$m = 1$	0.037	0.001	0.006	0.022	0.021	0.065	0.006	0.018	0.022
	$m = 2$	0.367	0.056	0.586	0.124	0.246	0.307	0.034	0.204	0.308
Unemployment	$m = 1$	0.021	0.001	0.003	0.037	0.013	0.036	0.005	0.015	0.013
	$m = 2$	0.161	0.060	0.930	0.077	0.161	0.318	0.040	0.230	0.143
Universal help	$m = 1$	0.040	0.001	0.005	0.026	0.021	0.042	0.009	0.017	0.016
	$m = 2$	0.353	0.037	0.573	0.101	0.245	0.370	0.039	0.384	0.113

Notes: The table reports the p-values of the Arellano–Bond test for first ($m=1$) and second ($m=2$) order auto-correlation in the first-differenced errors of each panel regression in Table (1).

Table 2: Arellano–Bond test for auto-correlation, multiplier spending regressions

4.2 Diagnostic Tests and Robustness

For diagnostics, we conducted the Arellano–Bond tests for first- and second-order autocorrelation in the first-differenced errors. The results are reported in Table 2. As can be seen, the null of no-autocorrelation of order one is rejected in almost all cases, which is a typical situation when the idiosyncratic errors are independent and identically distributed. Evidence of no-autocorrelation of order two is obtained in almost all cases (at a significance level of 5%) for the GDP growth, confidence change, and CPI change regressions, suggesting that the model is not mis-specified.

For robustness, we tried different variations of equation (1) including several combinations of regressors to control for the evolution of the pandemic and particular economic conditions of the countries. For instance, we considered different combinations of controls (additional to the ones included in the main regressions), such as the current account to GDP ratio, market openness, tourism flows, electricity prices, industrial production, among others, to capture particular economic conditions of the countries that can have effects in the corresponding dependent variable. Our findings reported in Table 1 are strongly robust to the inclusion of such additional controls. Taking into account the reduced number of observations, the models we reported above were the more parsimonious ones that satisfy the diagnostic checks.¹⁰

As a complementary empirical exercise, we also estimated the cumulative effect of a change in the spending category based on the following equation:

$$\sum_{j=1}^h y_{i,t+j} = \alpha_{i,h} + \sum_{j=1}^h \sum_{l=1}^p \gamma_{l,h} y_{i,t+j-l} + \beta_{1,h} \Delta SPEND_{i,t} + \beta_{2,h} X_{i,t} + \epsilon_{i,t}, h \in \{0, 1, 2, 3\} \quad (2)$$

Results are reported in the Online Appendix and provide similar insights to the ones discussed earlier.

¹⁰Detailed results are available from the authors upon request.

5 Conclusion

Fiscal measures in EU countries during the COVID-19 pandemic were successful in recovering output growth without substantially contributing to inflationary pressures in the economy (with the exception of universal help spending). Almost all EU countries in our sample used assistance to SMEs as the major measure to support their economies and increased this support during the crisis. According to our estimates and also findings from other studies (see [Gourinchas et al. \(2021\)](#)), this kind of measures, although effective in stimulating output and maintaining inflation, were not sufficiently targeted and generated output multipliers below one.

If policymakers and academics are to take a lesson from the COVID-19 crisis for the different fiscal measures one can use in such circumstances, the results of our exercise suggest that the best fiscal crisis support measure is clearly unemployment benefits and measures to maintain employment levels. According to our estimates, such measures induce sizeable output multipliers without creating inflationary pressures. Conversely, transfers to households did not assist the economic recovery and only generated stimulative demand effects by recouping confidence. Similarly, universal help spending did not boost output or confidence but exerted significant inflationary pressures.

References

- Arellano, M. and Bond, S. (1991), ‘Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations’, *The Review of Economic Studies* **58**(2), 277–297.
- Auerbach, A. J., Gorodnichenko, Y., McCrory, P. B. and Murphy, D. (2021), Fiscal Multipliers in the COVID19 Recession, Technical report, CEPR Working Paper DP16754.
- Auerbach, A. J., Gorodnichenko, Y. and Murphy, D. (2021), ‘Inequality, fiscal policy and covid19 restrictions in a demand-determined economy’, *European Economic Review* **137**, 103810.
- Bayer, C., Born, B., Luetticke, R., Müller, G. J. and Series, M. W. (2020), ‘The coronavirus stimulus package: How large is the transfer multiplier?’, *Economic Policy* **500**, 600.
- Chudik, A., Mohaddes, K. and Raissi, M. (2021), ‘Covid-19 fiscal support and its effectiveness’, *Economics Letters* p. 109939.
- Deb, P., Furceri, D., Ostry, J. D., Tawk, N. and Yang, N. (2021), ‘The Effects of Fiscal Measures During COVID-19’, *IMF Working Papers* **2021**(262).
- Faria-e Castro, M. (2021), ‘Fiscal policy during a pandemic’, *Journal of Economic Dynamics and Control* **125**, 104088.
- Georgarakos, D. and Kenny, G. (2022), ‘Household spending and government support during the covid-19 pandemic: Insights from a new consumer survey’, *Journal of Monetary Economics* **forthcoming**.
- Gourinchas, P.-O., Kalemli-Özcan, Penciakova, V. and Sander, N. (2021), Fiscal Policy in the Age of COVID: Does it ‘Get in all of the Cracks?’, Technical report, National Bureau of Economic Research.

- Guerrieri, V., Lorenzoni, G., Straub, L. and Werning, I. (2022), ‘Macroeconomic implications of covid-19: Can negative supply shocks cause demand shortages?’, *American Economic Review* **112**(5), 1437–74.
- König, M. and Winkler, A. (2021), ‘The impact of government responses to the covid-19 pandemic on gdp growth: Does strategy matter?’, *PloS one* **16**(11), e0259362.
- Pappa, E. and Vella, E. (2022), ‘Phase out of the crisis support measures: How successful are member states in moving from broad support measures towards more targeted support?’, *briefing for the EU Parliament’s in-house think tank* . [https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU\(2022\)689448](https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU(2022)689448).
- Ritchie, H., Mathieu, E., Rodés-Guirao, L., Appel, C., Giattino, C., Ortiz-Ospina, E., Hasell, J., Macdonald, B., Beltekian, D. and Roser, M. (2020), ‘Coronavirus pandemic (covid-19)’, *Our World in Data* . <https://ourworldindata.org/coronavirus>.