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Executive summary

All European Union countries are undergoing severe output losses as a consequence of the COVID-19 crisis, but some have been hurt more than others. In response to the crisis, EU leaders have agreed on a Recovery and Resilience Fund (RFF), which will help all EU countries, but those hit hardest will benefit most.

This Policy Contribution explores why some countries have been hit economically more than others by COVID-19. Using statistical techniques described in the technical appendices, several potential explanations were examined: the severity of lockdown measures, the structure of national economies, the fiscal capacity of governments to counter the collapse in economic activity, and the quality of governance in different countries.

We found that the strictness of lockdown measures, the share of tourism in the economy and the quality of governance all play a significant role in explaining differences in economic losses in different EU countries. However, public indebtedness has not played a role, suggesting that that the European Central Bank's pandemic emergency purchase programme has been effective.

We used our results to explore why some southern EU countries have been more affected by the COVID-19 crisis than some northern countries. Depending on the pairs of countries or country groupings that we compared, we found that differences in GDP losses were between 30 and 50 percent down to lockdown strictness, between 35 and 45 percent to the quality of governance and between 15 and 25 percent down to tourism.

This could have implications for the allocation of the RRF between recovery and resilience expenditures. Supporting the recovery through a combination of demand and supply initiatives is important to ensure that countries rebound as quickly as possible from the COVID-19 crisis, without leaving too much permanent damage to their economies. But in many countries, especially some of the southern countries hit hardest by the COVID-19 crisis, resilience is a major sticking point. Too often, in some of these countries, the poor quality of governance has had a negative impact on their resilience, as the relatively large size of their GDP shocks has demonstrated. It is crucial therefore that RRF programmes devote sufficient attention (and resources) to improving the quality of governance in these countries.

After five days and four nights of arduous negotiations, European Union leaders agreed on 21 July 2020 to set up a €750 billion fund to help EU countries recover from the COVID-19 crisis. All EU countries will benefit from the new fund, but those hit hardest will benefit the most[1].

This Policy Contribution explores first and foremost why some countries have been hit economically more than others by COVID-19. Several reasons for this have been put forward including the number of deaths per million inhabitants, the severity of lockdown measures, the structure of the economy and the ability of the government to counter the collapse in economic activity. B

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How should we measure the economic impact of the COVID-19 pandemic on EU countries? Most reports use the fall or expected fall in the real GDP growth rate in 2020. For instance,

forecast from the July forecast shown in Figure 1. To understand the reason for this adjustment and the difference it makes, consider the examples of Austria and Bulgaria, two countries that will see the same GDP decline of 7.1 percent in 2020 according the summer 2020 forecasts. Clearly, because of its much lower GDP per capita, Bulgaria was on a higher growth trajectory than Austria before the COVID-19 crisis. This was reflected by the fact that, in its winter 2020 forecast, the Commission predicted that GDP would grow in 2020 by 2.9 percent in Bulgaria but only 1.3 percent in Austria. Taking account of this correction, we now obtain a GDP shock of 10 percent (7.1 + 2.9 percent) in Bulgaria and 8.4 percent (7.1 + 1.3 percent) in Austria.

Figure 2 shows the GDP shock in 2020 on the basis of this approach, with the countries arranged according to the size of the economic shock.

Source: Bruegel based on European Commission (2020a,b).

As in Figure 1, Figure 2 shows major differences in the GDP shocks felt by the 27 countries, but there are also some significant changes in the country rankings. The five most-affected countries are now Croatia (-13.4 percent), Spain (-12.5 percent), Ireland (-12.1 percent), France (-11.7 percent) and Italy (-11.5 percent), a group that includes again three of the S4 countries, although Portugal ranks a close sixth. The five least-affected countries are now Sweden (-6.5 percent), Denmark (-6.7 percent), Germany (-7.4 percent), Finland (-7.8 percent) and Poland (-7.9 percent), a group that includes two of the F4 countries, but with the

What could explain the major differences between countries in the economic shocks they are undergoing in the wake of the COVID-19 crisis?

The first factor that comes to mind is the strictness of lockdown measures implemented by national, regional or local authorities to cope with the coronavirus pandemic[5]. We use the stringency index provided by the Oxford COVID-19 Government Response Tracker (OxCGRT, Oxford UniversityC9o03 -schmic

level of public debt, the degree of resilience of the economy to the COVID-19 shock, resulting from the quality of behaviour of both private and public economic agents, will be greater in

of measures imposed by Greece and the Netherlands was similar. For the di erential between Spain and the Netherlands, the most important factor is also governance, with lockdown strictness and tourism having similar weights. For the di erential between Portugal and the Netherlands, the most important factor is tourism, followed by lockdown strictness and gov

throughout the crisis, although a further increase cannot and should not be excluded, should the crisis take a turn for the worse.

Second, all EU countries, not just euro-area members, have been badly hit by the COVID-19 crisis. According to our estimates, EU countries will suffer an average GDP loss of nearly 10 percent in 2020, with no country suffering a loss of less than 6 percent. It was right, therefore, that EU leaders decided to set up a fund to help all EU countries recover from the crisis.

Third, although all EU countries are suffering an economic shock, some have been hurt more than others. Some southern countries will suffer GDP losses of around 12 percent in 2020, while some northern countries will see GDP losses of 'only' around 7 percent. It was right, therefore, that EU leaders agreed that the Recovery and Resilience Fund (RRF) should help some countries more than others, and that some southern countries will benefit most.

Fourth, our statistical analysis shows that three factors account for most of the differences in the size of the gross shock felt by EU countries: the strictness of lockdown measures, the structure of the economy (in particular the share of tourism in GDP) and each country's quality of governance. When comparing some of the southern countries with some of the
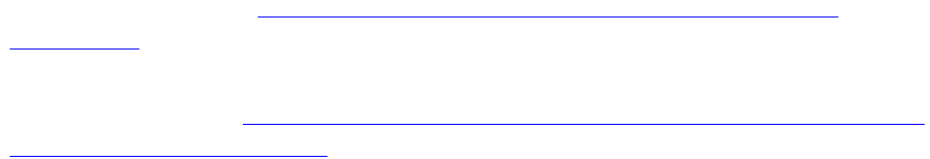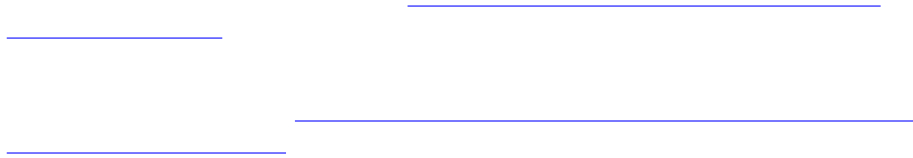
	(1)		(2)	
		-,		-,
	-4.875	-2.237*	-4.500	-2.222*
	-0.119	-2.242*	-0.134	-3.331**
U	-0.142	-2.377*	-0.148	-2.584**
B	-0.004	-0.524	--	--
A	0.173	1.943*	0.175	1.993*
A	0.560		0.575	

Source: Bruegel. Note: ** means significant at the 1% level; * means significant at the 5% level.

Equation (1) shows that the coefficients of LOCKDOWN, TOURISM and GOVERNANCE are all significant at the 5% level. By contrast, the coefficient of DEBT is not significantly different from zero, which implies that the level of public indebtedness does not contribute to explaining cross-country variations in the economic shock among EU countries. This suggests that the ECB's pandemic emergency purchase program (PEPP) has been successful in countering the risk that high public debt euro area countries would be cut off from the market if they attempt to expand their debt issuance to respond to the COVID-19 crisis.

In equation (2), we re-estimated the model without DEBT. The estimated coefficients of the three remaining explanatory variables and their degree of significance, increased slightly as a result, as did the adjusted R Squared.

The results in Table 1 suggest that LOCKDOWN, TOURISM and GOVERNANCE all contribute significantly to explaining cross-country differences in the covid economic shock. Together these three factors explain nearly 60% (the adjusted R squared equals 0.575 in equation 2), which is quite remarkable for a rather simple model estimated with just 26 data points.

We conducted two robustness checks of our estimates in equation (1).

First, we checked whether our results for the effect of GOVERNANCE may be spurious and linked to the omission of a variable, which would be linked to both Y and GOVERNANCE. One possible omission is the fact that Latin countries have been more affected by the covid crisis due to their greeting habits that makes the spread of the coronavirus more important than in countries with other cultures. These countries may therefore have a lower Y but, to the extent that culture is also correlated with governance, they could also have a lower value for GOVERNANCE. We checked this possibility by adding a LATIN dummy to the model with a value of 1 for the four Latin countries (France, Italy, Portugal, and Spain) and 0 for all the other countries. We also constructed a LATINB dummy, where we added Belgium to the group of Latin countries.

The results of the first robustness check are shown in equations (3) and (4) in Table 2, which need to be compared to equation (1) in Table 1. The coefficients of the LATIN and LATINB variables are both negative and significant, implying that, as suspected, Latin countries did suffer a bigger GDP shock than other countries, controlling for the other variables in the model. But the striking result is that the presence of LATIN or LATINB does not lower the coefficient of GOVERNANCE nor its degree of significance. On the contrary, they both increase somewhat with the addition of LATIN or LATINB. On the other hand, the coefficient of LOCKDOWN decreases drastically, and becoming not significantly different from zero at the 5% level. This suggests that Latin countries had to take stricter confinement measures than other countries because of their different cultural habits and that when LATIN is present in the model it directly affects the Y variable and lowers the impact of LOCKDOWN on Y. But what is more important for our results is that the presence of LATIN does not take away the importance of GOVERNANCE. If anything, it increases it a bit.

Second, we computed differently the size of the economic shock, comparing the July

Commission forecast for 2020 to the actual GDP growth in 2019 instead of the February Commission forecast for 2020. In equation (5) we re-estimate equation (4) with the new Y variable. e results are very similar to those for equation (4). e only di erence is that the coe cient of LATINB is no more signi cantly di erent from zero at the 5% level.

ese two robustness checks suggest that the estimates reported in Table 1 can be read with some degree of con dence.

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We then turn to the right-hand panel of Table 3, which uses equation (2) to compute the contribution of each of the four explanatory variables to the GDP shocks.

We first note that our preferred model does a remarkable job at predicting the two countries' GDP shocks. The predicted values of Y (which is computed by summing up the estimated constant and the estimated contributions of the three other explanatory variables) are very close to the actual values: -11.8% vs. -11.5% for IT and -8.5% vs. -8.1% for NL.

We then compute the contribution of each of the three explanatory variables to the differential in the GDP shocks between IT and NL. We find that LOCKDOWN AND GOVERNANCE each account for about half of the differential between the two countries: 55% for LOCKDOWN and 43% for GOVERNANCE, with the remaining 2% being accounted for by TOURISM

We repeated the exercise for compare Greece (EL), Spain (ES) and Portugal (PT) to the Netherlands. The left-hand panel in Table 4, reports the actual values of the GDP shocks and of our three explanatory variables. There are some important similarities and differences between the S4 countries. All four countries suffered from a negative shock of more than 11%, well above the Netherlands with a negative shock of 8.1%. For three of them (EL, ES and PT) the severity of the lockdown measures was not far above the Netherlands; here the outlier is Italy with much stricter measures than any other country. The same three countries (EL, ES and PT) are much more dependent on tourism (with a share in their GDP of more than 5%) than Italy and the Netherlands (where the share of tourism is only around 2%). Finally, all the S4 countries have a low quality of governance compared to the Netherlands, but it is especially low in Greece and Italy.

These differences and similarities between the S4 countries explain the differences and similarities in the relative contributions of the three explanatory variables to the predicted differences in their GDP shocks with the Netherlands, which are reported in the right-hand panel in Table 4. For the differential between EL and the NL, the most important factor is GOVERNANCE (58%), followed by TOURISM (37%), with LOCKDOWN playing only a marginal role (5%) since EL and NL had similar strictness measures (respectively 44 and 43). For the differential between ES and NL, the most important factor is also GOVERNANCE (47%), followed by LOCKDOWN (28%) and TOURISM (25%). Finally, for the differential between PT and NL, the most important factor is TOURISM (41%), followed by LOCKDOWN (30%) and GOVERNANCE (29%), whose relatively small role is due to the fact that Portugal has the best quality of governance among the S4 countries, according to our indicator.

A									. (2)
	IT	EL	ES	PT	IT-NL	EL-NL	ES-NL	PT-NL	S4-NL	S4-F4
	55	44	47	48	55%	5%	28%	30%	30%	51%
U	2.3	8.3	5.2	7.9	2%	37%	25%	41%	26%	15%
A	2.92	1.67	4.85	6.43	43%	58%	47%	29%	44%	34%
	-11.5	-11.4	-12.5	-11.5	100%	100%	100%	100%	100%	100%

Source: Bruegel. Note: ** means significant at the 1% level; * means significant at the 5% level.

Finally, we computed the average contribution of each of our three factors, by simply taking the average for the four southern countries compared to the Netherlands. We found that GOVERNANCE is the most important factor explaining 44% of the differential with the Netherlands, followed by LOCKDOWN (30%) and TOURISM (26%). We also computed the relative contribution of the three factors to the differential between the averages of the S4 and F4 groups. This time, we found that LOCKDOWN is the most important factor explaining 51% of the differential between the two groups, followed by GOVERNANCE (34%) and TOURISM

(15%). The differences between the last two columns, labelled respectively S4-NL and S4-NL, reflect obviously the fact that there are important differences between the Netherlands and some of the other frugal four countries with respect to our three explanatory variables. On LOCKDOWN, the situation of the Netherlands is basically identical to Austria and Denmark, but all three countries were much stricter than Sweden, a clear outlier among the 26 EU countries considered here. On TOURISM, the situation of the Netherlands is similar to Denmark and Sweden, but in all three countries the share of tourism in GDP is much lower than in Austria. Finally, on GOVERNANCE, the Netherlands scores very highly along with Denmark and Sweden, while Austria, though it has a good score, performs less well than the other three F4 countries[11].

In summary, we found that LOCKDOWN, TOURISM and GOVERNANCE all account for significant shares of the differences in the GDP shocks between the four southern countries, on the one hand, and the Netherlands or the average of the four frugal countries, on the other. Depending on the individual characteristics of the each of the S4 countries, LOCKDOWN accounted for between 5% (in EL) and 55% (in IT) of the differential with the Netherlands, TOURISM for between 2% (IT) and 41% (in PT) and GOVERNANCE for between 29% (in PT) and 58% (in EL). On average for the four countries, GOVERNANCE was either the top or second most important contributor depending on whether the differential was calculated between S4 and the Netherlands or F4; LOCKDOWN was either the second or the top contributor; and TOURISM was in third place in both instances.

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11   The implication is that the results of our calculations in Tables 3 and 4 depend crucially on the fact that we used the Netherlands as a comparator country for the four southern countries, except in the last column in Table 4, labelled S4-F4. Had we used Austria, Denmark or Sweden, instead, our results would have been different. For instance, using Sweden, the most extreme EU country in terms of the strictness of lockdown, as comparator country, one