

# Extraordinary Measures: The Role of Debt Levels in Fiscal Policy Responses to Covid-19

*Adam Elbourne, Giulia Piccillo, Konstantinos Velentzas*

## **Impressum:**

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email [office@cesifo.de](mailto:office@cesifo.de)

Editor: Clemens Fuest

<https://www.cesifo.org/en/wp>

An electronic version of the paper may be downloaded

- from the SSRN website: [www.SSRN.com](http://www.SSRN.com)
- from the RePEc website: [www.RePEc.org](http://www.RePEc.org)
- from the CESifo website: <https://www.cesifo.org/en/wp>

# Extraordinary Measures: The Role of Debt Levels in Fiscal Policy Responses to Covid-19

## Abstract

We use SVAR models for 18 economies to estimate how much fiscal policy deviated from pre-pandemic norms during the Covid-19 pandemic. For most countries, fiscal policy was more expansive than the pre-pandemic norm predicts based on the state of the economy during the pandemic. The size of the deviation from the pre-pandemic norm is not related to the level of government debt on the eve of the pandemic, as fiscal space concepts would predict.

JEL-Codes: E600, H500, C500.

Keywords: Covid-19, fiscal policy, SVAR, fiscal space.

*Adam Elbourne*  
*CPB Netherlands Bureau for Economic Policy*  
*Analysis, The Hague / The Netherlands*  
*A.C.Elbourne@cpb.nl*

*Giulia Piccillo*  
*Faculty of Business and Economics*  
*Maastricht University / The Netherlands*  
*g.piccillo@maastrichtuniversity.nl*

*Konstantinos Velentzas*  
*CPB Netherlands Bureau for Economic Policy Analysis*  
*& Maastricht University / The Netherlands*  
*konsta.velentzas@gmail.com*

December 15, 2023

## 1. Introduction

The Covid-19 pandemic was an unprecedented global shock, simultaneously affecting supply and demand in the global economy. One after the other, governments were forced to react to stop infections and protect the population from severe health and economic consequences (IMF, 2021b). As an economic response, nations issued large fiscal packages to protect households and firms vulnerable to the pandemic (Haroutunian, 2020). Even though the exact sizes and support schemes varied across countries (Maher et al., 2020; Alberola et al., 2021; Makin and Layton, 2021), it is generally considered that support packages were exceptional in magnitude.

The extraordinary size of Covid-19 fiscal policy made headlines in several countries. However, given the sharp declines in economic activity during the pandemic, a significant fiscal response was to be expected even if only through the automatic stabilisers. In this paper we argue that the gross size of the various pandemic support policies is misleading as a measure of how extraordinary they were, because they substituted for various other policies, such as automatic stabilisers, that would have taken place without them. Therefore, in a sample of 18 countries we use small SVAR models to estimate the expected fiscal policy response for a given economic situation in the pre-pandemic period and we define the extraordinary component of government policies as the departure from this national benchmark. Most countries, but not all, were more supportive than pre-pandemic norms would have predicted. The picture that emerges also contributes original insight on the timing of the response to the pandemic (the persistence of the stimulus over the two past years) as an important feature of governments' responses.

In addition, we proceed to use this new measure of the extraordinary component of fiscal policy to address a question about government emergency responses in crises: were countries with high debt levels constrained in their reactions to the Covid-19 pandemic? Figure 1 illustrates the relationship between fiscal spending reported by IMF (2021a) as a percentage of GDP during the pandemic and the debt-to-GDP ratio in 2019Q4, without controlling for the normal response of fiscal policy to downturns in economic activity. Although there is considerable variation in the observations around the best-fit line, the positive correlation of 0.32 between the fiscal spending and debt ratios suggests that higher pre-existing debt didn't tie the hands of policy makers during the pandemic: more indebted countries spent more. This finding would appear to be at odds with what we would have expected. For example, Romer and Romer (2019) show that countries with high debt-to-GDP ratios have smaller fiscal responses to financial crises. Moreover, Greppmair et al. (2023) show that countries with limited fiscal space saw bigger increases in CDS spreads at the onset of the pandemic. As such, the finding that countries with higher debt-to-GDP ratios

spent more would appear to be counterintuitive. However, since this measure doesn't account for changes in GDP, this relationship could be driven entirely by countries like Greece, Italy, the UK and the US experiencing larger falls in economic activity than Denmark and Sweden.

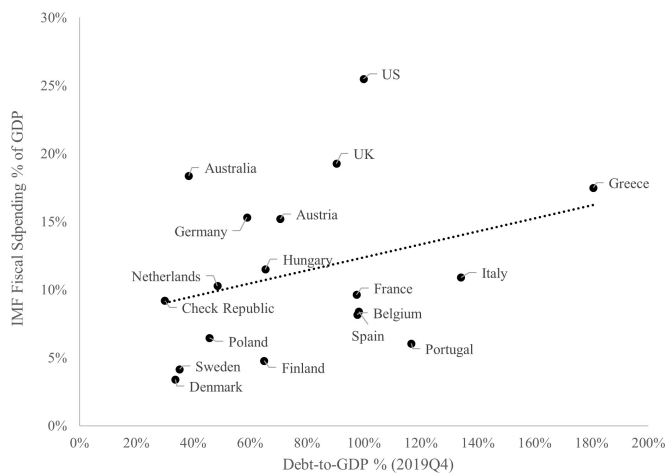


Figure 1: IMF measure of the fiscal response compared to pre-pandemic debt levels

Since this question is at the forefront of applied policy debates, we propose that a reasonable response should include a country's past fiscal norms: can governments offer extra support to their economies in times of crisis or are they constrained by pre-existing debt? In so doing, we discuss the size and timing of the extraordinary component of fiscal policy and its correlation to the initial level of debt. Even after controlling for the normal response of fiscal policy to economic downturns, we find no evidence that countries with higher debt levels on the eve of the pandemic deviated less from the normal behaviour than countries with less debt. If anything, the correlation for our main specifications are marginally positive - countries with higher debt deviated more, although this positive relationship is far from statistically significant.

A number of recent studies have focused on the determinants and size of the fiscal response during the Covid-19 pandemic. Romer (2021) conducts a comprehensive analysis to investigate the size and determinants of the fiscal response across a sample of advanced countries. To explore this relationship, Romer (2021) utilises data on fiscal spending during the Covid-19 pandemic obtained from the IMF Fiscal Affairs Department (2021), which measures the gross size of policies. Like us, Romer finds no significant relationship between the level of fiscal spending implemented and the

countries’ level of debt, even after controlling for other relevant variables such as Covid-19 deaths, S&P rating, gross and net debt.

Makin and Layton (2021) discuss the global fiscal response in the context of comparable historical episodes. By means of a descriptive analysis comparing the changes in government debt and budget deficits during the Covid-19 pandemic and the Global Financial Crisis, they conclude that the fiscal policy response during the Covid-19 pandemic was large and in some countries excessive. However, while similar in nature to our study, it is important to note that the evaluation of responsiveness in Makin and Layton (2021) relies solely on changes in debt and budget deficits in two different situations, without estimating a formal benchmark for the normal fiscal response as we do. Furthermore, our study uses a longer data set allowing us to look at the fiscal response in the second year of the pandemic during which most developed economies experienced a strong recovery.

The rest of this paper proceeds as follows: the next section surveys the relevant literature. Sections 2 and 3 describe the method and the data. Section 4 presents the results and discusses them in the light of our method and existing literature, and section 5 concludes.

## 2. Method

For each country we estimate a structural vector autoregression with 2 lags as indicated for most countries by the Schwartz Information Criterion<sup>1</sup>:

$$Y_t = \Gamma_0 + \sum_{s=1}^2 \Gamma_s Y_{t-s} + B\epsilon_t \quad (1)$$

where  $Y_t = (\text{Output}, \text{Prices}, \text{Unemployment}, \text{Fiscal Policy})$ ,  $\epsilon_t$  is a  $(4 \times 1)$  vector of errors,  $B$  is a  $(4 \times 4)$  matrix of the contemporaneous effects between the observable variables,  $\Gamma_0$  is a  $(4 \times 1)$  vector of constants, while  $\Gamma_s$  are  $(4 \times 4)$  matrices of the coefficients. For each country we estimate models in both levels (GDP, CPI, unemployment rate, accumulated primary deficit) and in first differences (GDP growth, CPI inflation, unemployment rate, primary deficit). The idea behind doing both is that in some countries, political processes are more responsive to output gaps and the level of debt, whereas in others fiscal responses are likely better described as reacting to recent economic changes. As a robustness exercise we also replace the

---

<sup>1</sup>The Schwartz Information Criterion suggested 1 lag for a minority of countries, but in order to harmonise specifications across countries we elected for 2 lags for all, since this choice only involves a loss of estimation efficiency rather than a bias.

accumulated budget deficits with gross government debt.<sup>2</sup> We control for the expected changes in fiscal policy given what's happening in the rest of the economy by assuming  $B$  is a Cholesky decomposition with the fiscal policy variable ordered last. Ordering the fiscal policy variable last allows it to react endogenously to changes in the macroeconomy, thus capturing the effects of automatic stabilisers in the economy (see Blanchard and Perotti (2002) and more recently Afonso et al (2018) for similar arguments).

### 3. Data

This paper utilises a dataset comprising quarterly data from 18 countries, covering the period from 2000Q1 to 2022Q2. We base the country selection on data availability and include data for the following countries: Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Spain, Sweden, the United Kingdom and the United States. We use four variables in our SVARs, namely: real gross domestic product (GDP), the consumer price index (CPI), the unemployment rate and accumulated budget deficits or gross government debt. The data for real GDP, CPI, the unemployment rate and gross government debt are from the OECD, while the data for budget deficits among EU countries are from Eurostat. Similarly, for the non-EU countries, we obtained the budget deficit data from their respective statistical offices.

For estimating the pre-pandemic normal fiscal response, we estimate the SVAR models on the sample 2000Q1 to 2019Q4. We then apply the estimated pre-pandemic policy response to the period 2020Q1 to 2022Q2 to provide a measure for how much fiscal policy deviated from normal during the pandemic. We chose to make 2020Q1 the first period of the pandemic because for some countries in our sample, especially Italy and Spain, it was. Even in countries hit later, households, firms and governments could already observe the events in Italy and Spain and change behaviour in anticipation. Moreover, choosing the same cut-off for all countries makes cross-country comparisons more transparent.

---

<sup>2</sup>For some countries, gross government contains significant changes not related to the state of the economy at that time. For example, in the Netherlands, some of the support to banks from the financial crisis of 2008/9 was paid back during the pandemic, which would show up in our analysis as unexpectedly tight fiscal policy.

## 4. Results

### 4.1. Was policy exceptional?

Figure 1 shows the estimated structural errors of fiscal policy for all 18 sample countries during the period from 2020Q1 to 2022Q2, measured in standard deviations of fiscal policy from the pre-pandemic fiscal rule. By construction, the typical deviation from the norm in the pre-pandemic period is 1. Each subfigure displays the decomposed structural errors of the budget deficit for both the model in levels and differences. For most countries both levels and differences specifications produce similar estimates.

According to our estimates, over the whole sample period almost all countries spent more than the pre-pandemic norm would have predicted. The range across countries was large with Italy deviating the most (as measured by the sum of the deviations: +45 standard deviations for the model in levels, +40 standard deviations in differences) and was more supportive than normal in every quarter, whilst the UK supported the least (-22 standard deviations in levels, -18 standard deviations in differences). Only 4 countries had negative sums: Australia, Denmark, the UK and the US, although Australia and Denmark were both close to zero across the entire pandemic. Interestingly all four countries have their own currencies, which would normally be associated with less binding borrowing constraints.

Looking more closely at sub-periods, the majority of countries had large positive deviations from the pre-pandemic norm in 2020Q2, coinciding with the peak impact of the first wave. Fiscal policy was significantly more expansive than would have been expected, even with the large drops in economic activity seen in 2020Q2. From 2020Q4 onwards, most countries were still more supportive than normal even though some countries, such as Finland, Germany, Poland and Sweden, moved closer to pre-pandemic norms. Other countries, such as Austria, Belgium, the Czech Republic, Italy and the Netherlands were more persistently supportive. Although outside the scope of this research, the continued positive deviations from pre-pandemic norms in some countries is noteworthy given the widespread take-off in inflation in late 2021 and early 2022.



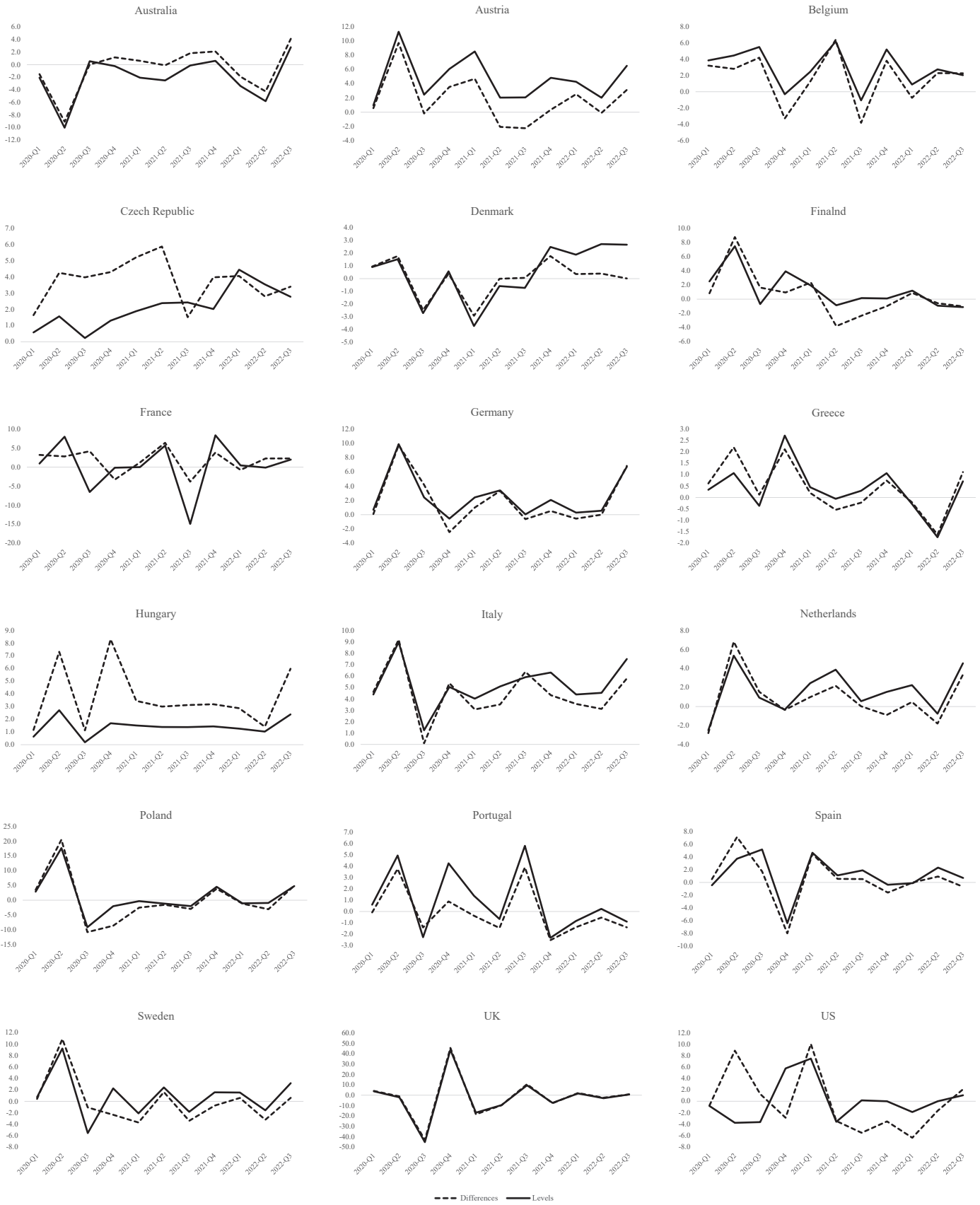


Figure 2: One-step ahead structural fiscal shocks in pre-pandemic standard deviations from 2020Q1 to 2022Q2

#### *4.2. Did high debt levels constrain spending?*

Now that we have established that fiscal policy was indeed exceptional in most countries, even after accounting for the size of economic downturns, we turn our attention to the role of debt levels. Figures 3 and 4 compare the size of the deviations from pre-pandemic fiscal norms from the difference models to debt-to-GDP levels in 2019Q4 for two time intervals: 2020Q1 to 2021Q1 and 2021Q1 to 2022Q2. Figures 5 and 6 do the same for the levels models. We split the pandemic into these two periods because, in most countries in our sample, most vulnerable people had been offered the Covid-19 vaccinations by the end of the first quarter of 2021, thus marking a new phase of the pandemic with fewer non-pharmaceutical interventions and reduced health risks holding back economic activity. The vertical axes correspond to the sum of fiscal policy shocks measured in standard deviation. Across all plots, the horizontal axes represent the debt-to-GDP ratio of the corresponding country as of 2019Q4, obtained from the OECD.

For the differences specification, the slope of the relationship is positive for both 2020Q1 - 2021Q1 (Pearson correlation: 0.119) and 2021Q2 - 2022Q1 (Pearson correlation: 0.019), although the positive slope is not statistically significant at the 10% level (two-sided p-values: 0.64 and 0.94). In any case, the relationship isn't negative as fiscal space concepts would predict. For the levels specifications the correlations are again positive for both periods (Pearson correlations: 0.191 and 0.064), although still not statistically significant (two-sided p-values: 0.45 and 0.80). Regardless of specifying the models in differences or levels, they do not support the prediction that countries with high debt levels were constrained in supporting their economies during the pandemic.

In the appendix we show comparable scatter plots from models using gross government debt instead of the budget deficit. Whilst the slope for the first year is negative in both differences and levels specifications, they are not statistically significant at conventional levels of significance. For the second year the correlations remain positive. Hence, we still can't reject the hypothesis that pre-existing debt levels did not constrain policy makers in offering economic support. Consequently, our findings suggest that policy makers' hands were not tied by pre-existing debt levels during the Covid-19 pandemic.

#### *4.3. Unemployment and furlough schemes*

One of the key economic support policies that many countries implemented were furlough schemes, whereby governments subsidised part or all of employees' wages whose work had disappeared or reduced substantially due to the pandemic. These schemes changed the link between unemployment rates and fiscal policy because

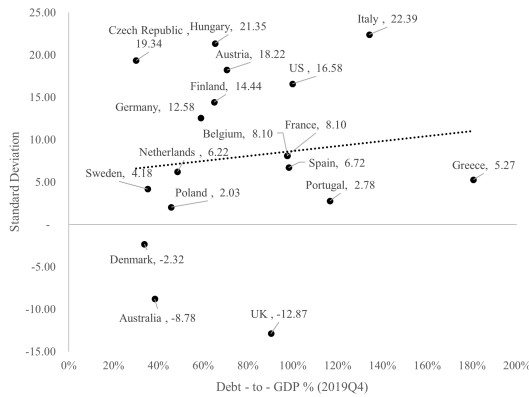


Figure 3: Differences, budget deficit Specification for the period 2020Q1 - 2021Q1

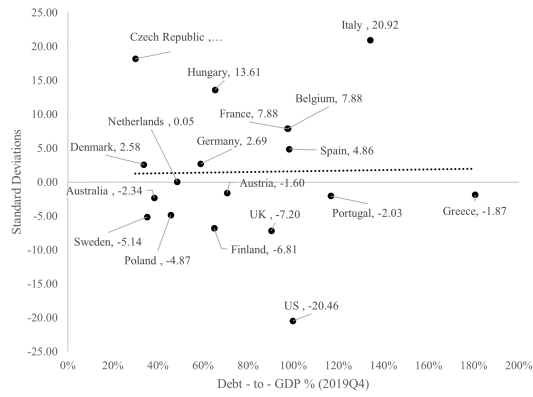


Figure 4: Differences, budget deficit Specification for the period 2021Q2 - 2022Q2

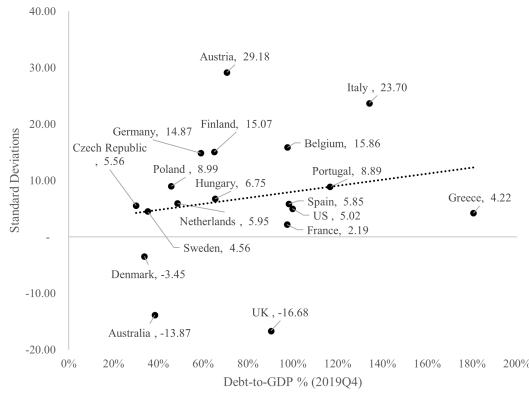


Figure 5: Levels, budget deficit Specification for the period 2020Q1 - 2021Q1

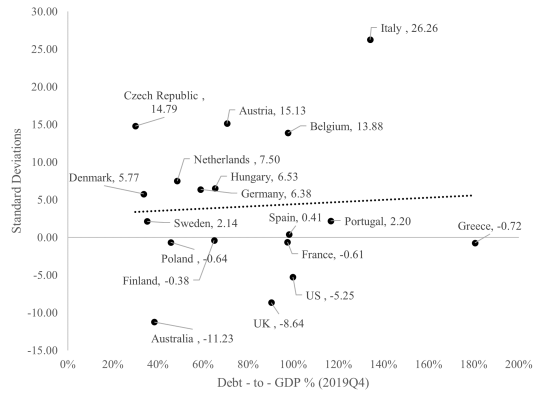


Figure 6: Levels, budget deficit Specification for the period 2021Q2 - 2022Q2

policy was still spending extra but without unemployment increasing. As such, the pre-pandemic fiscal norms in our baseline models including unemployment rates may overstate the generosity of fiscal policy because policy makers substituted furlough schemes for unemployment benefits.

To take this change into account, this section reports results from models excluding the unemployment rate. As such, all of the endogenous response of fiscal policy to changes in economic activity including the automatic stabilisers are captured by changes in prices and output, without the additional information from unemployment. Figures 7 to 10 show that, as with the main specification, all of the correlations are still positive (although not statistically significant at conventional

levels of significance). The countries in our sample with higher debt levels on the eve of the pandemic deviated more from their pre-pandemic norms than countries with less debt.

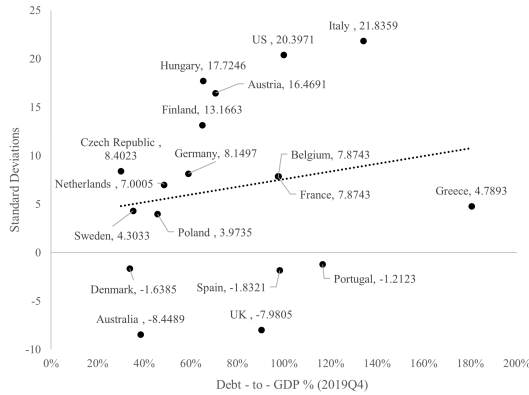


Figure 7: Differences, budget deficit excluding unemployment for the period 2020Q1 - 2021Q1

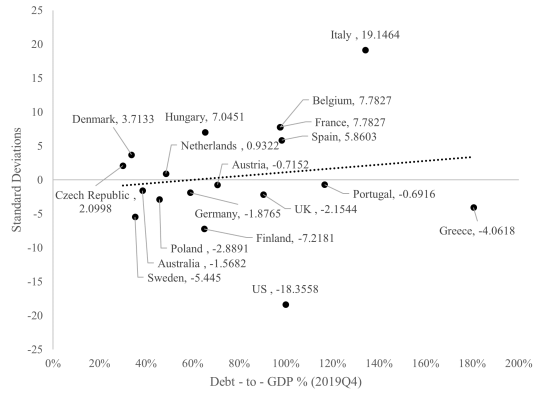


Figure 8: Differences, budget deficit excluding unemployment for the period 2021Q2 - 2022Q2

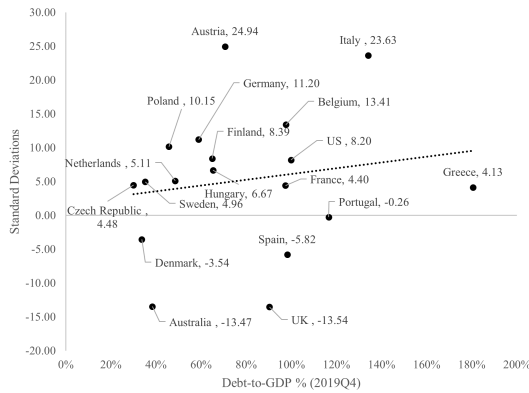


Figure 9: Levels, budget deficit excluding unemployment for the period 2020Q1 - 2021Q1

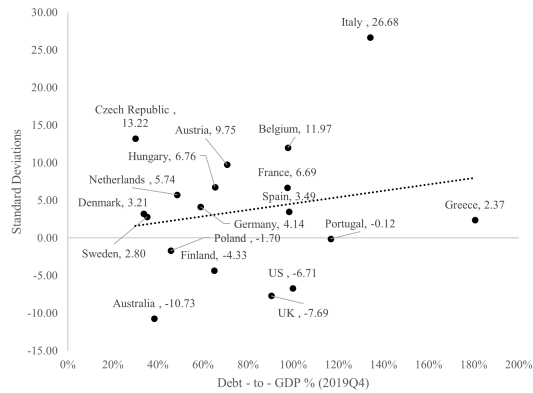


Figure 10: Levels, budget deficit excluding unemployment for the period 2021Q2 - 2022Q2

## 5. Conclusion

While extensive literature discusses the effectiveness of fiscal policy during the Covid-19 pandemic, recent studies have shifted the focus towards exploring its determinants. In this paper, we complement the current literature by investigating

the exceptional aspect of fiscal policy during the Covid-19 pandemic crisis. We estimate structural VARs for a sample of 18 countries and estimate the deviation of fiscal policy from the benchmark pre-pandemic policy rule. By controlling for the expected size of automatic stabilisers we can investigate to what extent high debt levels ‘tied the hands’ of policy makers during the pandemic. We find large positive deviations from pre-pandemic norms for most countries, highlighting the extraordinary nature of fiscal policy during the Covid-19 pandemic. Moreover, in our sample we find that countries with higher debt levels of the eve of the pandemic actually responded more, even after accounting for the severity of their economic downturns. Even though other studies, such as Greppmair et al. (2023), have reported evidence that highly indebted countries had to pay more to borrow during the pandemic, we find no evidence that the quantity of support was meaningfully constrained by fiscal space problems.

## References

- Alberola, E., Arslan, Y., Cheng, G., Moessner, R., 2021. Fiscal response to the covid-19 crisis in advanced and emerging market economies†. *Pacific Economic Review* 26, 459–468. URL: <https://onlinelibrary.wiley.com/doi/abs/10.1111/1468-0106.12370>, doi:<https://doi.org/10.1111/1468-0106.12370>, arXiv:<https://onlinelibrary.wiley.com/doi/pdf/10.1111/1468-0106.12370>.
- Greppmair, S., Jank, S., Smajlbegovic, E., 2023. On the importance of fiscal space: Evidence from short sellers during the covid-19 pandemic. *Journal of Banking & Finance* 147, 106652.
- Haroutunian, S., 2020. The COVID-19 crisis and its implications for fiscal policies. URL: [https://www.ecb.europa.eu/pub/economic-bulletin/focus/2020/html/ecb.ebbox202004\\_07%7E145cc90654.en.html](https://www.ecb.europa.eu/pub/economic-bulletin/focus/2020/html/ecb.ebbox202004_07%7E145cc90654.en.html).
- IMF, 2021a. Database of Country Fiscal Measures in Response to the COVID-19 Pandemic. URL: <https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>.
- IMF, 2021b. Policy Responses to COVID19. URL: <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>.
- Maher, C.S., Hoang, T., Hindery, A., 2020. Fiscal responses to covid-19: Evidence from local governments and nonprofits. *Public Administration Review* 80, 644–650. URL: <https://onlinelibrary.wiley.com/doi/abs/10.1111/puar.13238>, doi:<https://doi.org/10.1111/puar.13238>, arXiv:<https://onlinelibrary.wiley.com/doi/pdf/10.1111/puar.13238>.
- Makin, A.J., Layton, A., 2021. The global fiscal response to covid-19: Risks and repercussions. *Economic Analysis and Policy* 69, 340–349. URL: <https://www.sciencedirect.com/science/article/pii/S031359262030463X>, doi:<https://doi.org/10.1016/j.eap.2020.12.016>.
- Romer, C.D., 2021. The Fiscal Policy Response to the Pandemic. *Brookings papers on economic activity* 2021, 89–110. URL: <https://doi.org/10.1353/eca.2021.0009>, doi:10.1353/eca.2021.0009.
- Romer, C.D., Romer, D.H., 2019. Fiscal space and the aftermath of financial crises: How it matters and why. *Brookings Papers on Economic Activity* , 239–332.

## Appendix

### *Robustness to the choice of fiscal policy measure - gross government debt*

Figures 11 to 14 show scatter plots of the deviation from pre-pandemic norms when using gross government debt instead of budget deficits. None of the correlations are negative and statistically significant. The Pearson correlation for the models specified in differences for the first year is  $-0.268$  with two-sided p-value of  $0.28$ . The second year correlation is  $0.214$  with p-value of  $0.39$ . The correlations of the levels specifications are  $-0.160$  and  $0.183$  with p-values of  $0.53$  and  $0.47$ .

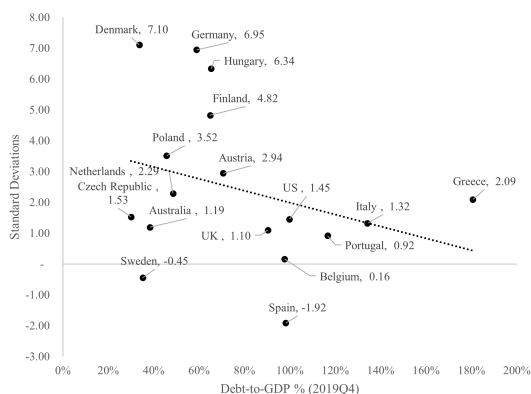


Figure 11: Differences, gross government debt specification for the period 2020Q1 - 2021Q1

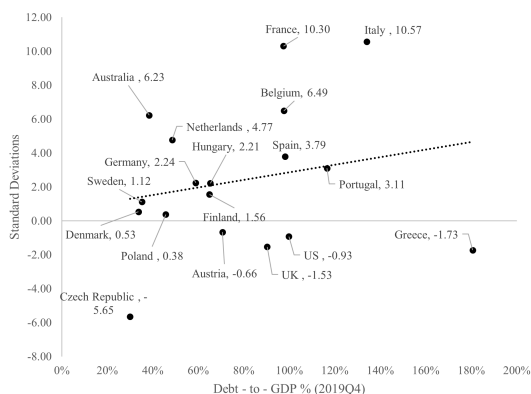


Figure 12: Differences, gross government debt specification for the period 2021Q2 - 2022Q2

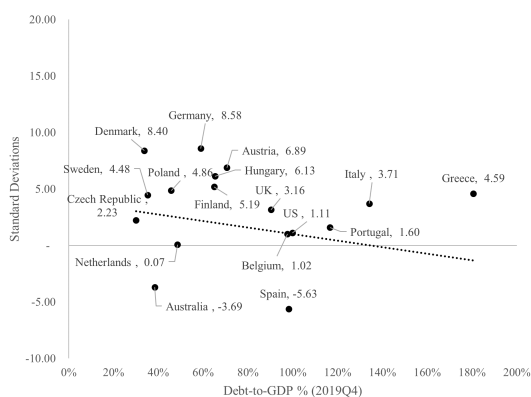


Figure 13: Levels, gross government debt specification for the period 2020Q1 - 2021Q1

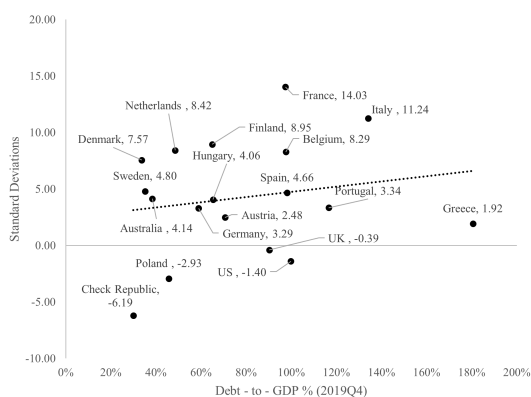


Figure 14: Levels, gross government debt specification for the period 2021Q2 - 2022Q2