



Munich Personal RePEc Archive

Determinants of budget deficits: Focus on the effects from the COVID-19 crisis

Tevdovski, Dragan and Jolakoski, Petar and Stojkoski,
Viktor

Faculty of Economics, University Ss. Cyril and Methodius in Skopje,
Association for Research and Analysis – ZMAI

31 May 2021

Online at <https://mpra.ub.uni-muenchen.de/108056/>
MPRA Paper No. 108056, posted 01 Jun 2021 01:58 UTC

Determinants of budget deficits: Focus on the effects from the COVID-19 crisis

Dragan Tevdovski * Petar Jolakoski[†] Viktor Stojkoski[‡]

May 31, 2021

Abstract

This paper revisits the discussion on determinants of budget balances and investigates the change in their effect in light of the Covid-19 crisis by utilizing data on 43 countries and a system generalized method of moments approach. The results show that the overall impact of the global pandemic led to a disproportionate increase in the magnitude of the estimated effects of the macroeconomic determinants on the budget balance. However, we also find that more developed economies were able to undertake higher stimulus packages for the relatively same level of primary balance. We believe that one of the factors affecting this outcome is that that they exhibit a higher government debt position in domestic currency denomination.

budget deficits, economic determinants, COVID-19

*Faculty of Economics, University Ss. Cyril and Methodius in Skopje, dragan@eccf.ukim.edu.mk

[†]Association for Research and Analysis – ZMAI, jolakoskip@gmail.com

[‡]Faculty of Economics, University Ss. Cyril and Methodius in Skopje and Association for Research and Analysis – ZMAI, vstojkoski@eccf.ukim.edu.mk

1 Introduction

Governments all around the world have taken forceful economic measures as a response to the sharp decline in global output due to the wide scale economic disruption caused by the COVID-19 pandemic. Both fiscal and monetary authorities stepped in to provide immediate liquidity support, replace lost household income, save jobs and prevent large-scale bankruptcies. However, the measures taken are costly. In particular, along with the drastic fall in government tax revenues and the abrupt rise in government expenditures, the measures are expected to push global public debt to an all-time high. In fact, the International Monetary Fund (IMF) estimated that global public debt will increase by 16 percentage points in 2020, from 83% in 2019 to around 100% of GDP in 2020, which is unparalleled to any increase in the past.

The focus of this paper is to review and revisit the determinants of budget balances in light of the global pandemic in 2020. We make an attempt to answer several compelling questions such as: Has the effect of a rise in government expenditure on the budget balance changed in 2020? How does the state of the labour market in 2020 affect the budget balance? Are budget balances in 2020 constrained by the prevailing debt levels and the current low long-term interest rates? Does the existence of previous vulnerabilities matter for the change in the budget balance in 2020?

To provide the answers, we use a system-GMM estimation procedure where we introduce interaction terms for macroeconomic variables and a dummy variable for 2020 in an otherwise standard specification including macroeconomic, political/institutional and demographic variables, as suggested by the literature (Alesina et al., 1998; Agnello and Sousa, 2009; Maltritz and Wüste, 2015). For this purpose, we utilize a dynamic panel dataset with 43 countries (all countries for which sufficient data is available) from 1995 to 2020. We use actual realizations of all of the series from 1995 to 2019 and IMF WEO forecasts of the series for 2020. The system approach allows us to address and overcome the issue of endogeneity that arises among the independent variables that is not accounted for in a standard least squares regression.

We contribute to the literature in several ways. First, a growing body of literature aims to determine the size of the budget deficits in 2020, and offer guidance on policies for sustainable repayment of the increased debt (Makin and Layton, 2021). However, to the best of our knowledge, the literature lacks investigations regarding the role of economic determinants on the magnitude of the budget deficits in 2020. This is among the first papers that attempt to quantify and analyze the potential difference in the effect of standard macroeconomic determinants on the budget balance prior to and during the COVID-19 pandemic. In addition, the paper offers a lengthy discussion on the implications of this change in terms of the long term economic scars that might result from the on-going crisis.

Our results indicate that the overall impact of the global pandemic led to a disproportionate increase in the magnitude of the estimated effects of almost all of the macroeconomic determinants on the budget balance. In particular, the effects of the economic slowdown, the rise in government

debt and government expenditure as well as population size on the budget balance are greater in 2020 in comparison to the preceding period. Thus, in 2020 larger public debts imply even lower budget deficits, suggesting that higher debt in the midst of a severe economic downturn constrained additional spending by the government.

We also discuss our findings by studying the relationship between the magnitude of the primary balance in 2020, the fiscal packages introduced to tackle the consequences of the COVID-19 pandemic and the government debt position by currency of denomination. We argue that more developed economies were able to undertake higher stimulus packages for the relatively same level of primary balance, and this was in part due to the fact that they exhibit a higher government debt position in domestic currency denomination (as percent of GDP).

The remainder of the paper is organized as follows: Section 2 offers a brief overview of the related literature. Section 3 introduces the applied methodology and the data used in more detail. Section 4 provides the empirical results and studies the thereby induced implications. In Section 5 we discuss our findings.

2 Literature Review

The existing literature studies the budget balance from two main perspectives: economic and political. A majority of the studies that are focused on the economic perspective analyze the response of fiscal policy to output. Standard Keynesian models deliver the need for fiscal policy to be countercyclical: allowing for budget deficits in recessions and saving for budget surpluses in booms, i.e., government spending (taxes) should rise (decrease) in recessions and increase in booms. In fact, the tax smoothing theory of Barro (1979) argues that the government should smooth both tax rates and government spending by borrowing during recessions and repaying during booms. Put simply, government spending will be uncorrelated with the changes in output, while tax revenue will be positively correlated. So far there is relatively mixed evidence about the cyclicity of fiscal policy in the voluminous literature (for example, (Galí and Perotti, 2003; Akitoby et al., 2004; Talvi and Vegh, 2005; Alesina et al., 2008; Frankel et al., 2013)). However, the general consensus from these studies is that fiscal policy is counter-cyclical in most developed countries, while it is pro-cyclical in developing countries (Afonso et al., 2010).

Evidently, the explanation for the cross-country variation in fiscal policy cyclicity cannot be provided solely by economic factors. The political characteristics of the governments, their ideological motivations, types of electoral systems and institutional arrangements are also important factors that determine fiscal policy. A large part of the literature focused on political determinants finds that weaker governments in terms of tenure and political power create larger budget deficits. Roubini and Sachs (1989) showed that countries where governments have short tenures tend to have higher deficits on average. Moreover, the paper shows that multi-party coalition governments have a higher tendency to develop large and persistent deficits in comparison with majority party

governments. Similarly, Lane (2003) argued that countries with dispersed political power are most likely to run pro-cyclical fiscal policies. Additionally, higher deficit is found to be positively associated with the size of the government cabinet measured as the number of spending ministers (Volkerink and De Haan, 2001; Perotti and Kontopoulos, 2002).

Although it is reasonable to expect that right-wing governments will practice tight fiscal policy and left-wing governments loose fiscal policy, the empirical literature found mixed evidence for the influence of the government ideological preferences on the budget balances (Alesina et al., 1997; Mulas-Granados, 2003). The budget deficits tend to be higher in election years in the case of opportunistic governments that do not have ideological preferences, but just follow policies that maximize their probability to win the next elections (Franzese Jr, 2002; De Haan and Mink, 2005). Alesina and Perotti (1995) found that large deficits are more common in countries with proportional rather than majoritarian and presidential electoral system. In addition, Alesina et al. (2008) argued that most of the pro-cyclicality of fiscal policy in developing countries can be explained by high level of corruption.

The institutional factors are also positively associated with fiscal performance. (Leachman et al., 2007) discussed that fiscal performance is better when fiscal budgeting institutions are strong. De Haan and Sturm (1997) found that a strong finance minister or commitment to negotiated budget targets can be especially effective in keeping deficits down in countries where there is some political instability. Henisz (2004) found that checks and balances that limit the discretion of policy-makers reduce the volatility of government expenditure and revenue.

Lastly, a relatively new, but important strand of literature is the examination of fiscal persistence. This is a measure of the degree of dependence of current fiscal behavior on its own past developments. In this aspect, Afonso et al. (2010) found that countries with higher fiscal persistence tend to have lower discretion.

3 Methodology

3.1 Model

In the construction of the econometric model we follow the literature described in the previous section and specify it as:

$$\text{Balance}_{it} = \beta_0 \text{Balance}_{it-1} + \mathbf{Y}'_{it} \beta_1 + \mathbf{X}'_{it} \beta_2 + \mathbf{Y}'_{it} D \delta_{\beta_1} + \mathbf{X}'_{it} D \delta_{\beta_2} + v_i + \varepsilon_{it}, \quad (3.1)$$

where the dependent variable Balance_{it} is the primary budget balance of country i in time t . We assume that the primary budget balance is dependent on its previous value Balance_{it-1} , with β_0 being its marginal effect and two disjoint sets of explanatory variables \mathbf{Y}'_{it} and \mathbf{X}'_{it} Agnello and Sousa (2009); Maltritz and Wüste (2015). The first set has a marginal effect β_1 and describes potential macroeconomic determinants of the primary budget balance, whereas the second set is

constituted of political and institutional variables, and β_2 is their marginal effect. In addition, in the equation we include a country specific effect v_i to account for potentially omitted variables that are invariant over time.

Similar model specifications have been used in (Alesina et al., 1998; Agnello and Sousa, 2009; Maltritz and Wüste, 2015) to understand the critical factors that drive the magnitude and characteristics of the budget deficit in an economy. The novelty in our specification is the presence of the interaction term between the independent variables and a dummy variable D for 2020, used for quantifying the potential different effect of the variables due to the coronavirus pandemic. Concretely, δ_{β_1} and δ_{β_2} represent a direct measure of the change in the effect of the, respectively, macroeconomic and political and institutional variables. A significant and negative value of δ_{β_1} (δ_{β_2}) implies that the studied variable had an important and larger contribution in the magnitude of the budget deficit in 2020, compared to the usual contribution.

A general problem of this model specification is the presence of endogeneity because of the potential interdependence between the explanatory variables and the budget balance (Agnello and Sousa, 2009). This may lead to biased and inefficient parameter estimates. To account for this problem, we resort to a system GMM parameter estimation. The system GMM solves the endogeneity problem via two steps. In the first step, each variable is first-differenced and thus the potential endogeneity due to correlation between the country-specific effects and the explanatory variables is removed (Arellano and Bond (1991)). In the second step, the endogeneity between the dependent and explanatory variables is removed by instrumenting the differenced variables with their available lags in levels: the levels of the dependent variable lagged for two or more periods and the levels of the explanatory variables lagged one or more periods (Blundell and Bond (1998)).

3.2 Data

For the purpose of our analysis, we construct an unbalanced panel annual dataset with macroeconomic, political and institutional variables for 43 countries, with yearly data covering the period from 1995 to 2020. We obtain macroeconomic data from the IMF World Economic Outlook (WEO) October 2020 Database and political and institutional data from Databanks International's Cross-National Time-Series Data Archive and Polity IV Database. Our starting point were all of the countries included in the WEO database, but some of the countries were removed from the initial sample due to lack of sufficient data availability in others databases.

For the period of 1995 to 2019, we use the actual realizations of the chosen variables. For 2020, however, we use forecasts for the macroeconomic variables (IMF) or an assumption that no change has taken place for the institutional and political variables. Although this is a rather strong assumption, our rationale is that changes in these variables require a multitude of legislative and political actions that can rarely be achieved within the span of one year. Our detailed analysis also showed that for all of the countries, it took at least two years for their polity score to change and it remained at the same value for the last few years of our sample. Furthermore, for the entire

dataset, the type of regime variable had little to no variation over the years and finally, in terms of the size of cabinet, the change in the number of ministers in the last period is at most 1 to 2 across majority of countries.

In all of our specifications, the dependent variable is the general government primary budget balance as % of GDP. We use this measure because it better matches the discretionary decisions of the fiscal authorities in comparison with the overall budget balance. It does not include interest payments for outstanding debt, which is piled up from the previous period that is not relevant to our study (Maltritz and Wüste, 2015).

The two sets of explanatory variables are based on the relevant existing literature, described in the previous section. We use a standard set of macroeconomic variables in the first set: lagged primary budget balance, government expenditure (log), gross debt (log), interest rate of government debt securities, unemployment rate, GDP growth rate and population (log).

For the second set of political and institutional explanatory variables we use: polity scale, type of regime and size of cabinet. *Polity scale* is a variable that evaluates how democratic a country is on a scale from -10 to 10, where the two extremes imply that the country is either fully autocratic (-10) or is fully democratic (10). *Type of regime* is a categorical variable that provides an estimate for the type of government regime in the country: i) civilian, ii) military-civilian and iii) military. *Size of cabinet* quantifies the number of ministers in a government. The list of all used variables, their transformation and data sources are presented in Table A1 of the Appendix. Table A2 in the Appendix presents a list of all countries included in the sample and their values for the macroeconomic variables for 2019 and 2020.

Table 1 summarizes the descriptive statistics for all of the variables that are included in our empirical analysis for 2019 and 2020. These statistics suggest that the primary budget deficit across all countries increased on average by 6.1 percentage points in 2020 (-6.4 percent of GDP) in comparison with 2019 (-0.32 percent of GDP), while the gross government debt increased on average by 12.8 percentage points from 2019 (69.3 percent of GDP) to 2020 (82.1 percent of GDP). This extraordinary increase in the global public debt happened at a time of further decline of average interest rates of government securities by almost 1 p.p. from 2019 (3.4 percent) to 2020 (2.5 percent). During the 2020 crisis, as expected, the loose fiscal policy leads government expenditures to increase on average by 8.7 percentage points, whereas for the unemployment rate the average increase was 2.5 percentage points and for GDP growth rate an average decrease of 8.6 percentage points across the entire sample. These numbers reflect the current economic conditions and the economic support packages implemented by policymakers around the world as a response to the global pandemic.

The polity scale variable shows that democracy is on a higher level in advanced economies than in emerging economies (9.1 and 5.3, respectively). The average number of ministers in the governments of both country groups is almost the same (around 21). Most of the governments of the countries in our sample are classified as civilian with a few exceptions (Algeria, Egypt, Fiji, Sudan and Thailand

	All countries	
Variable	2019	2020
Dependent variable		
Primary balance	-0.32 (2.85)	-6.44 (4.24)
Macroeconomic and demographic variables		
Gov. gross debt	69.27 (38.48)	82.14 (46.78)
Population	46.42 (73.33)	47.2 (77.73)
Unemployment rate	6.78 (6.37)	9.24 (8.31)
Interest rate	3.41 (3.43)	2.52 (3.3)
Gov. exp. (% of GDP)	34.77 (9.82)	42.88 (11.45)
GDP growth rate	2.47 (1.68)	-6.11 (2.80)
Political and institutional variables		
Polity	7.57 (4.08)	7.4 (4.37)
Size of cabinet	19.57 (5.51)	19 (5.47)
Civilian regime	25	21
Military-civilian regime	1	1
Military regime	0	0

Table 1: **Summary statistics. Mean values per country groups for 2019 and 2020. Standard deviations in brackets. Note: Regime statistics refer to number of countries**

classified as military-civilian; and Pakistan and Thailand have a military regime for a relatively short period of time).

In fact, discretionary budget measures on both the spending and the revenue side taken to combat the virus by emerging and developing economies account for more than 3.5% of GDP and more than 9% of GDP in advanced economies (IMF WEO October 2020). Given the specific nature of this shock, the severe weakening of aggregate demand and continuous disruptions of aggregate supply are expected to lead to the deepest global recession since World War II (World Bank Global Economic Prospects 2020). As a result, governments across the globe stepped in with extensive fiscal packages along with complimentary institutions to help the ailing economies, that include wage subsidies, tax deferrals, easing of regulatory burdens, transfers to firms and households, postponement of loan repayments, government guarantees among many other measures. Although the economic support offered by all of the countries is unprecedented and higher than what was offered during the global financial crisis in 2009 (World Bank Global Economic Prospects), the state of the economies prior to the emergence of the viral outbreak is also a crucial determinant of

the magnitude of their response.

4 Empirical results

In this section, we discuss the empirical results obtained using the [Arellano and Bond \(1991\)](#) and [Blundell and Bond \(1998\)](#) methods of implementing a dynamic linear GMM estimation. A summary of our main findings can be found in [Table 2](#). In column 1, we present the results from our model with the primary budget balance and the set of macroeconomic variables. We add additional explanatory variables that have been used in the literature that include a demographic effect (column 2) and a potential effect coming from political/institutional variables (column 3). Finally, in column 4 we present the results that include interaction terms with the variables that we consider to have been affected by the Covid-19 crisis and a dummy variable for 2020.

All of the macroeconomic variables are significant in all of the regressions we estimated and have the expected sign, as typically found in the literature ([Roubini and Sachs, 1989](#); [Bayar and Smeets, 2009](#); [Maltritz and Wüste, 2015](#)). The effect of the lagged primary budget balance is positive and significant. In fact, this persistence in the effect of the primary budget balance corresponds to a well-documented inertia in the budgetary process found in the literature. Similarly, the effect of the GDP growth rate is also positive and significant, as expected, because a higher growth rate of the economy improves the primary budgetary balance on the short run.

Next, government expenditure has a significant and negative impact on the primary budgetary balance as, by construction, higher government expenditure raises the primary budget deficit in the short run. In terms of the unemployment rate, the coefficient is negative and significant, implying that an increase in the unemployment rate worsens the primary budgetary balance, as a result of the additional government expenditure incurred to support the labour market. Another negative impact on the budget balance comes from population (significant in column 3 and 4).

The stock of debt and the long term interest rate have a significant and positive relationship with the primary budgetary balance. The fact that gross government debt has a positive effect on the primary budget balance confirms a previous finding in the empirical literature that higher debt improves the primary budget balance and reduces deficits. [Maltritz and Wüste \(2015\)](#) argue that high debt implies less fiscal space to encourage additional spending, while low debt levels enable countries to run higher deficits. We underline that higher interest payments from debt do not affect the primary balance which, by definition, excludes interest payments. However, higher long term interest rates on debt instruments also implies less fiscal space and leads to improved budgetary balances. On the other side, lower or negative long term interest rates on debt instruments encourage budget deficits.

In terms of the set of political/institutional variables, some of the results agree with the empirical findings in the literature. The coefficient in front of the polity scale variable is significant and positive, implying that a more democratic regime tends to be characterized with stronger institutions

and functional check and balances that limit the discretion of policy makers to increase budget deficits. This finding is in the line with the literature (for example see [Henisz \(2004\)](#) and [Leachman et al. \(2007\)](#)). The effect of the size of cabinet is negative but insignificant. A negative impact fits the stylized fact in the literature that higher number of spending ministers is associated with a lower primary balance (for example, [Volkerink and De Haan \(2001\)](#) and [Perotti and Kontopoulos \(2002\)](#)). Finally, in terms of the type of regime, the results show that countries that have a military-civilian or civilian regime tend to have higher primary budget deficits on average.

The last column shows the change in the effect of the macroeconomic variables on the primary budget balance in the year of the global pandemic. The pandemic increases the magnitude of the estimated effects of all of the variables, except of the unemployment rate where the direction of the relationship is reversed. Overall, the sharp decline in economic activity and increased government expenditures result in a higher budget deficit. This is what we expect, since given the economic toll of the crisis, all of the countries in our sample have implemented some form of economic support packages, resulting in a deterioration of their fiscal health. The resulting rise in the public debt leads to an increased magnitude of the positive effect of gross debt on the primary balance in 2020. This can be an indication that higher debt in the midst of a severe economic downturn implies enhanced incentives against spending. Moreover, population is expected to contribute more negatively to the primary balance in 2020, as with the on-going pandemic, more health related spending is needed in countries with a larger population. The only unexpected result is the positive effect coming from the unemployment rate in 2020, which may suggest that labor market deterioration led to lower government revenue mobilization and further constraints on the primary budget balance.

The robustness of our results is confirmed by re-estimating the model when the interest rate is removed from the list of explanatory variables. We explicitly choose this variable since, when excluded, the sample increases by the largest margin. The results are given in [Table A3](#) in the Appendix.

VARIABLES	(1) Macroeconomic	(2) Demographic	(3) Political/Institutional	(4) 2020
Primary balance (t-1)	0.404*** (0.018)	0.399*** (0.026)	0.374*** (0.020)	0.357*** (0.036)
GDP growth rate	0.244*** (0.013)	0.251*** (0.011)	0.223*** (0.015)	0.173*** (0.019)
Unemployment rate	-0.064*** (0.022)	-0.067*** (0.019)	-0.081*** (0.030)	-0.100* (0.053)
Government debt	2.828*** (0.376)	2.513*** (0.319)	2.830*** (0.337)	4.074*** (0.656)
Government expenditure	-17.267*** (0.839)	-17.070*** (1.074)	-19.745*** (1.709)	-17.660*** (1.660)
Interest rate	0.263*** (0.025)	0.243*** (0.019)	0.198*** (0.026)	0.181*** (0.051)
Population		-0.219 (1.707)	-6.323** (2.994)	-5.924* (3.233)
Polity			1.052*** (0.250)	0.705** (0.308)
Size of cabinet			-0.032 (0.031)	-0.027 (0.040)
Type of regime (2)			8.901*** (1.318)	5.687 (1.618)
Type of regime (3)			-5.435*** (3.139)	2.506 (3.742)
GDP*2020				0.984*** (0.241)
Unemployment*2020				0.647** (0.318)
Government expenditure*2020				-5.580*** (2.071)
Debt*2020				6.028*** (1.857)
Population*2020				-0.995** (0.433)
Constant	49.516*** (2.655)	50.961*** (5.614)	67.588*** (10.078)	58.025*** (9.028)
Observations	854	854	854	854
Number of countries	43	43	43	43

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: **Results. Arellano–Bover/Blundell–Bond linear dynamic panel-data estimation**

4.1 Implications

In the period that follows ahead, economies across the globe are expected to bear unprecedented economic and social costs from the COVID-19 pandemic. Returning to pre-crisis levels of economic activity is a daunting task for countries all over the world and the path to recovery is not to be smooth, even or certain.

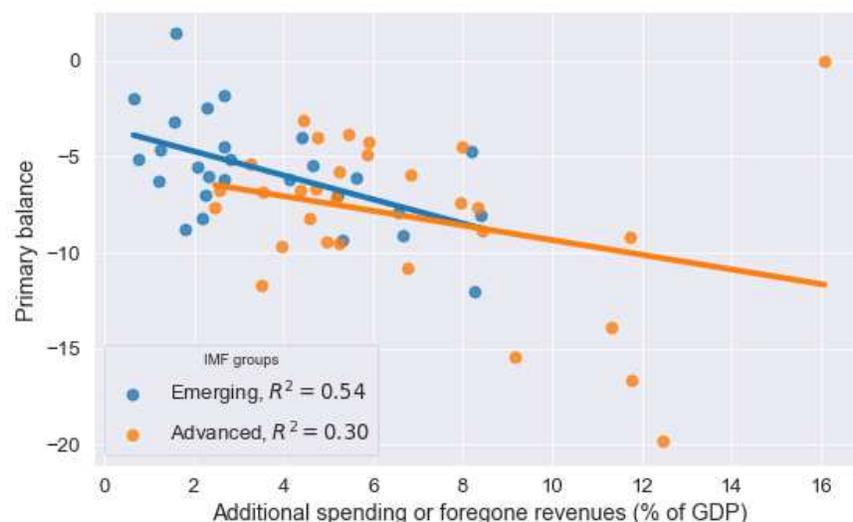


Figure 1: IMF country groups: Explained variation in budget deficits due to additional spending or foregone revenues in response to COVID-19 pandemic.

Source: Fiscal Monitor, Database of Country Fiscal Measures in Response to the COVID-19 Pandemic, IMF.

To begin with, the fiscal stimulus packages implemented by governments in response to the COVID-19 put a significant strain on public finances. The unparalleled fiscal response to demand slumps and supply interruptions that followed the crisis was to a large extent made by advanced economies and some large emerging market economies. This is because these countries relied on more favorable financing conditions prior to the crisis and retained the ability to borrow at lower interest rates (IMF, WEO 2020 and IMF, Fiscal Monitor 2020).

To better understand the relationship between the fiscal stimulus packages introduced by the governments and the budget deficits in 2020 in Figure 1 we plot the primary balance in 2020 as a function of the additional spending or foregone revenues in response to COVID-19. The source of data for countries' fiscal measures in response to pandemic is the Fiscal monitor database of IMF - we also divide the countries into emerging and advanced on the basis of the IMF's classification.

The figure shows that some advanced economies were able to undertake higher stimulus packages for the relatively same level of the primary balance. The conclusion is similar when looking at the total fiscal measures undertaken, which additionally include liquidity support in the form of equity injections, loans asset purchase or debt assumptions, as depicted in Figure 1. The figure highlights that total fiscal measures were in general higher in advanced economies in comparison with emerging market economies.

While country income per capita is an important determinant of the size of total fiscal measures during the pandemic, we want to emphasize that also government debt position in domestic currency denomination was relevant determinant during the COVID-19 crisis. We could not include this

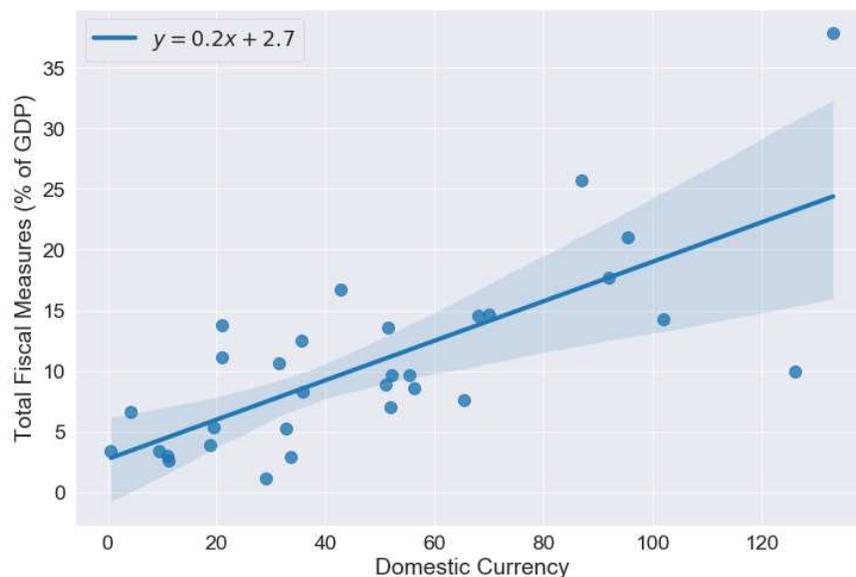


Figure 2: **Explained variation in total fiscal measures due to government debt position in domestic currency denomination (as a percent of GDP)**

variable in our regression model, due to lack of data availability for a lot of the countries in our sample. However, in Table A1 in the Appendix we present all of the countries for which data is available in the Fiscal Monitor of the IMF database and the Quarterly public sector debt database of the World Bank for gross central government debt position by currency of denomination (as a percent of GDP) in the first quarter of 2020. We illustrate the relationship using these countries in Figure 2. The figure shows that countries with a higher government debt position in domestic currency denomination (as percent of GDP) were able to execute higher total fiscal measures (as percent of GDP) during the pandemic. For example, four of five countries with one of the highest total fiscal measures as percent of GDP are Italy, United Kingdom, France and Spain, which have a debt position in domestic currency higher than 80 percent. Also, we note that the correlation coefficient between debt position in domestic currency denomination and size of the total fiscal measures is fairly high, equal to 0.737, and significant on the 1% level.

5 Discussion

The fiscal packages aimed to stimulate the economy amidst the COVID-19 pandemic led to an unprecedented growth in the budget balance deficits in almost every country in the world. Here, we discovered that this growth was accelerated by the change in the impact of the economic determinants that govern the magnitude of the budget deficits. We also postulated that more developed economies were able to undertake higher stimulus for the same level of budget deficits, mainly because of the advantage of servicing the debt in their national currency.

While the fiscal packages had a vital role in the efforts made by governments stepping in to combat the consequences of the virus, it is clear that future fiscal space will be limited as a result of these efforts. The rise in the global debt to GDP ratio can pose additional challenges for debt sustainability of all of the economies in the world in the medium to long run. Equally relevant is the potential risk in the horizon for debt financing conditions. This is because the decades long downward trend of long-term interest rates could be reversed, given that in many countries nominal interest rates are close to their lower bounds.

Moreover, some of the vulnerabilities that existed prior to the crisis, such as population aging, are likely to further contribute negatively to the outlook for the stock of sovereign debt. For instance, in their empirical study on OECD economies, [Honda and Miyamoto \(2020\)](#) found that population aging weakens fiscal spending effects and in order to support the economy in a downturn, countries will need to revert to larger fiscal support packages. Finally, the buildup of debt is also expected to constrain the use of government revenues for growth and development related spending needs in the future, as a large part of the inflows to the government budget will be consumed by debt service.

Last but not least, the size, distribution and adjustment of the budget balance in 2020 will determine both the general social prospects and industry-wise economic capabilities of each country in the aftermath of the pandemic ([Stojkoski et al., 2020a,b](#); [Tevdovski et al., 2021](#)). The structural changes induced on the economies as they adjust to constraints imposed by health authorities (social distancing, teleworking, movement impediments, capacity restrictions) will redistribute societal resources from highly inflexible sectors to highly adaptive sectors of the economy. Along that route, welfare losses arising from labour market distortions (jobs at the lower quantiles of the wage distribution, in informal employment, with temporary working arrangements) and human capital accumulation disruptions (schooling interruptions and transformation) will probably worsen the level of poverty and income inequality worldwide. In order to tackle such challenges, mechanisms to restore the fiscal health of governments will be vital in the period to come.

References

- Alberto Alesina, Roberto Perotti, José Tavares, Maurice Obstfeld, and Barry Eichengreen. The political economy of fiscal adjustments. Brookings Papers on Economic Activity, 1998(1):197–266, 1998.
- Luca Agnello and Ricardo M Sousa. The determinants of public deficit volatility. 2009.
- Dominik Maltritz and Sebastian Wüste. Determinants of budget deficits in europe: The role and relations of fiscal rules, fiscal councils, creative accounting and the euro. Economic Modelling, 48:222–236, 2015.

- Anthony J Makin and Allan Layton. The global fiscal response to covid-19: Risks and repercussions. Economic Analysis and Policy, 69:340–349, 2021.
- Robert J Barro. On the determination of the public debt. Journal of political Economy, 87(5, Part 1):940–971, 1979.
- Jordi Galí and Roberto Perotti. Fiscal policy and monetary integration in europe. economic policy, 18(37):533–572, 2003.
- Bernardin Akitoby, Benedict Clements, Sanjeev Gupta, and Gabriela Inchauste. The cyclical and long-term behavior of government expenditures in developing countries. 2004.
- Ernesto Talvi and Carlos A Vegh. Tax base variability and procyclical fiscal policy in developing countries. Journal of Development economics, 78(1):156–190, 2005.
- Alberto Alesina, Filipe R Campante, and Guido Tabellini. Why is fiscal policy often procyclical? Journal of the european economic association, 6(5):1006–1036, 2008.
- Jeffrey A Frankel, Carlos A Vegh, and Guillermo Vuletin. On graduation from fiscal procyclicality. Journal of Development Economics, 100(1):32–47, 2013.
- Antonio Afonso, Luca Agnello, and Davide Furceri. Fiscal policy responsiveness, persistence, and discretion. Public Choice, 145(3-4):503–530, 2010.
- Nouriel Roubini and Jeffrey D Sachs. Political and economic determinants of budget deficits in the industrial democracies. European Economic Review, 33(5):903–933, 1989.
- Philip R Lane. The cyclical behaviour of fiscal policy: evidence from the oecd. Journal of Public economics, 87(12):2661–2675, 2003.
- Bjørn Volkerink and Jakob De Haan. Fragmented government effects on fiscal policy: New evidence. Public choice, 109(3-4):221–242, 2001.
- Roberto Perotti and Yianos Kontopoulos. Fragmented fiscal policy. Journal of Public Economics, 86(2):191–222, 2002.
- Alberto Alesina, Nouriel Roubini, and Gerald D Cohen. Political cycles and the macroeconomy. MIT press, 1997.
- Carlos Mulas-Granados. The political and economic determinants of budgetary consolidation in europe. European Political Economy Review, 1(1):015–039, 2003.
- Robert J Franzese Jr. Electoral and partisan cycles in economic policies and outcomes. Annual review of political science, 5(1):369–421, 2002.
- Jakob De Haan and Mark Mink. Has the stability and growth pact impeded political budget cycles in the european union? 2005.

- Alberto Alesina and Roberto Perotti. The political economy of budget deficits. Staff Papers, 42(1):1–31, 1995.
- Lori L Leachman, Guillermo Rosas, Peter Lange, and Alan Bester. The political economy of budget deficits. Economics & Politics, 19(3):369–420, 2007.
- Jakob De Haan and Jan-Egbert Sturm. Political and economic determinants of oecd budget deficits and government expenditures: A reinvestigation. European Journal of Political Economy, 13(4):739–750, 1997.
- Witold Jerzy Henisz. Political institutions and policy volatility. Economics & Politics, 16(1):1–27, 2004.
- Manuel Arellano and Stephen Bond. 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, 1991.
- Richard Blundell and Stephen Bond. Initial conditions and moment restrictions in dynamic panel data models. Journal of econometrics, 87(1):115–143, 1998.
- Ali H Bayar and Bram Smeets. Economic, political and institutional determinants of budget deficits in the european union. 2009.
- Jiro Honda and Hiroaki Miyamoto. Would population aging change the output effects of fiscal policy? 2020.
- Viktor Stojkoski, Zoran Utkovski, Petar Jolakoski, Dragan Tevdovski, and Ljupco Kocarev. The socio-economic determinants of the coronavirus disease (covid-19) pandemic. arXiv preprint arXiv:2004.07947, 2020a.
- Viktor Stojkoski, Petar Jolakoski, and Igor Ivanovski. The short-run impact of covid-19 on the activity in the insurance industry in the republic of north macedonia. arXiv preprint arXiv:2011.10826, 2020b.
- Dragan Tevdovski, Petar Jolakoski, and Viktor Stojkoski. The impact of state capacity on the cross-country variations in covid-19 vaccination rates. Available at SSRN 3801205, 2021.

Appendix

Table A1: **List of countries and their, fiscal measures, primary budget balance and gross central government debt in domestic currency denomination.**

All variables are as % of GDP.

Country	Fiscal measures	Primary balance	Debt in domestic currency
Albania	2.87	-8.42	33.53
Armenia	2.98	-5.82	10.90
Australia	13.53	-10.06	51.55
Brazil	14.61	-16.78	69.90
Bulgaria	6.66	-2.00	4.20
Canada	16.73	-19.92	42.69
Colombia	5.27	-9.48	32.79
France	20.98	-10.77	95.47
Hungary	8.55	-8.28	56.17
Indonesia	3.83	-6.32	18.92
Ireland	7.59	-6.00	65.48
Israel	9.67	-12.94	52.12
Italy	37.93	-12.98	133.14
Lithuania	8.28	-6.72	35.78
Luxembourg	11.16	-6.98	20.89
Mexico	1.10	-5.8	28.97
Moldova	2.63	-8.00	11.21
Netherlands	8.85	-8.76	51.10
Philippines	3.37	-8.06	0.63
Portugal	9.95	-8.35	126.24
Romania	5.38	-9.59	19.51
Russia	3.41	-5.29	9.36
Slovak Republic	6.97	-8.84	51.82
Slovenia	14.56	-8.82	68.01
South Africa	9.61	-14.04	55.45
Spain	17.66	-14.09	92.06
Sweden	10.63	-5.90	31.48
Thailand	12.46	-5.21	35.58
Turkey	13.75	-7.88	21.10
United Kingdom	25.72	-16.46	86.99
United States	14.22	-18.72	101.88

Table A2: List of variables and data sources

Variables	Source
Primary balance	IMF, WEO; General government primary net lending/borrowing % of GDP
Debt	IMF, WEO; General government gross debt % of GDP
Unemployment rate	IMF, WEO; % of total labour force
GDP	IMF, WEO; Gross domestic product at constant prices
Population	IMF, WEO in persons (millions)
Government expenditure	IMF, WEO; % of GDP
Size of cabinet	CNTS (polit10)
Type of regime	CNTS (polit02)
Polity scale	Polity IV Database (polity2)

Table A3: **Results without the interest rate. Arellano–Bover/Blundell–Bond linear dynamic panel-data estimation**

VARIABLES	(1) Macroeconomic	(2) Demographic	(3) Political/Institutional	(4) 2020
Primary balance (t-1)	0.522*** (0.003)	0.528*** (0.005)	0.512*** (0.006)	0.536*** (0.006)
GDP growth rate	0.207*** (0.006)	0.221*** (0.010)	0.213*** (0.010)	0.093*** (0.007)
Unemployment rate	-0.025** (0.010)	-0.020 (0.013)	-0.050*** (0.016)	-0.021 (0.019)
Government debt	0.332*** (0.095)	0.279*** (0.050)	0.039 (0.080)	0.470*** (0.128)
Government expenditure	-13.109*** (0.325)	-12.991*** (0.395)	-13.530*** (0.478)	-12.511*** (0.511)
Population		0.090 (0.089)	0.497*** (0.140)	0.631*** (0.192)
Polity			0.118*** (0.018)	0.103*** (0.033)
Size of cabinet			-0.053*** (0.009)	-0.034*** (0.007)
Type of regime (2)			-1.008 (0.699)	-0.721 (1.304)
Type of regime (3)			-1.395 (2.218)	-4.453** (1.873)
GDP*2020				0.140*** (0.048)
Unemployment*2020				0.096 (0.098)
Government expenditure*2020				-2.948*** (0.271)
Debt*2020				1.966*** (0.279)
Population*2020				-0.514*** (0.127)
Constant	43.636*** (1.320)	43.094*** (1.490)	45.553*** (1.735)	40.123*** (1.991)
Observations	1,879	1,879	1,879	1,879
Number of countries	87	87	87	87

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1