THE CYCLICAL BEHAVIOUR OF FISCAL POLICY: ARE DEVELOPING COUNTRIES DIFFERENT, AND DO INSTITUTIONS MATTER?

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Abstract. The available empirical evidence shows that fiscal authorities commonly revert to procyclical fiscal policies instead of following the normative prescription of budgetary countercyclicality. The available empirical studies suggest that this phenomenon may be attributed to weak fiscal institutions. Hence, it is often advocated that strengthening institutions in the developing countries is a reliable way to improve the cyclical properties of fiscal policy. In this paper, we challenge this view by showing that the impact of institutions on the cyclical behaviour of fiscal policy is not uniform across all countries and differs significantly between advanced economies and the developing ones. In the latter, the impact of institutions on the quality of fiscal policy proves to be weak, which is in stark contrast to the strong relationship observed in developed economies. This surprising result suggests that the focus on improving institutional quality may be of little help as a tool to increase the countercyclicality of fiscal policy in the developing economies.

Keywords: procyclical fiscal policy, fiscal institutions.

JEL Classification: E63, H87.

Introduction

Reactions of fiscal policy to the business cycle has gained increasing attention in the recent years (see, e.g., Bergman & Hutchison, 2020 for reviews of recent literature). The mainstream normative approach suggests that optimal fiscal policy should behave countercyclically: fiscal surplus should be generated during economic upswings in order to finance deficit that is a result of subsequent downturns (Gootjes & de Haan, 2022). This prescription is in line with the standard new-Keynesian models, as well as with the tax-smoothing theory of Barro (1979). It is subject to discussion whether fiscal authorities should limit these reactions purely to automatic stabilizers, or should amplify them with discretionary actions. The latter are often advised against due to their small multipliers (Perotti, 2002), so-called non-Keynesian effects (Giavazzi & Pagano, 1990; Alesina et al., 2020), and lags in implementation.

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However, there is evidence that countercyclical behaviour of fiscal policy, as advised by the body of normative research, is not a commonly observed phenomenon. Gavin et al. (1996) first observed that many Latin American countries reverted to procyclical fiscal policies, which in turn increased their macroeconomic volatility. This result, which was surprising at first, was subsequently confirmed by many other researchers (see Ji & Mei, 2021 for a review of the relevant literature concerning low-income countries). Eyraud et al. (2017) and Bergman and Hutchison (2020) showed that in some cases, fiscal policy may also prove to be procyclical even in high-income, European countries, thus rendering this phenomenon worldwide and not limited to less-developed economies.

A number of analyses showed that fiscal policy being countercyclical is often related to strong institutional setup. Fiscal rules are among the institutions that are believed to limit the procyclicality of public expenditures, thus limiting their de-stabilising macroeconomic impact (Schaechter et al., 2012). They are an instrument that decreases incentives to increase budget deficits during upswings, leaving more fiscal space that can be used to stimulate the economy during economic downturns (Mackiewicz, 2007; Bergman et al., 2016; Onofrei et al., 2020). Empirical studies show that, indeed, fiscal institutions such as balanced-budget rules or debt limits reduce procyclicality and the resulting macroeconomic destabilisation (Combes et al., 2017). Calderón et al. (2016) showed that it is not only fiscal rules, but good quality of institutions in general that promote countercyclicality in fiscal policy, rendering it more conducive to macroeconomic stability and, thus, to long-run growth. It is therefore tempting to suggest that improving institutions, which are typically weaker in less developed countries, would be a key to improving the cyclical properties of fiscal policy by making it more countercyclical and, thus, improving its ability to stabilise the economy during downturns, without causing excessive expansion during the times of boost.

In this paper we argue that such a normative prescription may be fundamentally flawed. As a main contribution of this study, we show that relationship between institutional quality and healthy cyclical properties of fiscal policy is not uniform across the developed and developing economies. Using a large panel of 182 countries[1] over the period 1995–2015 we demonstrate that while among the developed countries stronger institutions are indeed linked to better fiscal policy, this relationship is considerably weaker in the group of developing economies. Hence, fostering the improvement of institutions should not be viewed as a steadfast cure against the procyclical fiscal policy in countries at lower levels of economic development. Instead, further studies are needed to improve our understanding of the mechanisms behind the observed empirical link, taking into account the possible structural differences between the developing and developed countries.

Our paper is organised as follows. In section two, we present a review of the literature concerning the phenomenon of fiscal procyclicality and derive the relevant hypotheses. The third section presents the main tool that we subsequently use to analyse the fiscal cyclicality – the fiscal reaction function – as well as the econometric methods that we used to capture and measure the determinants of cyclicality. In the fourth section, we show and discuss the interpretation of the results. The last section concludes.

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[1] In this paper, we uniformly apply the IMF classification, which distinguishes "advanced economies" and "emerging and developing economies". However, in order to sustain the flow of the text, we use terms "economies" and "countries" interchangeably and also abbreviate the term "emerging and developing economies" to "developing economies".

1. Related literature and hypotheses

After the seminal work by Gavin et al. (1996) that analysed fiscal policy in Latin American countries, Catao and Sutton (2002) followed their path and confirmed for other low-income countries that procyclical fiscal policy was a widespread phenomenon. Mackiewicz (2007) also observed that in European Monetary Union countries, a higher structural deficit tends to limit the extent to which fiscal policy can be countercyclical. Eyraud et al. (2017) showed that in some cases, fiscal policy may also prove to be procyclical even in high-income, European countries, thus rendering this phenomenon worldwide and not limited to poorer countries. Bergman and Hutchison (2020) confirmed that for a large panel of countries, procyclical fiscal policy is more common for economies where governments are generally less efficient while also confirming that balanced-budget rules may contribute to an improvement in the fiscal cyclical stance.

Different authors have proposed theoretical interpretations for the phenomenon of fiscal procyclicality. The first one was the concept of financial restraints by Gavin et al. (1996), Kaminski et al. (2004), Elgin et al. (2022), Gootjes and Haan (2022). This theory stresses the role of limited access to borrowing that coincides with the periods of economic depression. During economic turmoil, lenders are less prone to buy bonds of the developing countries, thus effectively forcing them to revert to fiscal contraction precisely at the moment, where the opposite stance would be optimal.

Alternatively, a group of authors derive procyclicality from the game theory. Tornell and Lane (1998, 1999) were the first to develop a model in which different political and administrative actors compete for the common pool – income from taxation. They show that under some fairly generic assumptions such a competition becomes more intense during economic upturns, when the common pool becomes larger. As a result, deficit may increase in "good times", leading precisely to the observed phenomenon of fiscal procyclicality (Turan & Yanıkkaya, 2020; Sharma & Mishra, 2022). Other authors developed models that stem from a similar concept, although stressing the role of output volatility and the dispersion of political powers (Tornell & Lane, 1998, 1999; Mawejje & Odhiambo, 2020), corruption (Alesina & Tabellini, 2005; Dumičić, 2019), or the polarisation of preferences (Woo, 2009; Aizenman et al., 2019). They empirically confirmed that, indeed, countries with volatile output and dispersed political power are those that run the most procyclical fiscal policies.

Calderón et al. (2016) used a sample of up to 112 developing and developed countries from 1984–2008 to provide empirical evidence that institutional quality determines the cyclical behaviour of policies. Economies with strong institutions typically adopt countercyclical policies, while those with weak institutions run procyclical policies. Frankel et al. (2013) reported that many emerging and developing economies witnessed improvements in institutional quality that resulted in a shift from pro- to anti-cyclical fiscal policies. Calderón and Nguyen (2016) also suggest that in a panel of Sub-Saharan African countries, the departure from a procyclical fiscal policy can be attributed to an improvement in the quality of institutions. Lledó and Poplawski-Ribero (2013) found for a similar panel of countries that stronger institutions tend to improve the control of central authorities over fiscal policy and

increase the probability of success of fiscal adjustments[2]. Combes et al. (2017) investigated the fiscal policy cyclical stance in a panel of 56 developed and developing countries for the period 1990–2011 and confirmed the presence of countercyclical policy. They also found fiscal policy to be dependent on the public debt-to-gross domestic product (GDP) ratio, being procyclical above a threshold of 87% debt. Abdih et al. (2010) examined a sample of 28 countries in the Middle East, North Africa and Central Asia from 1970–2007 and concluded that the fiscal policy had been typically procyclical; however, the behaviour of fiscal policy changed to countercyclical during the 2009 crisis.

The mixed picture that emerges from these observations suggests that there may indeed be different mechanisms at work behind the role of institutions in shaping fiscal policy in developing and developed economies. This ambiguity is of paramount importance when it comes to developing prescriptions for economic and institutional policy. Typically, developing countries are characterised by weaker institutions and worse (i.e., more procyclical) fiscal policy, while developed economies tend to have both better institutions and policies. It is therefore tempting to conclude that improving institutional quality in poorer countries is conducive to better fiscal policy and should render it more countercyclical, and thus beneficial to economic stabilisation and long-term growth.

However, to our knowledge, there are no studies available that take a closer look at the possible differences between developed and developing countries regarding the impact of institutions of fiscal pro- or countercyclicality. Bova et al. (2014) is probably the only work that partly deals with this problem. Their analysis showed that, historically, the adoption of fiscal rules did not prove conducive to better fiscal policy in a group of developing countries, thus indicating that the observed general relationship between institutions and fiscal cyclicality may indeed not be useful in designing real-world policies.

In the context of this open policy-related debate, in this study, we address the following hypotheses:

Hypothesis 1. Fiscal policy is countercyclical in both developing and developed economies.

Hypothesis 2. The relationship between institutional quality and degree of countercyclicality differs significantly between developing and developed countries.

2. Data and statistical methods

In order to specify the fiscal reaction function that describes the reaction of fiscal surplus to the level of economic activity, one should properly define the dependent variable. Different approaches to the problem are employed. The most common practice is to use the ratio of surplus to GDP $\left(\dfrac{S_{it}}{Y_{it}}\right)$ as the measure of fiscal stance. Business cycle is then introduced in the form of output gap $\left(\dfrac{Y_{it}}{\bar{Y}_{it}}\right)$ that is included as a covariate, together with other control variables. The fiscal reaction function for country i at time t is then:

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[2] Baskaran and Bigsten (2013) also found impact in the opposite direction: higher capacity to tax led to better governmets in a panel of 31 Sub-Saharan countries over years 1990–2005.

$$\frac{S_{it}}{Y_{it}} = \alpha_i + \beta_0 \frac{Y_{it}}{\overline{Y}_{it}} + \mathbf{x'_{it}}\boldsymbol{\beta}_1 + \eta_{it}, \tag{1}$$

where $\mathbf{x}_{it}$ is a vector of other control variables, and η_{it} denotes the disturbance term. However, using this specification, although simple and seemingly self-explanatory, is far from ideal. It implicitly imposes unitary output elasticity, which is not necessarily true due, among others, to progressive taxation which is prevalent in many countries. Also, using this specification will result in overestimating elasticity in countries with larger public sectors, while tending to underestimate it in countries with smaller public sectors[3]. In order to tackle these problems, Woo (2009) used a different approach, focusing purely on the expenditure side of the public sector. He argumented that automatic stabilizers tend to work mainly on the revenue side, so analysing expenditures will likely yield the better picture of discretionary fiscal actions. The equation used in the analysis was

$$\Delta\log\left(G_{it}\right) = \alpha_i + \beta_i\Delta\log\left(Y_{it}\right) + \mathbf{x'_{it}}\boldsymbol{\beta} + \eta_{it}, \tag{2}$$

where Y_{it} denotes real GDP and G_{it} is fiscal expenditures. While this approach allows for non-unitary elasticities, it is still sensitive to the issue of differences in relative size of public sector. Moreover, differencing can remove only the linear trend from the variables. In order to address aforementioned issues in a complex way, we propose an alternative approach. The equations that model key fiscal variables, general government real expenditure G and revenue H (for country i at year t), take the form:

$$G_{it} = \overline{G}_{it}\left(\tilde{y}_{it}\right)^{\varepsilon_G}, \ H_{it} = \overline{H}_{it}\left(\tilde{y}_{it}\right)^{\varepsilon_H}, \tag{3}$$

where $\overline{G}_{it}$ and $\overline{H}_{it}$ are, respectively, the structural levels of expenditure and revenue, $\tilde{y}_{it}$ is the output gap and ε_G and ε_H are short-run output elasticities of expenditure and revenue.

In this paper, we propose to replace the widely used definition of fiscal surplus that is typically defined as a difference between revenues and expenditures (i.e., $H_{it} - G_{it}$) with a better alternative. While the standard approach is deeply rooted in the bookkeeping definition of surplus, it is ill suited for macroeconomic modelling. We argue that defining surplus as the *ratio* of revenue to expenditure ($s_{it} - H_{it}/G_{it}$) has important advantages and is generally better tailored to modelling reactions of fiscal policy to the business cycle. These reactions can be modelled using the following formula, which was directly derived from (3):

$$\log\left(\frac{H_{it}}{G_{it}}\right) = \log\left(\frac{\overline{H}_{it}}{\overline{G}_{it}}\right) + \left(\varepsilon_H - \varepsilon_G\right)\log\left(\tilde{y}_{it}\right). \tag{4}$$

In this equation, the difference ($\varepsilon_H - \varepsilon_G$) measures elasticity of fiscal surplus with respect to output and is denoted as ε_S later in this text. Using the above specification allowed us to solve three problems simultaneously. First, we were henceforth able to compare cyclical reactions in countries with different-sized public sectors, avoiding the threat of assuming greater

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[3] To see this, one may assume the existence of two countries with fiscal revenues proportional to output and expenditures that are constant over time. These two countries differ only by the size of the public sector h (the ratio of revenue to GDP) so that $h_A < h_B$. An increase of the output gap by one percentage point leads to a change in the ratio of surplus to GDP by h_A and h_B, respectively. This creates a misleading picture that country B runs a stronger countercyclical policy, while, in fact, the fiscal authorities in both countries are neutral to the business cycle.

cyclical sensitivities in countries where they are simply a result of larger public sectors. We also allowed for non-unitary cyclical elasticities, while also for a random trend in the time series.

An open issue is how to model the structural surplus $\overline{s}_{it} = \dfrac{\overline{H}_{it}}{\overline{G}_{it}}$ in this equation. It can be specified in a general form as an autoregressive process with a vector $\mathbf{x}$ of exogenous covariates:

$$\log\left(\overline{s}_{it}\right) = \alpha_0 + \sum\nolimits_{n=1}^{N} L^n \alpha_n \log\left(\overline{s}_{i,t}\right) + \sum\nolimits_{m=0}^{M} L^m \left(\kappa_m \log\left(\tilde{y}_{it}\right) + \gamma_m' \mathbf{x_{it}}\right) + \eta_{it}. \qquad (5)$$

After solving for structural surplus and re-arranging, the actual (i.e., not cyclically adjusted) surplus follows the autoregressive process:

$$\log\left(s_{it}\right) = \alpha_0 + \varepsilon_S \log\left(\tilde{y}_{it}\right) + \sum\nolimits_{n=1}^{N} L^n \alpha_n \left(\log(s_{it}) - \varepsilon_S \log\left(\tilde{y}_{it}\right)\right) +$$
$$\sum\nolimits_{m=1}^{M} L^m \left(\kappa_m \log\left(\tilde{y}_{it}\right) + \gamma_m' \mathbf{x_{it}}\right) + \eta_{it}. \qquad (6)$$

It is worth noting that this equation, in contrast to the previous one, contains only the observable variables[4] and thus its parameters can be directly estimated.

However, in this paper we are particularly interested in the possibility that the cyclical behaviour of fiscal policy changes both temporally and spatially due to the institutional changes. There are potentially two ways to address this issue. One is to follow a two-step procedure: in the first step to estimate the time series model for each country and then, in the second step, to estimate a cross-sectional equation where the estimated elasticities become the dependent variables, with the institutional variables of interested used as covariates. This approach has been widely used in the past (Alesina & Tabellini, 2005; Mandon & Cazals, 2019).

However, this approach suffers from two shortcomings. Firstly, as Canova and Pappa (2005) pointed out, this procedure tends to overestimate the impact of the covariates on the elasticities of interest. More importantly, it imposes an implicit restriction on the type of variance that allows the estimation. Elasticities are estimated using only time-series data for specific countries. Then, their reactions to changing institutional conditions are estimated using the cross-section variance only, thus precluding any time variance of the institutions. This lies in stark contrast to the evidence that albeit institutions are relatively stable, they still do change over time in specific countries, thus also potentially affecting the cyclical fiscal stance (Gagnon & Gimet, 2020; Biolsi & Kim, 2021).

For these reasons, in this paper we used a different approach. We assume that elasticity of interest in Eq. (6) depends on the vector of institutional variables $\mathbf{z_{it}}$:

$$\varepsilon_{it} = \gamma_0 + \boldsymbol{\beta}' \mathbf{z_{it}} + \theta_{it}. \qquad (7)$$

At this point, it is possible to directly substitute (7) into (6) and obtain a behavioural equation that contains interaction variables. Unfortunately, in the equation that is a direct result of this substitution, the number of necessary combinations of variables (such as products of different lags of $\mathbf{z_{it}}$ and those of the output gap) grows almost exponentially, rendering the resulting equation difficult to estimate using the Generalized Method of Moments due

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[4] A notable exception is output gap that is estimated from a filtering procedure.

to the excessive number of instruments. In order to deal with this issue, we simplified the resulting equation to the form:

$$\log(s_{it}) = \alpha_0 + \gamma_0 \log(\tilde{y}_{it}) + \boldsymbol{\beta}_0' \mathbf{z}_{\mathbf{it}} \log(\tilde{y}_{it}) + \sum_{k=1}^{K} L^k \alpha_n \log(s_{it}) +$$

$$\sum_{w=0}^{W} L^w \kappa_w \log(\tilde{y}_{it}) + \sum_{m=1}^{M} L^m \boldsymbol{\gamma}_{\mathbf{m}}' \mathbf{x}_{\mathbf{it}} + \eta_{it}. \tag{8}$$

In this equation, parameters γ_0 and κ_0 are estimated jointly as $\gamma_0 + \kappa_0$. The latter (combined) parameter denotes the overall reaction of fiscal surplus to the business cycle, being the sum of automatic stabilizers and discretionary, cycle-related reactions of fiscal policy.

To our knowledge, there is a very limited number of studies that use interaction terms to allow for varying the parameters of the fiscal response to the business cycle. Calderón and Schmidt-Hebbel (2003) were probably the first to show that cyclical elasticities of fiscal policy are not only surprisingly small or negative, but also substantially vary between countries. However, they did not directly answer the question which factors are responsible for this variance. Persson and Tabellini (2005) explicitly used interaction terms of the output gap and dummy variables and showed that the cyclical fiscal stance may vary depending on the type of political regime (majoritarian or proportional). Frankel et al. (2013) explored the importance of institutional quality on fiscal policy cyclicality and confirmed the role of institutions in countries' ability to shift from pro- to countercyclical fiscal policies over the last decade. They found that the better the institutions, the more countercyclical the fiscal policy becomes. Combes et al. (2017) used an interaction term of public debt and the output gap in a study of the reaction of fiscal policy to the business cycle. They showed that the fiscal policy's cyclicality is indeed affected by the country's stock of debt. Calderón et al. (2016) evidenced cyclical behaviour of both monetary and fiscal policies to be dependent on the institutional quality indicator. They showed that economies with strong institutions adopt countercyclical policies while those with weak institutions run procyclical policies.

Compared to these studies, we go a step further and include the country's stage of development. Doing so allows us to distinguish between the impact of institutional quality and economic advancement. We proxy the stage of development by a dummy variable that divides countries into two groups, namely emerging and developing economies and developed ones, in accordance with the International Monetary Fund's (IMF's) classification. As suggested by Brambor et al. (2005), in our interaction model specification, we include all the constitutive terms (i.e. all the elements that form the interaction term). As we have two modifying variables, we introduce the following terms: *yo, qi, dev, yo×qi, yo×dev, qi×dev* and *yo×qi×dev*. This allowed us to calculate the marginal effect of the output gap on total surplus as institutional quality changes for each of the two groups of countries separately, and to examine the statistical significance of the marginal effect across institutional quality intervals.

To investigate the relationship between institutional quality and cyclical behaviour, we estimated the following equation using panel data for 182 countries over the period 1995–2015:

$$sl_{it} = \alpha_0 + \alpha_1 sl_{it-1} + \alpha_2 yo_{it} + \alpha_3 qi_{it} + \alpha_4 dev + \alpha_5 yo_{it} qi_{it} + \alpha_6 yo_{it} dev +$$

$$\alpha_7 qi_{it} dev + \alpha_8 yo_{it} qi_{it} dev + \alpha_9 debt_{it-1} + \alpha_{10} \pi_{it} + \mu_t + \varepsilon_{it}, \tag{9}$$

where *sl* is the natural logarithm of the ratio of revenue to expenditure of general government, both expressed as a per cent of GDP, *yo* is the real output gap measured by the natural

logarithm of the ratio of actual to potential GDP at 2010 constant market prices, and *qi* is the government effectiveness quality indicator, which captures institutional quality. We also introduce a set of control variables, including 1-year lagged general government gross debt as a per cent of GDP (*debt*) and inflation (π) measured by the GDP deflator. We express the level of development by a dummy variable *dev* that equals 1 for emerging and developing economies and 0 otherwise, following the IMF's classification of countries. The general specification also includes time-fixed effects (μ_t). Subscripts *i* and *t* denote the countries and time period, respectively.

We calculated potential GDP using World Development Indicators (WDI) data from the World Bank, employing a Hodrick–Prescott filter with a smoothing parameter of 6.25, as recommended for annual data. The data on fiscal policy indicators are sourced from the IMF's World Economic Outlook (WEO) database. The measure of the quality of institutions comes from the World Governance Indicators (WGI) database, which follows the methodology of Kaufmann et al. (2010). The inflation series was taken from the WDI dataset. The data definitions and sources are provided in Table 1, and the corresponding sample statistics are in Table 2.

We expect that the cyclical behaviour of fiscal policy depends on the quality of institutions. In particular, we hypothesise that the fiscal policy would be either procyclical or less countercyclical in countries with weak institutions and strongly anticyclical in those with strong institutions. However, we explicitly distinguish between the influence of the quality of institutions and the stage of development. Thus, we assume the impact of the quality of institutions on the cyclical behaviour of fiscal policy to be dependent on the stage of development, namely, to be different between groups of countries – emerging and developing economies (for brevity referred to as developing countries) and developed ones. With regard to our control variables, we expect the coefficient of lagged *total surplus* to be positive and lie between 0 and 1 and the impact of lagged general government gross debt and current inflation to be positive (Bystrov & Mackiewicz, 2020; Mackiewicz, 2023).

To estimate the dynamic model, we employ as our main technique the difference general methods of moments (GMM) estimator by Arellano and Bond (1991). Originally, this method was designed for small T, large N dynamic panels. Its advantage is the ability to address the problem of the endogeneity of regressors. This technique takes the first difference of the regression equation to remove the unobserved time-invariant effects, and then uses lagged levels of the variables as instruments for the first differences.

However, this technique may not be suitable for macroeconomic panels when T is large relative to N, as this situation entails many instruments, which may lead to biased estimates. Hence, we examine the robustness of our core method results by applying alternative techniques. We report first-differenced GMM without time-fixed effects and run LSDVC bias-corrected fixed effects regressions both with and without time dummies, as implemented by Bruno (2005). As evidenced by Judson and Owen (1999) and Bun and Kiviet (2003), LSDVC outperforms GMM-based estimators in terms of root mean square errors and bias for small and only moderately large cross-sectional dimensions, as in most macro panels (Gootjes et al., 2021). However, we are aware that this method may not be suitable in cases of endogenous and weakly exogenous regressors (Bruno, 2005); hence we treat this approach as a supplementary rather than our main source of results.

Table 1. Data definitions and sources

Variable name	Description	Definition	Source
sl	Total surplus	Natural logarithm of the ratio of general government revenue to general government expenditure, both expressed as percent of GDP.	International Monetary Fund's World Economic Outlook (WEO) database
yo	Output gap	Natural logarithm of the ratio of actual to potential GDP, both expressed at market prices (constant 2010 USD). Potential GDP was calculated from the real GDP using a Hodrick–Prescott filter.	World Development Indicators (WDI) database of the World Bank
qi	Quality of institutions	Government effectiveness indicator. The missing data for 1997, 1999 and 2001 are calculated as means of neighbouring years. The index is normalised to have a mean of 0 and standard deviation equal to 1.	World Governance Indicators (WGI) database, which follows the methodology of Kaufmann, Kraay and Mastruzzi (2010)
debt	Debt	General government gross debt, expressed as percent of GDP.	International Monetary Fund's World Economic Outlook (WEO) database
π	Inflation	GDP price deflator.	World Development Indicators (WDI) database of the World Bank
dev	Developing countries	Dummy variable equal to 1 for emerging and developing economies and 0 otherwise.	International Monetary Fund (World Economic Outlook)

Table 2. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
Full sample: 3163 observations, 182 countries				
sl	−0.07	0.20	−1.15	1.44
yo	0.00	0.03	−0.53	0.25
qi	0.06	1.01	−2.05	2.52
debt	55.07	47.85	0.00	789.83
π	6.47	10.07	−31.57	196.58
Advanced countries: 686 observations, 36 countries				
sl	−0.02	0.16	−0.68	1.23
yo	0.00	0.02	−0.15	0.10
qi	1.52	0.52	0.09	2.52
debt	57.43	40.02	0.00	249.11
π	2.34	2.78	−9.75	24.66
Developing countries: 2477 observations, 146 countries				
sl	−0.08	0.20	−1.15	1.44
yo	0.00	0.03	−0.53	0.25
qi	−0.34	0.70	−2.05	1.66
debt	54.41	49.79	0.00	789.83
π	7.62	11.02	−31.57	196.58

3. Results and discussion

Table 3 shows the estimation results obtained from different econometric methods. Columns (1) and (2) report the main results – the difference GMM estimates, with and without time-fixed effects, respectively. As a point of reference and in order to facilitate comparison with the existing literature, we also provided the results of estimation, where the main dummy variable (*dev*) was skipped altogether. As a robustness check, the next two columns show the LSDVC estimation results, with column (4) taking into account time effects and (5) without them. As the number of instruments in our base regression exceeds the number of cross-sections, we follow the strategy suggested by Roodman (2009) and keep the number of instruments lower than the number of countries. Thus, we perform an alternative estimation running difference GMM without time dummies. The results, presented in column (2) in Table 3, are very similar. Our main results also hold for the LSDVC estimates, presented in columns (3) and (4) in Table 3.

It is important to note that in an interaction model such as this, coefficients on constitutive terms may not be interpreted as unconditional marginal effects (Brambor et al., 2005). Hence, in order to gain an insightful interpretation of the results, we calculated the marginal effect of the output gap on total surplus, conditional on government effectiveness. This was done by calculating the derivate of *sl* with respect to *yo* for both groups of countries[5]:

$$\frac{\partial sl}{\partial yo} = \alpha_2 + \alpha_5 qi + \alpha_6 dev + \alpha_8 qi \times dev \quad \text{for} \ \ dev \in \{0,1\}. \tag{10}$$

Figures 1 and 3 depict the above-mentioned marginal effect in advanced and developing economies, respectively, calculated for the estimation results presented in Table 3, column (1). It should be noted that for our logarithmic measure of fiscal stance, value 1 may be treated as a benchmark that is close to a neutral fiscal policy. This is the case when all revenues are linearly proportional to output gap, while expenditures are cyclically neutral. Any value strongly below 1 should be interpreted as a procyclical fiscal policy, while values significantly above 1 correspond to a countercyclical fiscal stance.

Figure 1 should be interpreted jointly with Figure 2, which shows the distributions of the index of institutional quality. For the advanced economies, the distribution is clearly bimodal, with typical values concentrated around 1 and 2. For *qi* equal to 2, the marginal effect of the output gap on total surplus takes values around 3, which indicates a strongly countercyclical fiscal policy with its stabilising effect on the business cycle. However, for the second modal value of *qi*, around 1, the results are not as promising. The marginal effect becomes negative, indicating that even for a large group of countries classified as developed, the fiscal policy was slightly procyclical, with its effect exacerbating the business cycle fluctuations.

In the group of emerging economies, the picture is less blurred and, surprisingly, somewhat optimistic. Typically, the index of institutional quality *qi* takes values between –1 and 0 in these countries. As Figure 3 shows, the marginal effect of the output gap on fiscal surplus for these values of *qi* ranges between 0.7 and 1.3, which indicates that developing countries typically run neutral fiscal policies, relying mainly on automatic stabilisers. Only in a minority of cases did the marginal effect fall below the zero level, rendering the fiscal policy strongly procyclical in these economies.

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[5] For clarity, we omit time and cross section subscripts.

Table 3. Estimation results

Method	(1)	(2)	(3)	(4)	(5)
	Diff GMM	Diff GMM	Diff GMM	LSDVC	LSDVC
sl_{t-1}	0.2964*** (0.052)	0.3284*** (0.042)	0.3311*** (0.054)	0.4773*** (0.017)	0.4910*** (0.017)
yo	−4.4337** (2.241)	−5.5519** (2.378)	0.5435** (0.239)	−0.4361 (0.598)	−0.4170 (0.612)
qi	0.0849 (0.169)	0.0055 (0.144)	−0.1406 (0.117)	0.0425 (0.029)	0.0463 (0.029)
dev	0.00001 (0.000)	0.00001 (0.000)			
yo×qi	3.6149** (1.429)	4.6581*** (1.557)	0.2386 (0.229)	0.8482** (0.402)	1.1245*** (0.421)
yo×dev	5.6829** (2.396)	7.3276*** (2.610)		−1.0584* (0.616)	1.2836** (0.642)
qi×dev	−0.2500 (0.212)	−0.0739 (0.189)		−0.0424 (0.033)	−0.0474 (0.034)
yo×qi×dev	−3.0528** (1.365)	−3.6556** (1.455)		−0.9124** (0.426)	−1.0465** (0.436)
$debt_{t-1}$	0.0000 (0.000)	0.0003** (0.000)	0.0001 (0.000)	0.0001* (0.000)	0.0002*** (0.000)
π	0.0044*** (0.001)	0.0045*** (0.001)	0.0055*** (0.001)	0.0024*** (0.000)	0.0029*** (0.000)
Time dummies	yes	no	yes	yes	no
N	2,981	2,981	2,981	3,163	3,163
Number of countries	182	182	182	182	182
AR-1 (p-value)	0.000	0.000	0.000		
AR-2 (p-value)	0.127	0.194	0.055		
Hansen's (p-value)	0.390	0.349	0.171		
Number of instruments	198	179	128		

Note: heteroscedasticity and autocorrelation robust standard errors in parentheses. Asterisks indicate significance at levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Instruments used: sl, yo, yo×qi, $debt_{t-1}$, yo×qi×dev, lags 2 and 3.

An interesting result from this study is that the slopes of the two curves that depict the marginal effect of the output gap on total surplus differ significantly. Figure 4 shows both curves using the same scale, truncating them only for the range where the two-tailed 95% confidence interval lies above the zero line. In the group of advanced economies, the marginal effect of the output gap on total surplus is positive and statistically significant only for higher levels of institutional quality. In contrast, in the group of developing countries, the analysed effect is positive and statistically significant in the middle range of institutional quality indicator values. What is most interesting in this general picture is the substantial difference between the slopes of the two graphs. For advanced economies, the point estimate of the slope is 3.6, which means that an increase of institutional quality by 1 standard deviation is
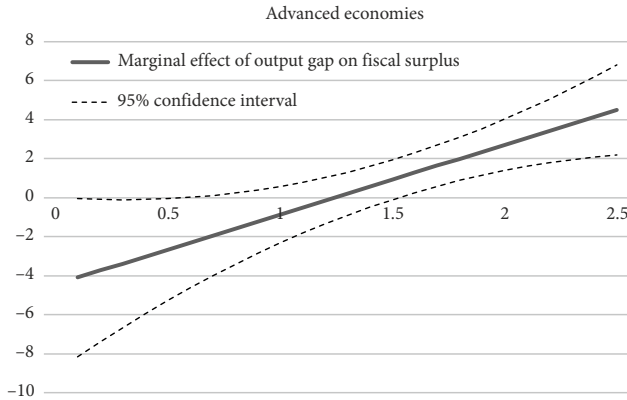
Figure 1. Marginal effect of the output gap on total surplus conditional
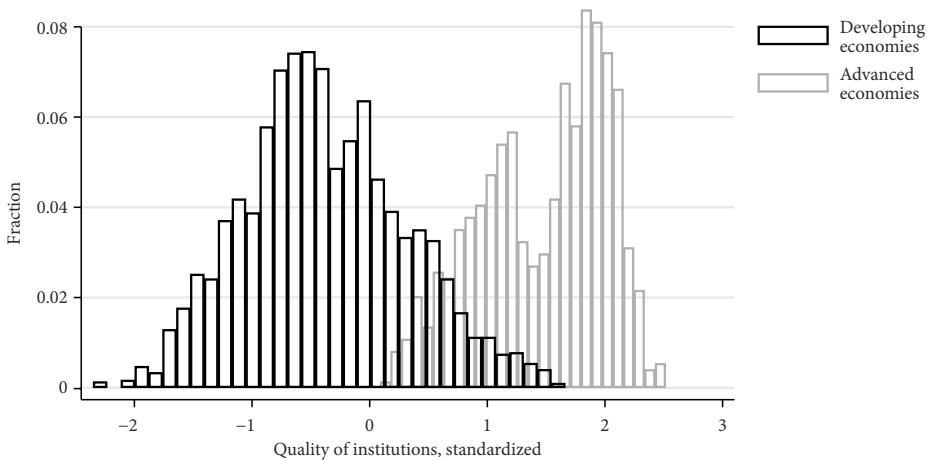on government effectiveness in advanced countries

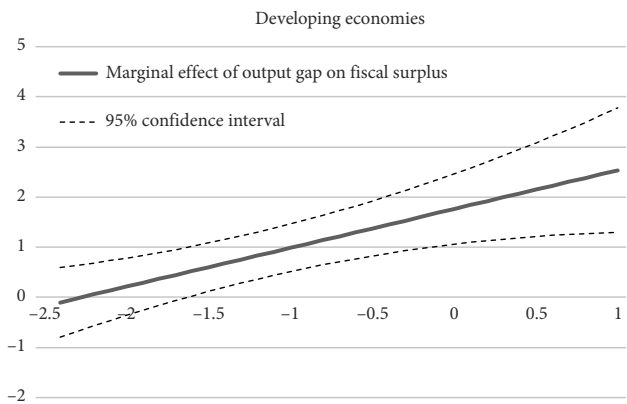Figure 2. Distribution of the standardized indicator of institutional quality

Figure 3. Marginal effect of the output gap on total surplus conditional
on government effectiveness in developing countries

coupled with a stronger countercyclical fiscal policy – the overall measure of the cyclicality of fiscal policy $\varepsilon_S + \kappa_0$ (Eq. (8)) increases by 3.6, *caeteris paribus*[6]. However, this effect is much less accentuated in the developing economies. Figure 4 shows that the corresponding marginal effect curve is almost flat in this group of countries. The point estimates (Table 3, column (1)) show that $\varepsilon_S + \kappa_0$ is lower by about 3.0 in the emerging economies than in the developed ones, effectively getting this slope close to 0 (the Wald test confirmed this result at 5% signficance level). This result suggests that while the relationship between institutional quality and the indicator of fiscal cyclicality is strong in advanced economies, it becomes weak in developing countries. This seriously undermines the notion that improving institutions in poorer countries is a surefire way to improve fiscal policy and revert it from pro- to countercyclical. On the other hand, such an improvement may not be necessary. As we can see, the fiscal policy in these countries proved to be quite close to what has been prescribed from normative studies (in terms of its cyclical properties) when differences in terms of the size of the public sector are taken into account.

Our findings are consistent with those obtained by Kassouri and Altıntaş (2021) for the cyclicality of fiscal policy in countries that are characterized by high level of institutional quality. However, there are also important differences between this study and their results. In their analysis the positive relationship between institutional quality and fiscal policy being countercyclical is uniform across the whole sample. Our study suggests that this (implicit) restriction is not valid. The strength of this relationship varies considerably between developed and developing countries. Also, cited authors show that fiscal policy tends to be procyclical in countries characterized by lower-quality institutions. According to our results, this may not be the case. While, indeed, there is some degree of procyclicality among the developing countries with weak institutions, in the majority of developing countries fiscal policy is mostly neutral. It should be noted, however, that part of these differences may be result of the fact that our analysis differs in terms of the cross-sectional and time dimensions, as well as
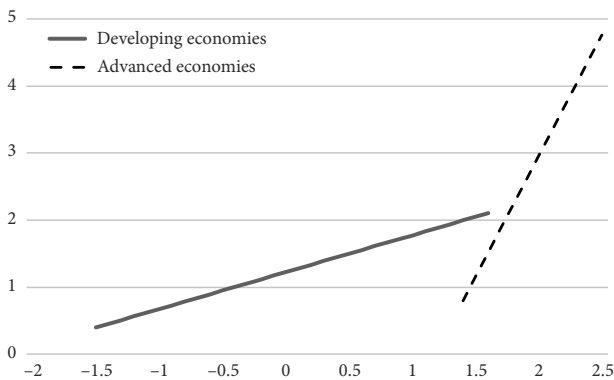

Figure 4. Marginal effects of the output gap on total surplus conditional
on government effectiveness, significant at 95% level

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[6] This magnitude is considerably smaller in the LSDVC-based estimations, albeit they remain statistically significant. Due to the potential endogeneity problems that LSDVC estimators are not designed to deal with, we rely on the difference GMM estimates.

the institutional quality and fiscal policy indicators used. Also, contrary to the specification used by Calderón et al. (2016), we controlled for the impact of inflation, general government gross debt, and the size of the public sector.

The anticyclical stance of fiscal policy evidenced by our study is partly consistent with the empirical work of Frankel et al. (2013), who reported a recent change from pro- to anti-cyclical fiscal policy in developing economies. They interpret that this result is a consequence of institutional advancement of these countries. In the light of our work, this interpretation becomes less founded: while fiscal policy in these countries turns out to be mostly neutral with respect to the business cycle, the relationship between institutions and fiscal properties remains weak. Hence, there might be other factors at play that may be responsible for observed shift, not necessarily the institutional improvement. In line with the literature, these factors may include public debt, terms of trade volatility, polarisation of preferences (Priewe, 2020; Yabré & Semedo, 2021; Jaillet & Pfister, 2022), or even levels of corruption (Bausch, 2019).

Our results support the observations made by Gootjes and de Haan (2022) that while there is a link between institutions and fiscal cyclicality in the European Union member countries, only countries with the strongest institutions in this group can achieve strong countercyclicality. In our sample, a similar phenomenon can be observed in the group of developed countries. This group consists of two sub-groups. In the first one, the index of fiscal institutions is close to 1, which in turn is linked to elasticity being close to –1, which in turn results in strong procyclicality. In these countries budgetary policy has a destabilizing effect, further exacerbating economic fluctuations. In the second sub-group, with index of fiscal institutions around 2, the quasi-elasticity of fiscal surplus exceeds 2, which denotes fiscal policy being strongly countercyclical, extending the effect of automatic stabilizers by additional discretionary measures. However, our results show that these observations cannot be easily extended to developing countries. Since in the latter group the overall relationship is significantly weaker, better institutions in these countries do not contribute to stronger fiscal countercyclicality to the same extent as in the sample examined by Gootjes and de Haan (2022).

The main empirical finding of this study can be interpreted in several ways, albeit at this point we are not able to find any of the interpretation fully satisfying from both theoretical and empirical point of view. One possible explanation of the observe phenomenon is the potential non-linearity of the relationship. Since less-developed countries tend to have, on average, weaker institutions than developed ones, a non-linear relationship could potentially lead to the regularity that we observed. However, adding second and third power to the measure of institutions (not reported here) did not yield statistical significance of the corresponding parameters. Another possibility is that, truly, the quality of institutions is of limited importance in determining the cyclical quality of fiscal policy in less-developed countries. These countries may encounter different limitations to their conduct of fiscal policy, such as limited access to borrowing or additional political instability that hinders the countercyclicality of fiscal policy, but was not captured by the institutional measures that we used in the empirical analysis.

Conclusions and limitations

In this paper, we examined the relationship between quality of institutions and the conduct of fiscal policy over the business cycle. We demonstrated that countries with better institutions tend to shape fiscal policy in a more stabilising manner. In line with the normative prescription, they manage to increase deficits in periods of economic turmoil and generate surpluses (or be close to surpluses) during economic upturns. However, our study revealed a puzzle. The relationship is quite strong only in the group of developed economies. In emerging and developing economies, stronger institutions turn out to be only weakly (albeit in a statistically significant manner) correlated with proper, countercyclical reactions of fiscal policy to the business cycle. This result presents a challenge to the conventional prescription, according to which improving institutions in less-developed countries is a way to make their fiscal policies more countercyclical over the business cycle.

Obviously, there are some limitations to this study that, while, in our view not invalidating its main results, should be noted. The first possible limitation results from our approach to measuring the cyclical behaviour of fiscal balance. In this task the researcher inevitably faces trade-offs between methodological feasibility, economic sense and statistical correctness. To our knowledge, there is no one and optimal way to discern cyclical and structural components – it is always, to some degree, a result of the researcher's discretion. Some authors argue in favour of focusing only on fiscal expenditures and neglect the revenue side of fiscal balance, since it is difficult to decompose the revenues into structural and cyclical component. However, in our view, such an approach suffers from two problems. One is that expenditures are subject to cyclical effects, such as social and unemployment-related expenditures, so the original problem, albeit reduced, is not eliminated. More importantly, a significant part of governments' fiscal actions refers to taxes and social contributions, which can be widely observed in the governments' efforts aimed at combatting the economic effects of the Covid pandemics. Limiting observations to expenditures only does not allow the researcher to account for these measures. Of course, there are other ways to measure fiscal stance, such as using fiscal data that are explicitly corrected for the effects of the business cycle. However, to our knowledge, none of the available methodologies that have been available earlier accounts for the differences in the size of public sector, hence we decided to apply the log-based approach proposed in this paper.

Also, an irregularity that calls for further exploration is the bimodal distribution of the quality of institutions observed among the developed countries. Bimodality is usually an indicator of internal, unaccounted variation of a phenomenon. Analysing the possible links between this variation and the cyclicality of fiscal policy is another field that, while promising, extends beyond the scope of this paper and creates a promising venue for further research.

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