Received: 6 June 2020 | Accepted: 20 April 2021

DOI: 10.1111/ecin.13008

ORIGINAL ARTICLE

Economic Inquiry

Fiscal space and the procyclicality of fiscal policy: The case for making hay while the sun shines

Asif Ahmad[1] | **Richard McManus**[2] | **F. Gulcin Ozkan**[3]

[1]Department of Economics and Related Studies, University of York, York, UK

[2]Christ Church Business School, Canterbury Christ Church University, Canterbury, UK

[3]King's Business School, King's College London, London, UK

Correspondence
F. Gulcin Ozkan, King's Business School, King's College London, Bush House, 30 Aldwych, London WC2B 4BG, UK.
Email: gulcin.ozkan@kcl.ac.uk

Abstract

Utilizing data from 133 countries over the period 1950–2014, we identify fiscal space as a key factor underlying the cyclicality of fiscal policies. We find that less fiscal space induces greater fiscal procyclicality and show that this relationship is nonlinear; countries in the bottom tail of the fiscal space distribution need to make significant improvements before they can perform countercyclical policy. Given the increasingly dominant role of fiscal action in downturns, as is highlighted during the Covid-19 crisis, these findings clearly indicate the importance of building fiscal space in good times to provide capacity for countercyclical policy in bad times.

KEYWORDS
fiscal cyclicality, fiscal policy, fiscal space, recession

JEL CLASSIFICATION
E62, H50, H68

1 | INTRODUCTION

How should fiscal policy be conducted to stabilize the economy over the business cycle? The Keynesian model of the business cycle suggests that fiscal authorities should conduct countercyclical fiscal policy that is contractionary during periods of expansion and expansionary during downturns to stabilize output fluctuations. In contrast, according to the Neoclassical theory, fiscal policy should aim to minimize distortions, and thus should remain neutral over the business cycle (Barro, 1979). Hence, if fiscal authorities followed Keynesian prescriptions, one should observe a negative correlation between government spending and output over the business cycle, and a positive correlation between tax rates and output. Conversely, those correlations should be essentially zero if fiscal policy is set according to the Neoclassical principles.

Although the success of monetary policy since the early 1990s led some to call for fiscal policy to take a smaller role in macroeconomic management (see e.g., Taylor, 2000), the scale of downturns in the wake of both the global financial crisis and the Covid-19 pandemic warranted a substantial fiscal response. Indeed, a majority of advanced economies offered fiscal support of unprecedented scale following the onset of the pandemic in March, 2020 (IMF Fiscal Monitor, 2021). Moreover, countercyclical fiscal policy is shown to play a significant role in mitigating output losses in downturns. For example, as is documented by Romer and Romer (2018, 2019), the decline in output following a financial

Abbreviations: EGLS, estimated generalized least squares; GMM, generalized method of moments.

crisis varies by as much as between 1% and 10%, depending upon whether countercyclical policy is enacted or not. Similarly, a large number of recent studies utilizing dynamic general equilibrium models establish that fiscal policy is particularly effective during recessionary periods (see e.g., Christiano et al., 2011; McManus et al., 2021). Empirical evidence has also been mounting on the heightened effectiveness of fiscal policy in bad times (see e.g., Auerbach & Gorodnichenko, 2013a, 2013b).

Such evidence calls for a fiscal policy stance aiming to smooth out the business cycle fluctuations; expansionary in downturns and contractionary in booms. Surprisingly, however, the empirical evidence consistently reveals that fiscal policy has been expansionary during booms and contractionary in recessions in many countries (Alesina et al., 2008; Gavin & Perotti, 1997; Ilzetzki & Végh, 2008; Kaminsky et al., 2004). It is also shown that such procyclical policies amplify fluctuations in real output, leading to prolonged recessions in bad times and inflationary pressures in good times, creating substantial macroeconomic instability (McManus & Ozkan, 2015). There is also widespread evidence that, in contrast to advanced nations, developing countries have long been following procyclical fiscal policies—expansionary (contractionary) in good (bad) times—a major source of fragility for these economies (Frankel et al., 2013; Lane, 2003; Talvi & Vegh, 2005; Thornton, 2008; Vegh & Vuletin, 2015).

Motivated by the importance of countercyclical fiscal policy in limiting business cycle fluctuations and the widespread evidence on fiscal procyclicality, this paper addresses two major issues. First, we document that, interestingly, fiscal procyclicality has been falling in low and middle-income countries whereas high-income countries returned to procyclical behavior in the aftermath of the global financial crisis, indicating that the tables have turned between the two sets of countries in recent years. Second, we examine the role of fiscal space as a major source of variation in fiscal cyclicality and provide an explanation for this reversal of fortune.

Fiscal space is defined as a government's room for maneuver in providing resources, either by raising expenditure or by reducing taxes, without undermining the sustainability of its fiscal position. Following a fiscal expansion, fiscal sustainability may be put at risk if the country in question faces a steeply rising cost of borrowing, jeopardizing its ability to service debt. The lack of fiscal space is therefore expected to limit the ability of policy makers to conduct countercyclical fiscal policy. It is also clear that a country's fiscal space is likely to be associated with its current fiscal standing represented by, for example, its fiscal balance and borrowing as a proportion of GDP. We utilize a set of such indicators to quantify fiscal space in our empirical analysis.

Utilizing data from 133 countries over the period 1950–2014 and a variety of empirical methods to estimate fiscal cyclicality yields a number of novel results with clear policy implications. First, we establish that less fiscal space induces greater fiscal procyclicality—a result consistent across different empirical specifications, a number of fiscal space measures, and a battery of robustness checks. Second, we show that the impact of fiscal space on fiscal procyclicality has increased over time, particularly in the aftermath of the global financial crisis when the estimated impact more than doubled. Given the reduction in fiscal space in high-income countries in this period (which we also document), this finding provides one explanation why advanced economies returned to procyclicality in the aftermath of the financial crisis. Third, and importantly, we find that the relationship between fiscal space and fiscal procyclicality is nonlinear; countries which are at the bottom end of the fiscal space distribution need to make significant improvements before they are able to perform countercyclical policy. When combined with the increasingly significant need for fiscal policy during economic downturns, as is currently experienced by a large number policymakers across the globe, our results point to the key importance of building fiscal space in good times to provide capacity for countercyclical policy in bad times.

The rest of this paper is organized as follows. Section 2 provides an analysis of fiscal cyclicality across country income-groups and over time on the basis of correlations between government consumption and output. Section 3 describes the estimation method and our data and presents the formal estimation of the relationship between fiscal space and fiscal cyclicality using Generalized Method of Moments (GMM) and Estimated Generalized Least Squares (EGLS) methods. Section 4 examines the impact of fiscal space on fiscal cyclicality over time, the robustness checks for which are presented in Section 5. Finally, Section 6 concludes.

2 | FISCAL PROCYCLICALITY

2.1 | Fiscal procyclicality over time

We start by examining the cyclical properties of fiscal policy over time. The simplest measure of fiscal cyclicality is the correlation between the cyclical components of government consumption and output. We first consider 15-year rolling

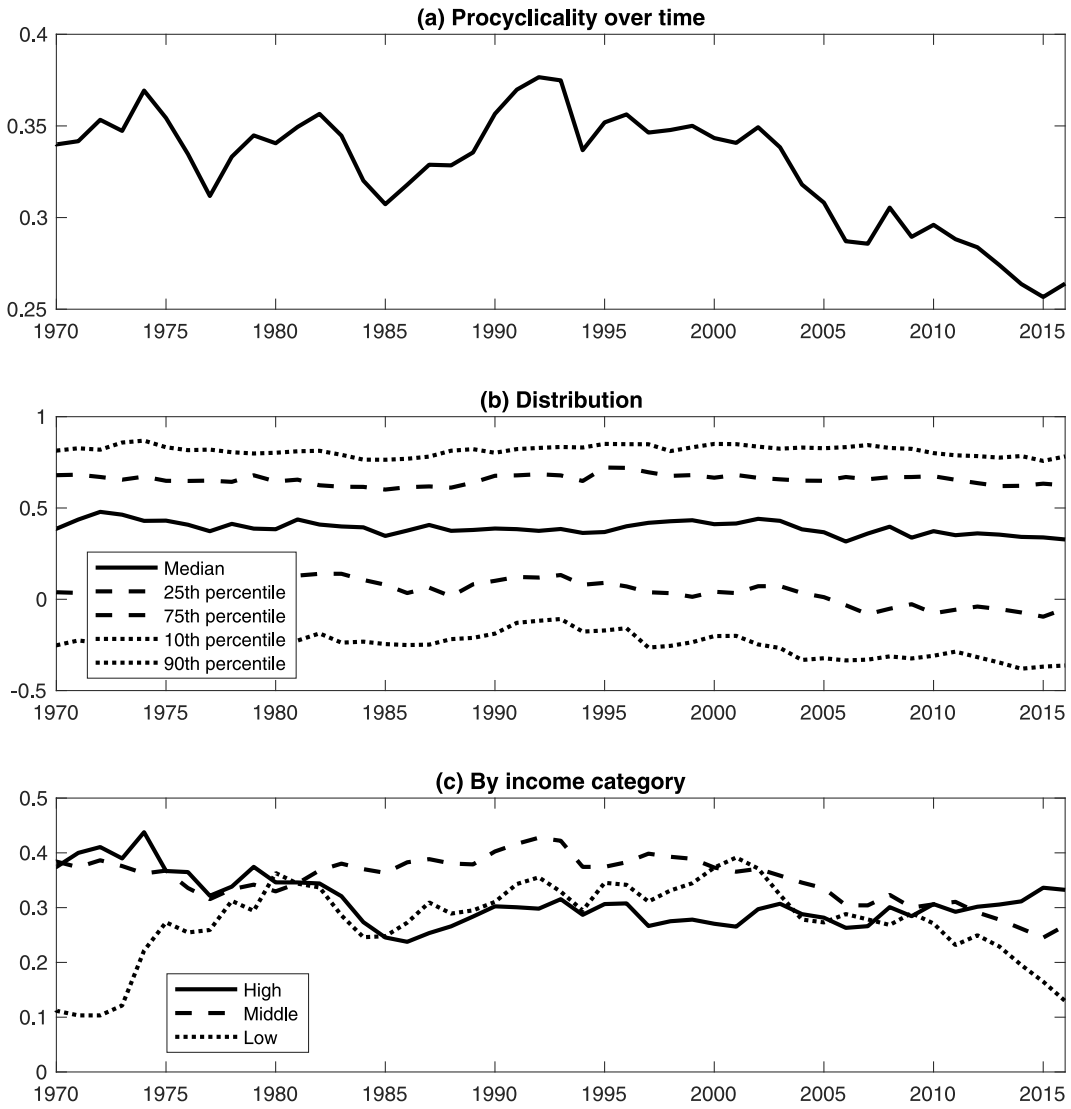

FIGURE 1 Fiscal procylicality over time. Fiscal procyclicality measured as the correlation between the cyclical components of government consumption and output using 15-year rolling windows. Panel (a) presents the average for all countries over the sample; Panel (b) presents particular points in the distribution of fiscal procyclicality, as identified by the legend; and Panel (c) by different income groups as classified by the World Bank.

correlation coefficients between the two, as presented in Figure 1.[1] Panel (a) illustrates that between 1970 and 1990 fiscal policy was noticeably procyclical with significant volatility in the level of procyclicality in which there has been a steady decline since 1990—a move toward countercyclical policy. Panel (b) demonstrates that much of the decline in the level of procyclicality since 1990 has come from the 10% of countries with the most countercyclical policy, as opposed to a shift across the whole population toward more countercyclical policy. Indeed, there has been limited variability in the median level of procyclicality throughout the sample period.

Panel (c) of Figure 1 presents a similar analysis, displaying the fiscal cyclicality of three broad categories of countries following the World Bank classification. It is clear from Panel (c) that throughout the 1980–2000s high-income countries had the lowest levels of fiscal procyclicality, as is widely argued (see e.g., Frankel et al., 2013). Yet, the middle- and low-income countries have been becoming progressively less procyclical (reconciling with Panel (a)). More interestingly, there has been a reversal of fortunes between country groupings since the start of the global financial crisis (henceforth "GFC"); it is the high-income countries providing the highest level of fiscal procyclicality since 2008. That is, some low-and-middle-income countries have been "graduating" from fiscal procyclicality to countercyclicality between the periods 1960–1999 and 2000–2009, and the high-income countries responded to the GFC in a procyclical fashion (see e.g., Céspedes & Velasco, 2014; Frankel et al., 2013; McManus & Ozkan, 2015).

2.2 | Fiscal procyclicality and graduation

Frankel et al. (2013) similarly look at fiscal procyclicality over time and conclude that many developing countries have graduated from fiscal procyclicality and now pursue countercyclical policies; this is consistent with the results in Figure 1 showing a trend of middle- and low-income countries becoming less procyclical with time. This conclusion is reached in Frankel et al. (2013) in a sample of 94 countries over the period 1960–2009, by assessing fiscal cyclicality over the periods 1960–1999 and 2000–2009; those countries deemed to have graduated were those who conducted procyclical policy in the early period (during 1960–1999) and countercyclical policy in the later period (during 2000–2009).

Performing the same analysis as Frankel et al. (2013) with our data set (which is both longer in time series and contains more countries) provides a similar number of countries who have "graduated" from procyclical fiscal policy (27% of countries compared with 28% in Frankel et al., 2013) but far fewer "established graduates," those who were fiscally countercyclical in the time period both before and after 2000. We find only 3% of countries being established graduates, unlike Frankel et al. (2013) where 15% are in this category; this is driven by the movement toward more procyclical fiscal policy by high-income countries from 2010 onwards, as is evidenced in Panel (c) of Figure 1.

Using paired t-tests comparing country-specific procyclicality statistics computed over different time horizons, we evaluate the statistical significance of the differences in fiscal procyclicality across different country groupings. Middle- and low-income countries have statistically significant lower levels of fiscal procyclicality between 2000 and 2016 relative to 1950–1999 (0.038, 0.021), 1960–1999 (0.035, 0.013), and 1980–1999 (0.051, 0.004), with *p*-values from the paired t-tests presented in parentheses for middle- and low-income countries, respectively. For high-income countries, the increase in fiscal procyclicality from the period 1980–1990s to 2000–2016 is not statistically significant, which is intuitive given the small changes observed in Panel (c) of Figure 1. Looking at individual countries, whereas two-thirds and three-fifths of low- and middle-income countries have become less procyclical between before and after 2000, only half of all high income countries have in the same time period. This is consistent with the averages presented in Figure 1; whereas low- and middle-income countries have been successful in reducing fiscal procyclicality, high-income countries have had mixed results.

3 | ESTIMATING FISCAL CYCLICALITY

3.1 | Fiscal space and fiscal cyclicality

Fiscal space, as is defined earlier, refers to the ability to pursue an active stabilization policy without undermining fiscal sustainability (see, e.g., IMF, 2018). As such, it is clear that the limit of fiscal space will also define the limit of countercyclical fiscal action, hence preparing the ground for procyclical fiscal policy. There are two main channels through which fiscal space impacts upon the cyclicality of fiscal policy. The first operates through financial constraints, particularly during economic downturns when a lack of fiscal space will increase the cost of financing additional expenditure. Financing constraints may impede market access completely or force borrowing at prohibitive rates, significantly undermining fiscal sustainability and hence dampening the capacity to enact expansionary fiscal policy (see e.g., Kaminsky et al., 2004; Romer & Romer, 2018).

The second channel through which fiscal space is likely to influence the course of fiscal policy over the business cycle arises from political economy constraints, particularly in good times (Alesina et al., 2008; Woo, 2009). For example, when output is above its trend, one would expect automatic stabilizers to facilitate an improved fiscal position and hence stronger fiscal space; however, pressures on policymakers to spend the surplus prevents such a boost to public finances, preventing the accumulation of resources to be spent in bad times. Moreover, the greater the scale of the political economy constraints (such as political instability, ethnic and religious polarization, high income and education inequality), the greater the pressure to spend away the surplus, hence the smaller the capacity to pursue expansionary fiscal policy when bad times arrive. In sum, we would expect the variation in fiscal space to have a significant influence on the cyclicality of fiscal policy.

3.2 | Methodology

We now turn to formally estimating the relationship between fiscal space and fiscal cyclicality by adopting the following specification:

$$HPG_{i,t} = \alpha + \beta HPY_{i,t} + \gamma FS_{i,t-1} + \delta_1\left(HPY_{i,t} \times FS_{i,t-1}\right) + \zeta HPG_{i,t-1} + \eta X_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $HPG_{i,t}$ is the cyclical component of growth in government consumption for country i in time t; $HPY_{i,t}$ is the cyclical component of output growth; $FS_{i,t}$ is fiscal space for which we use four alternative indicators; and vector $X_{i,t}$ is the set of other potential determinants of government consumption and its cyclicality. As is common to most macroeconomic panels, there are three potential issues with estimating Equation (1). First, fiscal space and government consumption may be endogenous such that the former might be both the cause and effect of the latter; second, time-invariant characteristics may be correlated with the explanatory variables; and third, the presence of the lagged dependent variable gives rise to potential autocorrelation. Given these three potential issues, we utilize Arellano and Bond (1991) GMM method containing lagged levels of endogenous regressors (predetermined and hence uncorrelated with the error term). In this estimation, country-specific fixed effects are eliminated by taking the first difference of the regression equation. Furthermore, the lagged dependent variable is also instrumented with its past levels to address the issues of autocorrelation. The use of the Arellano and Bond (1991) GMM method alleviates the potential endogeneity concern that it is not the business cycle influencing the cyclicality of government consumption, but that the influence of government consumption impacts the economy; that is, a countercyclical policy would appear to be procyclical due to the influence of government consumption on output. The use of the lagged (predetermined) values of $HPY_{i,t}$ in our specifications is also likely to mitigate this concern.

In line with Kaminsky et al. (2004), we measure the fiscal policy stance by investigating the policy instruments rather than outcomes (which are outside the fiscal authorities' control). In principle, there are only two fiscal indicators to measure the cyclicality of fiscal policy: government consumption (as opposed to government spending that comprises debt services and transfers) and tax rates (as opposed to tax revenues which react endogenously to the business cycle). Given the unavailability of cross-country data on the latter, we use government consumption in our empirical analysis.[2] We use government consumption as our benchmark measure of government expenditure; we replace this with government expenditure (including government investment and expenditure on interest payments and transfers) as part of our sensitivity checks in Section 5.

Note that Equation (1) estimates the cyclicality of fiscal policy through the interaction terms with respect to the cyclical component of government consumption (δ_1). Formally, fiscal procyclicality is derived from Equation (1) through $\partial HPG_{i,t}/\partial HPY_{i,t} = \beta + \delta_1 FS_{i,t-1}$, and thus δ_1 estimates the impact of fiscal space on procyclicality. An alternative approach would be to take the correlation coefficients in Figure 1 and use these as a measure of fiscal procyclicality (see e.g., Frankel et al., 2013); however, this approach disregards the possibility that correlation coefficients may be different across countries as discussed in Forbes and Rigobon (2002). More specifically, correlation coefficients will be driven by both the cyclicality of government expenditure and the shocks that drive the business cycle within a country; as shocks will be different by country, comparisons of correlation coefficients cannot themselves be conclusive.

To test for whether the impact of fiscal space on fiscal procyclicality changes over time, we extend the above specification to include both the $FS_{i,1990} \times HPY_{i.t}$ and $\Delta FS_{i.t-1} \times HPY_{i,t}$, the former of which is the measure of fiscal space at the start of time period, and the latter the change in fiscal space relative to this starting point, both interacted with the cyclical component of output:

$$\begin{aligned} HPG_{i,t} = {} & \alpha + \beta HPY_{i,t} + \gamma FS_{i,t-1} + \delta_1\left(HPY_{i,t} \times FS_{i,t-1}\right) \\ & + \theta_1\left(FS_{i,1990} \times HPY_{i,t}\right) + \theta_2\left(\Delta FS_{i,t-1} \times HPY_{i,t}\right) + \zeta HPG_{i,t-1} + \eta X_{i,t} + \varepsilon'_{i,t} \end{aligned} \quad (2)$$

In Equation (2), θ_1 captures the impact of the starting level of fiscal space on fiscal cyclicality; a negative θ_1 indicates that lower initial fiscal space leads to more procyclical fiscal policy. Similarly, θ_2 provides an estimate of the impact of fiscal space on procyclicality over time, relative to this initial starting level; a negative θ_2 estimates that even more fiscal space is required (relative to 1990) in order to conduct countercyclical policy. A similar specification is used in Frankel et al. (2013) to estimate the impact of institutional quality on fiscal procyclicality.

Finally, we extend Equation (1) to allow for a non-linear impact between fiscal space and procyclicality:

$$\begin{aligned} HPG_{i,t} = {} & \alpha + \beta HPY_{i,t} + \gamma FS_{i,t-1} + \delta_1\left(HPY_{i,t} \times FS_{i,t-1}\right) + \delta_2\left(HPY_{i,t} \times FS^2_{i,t-1}\right) \\ & + \zeta HPG_{i,t-1} + \eta X_{i,t} + \varepsilon''_{i,t} \end{aligned} \quad (3)$$

where the combinations of δ_1 and δ_2 estimate the potentially non-linear impact of fiscal space on fiscal procyclicality. Note fiscal procyclicality is measured in Equation (3) through $\partial HPG_{i,t}/\partial HPY_{i,t} = \beta + \delta_1 FS_{i,t-1} + \delta_2 FS^2_{i,t-1}$ and thus the impact of fiscal space on fiscal procyclicality is identified by $\partial[\partial HPG_{i,t}/\partial HPY_{i,t}]/\partial FS_{i,t-1} = \delta_1 + 2\delta_2 FS_{i,t-1}$. To illustrate the combination of these estimates (including bootstrapped confidence intervals), we plot the estimated effect across the distribution of fiscal space.

3.3 | Data

We use data from 133 countries for the period 1970–2014.[3] Data on nominal government consumption (G) and output (Y) are taken from the World Bank (WDI) where possible and are supplemented with data from IMF IFS otherwise; we convert these into real values using a CPI index from IFS. Data for the variable *InitialGDP* are taken from the Penn World Tables (6.3).

To measure fiscal space, we utilize four indicators: fiscal balance as a proportion of GDP (FS^{FBY}); general government gross debt as a proportion of GDP (FS^{GGDY}); the cyclically adjusted balance as a proportion of potential GDP (FS^{CBY}); and the fiscal balance as a proportion of average tax revenues (FS^{DFFB}). These measures encompass both short (FS^{FBY}, FS^{CBY}, and FS^{DFFB}) and long run (FS^{GGDY}) indicators, and are based on alternative methods of controlling for the business cycle. All four indicators are intended as alternative measures of the ability of a government to service its debt, as is also highlighted by Kose et al. (2017) as an underlying criterion in their set of fiscal space variables. This variety of measures provides an additional robustness check on our results. A cumulative normal distribution transformation is used to convert each variable to a (0, 1) value to reduce the impact of outliers. In each case, the mean and standard deviation of each fiscal space variable within a country-income classification group as per the World Bank (i.e., those used in Panel (c) of Figure 1) is used for this transformation; a similar approach is adopted by Romer and Romer (2018).

4 | FISCAL PROCYCLICALITY AND FISCAL SPACE

4.1 | The impact of fiscal space on fiscal procyclicality

As a baseline, we estimate a simple correlation between cyclical government consumption and cyclical output, conditional on lagged fiscal space; results for which can be found in columns (1), (4), (7), and (10) of Table 1. Countries are observed, on average, to conduct procyclical fiscal policy, as demonstrated by the positive and strongly statistically significant coefficients on the HPY_t estimates. Moreover, less fiscal space is estimated to lead to lower levels of government consumption. Our benchmark results from utilizing Equation (1) are presented in Table 1 under both the EGLS and the Arellano and Bond (1991) GMM specification for each fiscal space variable. We use the log of GDP per capita in 1970 ("*InitialGDP*") interacted with the cyclical component of output (HPY_t) as a control variable (X in Equation (1)); this is line with the literature where it is frequently found that countries with higher incomes have lower levels of fiscal procyclicality (see e.g., Alesina et al., 2008; Woo, 2009). We use this as our only control variable in our benchmark specifications, although this is extended in Section 5.

As is clear from all specifications in Table 1, less fiscal space leads to higher levels of fiscal procyclicality and these estimates are highly statistically significant, as illustrated by the estimates on the $FS_{i,t-1} \times HPY_{i.t}$ coefficient. Note that in one of the fiscal space variables (FS^{GGDY}: columns (4)–(6)) a higher number represents less fiscal space (as this represents higher debt) but in all others the reverse is true, that a higher number represents higher fiscal space. These effects are estimated to be stronger and more statistically significant when controlling for endogeneity and autocorrelation in the GMM specifications; further the diagnostics from these specifications (presented in the bottom half of Table 1) illustrate that there is insufficient evidence to suggest that the instruments are not valid nor that they suffer from autocorrelation. There is strong evidence to suggest that less fiscal space leads to more procyclical behavior and this result is neither sensitive to how fiscal space is measured nor to the estimation technique.

TABLE 1 Fiscal procyclicality and fiscal space

FS variable	(1) EGLS FS^{FBY}	(2) EGLS FS^{FBY}	(3) GMM FS^{FBY}	(4) EGLS FS^{GGDY}	(5) EGLS FS^{GGDY}	(6) GMM FS^{GGDY}	(7) EGLS FS^{CBY}	(8) EGLS FS^{CBY}	(9) GMM FS^{CBY}	(10) EGLS FS^{DFFB}	(11) EGLS FS^{DFFB}	(12) GMM FS^{DFFB}
InitialGDP $\times HPY_t$	-	−0.287*** (0.070)	−0.399*** (0.000)	-	−0.148*** (0.057)	−0.256*** (0.000)	-	−0.367*** (0.076)	−0.484*** (0.001)	-	−0.248*** (0.073)	−0.320*** (0.000)
HPG_{t-1}	-	0.510*** (0.020)	0.455*** (0.000)	-	0.501*** (0.021)	0.216*** (0.000)	-	0.518*** (0.021)	0.456*** (0.000)	-	0.509*** (0.020)	0.464*** (0.000)
HPY_t	0.450*** (0.062)	1.633*** (0.293)	2.102*** (0.001)	0.391*** (0.060)	0.715*** (0.222)	1.364*** (0.000)	0.476*** (0.056)	1.918*** (0.331)	2.438*** (0.003)	0.413*** (0.056)	1.392*** (0.367)	1.668*** (0.001)
FS_{t-1}	−0.011*** (0.004)	0.006** (0.003)	0.009*** (0.000)	0.015*** (0.003)	−0.011*** (0.003)	−0.002*** (0.000)	−0.018*** (0.003)	0.003 (0.003)	70.010*** (0.000)	−0.008 (0.009)	0.016 (0.009)	0.017*** (0.000)
$FS_{t-1} \times HPY_t$	-	−0.522*** (0.169)	−0.563*** (0.001)	-	0.264** (0.122)	0.143*** (0.000)	-	−0.406** (0.182)	−0.522*** (0.002)	-	−0.300 (0.312)	−0.289*** (0.000)
Adjusted R^2	0.0487	0.3377	-	0.0588	0.3486	-	0.0661	0.3532	-	0.0423	0.3323	-
Observations	2767	2767	2635	2487	2487	2357	2567	2567	2445	2767	2767	2635
Countries	132	132	132	130	130	130	122	122	122	132	132	132
J-statistic	-	-	0.468	-	-	0.507	-	-	0.947	-	-	0.969
AR(1) m-statistic	-	-	0.887	-	-	0.190	-	-	0.989	-	-	0.890
AR(2) m-statistic	-	-	0.872	-	-	0.589	-	-	0.983	-	-	0.802

Note: Dependent Variable HPG_t. EGLS estimations are performed using cross-sectional country-fixed effects and a cross-sectional weighting matrix. GMM estimations are performed using White period instrument weighting matrix (AB *n*-step); for both GMM and EGLS estimation, White heteroscedasticity-consistent standard errors are presented in parentheses. Instrumental variables are sets composed of lagged regressors and dependent variable. Set 1 is composed of lags of Fiscal Space from 3 to 6, lag of $FS_{t-1} \times HPY_t$ from 3 to 6, lag of HPG_t from 2 to 6, lag of HPY_t from 2 to 6. Set 2 is composed of lags of Fiscal Space from 5 to 7, lag of $FS_{t-1} \times HPY_t$ from 3 to 9, lag of HPG_t from 5 to 7, lag of HPY_t from 5 to 7. Set 3 is composed of lags of Fiscal Space from 3 to 7, lag of $FS_{t-1} \times HPY_t$ from 2 to 5, lag of HPG_t from 2 to 5, lag of HPY_t from 2 to 5. Set 4 is composed of lags of Fiscal Space from 3 to 6, lag of $FS_{t-1} \times HPY_t$ from 3 to 6, lag of HPG_t from 2 to 5, lag of HPY_t from 2 to 5. GMM estimations Columns (3), (6), (9), and (12) were performed using instrumental variable Set 1, Set 2, Set 3, and Set 4, respectively. "J-statistic" presents *p*-value of a Sargan–Hansen test; and "*AR*(*x*) m-statistic" presents *p*-values for an Arellano–Bond test where the null hypothesis is that there is no autocorrelation in the specification. All regression specifications include intercept term. Level of significance: ***1%, **5%, *10%.

Abbreviations: EGLS, Estimated Generalized Least Squares; GMM, Generalized Method of Moments.

4.2 | The impact of fiscal space on fiscal procyclicality over time

To test whether the impact of fiscal space on fiscal procyclicality has changed over our sample period, we estimate Equation (2) for each of the fiscal space variables for the whole sample, and for pre and post-GFC periods, separately.[4] We use EGLS estimation given the difficulty in finding instruments for $\Delta FS_{t-1} \times HPY_t$ (unlike $FS_{t-1} \times HPY_t$).[5] The estimation results are presented in Table 2. In all specifications, the statistically significant benchmark result from above is maintained: less fiscal space leads to more procyclical fiscal policy, observed from the combination of results from the $FS_{1990} \times HPY_t$ and $\Delta FS_{t-1} \times HPY_t$ variables. The coefficient attached to the former (θ_1) provides an estimate of the importance of the initial level of fiscal space and to the latter (θ_2) the change of fiscal space from this initial position. Furthermore, we observe that this impact is stronger during the post-GFC period (observed from comparing results $\Delta FS \times HPY_t$ when estimated in the two subsamples).

The estimated impact of fiscal space on fiscal procyclicality more than doubles during the period of the post-GFC period relative to before, for all four fiscal space measures. This suggests that a lack of fiscal space was more detrimental to economies in conducting countercyclical policy during the period of the Great Recession. This reconciles with the increased emphasis on large budget deficits and growing government debt in policy debates during economic downturns. Also note that the estimation for the post GFC period is the only one where the control variable of initial GDP interacted with the cyclical component of output ($InitialGDP \times HPY_t$) is not statistically significant. For the other time periods in Table 2 (and in the results from Table 1), high-income countries were estimated to be less procyclical, holding all else constant, consistent with previous literature (see e.g., Alesina et al., 2008; Woo, 2009). In the post-GFC period, this is no longer true and this reconciles with Figure 1.

4.3 | Nonlinearity in the fiscal space-fiscal cyclicality relationship

Our findings above establish that fiscal space plays a significant role in enabling countercyclical fiscal policy, and that this impact is amplified in the post-GFC period. We now re-estimate Equation (3) allowing for a nonlinear impact of fiscal space on fiscal procyclicality; results are presented in Table 3.[6] Using the point estimates and standard errors in these specifications, we illustrate the impact of fiscal space on fiscal procyclicality through double-differentiating Equation (3) with respect to HPY_t and FS_{t-1} and bootstrapping 95% confidence intervals; the results are presented in the first row of Figure 2.

With three of the four fiscal space variables, there is statistically significant evidence of a non-linear relationship.[7] Importantly, for those in the bottom quartile—representing the least fiscal space—small improvements lead to only marginal differences in fiscal procyclicality. That is, small improvements in fiscal space for those who already have little are estimated to have limited impact on fiscal procyclicality; a significant improvement is needed in fiscal space to switch to countercyclical policy.

4.4 | Fiscal procyclicality over time

Our results suggest that: (a) less fiscal space leads to more procyclical behavior (Table 1); (b) this effect is stronger after the GFC than before (Table 2); and (c) the detrimental effects on fiscal cyclicality can be avoided by ensuring fiscal space is above a threshold level (Table 3 and Figure 2.). We now compare fiscal space over time by country income type to reconcile these results back to those observed in Figure 1. The pattern of fiscal cyclicality, as displayed in Figure 1 suggests that high (middle and low) income countries have been becoming progressively procyclical (countercyclical) over time since 2000. This, in turn, implies that high (middle and low) income countries had worsening (strengthening) fiscal space in the latter period, preventing (enabling) countercyclical fiscal action.

To examine whether that has indeed been the case, we now turn to the evolution of fiscal space in our sample period. The bottom two rows of Figure 2 present average fiscal space by middle- and low- (black bars) and high-income countries (gray bars) in the period 1990–2007 (the second row of Figure 2) and in the period 2008–2014 (the bottom row) for the four fiscal space variables.[8] Three broad conclusions can be reached from Figure 2. First, before the GFC the distribution of fiscal space between high- and middle- and low-income countries was approximately the same, especially when considering the range of fiscal space measures; this is illustrated through comparing the gray (high income) and black (middle and low income) histograms in the second row of Figure 2. Second, the period after the

TABLE 2 The impact of fiscal space on fiscal procyclicality over time

FS variable	(1) 1990–2014 FS^{FBY}	(2) 1990–2007 FS^{FBY}	(3) 2008–2014 FS^{FBY}	(4) 1990–2014 FS^{GGDY}	(5) 1990–2007 FS^{GGDY}	(6) 2008–2014 FS^{GGDY}	(7) 1990–2014 FS^{CBY}	(8) 1990–2007 FS^{CBY}	(9) 2008–2014 FS^{CBY}	(10) 1990–2014 FS^{DFFB}	(11) 1990–2007 FS^{DFFB}	(12) 2008–2014 FS^{DFFB}
$InitialGDP \times HPY_t$	−0.218**	−0.217**	−0.099	−0.184***	−0.109	−0.127	−0.365***	−0.356	−0.274**	−0.208**	−0.251***	−0.062
	(0.089)	(0.093)	(0.062)	(0.055)	(0.106)	(0.111)	(0.067)	(0.229)	(0.126)	(0.089)	(0.091)	(0.049)
HPG_{t-1}	0.506***	0.499***	0.265***	0.515***	0.382***	0.217***	0.515***	0.359***	0.261***	0.507***	0.502***	0.262***
	(0.023)	(0.028)	(0.048)	(0.023)	(0.048)	(0.052)	(0.017)	(0.055)	(0.045)	(0.023)	(0.027)	(0.046)
HPY_t	1.445***	1.238***	1.158***	0.913***	0.930*	0.289	1.989***	1.832**	1.912***	1.209***	1.275***	0.196
	(0.351)	(0.394)	(0.359)	(0.216)	(0.508)	(0.459)	(0.269)	(0.861)	(0.676)	(0.404)	(0.423)	(0.379)
$FS^{1990} \times HPY_t$	−0.648***	−0.275	−0.756*	0.173	−0.114	1.247***	−0.559***	−0.048	−0.967*	−0.167	−0.049	1.079
	(0.237)	(0.242)	(0.404)	(0.128)	(0.322)	(0.427)	(0.151)	(0.508)	(0.497)	(0.469)	(0.469)	(0.693)
ΔFS_{t-1}	0.006	0.0003	0.019	−0.011***	−0.019**	−0.072***	0.005**	0.009	−0.002	0.017*	0.003	0.065***
	(0.003)	(0.003)	(0.015)	(0.003)	(0.007)	(0.003)	(0.002)	(0.009)	(0.008)	(0.009)	(0.008)	(0.013)
$\Delta FS_{t-1} \times HPY_t$	−0.528***	−0.261	−1.487***	0.454***	0.425	1.069***	−0.285**	−0.176	−1.335***	−0.651**	−0.537*	−1.045***
	(0.198)	(0.169)	(0.338)	(0.146)	(0.487)	(0.289)	(0.148)	(0.483)	(0.388)	(0.302)	(0.289)	(0.374)
Adjusted R^2	0.3239	0.3671	0.2727	0.3642	0.2415	0.425	0.3444	0.2019	0.2545	0.3286	0.3726	0.2932
Observations	2635	1723	779	2357	1461	766	2445	1599	723	2635	1723	779
Countries	132	131	132	130	128	130	122	121	122	132	131	132

Note: Dependent Variable HPG_t. All specifications are estimated using the Estimated Generalized Least Squares, as outlined in Table 1. All other notes are in line with those underneath Table 1.

TABLE 3 The nonlinear impact of fiscal space on fiscal procyclicality over time

FS variable	(1) FS^{FBY}	(2) FS^{GGDY}	(3) FS^{CBY}	(4) FS^{DFFB}
$InitialGDP \times HPY_t$	−0.255* (0.134)	−0.077 (0.112)	−0.395*** (0.137)	−0.280** (0.124)
HPG_{t-1}	0.386*** (0.059)	0.372*** (0.070)	0.385*** (0.060)	0.387*** (0.060)
HPY_t	1.236** (0.627)	0.193 (0.532)	1.823*** (0.671)	1.151** (0.574)
HPY_t^2	−0.623 (1.342)	−0.675 (2.238)	−0.702 (1.243)	−1.187 (1.357)
FS_{t-1}	−0.03 (0.030)	−0.024 (0.035)	−0.038 (0.026)	−0.048 (0.058)
FS_{t-1}^2	0.041 (0.029)	0.015 (0.029)	0.047* (0.024)	0.066 (0.053)
$FS_{t-1} \times HPY_t$	1.626 (1.078)	2.966* (1.588)	1.508 (1.128)	2.170** (0.949)
$FS_{t-1}^2 \times HPY_t$	−2.030** (0.970)	−2.599* (1.548)	−1.922* (1.095)	−2.434*** (0.768)
Adjusted R^2	0.2372	0.2455	0.2503	0.2394
Observations	2767	2487	2567	2767
Countries	132	130	122	132

Note: Dependent Variable HPG_t. All specifications are estimated using Estimated Generalized Least Squares, as outlined in Table 1, all notation is in line with Table 1.

financial crash is associated with lower fiscal space for high-income countries; this is illustrated through comparing gray histograms in the second row of Figure 2 compared with the third row. Finally, fiscal space of middle- and low-income countries improved in the period after the GFC; illustrated through comparing the black histograms in the second row of Figure 2 compared with the third row. Correspondingly, the fiscal space of low-income countries improved relative to high-income countries after the financial crash.

This reconciles with the results from Figure 1 in that high-income countries have become more procyclical after the GFC; with a significant proportion of these countries being in the left tail of the fiscal space distribution, giving them insufficient capacity to conduct countercyclical policy during the recession.[9] Thus, there is a clear narrative throughout the results that the lack of fiscal space is an important source of fiscal procyclicality and that worsening policy in high income countries was driven by worsening levels of fiscal space.

5 | SENSITIVITY

In our analysis above, we have already tested the sensitivity of our results to potential endogeneity between fiscal cyclicality and the business cycle and fiscal space (through the use of GMM estimation) and to the fiscal space measure used (by applying four different measures of fiscal space). We now consider a number of further robustness checks.

5.1 | Fiscal procyclicality over time

As is stated above, our benchmark estimations in Section 2 are based on data filtered by the Hodrick–Prescott method. Based on the arguments that Hodrick–Prescott can be a poor filter, especially at the two ends of time series data (see e.g., Hamilton, 2018), we re-estimate our specifications using a polynomial time trend for the cyclical components of GDP and government consumption as an alternative to the Hodrick–Prescott filter to detrend data. Doing so provides similar results to the benchmark, as is shown in Figure S1.[10] Moreover, using other methods to derive fiscal cyclicality measures including regression results and other correlation coefficients (as utilized in McManus & Ozkan, 2015) also provides results in line with those in Figure 1, also seen in Figure S1. Finally, we also consider 10-year rolling correlation coefficients between Hodrick–Prescott filtered data, as opposed to the 15 years applied in Figure 1 (results presented in Panel (f) of Figure S1).[11] Using a shorter time horizon naturally leads to more variability in the correlation coefficients, but the general conclusions on procyclicality across time remain unchanged; high-income countries were consistently less fiscally pro-cyclical but since the mid-1990s low- and middle-income countries have been becoming less procyclical and high-income countries slightly more procyclical until their relative positions have reversed.

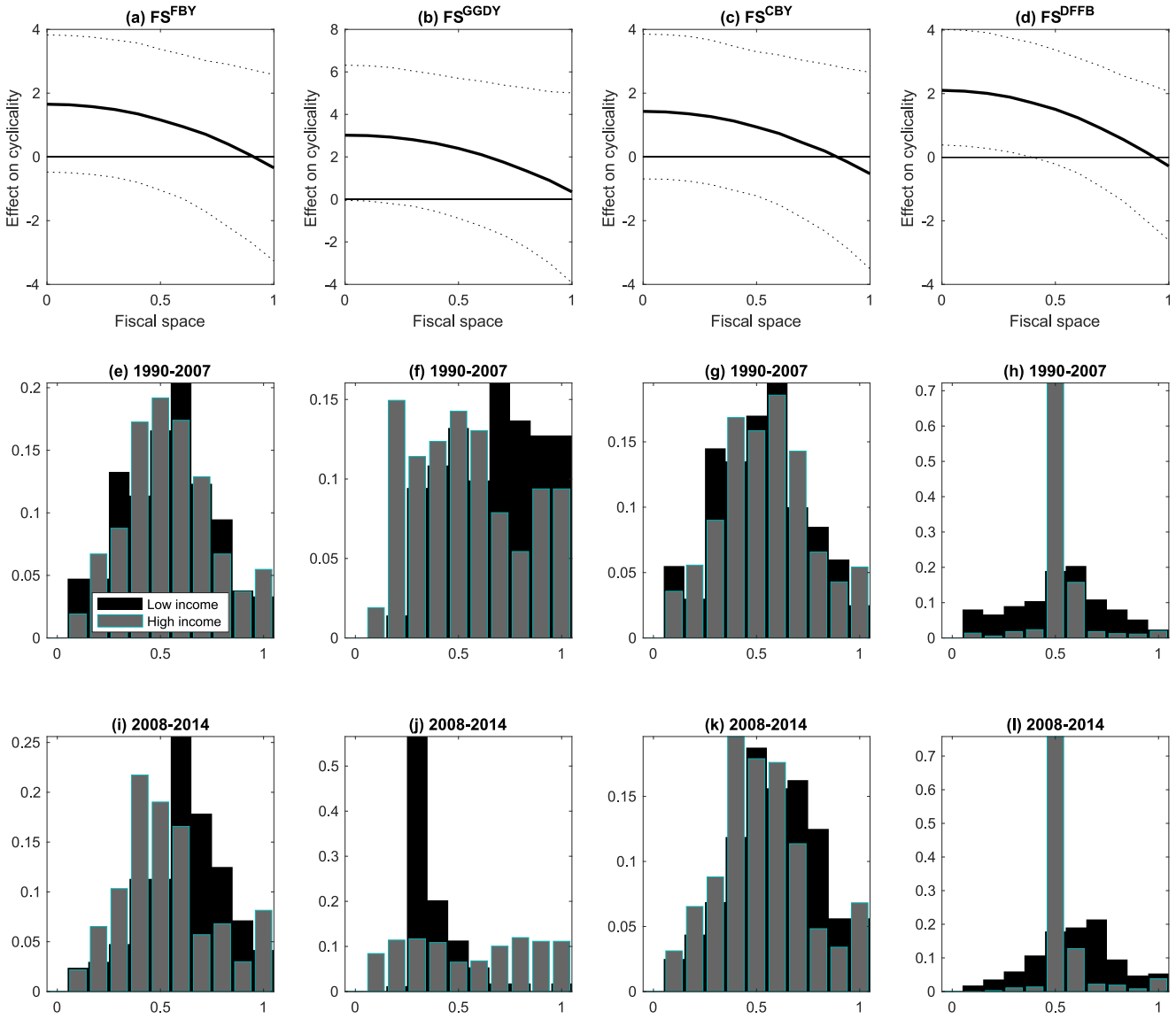

FIGURE 2 Fiscal procyclicality, fiscal space, and their nonlinear relationship. Panels (a)–(d) present the effect of fiscal space (*x*-axis) on fiscal procyclicality (*y*-axis) between the range of possible values, with 95% confidence intervals bootstrapped using the estimation results from Table 3. Panels (e)–(h) present the distribution fiscal space for middle- and low-income (black bars) and high-income (gray bars) countries as an average over the period 1990 and 2007, and Panels (i)–(l) the same for the period 2008–2014 [Colour figure can be viewed at wileyonlinelibrary.com]

5.2 | Granger causality

As discussed in Section 3.2, fiscal space and government consumption maybe endogenous such that the former might be both the cause and effect of the latter; this motivated our methodology (GMM estimation). To further test for this potential endogeneity, we perform a set of Granger causality tests to examine the causal relationship between the cyclical component of government consumption (HPG_t) and fiscal space (FS_t) across our four measures for the latter; results are presented in Table S1. For all fiscal instruments, there is sufficient evidence to reject the null hypothesis that fiscal space does not cause cyclical government consumption; however, for only one fiscal space measure (FS^{GGDY}: general government gross debt as a proportion of GDP) is there sufficient evidence to reject the null hypothesis that this is not caused by the cyclical component of government consumption. Importantly, there is strong evidence for the causal relationship we propose and weak evidence for potential endogeneity, for which our estimation strategy allows.

5.3 | Different time periods

In Section 4.2, when estimating Equation (2), we used 1990 as our reference point for fiscal space and we split our sample into two; between 1990 and 2007 and between 2008 and 2014. Tables S1 and S2 present tests of the sensitivity of our results to both of these choices, respectively. Using 2000 as our reference point for fiscal space (Table S2) provides similar result to those of our benchmark, for three of our four fiscal space variables; that is, procyclical fiscal policy is observed on average across the sample periods and the impact of fiscal space of fiscal procyclicality was significantly stronger in the post-GFC period than before. Similarly, comparing the time periods through splitting samples at 1999 and 2009 (Table S3) also provides similar results.

5.4 | Other robustness tests

Results in specification (1) presented in Table 1 provide evidence that less fiscal space leads to higher levels of fiscal procyclicality; adding further control variables to this analysis provides similar results as presented in Table S4. For example, political and financial constraints are identified as the two key determinants of fiscal procyclicality, as discussed earlier. For the former, we include in Table S4 *POLCON* which measures the intensity to which the policymakers face political constraint in executing their policies (see e.g., Henisz, 2002, all variables and their sources are described in Table A1). Greater political constraints can provide better monitoring on public finance disbursement (see e.g., Woo, 2009) and moreover, can keep the conflict of interest among the policy makers in-check, alleviating the detrimental effects of the common pool problems and fragmented policymaking in determining the fiscal policy (see e.g., Tornell & Lane, 1999; Velasco, 1999; Woo, 2009). We further include *POLCOR* which measures political corruption (including executive, legislative, and public sector) and *EGDEMO*—a measure of ideal egalitarian democracy. Lower levels of political corruption and higher levels of democracy both reflect the quality of institutions and are expected to improve the conduct of macroeconomic policy and thus reduce fiscal procyclicality (see e.g., Frankel et al., 2013).

To control for financial constraints, we include financial depth (*FINDEPTH*) and integration (*FINOPEN*). Limited access to international capital markets may restrict the ability of fiscal authorities to conduct countercyclical policies, particularly in recessions. It is argued that procyclical policy arises due to cut-off from international credit markets in downturns, either because of incomplete international credit markets or credit constraints due to poor credit ratings (see e.g., Gavin & Perotti, 1997, among others).

Finally, we include trade openness (*TRADE*) to incorporate the argument that more open countries are likely to experience greater external shocks (through trading partners' export demand), which may need offsetting through fiscal adjustments (Rodrik, 1998). Table S4 provides weak evidence to suggest that more open economies perform more procyclical policy. We find support for the hypothesis that financial constraints lead to greater fiscal procyclicality, but not for political constraints being the cause; however, when each control variable is added one at a time, both political and financial constraint variables are statistically significant. In all specifications in Table S4, the main results from Table 1 are maintained; indeed, in all specifications the results get stronger when adding control variables.

Using a polynomial trend for the cyclical components of GDP and government consumption (as discussed in Section 5.1) provides similar results to the benchmark, as is shown in Panels (b)–(d) of Tables S5–S7. Note that changing the method of identifying the cyclical components of the time series changes the magnitude of these variables and thus a direct comparison of regression coefficients is not like-for-like. The results presented in Tables S5–S7 demonstrate that both the direction of these relationship and the statistical significance prevail. Moreover, the coefficients are consistent across the different forms of polynomial time trends (for which a more direct comparison can be made) providing evidence that the relationship between fiscal space and fiscal procyclicality is stable and not sensitive to how the cyclical properties of government consumption and output are derived.

The fiscal space variables were calculated performing a cumulative normal transformation using the mean and standard deviation of each fiscal space variable within each country-income group, as classified by the World Bank, as discussed in Section 3.3. Results are robust to deriving the fiscal space variables using the whole-sample mean and standard deviation, as seen in Panel (e) of Tables S5–S7.

We test for the contemporaneous impact of fiscal space on fiscal procyclicality by using FS_t in Equations (1)–(3). Results from this estimation are presented in Panel (f) of Tables S5–S7; all results are consistent with those above. Finally, we also test the sensitivity of our results to the measure of government consumption used in the specifications. Panel (g) of Tables S5–S7 provide results where the variable HPG_t is total government expenditure from the World Economic Outlook

from the IMF, which include government investment and expenditure on interest payments and transfers. Results in Tables S5 and S7 are consistent with the benchmark results above; that is, more fiscal space is associated with lower levels of fiscal procyclicality; and the impact of fiscal space on fiscal procyclicality was stronger in the period post-2008. The one area where the results differ when considering this more inclusive measure of government expenditure is with respect to Table S7; the results here favor a linear relationship between fiscal space and fiscal procyclicality than a nonlinear one.

6 | CONCLUSIONS

This paper presents a comprehensive examination of the role of fiscal space as a key source of cross-country variation in fiscal cyclicality. Procyclical fiscal policymaking—the inability to implement policies to smooth the business cycle—has long been identified as a major weakness in the policymaking, especially in developing countries. Uncovering the underlying sources of such suboptimal policies is therefore of key policy relevance.

Utilizing data from 133 countries over 1950–2014 and a variety of empirical specifications, we find that fiscal space plays a key role in the cyclicality of fiscal policies across countries and over time; the greater the fiscal space, the greater the ability to conduct countercyclical fiscal policy. We also show that this has been particularly the case in the post-global financial crisis period. Hence, our finding underscored how the reduction in fiscal space in advanced economies in the post-2009 period limited their ability to adopt countercyclical fiscal policies as response to the global financial crisis. Also importantly, we find that the relationship between fiscal space and fiscal procyclicality is nonlinear; countries which are at the bottom end of the fiscal space distribution need to make significant improvements before they are able to perform countercyclical policy.

Overall, our findings clearly point to the importance of building fiscal space as a major precaution against the shocks in bad times. And as such, it is straightforward to conjecture that countries that have such built-in fiscal capacity will be better able to fight economic downturns. Indeed, in the context of the current Covid-19 crisis, some of the developing and emerging economies have already decoupled from the rest on account of their lack of such fiscal space and hence the inability to respond to the sharp slowdown in economic activity.

ACKNOWLEDGMENT

We would like to thank participants at the Money, Macro and Finance 2019 Conference, at Heriot-Watt University for comments.

ENDNOTES

[1] A similar methodology is also followed by Frankel et al. (2013). The cyclical component in each series is derived using a Hodrick–Prescott filter with $\lambda = 100$. A full description of the data can be found in Table A1.

[2] An alternative fiscal indicator in the existing literature has been the fiscal balance; however, a disadvantage of this measure is that the cyclicality of tax revenues would lead to biases in the estimated cyclicality stances (Ilzetzki and Végh, 2008).

[3] Although we were able to use data from 1950–2014 in our analysis in Section 2, our regression analysis is based on data over 1970–2014, due to data availability of control variables.

[4] Note that when different subsamples of data are used, the Hodrick–Prescott filtering process is applied to the whole data and then the subsample taken, not the other way round (that is, not take the subsample and then apply the filter). This process minimizes the potential impact of the criticism that the Hodrick–Prescott filtering process leads to spurious results at the end of the time series. As in Table 1, the only control variable we apply in this benchmark specification is InitialGDP interacted with HPY_t. In Section 5.3, we test the robustness of the results to changes in the time periods in the analysis and the reference point for fiscal space.

[5] Note that both defining our variables as changes and splitting time horizons reduce the number of potential observations, making it more challenging to find instruments for $\Delta FS_{t-1} \times HPY_t$.

[6] Again, as above, the only control variable we include in this benchmark specification is InitialGDP interacted with HPY_t.

[7] For government debt as a proportion of GDP (FS^{GGDY}), there is no evidence of a statistically significant nonlinear relationship.

[8] Note, for all variables with the exception of FS^{GGDY}, lower numbers represent less fiscal space.

[9] Average cyclical output growth was negative between 2009 and 2015 for high-income countries, with 67% of the high-income countries having negative growth. Whereas the cyclical component of government consumption was positive in 2009, it was negative (on average) for high-income countries up to 2015.

[10] We find the polynomial time trends by estimating a function $X_t = \alpha + \sum \gamma_j t^i + e_t$ where t represents time and $j = \{2, 3, 4, 5\}$ is the order of the polynomial.

[11] Alesina et al. (2008) argue that to get a reliable evaluation of fiscal procyclicality one needs to observe at least two or three business cycles and therefore uses 16 years in their analysis; Woo (2009) goes further and adopts 25-year intervals over which fiscal cyclicality is estimated.

REFERENCES

Alesina, A., Campante, F.R. & Tabellini, G. (2008) Why is fiscal policy often procyclical? *Journal of the European Economic Association*, 6(5), 1006–1036.

Arellano, M. & Bond, S. (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297.

Auerbach, A.J. & Gorodnichenko, Y. (2013a) Fiscal multipliers in recession and expansion. In: Alesina, A. & Giavazzi, F. (Eds.) *Fiscal Policy after the Financial Crisis*. University of Chicago Press, pp. 63–98.

Auerbach, A.J. & Gorodnichenko, Y. (2013b) Output spillovers from fiscal policy. *American Economic Review*, 103(3), 141–146.

Barro, R.J. (1979) On the determination of the public debt. *Journal of Political Economy*, 87(5, Part 1), 940–971.

Céspedes, L.F. & Velasco, A. (2014) Was this time different?: fiscal policy in commodity republics. *Journal of Development Economics*, 106, 92–106.

Christiano, L., Eichenbaum, M. & Rebelo, S. (2011) When is the government spending multiplier large? *Journal of Political Economy*, 119(1), 78–121.

Forbes, K.J. & Rigobon, R. (2002) No contagion, only interdependence: measuring stock market comovements. *The Journal of Finance*, 57(5), 2223–2261.

Frankel, J.A., Vegh, C.A. & Vuletin, G. (2013) On graduation from fiscal procyclicality. *Journal of Development Economics*, 100(1), 32–47.

Gavin, M. & Perotti, R. (1997) Fiscal policy in Latin America. *NBER Macroeconomics Annual*, 12, 11–61.

Hamilton, J.D. (2018) Why you should never use the Hodrick-Prescott filter. *The Review of Economics and Statistics*, 100(5), 831–843.

Henisz, W.J. (2002) The institutional environment for infrastructure investment. *Industrial and Corporate Change*, 11(2), 355–389.

Ilzetzki, E. & Végh, C.A. (2008), *Procyclical fiscal policy in developing countries: truth or fiction?* Technical report. National Bureau of Economic Research.

IMF. (2018) *Capitalizing on Good Times: IMF Fiscal Monitor*. Washington, DC: International Monetary Fund https://www.imf.org/en/Publications/FM/Issues/2018/04/06/fiscal-monitor-april-2018

IMF. (2021) *A Fair Shot: IMF Fiscal Monitor*. Washington, DC: International Monetary Fund https://www.imf.org/en/Publications/FM/Issues/2021/03/29/fiscal-monitor-april-2021

Kaminsky, G., Reinhart, C. & Végh, C. (2004) When it rains, it pours: procyclical macropolicies and capital flows. *NBER Macroeconomics Annual*, *2004*, 11–53.

Kose, M.A., Kurlat, S., Ohnsorge, F. & Sugawara, N. (2017) *A cross-country database of fiscal space*. The World Bank.

Lane, P.R. (2003) Business cycles and macroeconomic policy in emerging market economies. *International Finance*, 6(1), 89–108.

McManus, R., Gulcin Ozkan, F. & Trzeciakiewicz, D. (2021) Why are fiscal multipliers asymmetric? The role of credit constraints. *Economica*, 88(349), 32–69.

McManus, R. & Ozkan, F.G. (2015) On the consequences of pro-cyclical fiscal policy. *Fiscal Studies*, 36(1), 29–50.

Rodrik, D. (1998) Why do more open economies have bigger governments? *Journal of Political Economy*, 106(5), 997–1032.

Romer, C.D. & Romer, D.H. (2018) Phillips lecture—why some times are different: macroeconomic policy and the aftermath of financial crises. *Economica*, 85(337), 1–40.

Romer, C.D. & Romer, D.H. (2019) Fiscal space and the aftermath of financial crises: how it matters and why, Technical report. National Bureau of Economic Research.

Talvi, E. & Végh, C.A. (2005) Tax base variability and procyclical fiscal policy in developing countries. *Journal of Development Economics*, 78(1), 156–190.

Taylor, J.B. (2000) Reassessing discretionary fiscal policy. *Journal of Economic Perspectives*, 14(3), 21–36.

Thornton, J. (2008) Explaining procyclical fiscal policy in African countries. *Journal of African Economies*, 17(3), 451–464.

Tornell, A. & Lane, P.R. (1999) The voracity effect. *American Economic Review*, 89(1), 22–46.

Vegh, C.A. & Vuletin, G. (2015) How is tax policy conducted over the business cycle? *American Economic Journal: Economic Policy*, 7(3), 327–370.

Velasco, A. (1999) A model of endogenous fiscal deficits and delayed fiscal reforms. In: J. M. Poterba, & J. V. Hagen (Eds.), *Fiscal institutions and fiscal performance*. University of Chicago Press, pp. 37–58.

Woo, J. (2009) Why do more polarized countries run more procyclical fiscal policy? *Review of Economics and Statistics*, *91*(4), 850–870.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

How to cite this article: Ahmad, A., McManus, R. & Ozkan, F.G. (2021) Fiscal space and the procyclicality of fiscal policy: The case for making hay while the sun shines. *Economic Inquiry*, 59(4), 1687–1701. Available from: https://doi.org/10.1111/ecin.13008

APPENDIX

TABLE A1 Variable description and source

Variables	Description and source
HPG	Cyclical component of real general government final consumption expenditure derived from logarithm deviation from its Hodrick–Prescott trend. Data cover the time horizon 1950–2014. Real annual consumption converted from its nominal values, where possible, using GDP deflator and otherwise by using CPI. Data are in local currency. Data are obtained from World Development Indicator (2015) and IMF International Financial Statistics (IFS) (2015). Access through UK Data Services. The Hodrick–Prescott filter is applied to the whole time series and then (where applicable) different subsamples are taken.
HPY	Cyclical component of real GDP derived from logarithm deviation from its Hodrick–Prescott trend. Data cover the time horizon 1950–2014. Real GDP converted from its nominal values, where possible, using GDP deflator and otherwise by using CPI. Data are in local currency. Data are obtained from World Development Indicator (2015) and IMF IFS (2015). Access through UK Data Services. The Hodrick–Prescott filter is applied to the whole time series and then (where applicable) different subsamples are taken.
Fiscal Space (FS^{FBY}, FS^{GGDY}, FS^{CBY}, *and* FS^{DFFB})	Fiscal space is the normalized variable (0 to 1). Fiscal space is measured by Fiscal balance, percentage of GDP (FBY), General government gross debt, percentage of GDP (GGDY), Cyclically-adjusted balance, percentage of potential GDP (CBY) and Fiscal balance, percentage of average tax revenues (DFFB). Data source is World Development Indicator (2015)
InitialGDP	Initial real GDP per-capita measured by Log of real GDP per-capita in 1970. Data are obtained from Penn World Table (PWT Version 6.3).
TRADE	The sum of exports and imports of goods and services measured as a share of gross domestic product. Data are obtained from World Development Indicator (2015).
POLCON	High value reflect high political constraints and low value indicate low political constraints. Data are obtained from Henisz (2012). Access through Management Department, University of Pennsylvania.
POLCORR	Political corruption index by taking the average of (a) public sector corruption; (b) executive corruption; (c) legislative corruption; and (d) judicial corruption. These four different government spheres are weighted equally by taking average for each country for each year over the time horizon 1970–2014 to construct the index. The index ranges from 0 (greater political corruption) to 1 (lowest political corruption). Data are obtained from V-Dem (Varieties of Democracy) Dataset.
EGLDEMO	An assessment of ideal egalitarian democracy. Egalitarian democracy is achieved when rights and freedoms of individuals are protected equally; and resources are distributed equally across all social groups. The distribution of resources must be sufficient to ensure that citizens' basic needs are met in a way that enables their meaningful participation. Additionally, an equal distribution of resources ensures the potential for greater equality in the distribution of power. It is a normalized annual data index ranges from 0 (lowest egalitarian democracy) to 1 (highest egalitarian democracy). Data are obtained from V-Dem Dataset.
FINOPEN	Measured with the Chinn and Ito (2006) financial openness index [Chinn, M.D. and Ito, H., 2006. What matters for financial development? Capital controls, institutions, and interactions. Journal of development economics, 81(1), pp.163-192.]. The index measures a country's degree of capital account openness. The index ranges from 0 (lowest financial openness) to 1 (highest financial openness). We use updated data which covers from 1970-2014. Data are averaged over 1970-2014 for cross-country estimation and annual data are used for panel-data estimation. Access through Web.pdx.edu.
FINDEPTH	Measures country's liquid liabilities as a share of GDP. Data are obtained from IFS (2015), International Monetary Fund (IMF) (2015). Access through UK data services.