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Policy Space Index: Short-Term Response to a Catastrophic Event

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Policy Space Index: Short-Term Response to a Catastrophic Event

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ABSTRACT: What policy space does a country have for a short-term response to a catastrophic event? To quantify this space, the paper proposes a policy space index. The index combines a quantitative, albeit relatively limited and narrow, fiscal space concept with the indicators of nominal monetary space and reserve space. Each nominal policy space indicator is then adjusted for individual country's institutional features, such as the status of its currency, income group, access to capital markets, debt distress level, and the exchange rate regime. The final policy space index is derived as a composite of the three nominal policy space indicators, each adjusted for five institutional features. This index is different from the approach to measure fiscal space at the IMF and requires more work before it can be used operationally. The proposed index allows measuring the overall policy space in each country directly in percent of GDP. By way of illustration, the paper applies the index to the Covid-19 crisis.

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WORKING PAPERS

Policy Space Index: Short-Term Response to a Catastrophic Event

Prepared by Prepared by José Ferrer and Alexei Kireyev[1]

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Contents

Introduction

1. What policy space does a country have to respond to a 'black swan' event? The unprecedented Covid-19 crisis has put this question at the forefront of the policy debate, as countries have scrambled to mobilize resource for an immediate short-term response. Government and central banks across the world have deployed stimulus packages to support their economies of nearly US$ 12 trillion of fiscal policy support from governments and a massive injection of liquidity from central banks.[1] The size of such packages depended mainly on the policy space[2] available to them before the pandemic and institutional features of each economy.

2. The purpose of the paper is to propose an effective policy space index. The index allows to assess the policy space available to each country for a short-term response to a catastrophic event, like the Covid-19 pandemic. The index combines several traditional indicators in different dimensions, such as fiscal, debt, monetary, and international reserves, earlier assessed individually, in a single index of policy space. The index is conditional on each economy's institutional features, such as the status of the national currency, the exchange rate regime, access to capital markets, and other factors. The paper contributes to the literature along several dimensions: (i) it provides an overview and takes stock of the current discussion on policy space and its components; (ii) it proposes a synthetic policy space index[3]; (iii) the paper illustrates the suggested index by assessing the short-term policy space immediately available to countries to fight the Covid-19 crisis.

3. The concept of policy space in this paper differs from the concept of fiscal space used in the IMF. Differences arise because the methodology and key definitions of fiscal space are different. For example, IMF (2018a) defines fiscal space as the room for undertaking discretionary fiscal policy by raising expenditure or reducing taxes relative to existing baseline without compromising market access and debt sustainability (see paragraph 22 for a detailed discussion). In contrast, this paper narrowly defines fiscal space as borrowing space and space related to gross financing needs. At the Fund, the issue of policy space has been addressed mainly in the context of fiscal and debt sustainability and is assessed in programs and surveillance. The discussion in this paper draws on published Fund assessments, databases, and country classifications used for analytical and policy advice purposes[4]. Because of data limitations, some definitions used in the index, which requires mainly quantitative assessments, may differ somewhat from those used at the IMF, which may include an element of judgement. Beyond the IMF, individual elements of policy space have been extensively explored by other international institutions, such as the World Bank (for example, Kose and Ohnsorge, 2019; World Bank, 2020a) and in academia (Blanchard and Pisani-Ferry, 2020; Chen and Woo, 2020; Kentikelenis et al., 2016; Lilley and Rogoff, 2020; Romer and Romer, 2018). A more holistic approach to policy space may be useful for policymakers.

4. The paper concludes that countries can be classified in several groups according to their available policy space. These groups include reserve currency countries, countries with substantial, limited, and no policy space. By way of illustration, the paper applies the index to the Covid-19 crisis. The index suggests that while a substantial number of countries have enough policy space to deal with the economic fallout from the crisis, at least 98 countries (about 8 percent of global GDP and 19 percent of population) have no or very limited policy space and may require emergency assistance.

[1] Managing Director Georgieva's Remarks at the Conference on Lessons from the Global Financial Crisis in The Age of COVID-19. November 23, 2020. Available at https://www.imf.org/en/News/Articles/2020/11/23/sp112320md-remarks-oap-on-lessons-from-gfc-in-the-age-of-covid19.

[2] The IMF's approach to assessing fiscal space differs in definitional and methodological terms, and while more detailed and accurate, it doesn't quantify space.

[3] The proposed fiscal space index is not meant to replace the IMF's Board-approved FSF, but to complement it by quantifying select elements of fiscal space and combining it with other policy space dimensions.

[4]For example, IMF, 2018a. Assessing Fiscal Space: An Update and Stocktaking. *IMF Policy Paper*, April 11 and IMF (2016c).

5. The rest of the paper is organized as follows. Section II reviews the literature and develops the concept of policy space based on earlier research. Section III discussed key quantitative components of policy space. Section IV covers institutional components of policy space and their interaction with the quantitative components. Section V presents the calculation methodology of policy space and illustrates them in application to the Covid-19 crisis. Finally, section VI concludes and outlines directions for further research.

Policy Space Concept

Literature Review

6. The literature usually interprets policy space as the ability to conduct desired policies. Such policies should not compromise price stability, debt sustainability, market access, reserve adequacy, and other constraints. Recent literature has evoked the concept of policy space, first, in the context of the discussion in the early 2000s of whether WTO rules and Fund conditionality leave countries sufficient space to conduct independent policies. Second, the policy space issue was forcefully raised in the aftermath of the global financing crisis (GFC) of 2008-09 as governments' ability to fend off its impact without compromising long-term sustainability, growth, and inflation. Finally, most recently, the 2020 Covid-19 crisis has again forcefully put the issue of policy space at the forefront of the policy debate in a very different, mainly short-term sense. These approaches to policy space in the literature are discussed below.

7. The term 'policy space' emerged in the early 2000s in discussions of WTO rules. At that time, policy space was generally defined as 'the scope for domestic policies, especially in the areas of trade, investment and industrial development' which might be 'framed by international disciplines, commitments, and global market considerations' (Page, 2007). Some developing countries considered that international rules, such as WTO agreements on tariffs, intellectual property, services and investment, restricted their policy space to promote development (Muchhala, 2007). The argument for policy space stated that developing countries need the freedom to choose the best mix of policies for achieving sustainable and equitable growth. For example, Chang (2006) argued that the policy space strongly influenced countries' ability to develop and called for the need to critically reexamine the principles of a level playing field, special and differential treatment, less-than-full-reciprocity, flexibility, and national autonomy. In part as a result, the United Nations Conference on Trade and Development (UNCTAD) adopted three legal principles that validated the concept of policy space: the sovereign equality of states, the right to development, and the principle of special treatment for developing countries (UNCTAD, 2004).

8. Policy space was also discussed in a broader macroeconomic context. For example, Ocampo and Vos (2008) looked at how much policy space developing countries have for autonomous countercyclical policies consistent with longer-term development objectives and felt that, with deeper integration into global markets, developing countries have lost such space. Koivusalo, Schrecker, and Labonté (2009) suggested that policy space depended on a country's position in the world economy, as both formal and informal constraints associated with globalization limit the policy measures governments can use. At the same time, Chang (2006) and Muchhala (2007) argued that, while some policy space was indeed closed by the nature of international agreements, much policy space remained, and that transparent international rules helped create new policy space and opportunities.

9. Extensive discussions of policy space followed the Global Financial Crisis (GFC) of 2008-09. In the IMF, this discussion focused mainly on the means to secure the post-crisis recovery. The main concern was that governments lacked the power to deal with negative shocks, as they had run out of policy space to stimulate growth (IMF, 2016a). The common perception was that the effective lower bound on policy interest rates limited the room to loosen monetary conditions and that high debt constrained fiscal policy, including

automatic stabilizers. The Fund argued that policy space still existed and should have been used through a comprehensive, consistent, and coordinated approach to policy making (IMF, 2010).

10. In academic circles, much of the discussion focused on the Fund's handling the crisis and the need of policy space during crises. For example, Grabel (2011) saw the IMF's response to the GFC as 'productive incoherence', i.e., the proliferation of inconsistent and even contradictory strategies, such as the reiteration of pro-cyclical policy adjustment, which did not allow to create policy space. In the same vein, Kentikelenis, Stubbs, and King (2016) revisited policy content of IMF programs and found little evidence of a fundamental transformation of IMF conditionality that, they argued, had not allowed for enough policy space in the past. Romer and Romer (2017) hypothesized that the aftermath of financial distress may be much worse when a country lacks monetary and fiscal policy space.

11. Finally, the issue of policy space has re-emerged in the context of the Covid-19 crisis. The Fund has underscored that with the onset of the crisis, the authorities in many countries quickly realized the limitations of their policy space. In an environment of low policy rates, advanced economies' central banks had very limited conventional *monetary policy space* and had to rely on an unprecedented expansion of their balance sheet. A number of emerging markets central banks have also embarked in unconventional policy measures for the first time (Adrian, 2020). The use of *fiscal policy space* to respond to the crisis, on the other hand, was considered quite possible and even desirable (IMF, 2020b). The IMF advised advanced economies with ample fiscal space to boost potential growth by increasing spending on health care, research and development, training, and infrastructure. Advanced economies with some or limited fiscal space were advised to reconfigure their spending and revenue mix to allow for greater capital spending. Emerging markets were considered to have limited fiscal space, although some did not have any, and policymakers were advised to finance development in a fiscally responsible way, improve the efficiency of public investment, and strengthen social safety nets. Most low-income developing countries did not have any fiscal space, although some countries had some, and were encouraged to strike a balance between addressing development needs and safeguarding debt.

12. Beyond the IMF, mainly conventional approaches to policy space took centerstage. Landau (2020) argued that low interest rates and low inflation together create a large policy space for governments to respond to the crisis by financing exceptional expenditure. To make the existing policy space sustainable, the perspective of fiscal dominance must be eliminated, and central banks' independence must be respected. Chen and Woo (2020) pointed that, broadly speaking, large countries with convertible currencies, low debt, and plentiful reserves can be perceived as having plenty of policy space. At the same time, most developing countries were considered to have no or very limited policy space and encouraged to finance their emergency expenditure by borrowing (Soto, 2020). To expand policy space restricted by international agreements, Kozul-Wright and Gallagher (2020) noted that exceptions for national security and public health emergencies were allowed under WTO rules and in regional and bilateral trade and investment treaties. Such exceptions could be called on to help countries protect this policy space to raise manufacturing capabilities, buy compulsory licenses, and import generic medicines.

13. Only a few authors have proposed metrics to quantify policy space. For example, Romer and Romer (2018) measured monetary policy space by a dummy variable for whether the policy rate is above the zero lower bound and fiscal space by the ratio of gross debt to GDP. They found that the degree of monetary and fiscal policy space prior to financial distress—that is, whether the policy interest rate is above the zero lower bound and whether the debt-to-GDP ratio is relatively low—greatly affects the aftermath of crises. The decline in output following a crisis was less than 1 percent, when a country possesses both types of policy space, but almost 10 percent, when it had neither. Gallagher, Sklar, Thrasher (2019) sought to quantify policy space in trade and investment treaties by assigning scores between zero and three to five indicators designed to capture their restrictiveness. They found that international trade and investment treaties become increasingly restrictive for the ability of national authorities to regulate cross-border financial flows. Neither paper, however,

suggested a synthetic index that would summarize with one number the policy space across several macroeconomic dimensions.

Policy Space Matrix

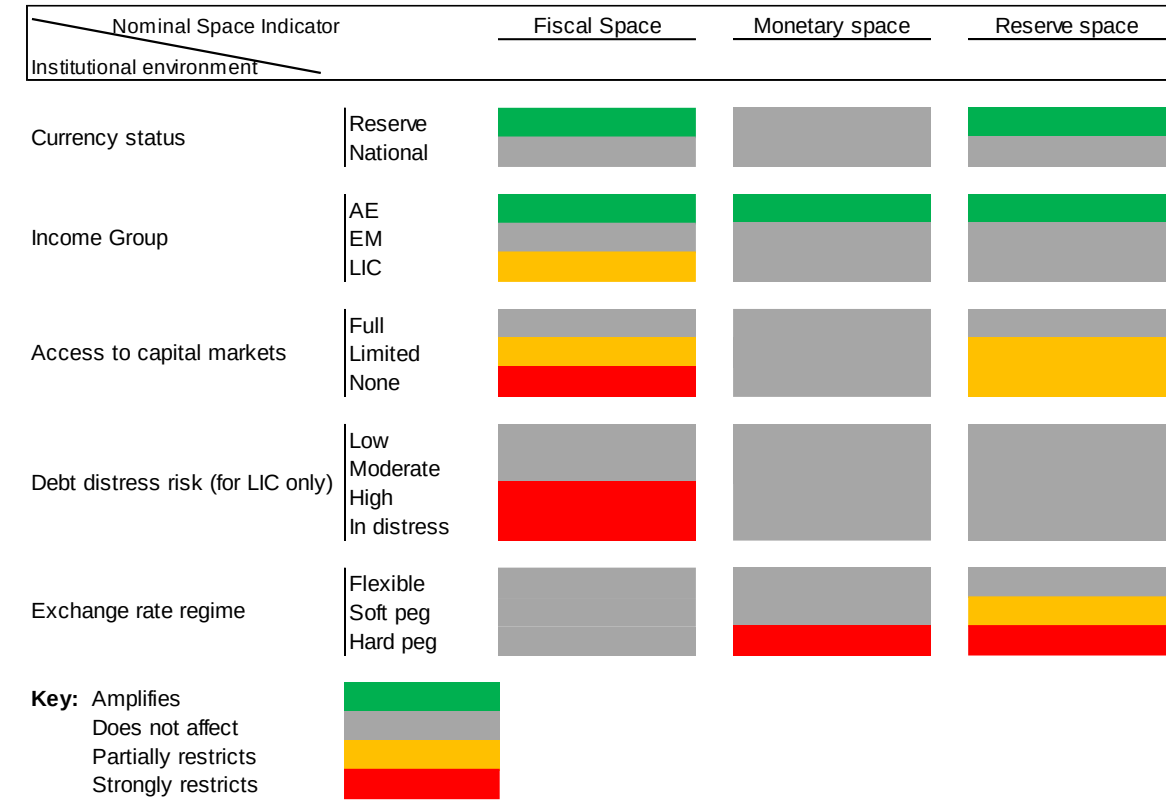
14. In this paper, policy space is defined as a country's ability to finance measures needed to respond to shocks in the short run. This response can be based on the use of existing or newly created instruments, own or borrowed resources, but in any case, should not undermine its macroeconomic stability during the current year. Therefore, the policy space in this restricted and somewhat static definition depends on a country's own policies, for example, its fiscal and monetary policies, and the willingness of its partners to assist in times of difficulties, for example, by providing lending.

15. This definition of policy space differs from those proposed in the literature. First, policy space in this definition includes combined financing from all available sources, while in the literature policy space is mainly confined to fiscal or borrowing space, although its other dimensions have also been mentioned (see ¶13). Second, this definition applies only to policy space available for a very short-term reaction to a catastrophic event, thus excluding all structural and other measures a government could in principle take to enhance its policy space with time. Finally, policy space in this definition can be measured directly in national currency and thus in percent of each country's GDP, which makes it more relevant for policy makers than the scores proposed in the literature.

16. In the long run, policy space is part of a macroeconomic framework. In this broader context, available policy space depends on and reflects fiscal, monetary, exchange rate, structural and other macroeconomic policies conducted by the government. It should be defined relative to the current level of state variables, such as real growth, inflation, fiscal deficit, current account deficit, and debt, and then assessed in a dynamic forward-looking model. Potentially, inequality, gender, and climate change variables can be built into the mix. In this broad sense, policy space is a country's capacity to tolerate lower growth, higher inflation, worse fiscal and current account deficits, larger public and external debt, and potentially higher inequality, gender disparity, and faster climate change, without compromising macroeconomic stability. The assessment of policy space in the long run is beyond the scope of this paper.

17. The short-term policy space concept can be presented in a matrix form. This is a 5x3 matrix, which reflects quantitative and qualitative components of policy space (Figure 1). Quantitatively, policy space should reflect at a minimum the country's fiscal, monetary, and reserve stance. This is usually done through the use of limits on the amount of debt and other fiscal indicators, floors on the amount of reserves, or lower bounds to the central bank's policy rate. This is what we do for the calculations of the police space index and refer to them in general as "thresholds". Qualitatively, the assessment of policy space under each of these components depends on the country's national currency status (reserve currency or national currency), income group (advanced economies (AE), emerging markets (EM) or low-income countries (LIC)), its access to capital markets (full, limited or none), debt distress risk (low, moderate, high, in distress), and its exchange rate regime (flexible, soft peg or hard peg). There are two different fiscal components in the policy space concept: fiscal space as measured quantitatively in percent of GDP; and 'fiscal risks' as measured by investors' sentiments and willingness to lend (access to capital markets and risk of debt distress). Assessing both usually involves substantial expert judgment.

Figure 1. Effective Policy Space Matrix



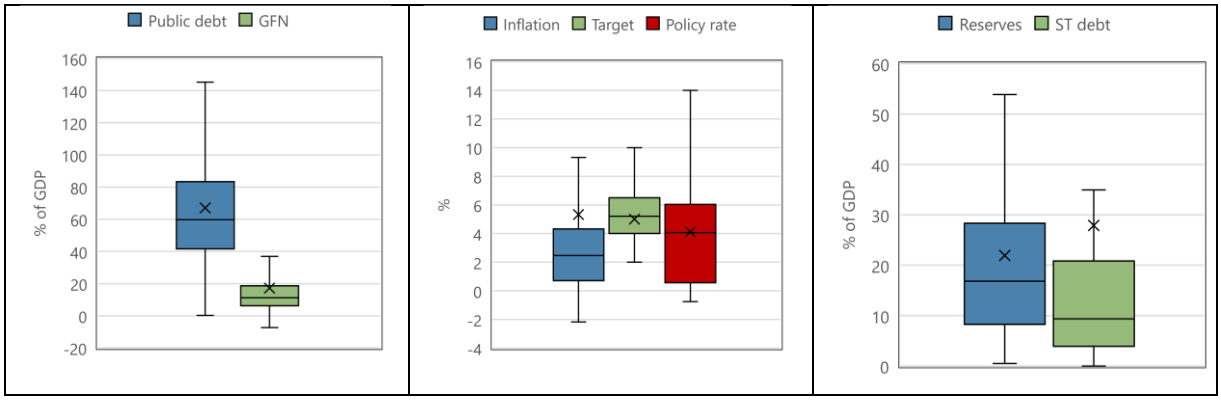
Source: Authors' presentation.

18. In the rest of the paper, we distinguish "nominal" and "effective" policy space. *Nominal policy space* is defined as the difference between a defined threshold and the observed policy indicator (e.g., debt to GDP, reserves as months of imports). Nominal space can be positive when the indicator is below the threshold and negative otherwise. In contrast, *effective policy space* is nominal space adjusted for the country's specific institutional environment shown in the rows of Figure 1. A green coloring suggests that institutional environment amplifies existing nominal space. This is the case, for example, for reserve currency countries and fiscal space. A grey coloring suggests that institutional environment allows the entirety of nominal space to be used (i.e., is neutral); while yellow and red suggest that nominal space is either partially or strongly restricted by this institutional feature, respectively. For example, in a flexible exchange rate environment, all existing monetary space can be used; while under a fixed exchange rate regime, monetary space is heavily restricted (fully restricted in practice), even if some nominal space is available, as effectively monetary policy does not exist. In addition, effective space is always non-negative, as it is not possible to adjust policy space that does not exist.

19. The index is constructed based on the IMF's World Economic Outlook (WEO) database. Most macroeconomic indicators come from the IMF's WEO database as published in October 2020 (IMF, 2020d). The database includes 178 countries accounting for 98 percent of global GDP and 97 percent of global population in 2020, while 20 countries and territories are excluded due to lack of sufficient data. To establish regularities across countries and overcome the issue of heterogeneity, all calculations for the index are dome for groups of broadly comparable countries (Box 1).

Text Box 1. Country Heterogeneity and Regularity

The countries included in the index display high degrees of heterogeneity. The empirical distributions of the raw data used to compute each dimension of the index are summarized in the figure below. The end points of the colored bar represent the 1st and 3rd quartiles while the horizontal line inside the bar represents the median, and the point marked by the cross represents the average value. For example, the first panel on the left summarizes the distribution of the two key variables used to compute fiscal space, i.e., the public debt and gross financing needs (GFN), both as percentage of GDP. The median value of the debt-to-GDP ratio in the sample is 60 percent and the average is 67 percent. We observe significant extreme values with a maximum of 140 percent and a minimum of 0.3 percent; however, 50 percent of our sample (difference between 3rd and 1st quartiles) is between 40 percent and 80 percent. Gross financing needs, on the other hand, exhibit much less dispersion with a median of 11 percent, an average value of 17 percent and an interquartile range of about 13 percent (from 6 percent to 19 percent of GDP).



These figures also show the degree of symmetry of the distribution. The observed difference between mean and median values can be viewed as an approximation to the skewness of the distribution. For example, in the second panel the average value for inflation is significantly above its median value suggesting that its distribution is highly skewed to the left toward lower values. Similarly, the third panel shows a highly left-skewed distribution of short-term debt.

To overcome the issue of heterogeneity, all calculations are made for country groups. The groups are based on the WEO classification of countries by their income level. The groups are the following: advanced economies (AE), emerging markets (EM), and low-income countries (LIC). LICs are defined as the countries eligible to PRGT facilities (IMF, 2021b). Such grouping of countries significantly reduces heterogeneity within each group.

Policy Space Components

Fiscal Space

20. Fiscal space is the main quantitative component of policy space. This paper builds on the IMF definition of fiscal space and expands it by including borrowing space and financing space. In this respect, it is important to start with the discussion of the Fund concept of fiscal space. IMF (2018a) narrowly defines fiscal space as the room for undertaking discretionary fiscal policy by raising expenditure or reducing taxes relative to

existing baseline without compromising market access and debt sustainability. Discretionary fiscal policy can take the form of stimulus or slower pace of consolidation. Reallocating spending withing the same fiscal envelope does not create fiscal space: although fiscal multipliers can be different across spending categories, such reallocation does not change the overall fiscal impulse.

21. Fiscal space consists of borrowing space and financing needs. Borrowing space largely depends on a country's debt sustainability, the extent and nature of its debt vulnerabilities. But even with elevated levels of public debt, some countries may have at least some space because of low gross financing needs (IMF, 2018a).

22. The assessment of fiscal space relies on quantitative indicators and judgement. The IMF explicitly states that any quantitative assessment should be based on a comprehensive approach and incorporate judgement (IMF, 2018a and 2018b). Its approach to measuring fiscal space is based on several considerations: (i) liquidity defined as market access at reasonable conditions and assessed based on conventional DSA indicators related to the cost and reliability of market access; (ii) solvency defined as public debt sustainability assessed based on conventional DSA indicators, including the level and trajectory of debt, gross financing needs, and the realism of the projected adjustment path; and (iii) dynamic analysis to assess whether discretionary fiscal measures preserve fiscal space, i.e., remains consistent with liquidity and solvency. Finally, judgment regarding fiscal space should consider initial conditions, in particular fiscal multipliers, monetary policy, fiscal credibility, the nature of spending, the form policy measures, and complementarity with structural reforms.

23. At the IMF, quantitative assessments of fiscal space consist of three blocks. Block 1 assesses the initial state of the economy, including macroeconomic, fiscal, external sector, cyclical conditions, public contingent liabilities, and structural gaps. Block 2 provides a diagnosis of fiscal space based on a set of indicators to capture availability of financing on favorable terms and debt burden, as well as future fiscal adjustment needs. Block 3 simulates the macro-fiscal impact of alternative discretionary fiscal policies. The quantitative assessment ends with the aggregation of all three blocks, usually based on the worst or the average of all included indicators. The final desk assessment of fiscal space draws on the three blocks and additional country-specific factors. IMF fiscal space assessments are made only for a subset of the membership (69 countries).

24. Fiscal space assessments are already conducted at the IMF, at least in part, relative to benchmarks. All benchmarks are indicative. For example, for advanced economies, the debt level sustainability benchmark is 85 percent of GDP and for gross financing needs it is 20 percent of GDP. For emerging market economies, the benchmarks are 70 and 15 percent of GDP respectively (IMF, 2018c). If the debt level and gross financing needs remain below the benchmark in the last year before the projections and over the projection period, the contribution to fiscal space is considered positive. If the respective benchmark is breached for at least one year in the last year before the projections or over the projection period, the contribution to fiscal space is negative.

25. The IMF classifies countries in categories by availability of fiscal space. Initially, there were three categories of fiscal space in this framework: (i) fiscal space was considered *limited* when no or only marginal fiscal loosening compared to the baseline can be contemplated; (ii) there was *some* fiscal space when there were some concerns about financing, fiscal sustainability, or credibility, but meaningful temporary fiscal measures were still possible within certain limits; (iii) fiscal space was considered *substantial* when financing, fiscal sustainability, and credibility considerations suggest no significant constraint to undertaking temporary fiscal measures. In 2019, the IMF revised the fiscal space classification categories. The category of *limited fiscal space* was split into two new categories. Countries where fiscal sustainability and market financing were in question, or market financing was already prohibitively expensive, were classified as having *no fiscal space.* Countries, where there were clear, but not imminent, risks to fiscal sustainability and marginal fiscal loosening was possible compared to the baseline, were classified as having *fiscal space at risk.* Thus, the framework

could identify fiscal space availability or its absence. The other two categories (*some* and *substantial fiscal space*) remained unchanged.

26. Borrowing space is the first component of fiscal space.[5] As public debt sustainability closely depends on fiscal policy, borrowing space is closely linked to fiscal space, which consists of many components as detailed above. Thus, borrowing space is usually defined as a country's capacity to borrow without undermining debt sustainability. In many countries, a public borrowing plan is usually an integral component of a country's fiscal framework. Its compatibility with maintaining debt sustainability over the medium-term is a key concern. Thus, the size of available borrowing space available would depend on the extent and nature of the country's debt vulnerabilities. Another consideration would be the assessment of the feasibility of achieving planned borrowing levels at the envisaged terms.

27. Borrowing space is part of the IMF's debt sustainability framework (DSF). The recent reform of Fund policy on public debt limits put debt sustainability in a broader macroeconomic context allowing for greater flexibility in debt limits and assessing debt sustainability for all countries (IMF, 2020i). For LICs, the published DSF contains numerical thresholds and is designed to guide LICs borrowing decisions to match their financing needs with repayment ability (IMF, 2020b). The DSF recognizes that countries with different policy and institutional strengths, macroeconomic performance, and buffers to absorb shocks, have different abilities to handle debt. The DSF, therefore, classifies countries into one of three debt-carrying capacity categories (strong, medium, and weak). The classification is based on a composite indicator, which draws on the country's historical performance and outlook for real growth, international reserves coverage, remittance inflows, and the state of the global environment, and the World Bank's Country Policy and Institutional Assessment index. Different indicative thresholds for debt burdens are used depending on the country's debt-carrying capacity. The thresholds on external debt are set in terms of present value (PV) of GDP and in nominal terms (Figure 2). A 5-percent discount rate has been used since 2013 to calculate the PV of external debt. Debt sustainability is assessed based on both, the framework and judgement.

Figure 2. Debt Sustainability Thresholds for LICs

	PV of external debt in percent of		External Debt service in percent of		PV of total public debt in percent of
	GDP	Exports	Export	Revenue	GDP
Weak	30	140	10	14	35
Medium	40	180	15	18	55
Strong	50	240	21	23	70

Source: IMF, 2018d; IMF, 2020b.

28. Borrowing space can deviate from fiscal space. For example, even if debt space is absent, countries can still have fiscal space if non-debt financing options are available, for example disposal of government financial assets, such as currency and deposits, non-monetary gold, SDRs, equity and investment fund shares, privatization of a controlling equity of a public corporation. In addition to debt, governments can finance deficits

[5] Borrowing space is not defined in the IMF fiscal space framework.

by selling non-financial assets, such as fixed assets (buildings, machinery, cultivates biological resources, intellectual property, weapons systems), inventories, valuables, and non-produced assets (land, mineral and energy resources, permits and leases to use natural resources and radio spectra). Finally, in cases of fiscal dominance, governments can use monetary financing.

29. Gross financing needs is the second component of fiscal space. A relatively low budget deficit and smaller upcoming debt repayments contribute to create room and allow governments to raise spending or lower taxes in case of need, without compromising debt sustainability and market access.

30. In this paper, the nominal fiscal space is narrowly defined as the sum of borrowing space and financing space. As argued above, fiscal space is a highly complex concept, as it should include in addition to purely fiscal variables other factors, such as the price of new debt as well as the availability of liquid assets. However, due to lack of quantitative metrics available for many countries, fiscal space in this paper is narrowly defined as borrowing space plus financing space. It must be recognized that although these are the main contributors to fiscal space, the proposed index may fail to capture some of these alternative factors that determine fiscal space. Borrowing space is calculated as the difference between a country's public debt-to-GDP ratio and its sustainability threshold. Similarly, financing space is calculated as the difference between a country's gross financing needs as percent of GDP and the corresponding sustainability threshold. Thresholds for both variables are defined as a function of the country's income group (AE, EM, LIC) and their access to capital markets (0, 1, 2). The following matrix summarizes these thresholds (Figure 3). Following DSF guidance, the sustainability thresholds for LICs are calculated in *present value*[6] of their debt, while for AEs and EMs the thresholds based on the nominal level of their debt stock. Gross financing needs thresholds are all defined in levels. By access to capital markets, countries are grouped in three categories: no access to capital markets (none), limited access (limited), and full access (see subsection IVc for the definitions of these categories).

Figure 3. Borrowing and Financing Thresholds (in percent of GDP)

		Public Debt			GFN		
		AE	EM	LIC*	AE	EM	LIC
Access to capital markets	None	70	55	35	15	10	7
	Limited	70	60	55	15	15	10
	Full	85	70	70	20	15	15

** In present value*

Source: IMF, 2020b; authors' calculations.

Monetary Space

31. Monetary space is the second quantitative component of policy space. Monetary space is conventionally defined as ability of central banks to change policy rates at their discretion to achieve their macroeconomic objectives. The existence of monetary policy space has been forcefully called into question by the zero bound on policy rates, prevailing in most advanced economies in the years post-global financial crisis. Recent discussions of monetary policy space have focused on the inconvenient fact that monetary policy space

[6] In line with DSF practices, a 5% discount rate is used for all countries.

has remained largely constrained by the lower bound of interest rates, limiting the policy options available to Central Banks for addressing future deflationary shocks. The existence of cash prevents central banks from cutting interest rates much below zero.

32. Monetary space is usually measured as central banks' ability to change policy rates. For example, Romer and Romer (2017) measure monetary policy space as a dummy variable for whether the policy rate is above the zero-lower bound. They suggest that the simplest measure of monetary policy space in advanced economies is a dummy variable that is equal to 1, if the policy interest rate is greater than 1.25 percent at the end of the previous half-year, and 0 otherwise. The authors recognize that although the cutoff level is admittedly arbitrary, this measure captures the notion that, if the policy interest rate is below a certain level, central banks are severely limited in their use of conventional monetary policy. Other variants of this measure are also possible, such as different cutoff level and a range of means and standard deviations of the cumulative normal distribution in the policy rate. Also, central banks can support the economy after hitting the zero lower bound by using forward guidance and credit easing (e.g., purchasing long-term securities). As for the quantification, Wu and Xia (2016), for example, constructed a shadow rate to convert the interest rate term structure into a short-term rate, thus helping to quantify policy space. Finally, it should be also acknowledged that monetary policy space or space to change policy rates is also affected by the difference between actual and potential output or between real and neutral real interest rate.

33. Monetary space can also be defined as central banks' leeway to increase inflation. Relative to Romer and Romer's (2017) definition, we consider that monetary space exists, if headline inflation is projected to remain below target. Or if, in countries where inflation is already at the targeted level, central banks intend to raise temporarily the target to give more monetary space to fight the crisis. In countries where inflation is well below target, central banks have substantial discretion to reduce policy rates or implement quantitative easing to boost inflation to the targeted level. Most central banks where inflation is below target have policy space for additional monetary expansion before inflation expectations change and they reach the targeted inflation level, at least in the short run. In addition, the existence of lower and upper bounds to the inflation target could affect the use of policy space —countries with inflation above target, but below the upper bound, may assess differently the policy space than just simply looking at the target. Something similar could happen for countries with inflation above the upper bound, but still with relatively low inflation and central bank credibility. For countries without an inflation targeting framework, an average 2020 inflation target for their respective income group is used as an implicit inflation target. The effective zero bound on policy interest rates is not an impediment, as on technical grounds, there is no reason why interest rates cannot be set deeply negative "if backed up by measures to prevent cash hoarding by financial firms" (Lilley and Rogoff, 2020).

34. In this paper, monetary space is defined as central banks' ability to stimulate the economy without compromising price stability. In line with the two definitions of monetary space mentioned above, monetary space is measured here as an intersection of growth and inflation. On one side, central banks' monetary policy can be constrained by the zero-lower bound, although in practice in some AEs interest rates dropped below zero. To better capture this reality, this paper applies an effective lower bound of -1 percent. On the other hand, monetary policy is also constrained by the need to ensure controlled inflation as defined by their inflation target. Therefore, our measure of monetary space will be the central bank's room to support growth through both conventional and unconventional monetary policy, as long as inflation remains reasonably close to the target. Central banks are assumed to exhaust their conventional monetary policy tools before using unconventional policies such as QE. This adds to the realism of the proposed index by taking in part of the central bank's decision-making process in lowering rates.

Reserve Space

35. Reserve space in the third quantitative component of policy space. The concept of reserve space can be derived from the reserve adequacy metric. The traditional metrics, which remain broadly relevant and are routinely used for policy making, include import cover, the ratio of reserves to short-term debt, and the ratio

of reserves to broad money (IMF, 2011). The import cover ratio is usually viewed as relevant for countries with relatively closed capital accounts, as it points at how long imports can be sustained in the event of a shock. Its traditional metrics have been based on months of prospective imports, with 3 months of import coverage and 100 percent cover of short-term debt with reserves as the most widely used standards of adequacy (IMF, 2013). Finally, for countries with large banking sector and very open capital accounts, the ratio of reserves to broad money has been used to capture capital flight risks, with the upper end of a prudent range for reserve holdings typically set at 20 percent (IMF, 2016b).

36. Combination metrics have been also used to assess reserve adequacy. The most common such metric is the expanded Greenspan-Guidotti rule, consisting of short-term debt plus the current account deficit, which is intended to reflect the full potential 12-month financing need (Greenspan, 1999). Another combination metric was proposed in Wijnholds and Kapteyn (2001) and used short-term debt and broad money to model debt repayments and capital outflows as motivations for holding reserves, considering exchange rate regimes and country risks. Jeanne and Rancière (2011) developed an optimal reserve model, where the optimal level of reserves is determined by balancing the economic cost with the opportunity cost of holding reserves and reflecting the degree of risk aversion. Their model suggests that many emerging markets (EMs) would optimally hold reserves at around 80-100 percent of short-term debt plus the current account deficit.

37. The IMF has developed an analytical framework to assess reserve adequacy. It is based on the assessment of reserve adequacy (ARA) by groups of countries—in developed, emerging, and developing and credit constrained economies (IMF, 2016b; IMF 2020c). The framework is based on a broad view of potential risks, sources of shocks, and vulnerabilities underlying reserve needs than transitional metrics.

38. IMF ARA metrics focus on reserve adequacy for precautionary purposes. While there are multiple reasons for holding reserves, ARA focuses only on precautionary motives defined as the role of reserves in providing adequate space to country authorities to respond to shocks and prevent disorderly market conditions and undue economic dislocation (IMF, 2016b). The precautionary motive for holding reserves differs by country group. In general, advanced economies need reserves for precautionary purposes to limit the risk of market dysfunction from shortages in foreign currency. Countries with market access need reserves to mitigate the risk of crises from potential current and capital account shortfalls. Finally, countries with limited market access need reserves to protect domestic absorption against current account shocks.

39. In this paper, nominal reserve space is defined as the level of reserves exceeding two reserve adequacy metrics. Assuming that countries hold reserves for precautionary and liquidity purposes, the adequacy level depends on the country's income group and access to capital markets. In Figure 4 we show the matrix containing adequacy thresholds for both metrics considered (months of next year's imports and percent of short-term debt) depending on the county's income group and access to capital markets. For instance, EM and LIC reserves are considered adequate if the country maintains three or more months of the prospective value of imports of goods and services. Additionally, EM and LIC reserves need to accrue to 100% of short-term debt (Greenspan-Guidotti rule) if they have at least some constraints to international capital markets. If not, we assume only 50% of short-term debt cover is adequate. On the other hand, AE reserves are considered adequate above one month of imports and no short-term debt cover is required. We adopt a somewhat simpler approach given that more complex combination metrics, such as those discussed above, and more detailed ARA-based reserve metrics, are not available for most countries.

Figure 4. Reserve Adequacy Thresholds

Access to capital markets	Months of Imports*			% of Short-term Debt		
	AE	EM	LIC	AE	EM	LIC
None	1	3	3	0	100	100
Limited	1	3	3	0	100	100
Full	1	3	3	0	50	50

** Next year's imports*

Source: IMF, 2015; authors' calculations.

Institutional Environment

40. Policy space critically depends on the institutional environment. Governments' capacity to have and increase policy space reflects institutional, structural, and other policy constraints, in which they operate. For the purposes of this paper, five components of institutional environment are considered – the international status of the local currency (reserve currency countries (RCCs) vs non-RCCs), the country's income group, its access to international capital markets, risk of debt distress, and its exchange rate regime.

International Status of National Currency

41. The reserve currency status of the national currency amplifies policy space. Reserve currency is conventionally defined as a foreign currency held in significant quantities by central banks as part of their foreign exchange reserves. IMF Articles of Agreement do not define reserve currency directly, but they mention reserve assets[7]. Reserve currencies are just one form of reserve assets and refer narrowly to currencies providing the official sector with a good store of value and ready access to international liquidity. Ready access to international liquidity is closely linked to the Fund's definition of freely usable currencies, defined in the Articles of Agreement as currencies which are widely used to make payments for international transactions and widely traded in principal exchange markets. Also, the IMF regularly publishes Currency Composition of Official Foreign Exchange Reserves (COFER) (IMF, 2020a). The currencies, identified in COFER as currencies of foreign exchange reserves, are U.S. dollar, Euro, Chinese renminbi, Japanese yen, Pound sterling, Australian dollar, Canadian dollar, Swiss franc, and other currencies undistinguishably reported as one group. Therefore, at least 26 countries can issue reserve currencies. Iancu et al. (2020) define reserve currencies as the currencies separately identified and reported in the IMF COFER database: eight currencies currently in use (the SDR currencies—US dollar, euro, Japanese yen, British pound, and Chinese renminbi, plus the Swiss franc, Canadian dollar, and Australian dollar—comprising 97 percent of total allocated reserves), and three currencies preceding and later replaced by the euro. Finally, the currencies included in the SDR basket (U.S. dollar, euro, Chinese yuan, Japanese yen, and U.K. pound sterling) can also be considered reserve currencies.

42. Official foreign exchange reserves are held in support of a range of objectives. They include the objectives to support and maintain confidence in the national policies, provide a level of confidence to markets that a country can meet its external obligations, demonstrate the backing of domestic currency by external assets, assist the government in meeting its foreign exchange needs and external debt obligations, and others. The US dollar dominates reserve currencies. Ilzetzki, Reinhart, and Rogoff (2019) show that the US. dollar

[7] Article VIII, Section 7 sets out the obligation of each IMF member to collaborate with the Fund and with other members in order to ensure that the policies of the member with respect to reserve assets are consistent with the objectives of promoting better international surveillance of international liquidity.

scores as the world's dominant anchor currency by a very large margin. In contrast, the global role of the euro appears to have stalled.

43. In this paper, however, RCCs are defined as the United States and countries in the Euro area. Their central banks issue reserve currencies (US dollar and Euro, respectively), their government repay their debts mainly in national currencies, can readily swap their nationals currencies for other currencies, and their currencies are widely accepted for international transactions[8].

44. In reserve currency countries, money cannot 'run out.' A recent string of literature (Landau, 2020) argues that in RCCs governments can always borrow from their own central banks, i.e., finance its debt by money creation. Although such policies involve risks of default and inflation respectively, all what governments need to do is manage these risks well. Blanchard and Pisani-Ferry (2020) point out that, when interest rates are equal to zero, the purchase of government bonds by the central bank in exchange for money just replaces one zero interest rate liability, called debt, by another, called money, and therefore does not affect public debt dynamics. Policy interest rates are indeed equal to zero, negative or close to zero in all RCCs. Referring to advanced economies, Turner (2015) argues that the technical feasibility and desirability in some circumstances of monetary finance was not in doubt. Once it becomes obvious that monetary financing is always feasible, the government budget constraint in RCCs exists only because monetary financing is excluded from the menu of instruments on political grounds.

45. The need for reserve buffers likely differs between RCCs and other countries. In RCCs and other countries with predictable access to reserve currencies, the need for reserves is obviously lower than in other countries (Iancu, 2020). As ARA 2013 argued reserve currency issuers as well as countries with standing central bank swap lines are unlikely to need sizable reserves for precautionary purposes, as they can create assets which can be swapped into any other currency at any time. For non-reserve issuers without predictable access to reserve currencies, external buffers, including in the form of reserves, can provide insurance against the risk of market dysfunction (IMF 2013). To the extent that RCCs have transactions with (or debt to) other countries in other currencies, they might want to hold international reserves in other currencies, say dollars. However, they do not need for sizeable reserves for precautionary purposes, as they can create assets that could be swapped into dollars. And second, it is the credibility of policies more broadly, so not only monetary, but also exchange rate and fiscal policies, that is relevant.

46. In recent years, RCCs have expanded their base money substantially with no impact on inflation. As there is no single metric for the appropriate size of a central bank's balance sheet, either in normal or in crisis times, if balance sheet size is driven by demand for the central bank's liabilities, then its size does not pose problem, regardless of the maturity of the assets held. Therefore, for RCC central banks with a credible fiscal backstop, the risks entailed in balance sheet expansion have been and would be manageable, as long as monetary stability is preserved by keeping inflation expectations anchored.

47. Non-RCCs have strong institutional disadvantages in policy space. Non-RCCs' policy space is severely limited by the fact that other countries do not demand their currencies with the view to replenish their reserves or pay for international transactions. Therefore, the scope for non-RCCs' central banks to expand their balance sheets is limited. In these countries, money can actually 'run out,' as confidence in local currency can be undermined, if the central bank's credibility is put at risk by concerns that its balance sheet is abused by government. If economic agents consider that the central bank will not be able to maintain monetary policy independence, when the government purchases assets, then inflationary pressures may build, and inflation expectations may become de-anchored. In non-RCCs, such market doubts could lead to currency substitution, and thus exchange rate depreciation and imported inflation.

[8] An important difference is that the Euro zone countries have a reserve currency (Euro) that they do not control directly. The Euro is controlled by the ECB in the interests of all countries of the Euro zone.

Income Group

48. Higher income level also amplifies policy space. High-income economies are generally characterized by stronger institutional stability, rule of law, business practices, and resilience to shocks than lower-income economies. Therefore, we consider AEs to have at least some advantages in all three quantitative components of policy space. For example, their fiscal space is amplified by their internationally recognized public debt and more stable public finances reflected in higher sustainability thresholds with respect to EMs and LICs (85/20 relative to 70/15 percent for public debt and GFN respectively). AEs' monetary space is also amplified by their capacity to set negative policy rates. So far only central banks in AEs have made the decision to set negative interest rates as a measure to stimulate their economies. This has not been the case for EMs and LICs. We attribute this to higher central bank credibility and the higher overall stability and maturity of financial markets in AEs. Finally, AEs' reserve space is amplified by the lower probability of balance of payments shortfalls and their higher access to international markets in case of external shocks. This translates into lower reserve adequacy thresholds for AEs than for EMs and LICs (only 1 month of import coverage for AEs relative to 3 months of imports for others and lower short-term debt coverage ratios). The combination of higher debt/GFN thresholds, negative policy rates, and lower reserve coverage by itself creates additional policy space in AEs relative all other countries.

Access to Capital Markets

49. Access to capital markets can limit a country's policy space. In principle, the capacity of countries to borrow from international capital markets can decrease their policy space. In a nutshell, if a government has access to capital market financing at a reasonable risk premium, it has fiscal space; if, however, the country's debt is classified as highly speculative investment or similar, the country is considered to have no fiscal space. This is meant to reflect the unwillingness of foreign investors to buy sovereign bonds from such a country with would in turn restrict said country's ability to obtain funding through the issue of debt. The assessment of market access is often based on the sovereign bond spreads: the higher the spread, the higher the risk premium and therefore the lower market access. Also, debt indicators typically leading to fiscal distress, such as public debt held by non-residents, public debt in foreign currency, the short-term debt share, and external financing requirements, can also indirectly signal degree of market access.

50. In this paper, access to capital markets is measured by Moody's global ratings. The reason for the selection of Moody's over other ratings agencies is that Moody's country coverage is more comprehensive, and the ratings are more granular. These ratings on long-term obligation in foreign currency reflect opinions on the relative credit risk of fixed-income obligations with an original maturity of one year or more (Moody's, 2020). The ratings assess the possibility that a financial obligation will not be honored as promised and reflect both the likelihood of default and any financial losses suffered in the event of default. 130 countries have Moody's ratings and are labeled according to Moody's credit risk scale going from Aaa to D. We define and indicator that takes three values based on these classifications: full access (investment grade ratings) taking a value of 2, limited access (non-investment grade ratings with speculative elements) taking a value of 1, and no access (noninvestment grade ratings with obligations in or near default) with a value of 0. If no classification is available, we assume a value of 0 (no access).

Risk of Debt Distress

51. The risk of debt distress severely limits policy space. Under the DSF (IMF, 2020b), for low-income countries (LICs), risk signals to debt sustainability are derived by comparing debt burden indicators with the indicative thresholds over a projection period. There are four ratings for the risk of external public debt distress: *low risk*, if none of the debt burden indicators breach their respective thresholds under the baseline and stress tests; *moderate risk*, if none of the debt burden indicators breach their thresholds under the baseline scenario, but at least one indicator breaches its threshold under the stress tests; *high risk*, if any of the external debt burden indicators breaches its threshold under the baseline scenario, but the country does not currently face

any repayment difficulties; or in *debt distress*, when the country is already experiencing difficulties in servicing its debt, as evidenced, for example, by the existence of arrears, ongoing or impending debt restructuring, or indications of a high probability of a future debt distress event (e.g., debt and debt service indicators show large near-term breaches, or significant or sustained breach of thresholds).

52. There are no IMF debt distress ratings or methodology for countries other than LICs. The reform of the policy on public debt limits (IMF, 2020f) encouraged adequate debt disclosure to the IMF; allowed for greater tailoring of debt conditionality for LICs; encouraged the broader use of debt conditionality in present value terms accommodated non-concessional borrowing (subject to safeguards); and clarified the definition of concessional debt. For all countries other than LICs, debt sustainability is assessed relative to country-specific circumstances. IMF DSAs, published usually as part of surveillance or program staff reports, include bottom-line assessment of debt distress risks. Such assessments vary from country to country, there is no common terminology related to risks of debt distress, and multiple qualifications reflecting each country's specificity may be used[9]. Therefore, due to the low degree of comparability of these classifications, debt distress risk considerations were only incorporated into our policy space measure for LICs, i.e., countries for which harmonized ratings are already being produced and published by the Fund. This is also meant to reflect an additional adjustment for the extra risk that lending to LICs can have.

Exchange Rate Regime

53. The exchange rate regime has an ambiguous impact on policy space. A fixed exchange rate regime severely limits policy space, whereas floating exchange rate regime amplifies it. In members of currency unions, from their individual point of view, the flexible exchange rate is not unrestrictive, as the exchange rate with other members of the union is fixed. Policy space would depend on the need to defend of a certain level of exchange rate. Countries with floating exchange rate regimes, where there is no explicit or implicit commitment to a specific level of exchange rate, have more policy space than countries with any form of a managed exchange rates. IMF Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) (IMF, 2018e) provides information on the de jure exchange rate arrangements as described by the countries and the de facto arrangements, which are classified into three types and 10 categories. This paper follows the classification of exchange rate arrangements by types into hard pegs, soft pegs, and floating regimes.

Policy Space Index

Effective Policy Space Calculation

54. Effective policy space is calculated as a conditional measure of policy space components. Nominal policy space consists of the three quantitative components discussed above - fiscal space, monetary space, and reserve space, - all expressed in percent of GDP. Nominal space for each of the three quantitative components is a priori defined as a distance to its respective threshold weighted by a probability of constraint which increases as the target indicator moves closer to its threshold. Each quantitative component is then adjusted to reflect the country's institutional environment that have not been accounted for yet, such as its exchange rate regime, or the risk of debt distress (only for LICs). The *effective policy space index* is then calculated as an aggregated index of the three quantitative and five institutional components. The calculations illustrated here assess the space the countries have to fight a negative shock, such as the Covid-19 pandemic

[9] The new set of tools to be rolled out in the first half of 2022 will provide a harmonized sovereign risk assessment for higher income and market access economies.

in 2020, and only for short-term policy actions. To calculate the effective policy space for each country, we follow the steps below:

55. Step 1: Calculate effective fiscal space. Fiscal space, as discussed above, is composed of borrowing and financing space. First, we need to define the thresholds. The thresholds used are those displayed in Figure 3 which depend on the country's income level and access to capital market. The thresholds are applied to the level of debt and the current value of gross financing needs[10]. In order to avoid the rough discontinuity of applying a discrete threshold, we take a probabilistic approach by assuming a normal distribution with mean equal to median levels of public debt and gross financing needs (as percent of GDP) since 2007, and standard deviation such that the DSF thresholds are at 2 standard deviations from the mean. By doing so we allow effective space to decrease smoothly as debt and financing need approach the threshold.

In practice, country *j*'s effective borrowing and financing space B_j and F_j are computed as:

$$B_j = \left[\tau^d\left(I_j;\kappa_j\right) - D_j + RCC_j \times \alpha^{\mathrm{d}}\right] \times \Phi\left[\mu^d(I_j;\kappa_j);\sigma^d(I_j;\kappa_j)\right]$$

$$F_j = \left[\tau^f\left(I_j;\kappa_j\right) - GFN_j + RCC_j \times \alpha^f\right] \times \Phi\left[\mu^f\left(I_j;\kappa_j\right);\sigma^f(I_j;\kappa_j\right]$$

where τ^d, τ^f are the corresponding thresholds to public debt and gross financing needs which depend on the country's access to capital markets κ_j and its income level I_j (Figure 3). RCC_j is a categorical variable taking the value of 1 if the country is classified as a reserve currency country. This categorical variable is multiplied by α_d, α_f which are the debt and financing premia for RCCs. $\Phi[\mu;\sigma]$ is the cumulative normal distribution with mean μ and standard deviation σ both of which depend on the threshold $\tau(I_j;\kappa_j)$, since they are defined such that τ is equal to $\mu + 2\sigma$[11]. After computing borrowing space and financing need space, we adjust for whether the country is experiencing – or is in high risk of experiencing – debt distress. This adjustment is made exclusively for LICs and is discrete in that countries considered to be at high risk of debt distress have no fiscal space regardless of their underlying indicators (assuming no official financing is available). Thus, effective fiscal space (EFS) for country j is computed as

$$EFS_j = \left(B_j + F_j\right) \times (1 - \mathbf{1}_{\{dist\}})$$

where $\mathbf{1}_{\{dist\}}$ is a categorical variable that takes the value of 1 if county j is either in high risk of or in debt distress and 0 otherwise.

As argued above, RCC status enhances policy space, as it allows such countries to increase their debt-carrying and fiscal deficit capacity. To estimate α_d, we estimate a panel regression random effects (RE) model using yearly data for 177 countries with the following specification:

$$D_{i,t} = \beta_0 + \beta_1 Frisk_{i,t} + \beta_2 Crisis_{i,t} + \alpha_d RCC_{i,t} + u_i + \eta_{i,t}$$

where $Frisk$ is VEE's fiscal risk index, $Crisis$ is a time dummy that takes the value of 1 if the year is a crisis year (i.e. 2008, 2009 or 2020) and 0 otherwise, RCC is a dummy variable that takes the value of 1 if the country is classified as a RCC and 0 otherwise, and u_i is the county-specific effect assumed to follow the classic RE assumptions. The results of the model are shown in Figure 5. The generalized least squares (GLS) estimate of α_d suggests that RCCs have held, on average, 27.8 percent of GDP more in public debt than non-RCCs, controlling for fiscal risk and other country-specific characteristics through u_i. In practice, this means that for any level of income and access to capital market, RCCs get a "premium" of +27.8 to their debt threshold. The robustness of our estimate is confirmed by contrasting it with the POLS estimator also shown in Figure 5 which suggest a premium of +29[12]. The same specification is used to estimate α_f replacing $D_{i,t}$ with $GFN_{i,t}$. RE and

[10] As noted in Section II, for LICs the threshold is applied to the present value of public debt using a 5% discount rate.

[11] The mean of the distribution μ is set as the conditional average since 2007. Changing μ while maintaining τ constant, changes the results only marginally.

[12] Fixed effect (FE) GLS estimator could not be used due to collinearity issues with the RCC dummy.

POLS estimates are shown in Figure 5. For gross financing needs, the data suggests a premium of about 14 percent of GDP. For consistency, we kept the RE estimator. Full regression tables can be found in the Appendix.

Figure 5. Estimates of RCC Debt and Financing Premia

	GLS RE	POLS
α_d	27.82***	29.00***
	(8.48)	(2.60)
α_f	13.50*	14.34***
	(7.16)	(2.00)

Notes: Robust standard errors shown in parenthesis. *** significant at 1% ; ** significant at 5% ; * significant at 10%
Source: Authors' estimates.

56. Step 2: Calculate effective monetary space. As defined above, monetary space is determined by two factors: 1) the room a central bank has to lower policy rates and/or to conduct unconventional monetary policy, and 2) the country's current inflation rate and the central bank's inflation target. Like the calculation of fiscal space, we take a probabilistic approach to assess the distance between the relevant variables' actual value and their threshold. Following Romer & Romer (2017), we consider a normal distribution with mean 1.25 and standard deviation of 0.625 for the policy rate. This implicitly restricts central banks from lowering rates below 0 (as 0 is 2σ away from the mean making the cumulative probability virtually 0). In the spirit of realism and to account for the different restrictions different central banks might face, we apply a slightly different distribution for AEs. Keeping the mean at 1.25, we assume a standard deviation of 1.125 such that in AEs the monetary policy rate can effectively go as low as -1. For this, we use data on central banks' policy rates (IMF, 2020e)[13]. For inflation, we take a similar approach wherein the central bank's inflation target is used as the threshold and μ was chosen to be ¾ of the target and σ was chosen to be ¼ of the target. In this way, we allow a country to exceed it inflation target by 25% (1σ) in the short term. For this we use data on central banks' inflation targets (IMF, AREAER, 2018)[14].

Thus, the maximum tolerable inflation in the short term will vary across countries and will be calculated as $\pi_j^{max} = \mu_j + 2\sigma_j = 0.75\tau_j^{\pi} + 0.5\tau_j^{\pi} = 1.25\tau_j^{\pi}$ where τ_j^{π} is country j's inflation target. Finally, we also account for central banks' credibility as an alternative to create more policy space by modelling it as the inverse of the average deviation from its annual inflation target in the last 10 years. Thus, countries where inflation has been consistently at or near the target will have additional monetary space due as a way to reflect the anchoring of inflation expectations as a result of a higher central bank credibility. This adjustment will prevent underestimation of monetary space in countries where the central bank has successfully maintained inflation at or near its target. The effective room for additional inflation is therefore calculated as:

$$\mathbf{E}[\Delta\pi_j] = \frac{(\pi_j^{max} - \pi_j)}{\sigma_\tau} \times \Phi\left[\mu_\pi(\mathrm{I_j})\,;\sigma_\pi(\mathrm{I_j})\right]$$

where

[13] When data was not available, the average of its income group (AE, EM or LIC) was assumed.

[14] When data was not available, the average of its income group (AE, EM or LIC) was assumed. For countries without an inflation targeting framework, an average of inflation targets in 2020 in countries with an inflations targeting framework for each income group is used as a proxy for their inflation target.

$$\sigma_\tau = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(\pi_i - \tau_j^{\pi}\right)^2}$$

This is then translated into monetary policy action using elasticity estimates from two panel autoregressive processes using quarterly data, 4 lags, and allowing for country fixed effects.[15] The estimated equation can be written as:

$$cpi_{i,t} = c_1 + A(L)X_{i,t} + \gamma_1 R_t + \delta_1 D_t + u_{i,1} + \varepsilon_{i,t,1}$$
$$gdp_{i,t} = c_2 + B(L)X_{i,t} + \gamma_2 R_t + \delta_2 D_t + u_{i,2} + \varepsilon_{i,t,2}$$

Where $A(L)$ and $B(L)$ are lag operator polynomials, $X_{t,i} = \begin{bmatrix} cpi_{t,i} & gdp_{t,i} & R_{t,i} \end{bmatrix}$ is the vector of regressors: log of the CPI, log of real GDP, and the corresponding monetary policy rate. D_t is a recession dummy we add to control for large movements in our variables during recessions (e.g., 2008). We estimate both equations allowing for country fixed effects (reflected by the terms $u_{i,1}$ and $u_{i,2}$) and obtain the average short-term elasticity of inflation and real GDP to a monetary policy change ψ_{cpi} and ψ_{gdp} (Figure 6) as the sum of the coefficients on the lagged values of the policy rate in each equation[16]. With these estimates, we can calculate by how many percentage points can the central bank reduce the policy rate until it reaches its maximum tolerable inflation π_{max} and determine how much would this expansionary monetary policy boost GDP in the short run. Hence, effective monetary space (EMS) for country j is calculated as:

$$EMS_j = \left[\frac{\mathbf{E}[\Delta\pi_j]}{\psi_{cpi}} \times \psi_{gdp}\right]\left(1 - \mathbf{1}_{\{hard\}}\right)$$

Where $\mathbf{1}_{\{hard\}}$ is a categorical variable that takes the value of 1 if the country has some form of a pegged exchange rate regime and 0 otherwise. The adjustment for countries that have pegs in their currency stems from the relationship between free exchange rate regimes and monetary policy, as countries with fixed or heavily managed exchange rates do not have fully independent monetary policy. Because soft pegs allow for a limited degree of monetary policy flexibility to deal with shocks, these regimes may be also considered when estimating monetary policy space.

Figure 6. Estimates of Average Inflation and Growth Elasticities

	Ψ_r
CPI	-0.178***
	(0.012)
GDP	-0.132***
	(0.041)

Notes: Coefficients and standard errors shown are for the sum of lagged coefficients. *** significant at 1%; ** significant at 5%; * significant at 10%.
Source: Authors' estimates.

[15] Using a structural VAR with a Cholesky decomposition as in Christiano et al. (2005) is an alternative method for this estimation but is nor really feasible in this case given the dataset.

[16] In both equations, the contemporaneous response of monetary policy to changes in output and inflation was added to control for endogenous responses of monetary authorities after a shock. However, this coefficient was not included in the calculation of elasticities.

57. Step 3: Calculate effective reserve space. Following a probabilistic approach similar to that of the previous steps, we define the reserve adequacy thresholds displayed in Figure 4 to be equal to $\mu + 2\sigma$ for each income group. We set the mean of the distributions μ to be equal to the median value of reserves as months of imports in the last 15 years. Countries' capacity to use reserves is also constrained by their type of exchange rate regime. With a hard peg, reserves may be viewed only as a means to defend the peg, whereas with a floating exchange rate the level of reserves is not critical, as the flexible exchange rate can in principle offsets all disequilibria. To account for different exchange rate regimes that might have bearing in the country's usage of reserves, we also adjust for this fact by classifying countries into three groups of exchange rate regimes: flexible, soft pegs and hard pegs. An additional adjustment is made for RCCs whereby the threshold is effectively reduced to 0. (i.e., no minimum threshold). This is done to reflect the fact that RCCs have no need to hold significant reserves as buffers for future crisis given that, in that case, they can issue their own currency (IMF, 2015). Thus, Effective Reserve Space (ERS) for country j is calculated as:

$$ERS_j = \text{Max}\left\{\left(\frac{R_j - \left(1 - \mathbf{1}_{\{AE\}}\right) \times \left(SD_j \times \rho(\kappa)\right)}{M_{j;t+1}} \times 12 - \left(1 - RCC_j\right) \times \tau_j^R\left(I_j\right)\right) - \bar{R} \times \mathbf{1}_{\{soft\}}; 0\right\} \times \Phi\left[\mu_R\left(\mathrm{I_j}\right); \sigma_R\left(\mathrm{I_j}\right)\right] \times \left(1 - \mathbf{1}_{\{hard\}}\right)$$

where R_j is country j's reserves in in dollar amounts, $M_{j;t+1}$ is the country's next years' imports (in dollars), SD_j is the country's short-term debt in dollars, $\rho(\kappa_j)$ is an indicator function that takes the value of 1 if country j has limited or no access to capital markets, and takes the value of 0.5 if it has full access. Then, $\bar{R}$ is the median level of reserves held by countries with a soft peg, and $\mathbf{1}_{\{AE\}}, \mathbf{1}_{\{soft\}}, \mathbf{1}_{\{hard\}}$ are indicators functions for advanced economies, countries with soft and hard pegs respectively. This formula thus reflects the assumptions that countries with a flexible exchange rate have institutional advantages in the availability of reserves to face negative shocks, similarly, AEs and economies with full access to international capital markets have also less need to keep reserves. By the same logic, if a country has a soft peg regime or has at least some constraint to access capital markets, the assumption is that it can only make limited use of its reserves. The lower limit for countries with soft peg exchange rate regime is assumed to be the median level of reserves that other countries with soft pegs are expected to maintain in 2020 (4.1 percent of GDP). For EM and LICs with limited access to capital markets 100% coverage of their short-term debt is also required following the Greenspan-Guidotti rule. Lastly, if a country has a hard peg, then it is considered that none of the nominal reserve space is available and thus the effective reserve space is equal to zero.

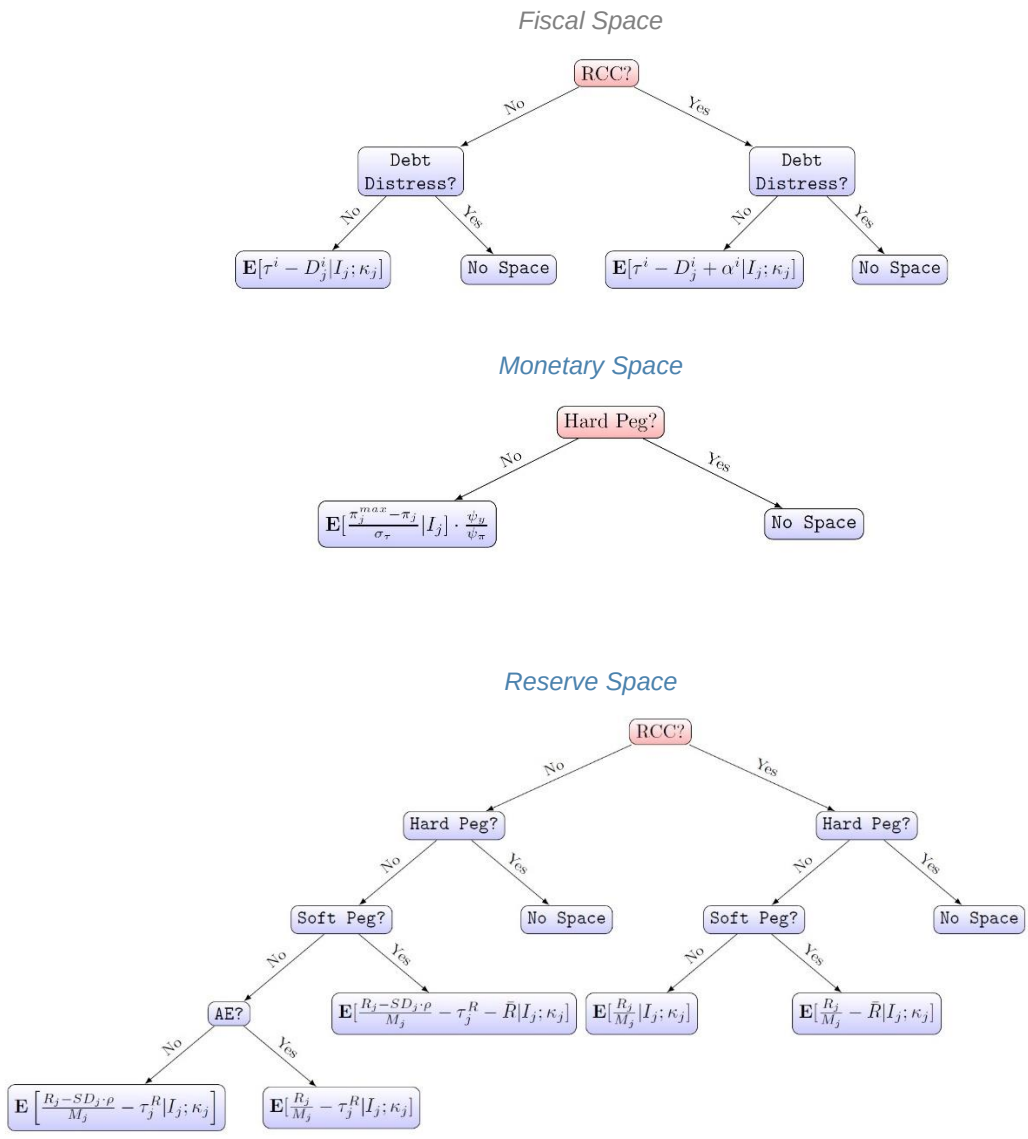
58. Step 4: Calculate total effective policy space. Finally, to compute the total effective policy space for country j the effective fiscal space, effective monetary space, and effective reserve space calculated above need to be summed up:

$$Effective\ Policy\ Space_j = EFS_j + EMS_j + ERS_j$$

As all the components are expressed in percent of GDP and reflect different dimensions of policy space, they are additive and can be summed up to arrive to the overall assessment of the effective policy space available to the authorities. Significant correlation and interactions between these three components are not ruled out by our approach to the extent that their joint behavior is already reflected in the levels of the variables used. For example, accommodative monetary policy can support fiscal policy by reducing the debt burden and preventing a "crowding-out" of private investment from fiscal stimulus. Thus, the size of fiscal space can depend on monetary policy and vice versa, and it could be beneficial to consider monetary-fiscal interaction effects. Also, further assumptions would be required to model the *dynamic* behavior of each component and their interactions. This, however, falls outside the scope of this paper.

All three effective policy space components are bounded below by zero, even though the individual nominal policy space indices can be negative. This reflects the fact that negative policy space is, in practice, no different to having none of it to the extent that this means no ability to respond to shocks from the authorities. This is true irrespective of how negative the nominal policy space on individual components is. The decision tree gives a visual representation of the calculate on methodology presented above (Figure 7).

Figure 7. Policy Space Decision Trees



Source: Authors' presentation.

59. The proposed index of the effective policy space has limitations. As mentioned above, as a static measure, our index should not be affected by interactions between components. However, it may miss important dynamic interactions among different dimensions of policy space. For example, a large fiscal deficit (which leads to a large negative nominal fiscal space) can result in monetary financing and erode monetary

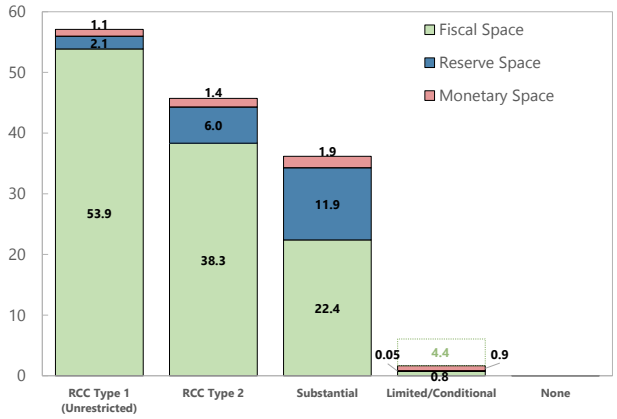
space; but by bounding the effective fiscal space at zero, this interaction would be muted in the final index. The use of discrete adjustments (e.g., effective fiscal policy space is set to zero when VE fiscal risk is high), while helping simplify and improving tractability of the final index, is also a potential limitation. Discrete adjustments (as represented visually by Figure 7) may be an over-simplification of more complex assessments. For instance, VE ratings are affected by many other factors, and it is possible that a country with moderate fiscal space can still receive a high-risk VE rating. Or countries with low credit classification can still have some access to international capital markets.

Application to the Covid-19 Crisis

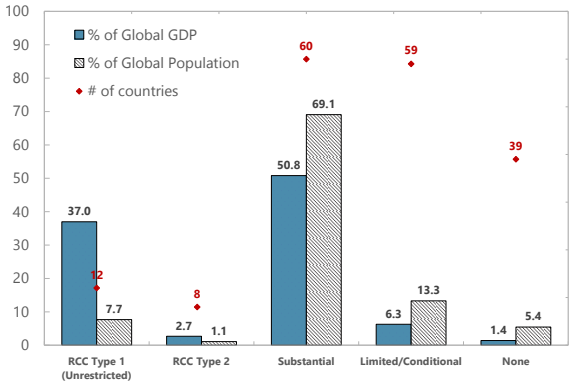
60. Several groups of countries can be distinguished by effective policy space. The 178 countries included in our sample – out of 187 countries in the WEO database as of October 2020 (IMF, 2020d) – can be classified in five groups by the decreasing level of available policy space (Figure 8)[17].

Figure 8. Effective Policy Space During Covid-19

a. Average Effective Policy Space by Group (In Percent of GDP)



b. Group Composition (in percent; number of countries)



Source: Authors' calculations.

[17] Detailed calculations of policy space for each country are available from the authors.

61. Group 1. Reserve currency countries with unrestricted policy space (RCC Type 1). This group includes reserve currency countries (RCCs) with full access to capital markets and low fiscal risks. In the short run, countries in this group have virtually unrestricted resources to fight crises, even comparable to the Covid-19 in magnitude. For example, several European countries can be classified as having unlimited effective policy space because they have large amounts of fiscal space, as their debt levels are below the sustainability thresholds defined for RCCs. Finally, they have reserve space since as RCCs members of the Euro area, there is no real minimum level of reserves that these countries need to hold. Their institutional environment generally amplifies policy space, as the exchange rate regime is flexible, they enjoy full access to capital markets, and enjoy the benefits of issuing reserve currencies. There are 12 countries in this group, all of them advanced economies, representing over one third of global GDP and almost 8 percent of world's population.

62. Group 2. Reserve currency countries with somewhat restricted policy space (RCC Type 2). This group includes RCCs with limited access to capital markets and mounting signs of fiscal risks. In the short run, countries in this group still have enough resources to fight most crises but need to address mounting vulnerabilities. For example, some Euro area member countries can be classified as type 2 RCC countries. In our framework, the ECB grants the status of reserve currency countries to all Euro are members as it can provide significant support by expanding its balance sheet for monetary policy purposes. This, in principle, makes the availability of a reserve currency from the ECB limited only by the inflation rate. At the same time, irrespective of such availability of reserve currency, as long as inflation remains low, a Euro-zone country can exhibit signs of mounting risks, if, for example, its debt levels are well above the sustainability thresholds. The country specific institutional environment imposes additional restrictions, as increasing fiscal risks and constrained access to capital markets can restrict these countries' ability to quickly respond to a negative shock. Moreover, in the case of the Euro area, it can be argued that the membership to the currency union imposes additional constraints to policy space rather than being a source for it. This group includes only 8 countries, also all of them advanced economies, producing about 3 percent of world GDP.

63. Group 3. Non-reserve currency countries with substantial policy space. Countries in this group are not RCCs but have considerable policy space, large enough to absorb in the short run all costs of the Covid-19 crisis or a similar-size negative shock. A country having substantial space is defined as one having total policy space in excess to the median decrease in real GDP in the year 2020. This threshold is thus set at 5 percent. For example, an African country (EM) has effective policy space of 9.7 percent of GDP. It consists of monetary space of 1.2 percent of GDP as its inflation is well below the inflation target and policy rates stand far enough to the zero-lower bound (ZLB). Additionally, its exchange rate is flexible, which allows it to make full use of its substantial reserve space which equals 8.5 percent of GDP. Though this country has zero fiscal space its combined monetary and reserve space exceed what was needed to cover the cost of the crisis in 2020 assessed at an average of 6.3 percent of GDP. On the opposite side, a European country (AE), outside the Euro area, has no monetary space or reserve space as it has a fixed exchange rate. However, this country also exhibits substantial fiscal space as its debt levels are well below the sustainability threshold and has full access to capital markets. A total of 60 countries accounting for about 69 percent of global population producing roughly half of global GDP can be included in this group. Many advanced economies with non-reserve currencies, as well as oil producers and other commodity exporters fall into this group.

64. Group 4. Non-reserve currency countries with limited and/or conditional policy space. Countries in this group have either very limited or no effective policy space. In the latter case, these countries would still qualify for conditional or concessional lending. The sub-group of countries with limited effective policy space includes countries with some positive effective space but that is still insufficient to cover all financing needs from the Covid-19 crisis in the short run. The sub-group of countries with conditional effective policy space includes countries with no effective policy space but still with some *nominal* fiscal space (i.e., their fiscal indicators show *a priori* that the country has additional debt carrying capacity), which could be filled by international organizations and bilateral donors on their terms and conditions. Such financing can be

concessional and non-concessional, under any of the existing facilities.[18] LICs in debt distress do not have conditional effective policy space. For example, a middle eastern EM, has effective policy space equal to 1 percent of GDP, which is insufficient to cover the cost of similar crisis (5 percent of GDP). It consists of a small fiscal space, as its debt level and gross financing are slightly below the defined thresholds for an EM with no access to capital markets. Given these institutional liabilities, this country's nominal fiscal space is substantially larger at 17.1 percent of GDP. Being an EM with no other institutional risks, this country would qualify for conditional lending for this amount and thus its conditional policy space is equal to 17.1 percent of GDP. Another example is a LIC in Southeast Asia, which has some fiscal (2.0) and monetary space (0.1) as it has a soft peg and limited access to capital markets. It has no reserve space. Thus, the country has effective policy space of 2.1 percent of GDP. However, given its current levels of debt stock and gross financing needs, it still has access to financing from bilateral and multilateral donors for an amount of an additional 1 percent of GDP. Its total conditional policy space is therefore equal to 3.1 percent of GDP. This group includes 59 countries, accounting for 13 percent of global population and producing 6.3 percent of global GDP. The group is very diverse and includes advanced, middle-income and LICs, each of them facing country-specific problems that severely limit their policy space.

65. Group 5. Non-reserve currency countries with no policy space. This is a residual group, which includes all other countries with the policy space index equal to zero. Although its individual components may indicate some *nominal* space in particular areas, the institutional characteristics of these countries suggest that this space cannot be used. Countries in this group have effective policy space equal to zero and have no room even for conditional financing. They will have to rely on grants and donors willing to take substantial default risks. For example, a small African country that, while exhibiting some reserve space, it has no effective policy space as it has a fixed exchange rate regime, and no space across all other dimensions. This lack of effective policy space suggest that the authorities will have to rely entirely on external help in covering even the short-term costs of the Covid-19 crisis and future shocks. Another African country can be an example of another country in this group. This country has substantial fiscal space but is in a status of debt distress and has no access to capital markets. Thus, it cannot use any of its available space. Some 39 middle- and low-income countries, representing 1.4 percent of global GDP and 5.4 percent of global population are included in this group.

66. As a result of the crisis, our analysis suggests that countries have lost about 15 percent of GDP in policy space. This average loss of nominal policy space between 2019 and 2020 masks important details (Figure 9). First, LICs exhibit substantially lower average response compared to AE and EMs. The latter two show an average change in policy space of about 20 percent of GDP while LICs only spent 5.6 percent of their GDP on average. This is indicative of the lower availability of policy space in LICs but also of the degree to which different countries were affected by the crisis. Second, the loss of nominal policy space is almost entirely driven by the reduction in nominal fiscal space (13.4 percent of GDP), which shows that so far, the response to the crisis has been overwhelmingly fiscal (88% of the total response). At the same time, monetary space has changed only marginally reflecting the widespread persistence of historically low interest rates. Furthermore, reserve space accounts for only 11.5 percent of the total suggesting that, on average, countries see this instrument as last resort. Third, the responses' composition also varied across income groups. For AEs, fiscal response represented 97 percent of the total, while for EM and LICs it represented 87 and 70 percent of the total respectively thus suggesting a positive relationship between income level and reliance on fiscal policy. Conversely, reliance on reserves seems to be negatively corelated with income as the share of reserve response was 28 percent for LICs while for AE and EMs it was 2.6 and 12.1 percent.

[18] Eligibility for concessional financing from IFIs can constitute an additional 'emergency' source of financing for countries experiencing large adverse shocks (such as the COVID-19 pandemic). This might be a potential source for underestimation of fiscal space. Although certain countries may have borrowed too much, limiting their ability to expand their concessional debt successfully and promptly, in general it may deliver additional policy space during a crisis.

Figure 9. Change in Nominal Policy Space by Income Group, 2019-20

a. In percent of GDP

Group	Overall	Fiscal		Monetary	Reserves
		Debt	GFN		
AE	-19.4	-11.9	-7.0	0.0	-0.5
EM	-20.0	-10.7	-6.8	-0.1	-2.4
LIC	-5.6	-1.6	-2.4	-0.1	-1.6
All	**-15.3**	**-8.0**	**-5.4**	**-0.1**	**-1.8**

b. In percent of total

Group	Overall	Fiscal		Monetary	Reserves
		Debt	GFN		
AE	100	61.2	36.0	0.2	2.6
EM	100	53.4	34.1	0.4	12.1
LIC	100	28.4	41.8	2.0	27.8
All	**100**	**52.4**	**35.5**	**0.5**	**11.5**

Source: Authors' calculations.

Robustness Check

67. Robustness of the policy space calculations can be confirmed by other methods. A principal component analysis (PCA) index can be used to check the robustness of our index as PCA allows us to compute the weights ω_i as the solution to

$$\max_{\omega_i} \omega_i' \mathbf{\Sigma} \omega_i$$
$$s.t.\ \omega_i' \omega_i = 1$$
$$\omega_i \mathbf{\Sigma} \omega_i = 0$$

where $\mathbf{\Sigma}$ is the variance-covariance matrix of the variables included in the analysis. Our policy space index includes eight components; thus, it would be reasonably to evaluate whether it is correctly capturing the information embedded in them.

68. Principal component analysis extracts common components from high-dimensional datasets such that they maximize explained variance and remain orthogonal to each other. We include 11[19] variables reflecting each of the policy space components mentioned in these paper and other key indicators of a country's macroeconomic stability. These variable are: 1) debt-to-GDP ratio, 2) gross financing needs as percent of GDP, 3) reserves in months of imports, 4) CPI inflation, 5) VE's fiscal risk index, 6) Moody's 2020 sovereign debt ratings, 7) a categorical variable capturing the rigidity of the country's exchange rate arrangement equal to 1 (flexible), 2 (soft peg) or 3 (hard peg), and 8) a dummy for reserve currency countries

[19] Risk of debt distress was not included in this analysis since it is only available for LICs and would therefore restrict the validity of the analysis only to such countries.

equal to 0 (non-RCC) or 1 (RCC), 9) current account balance (in percent of GDP), 10) real GDP growth, and 11) GDP per capita as a proxy to control for the country's income group (AE, EM or LIC). The first 4 principal components – accounting for 69 percent of the total variance – are used to compute a PCA-based index.

69. The PCA index is computed as a weighted average of each principal component. In order to produce a single index, we regress our effective policy space index on the 4 principal components and compute the predicted value $\widehat{EPS}_t$ in:

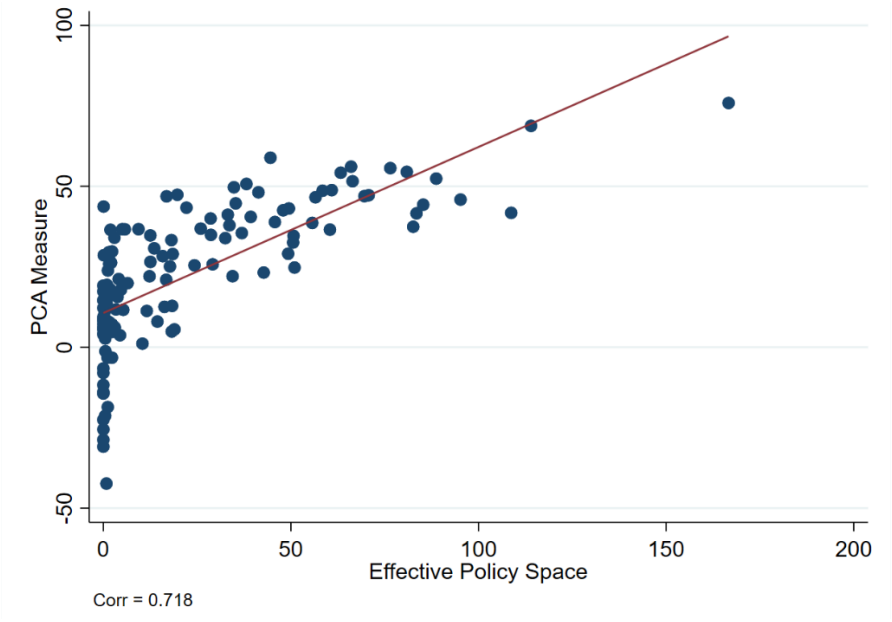
$$EPS_t = \alpha + \boldsymbol{X\beta} + \varepsilon_t$$

Where $\boldsymbol{X} = [PC_{1,t}\ PC_{2,t}\ PC_{3,t}\ PC_{4,t}]$, $\boldsymbol{\beta} = [\beta_1\ \beta_2\ \beta_3\ \beta_4]'$. Hence, the weights correspond to the estimated regression coefficients β_1 - β_4. The predicted values $\widehat{EPS}_t$ show substantial correlation with our effective policy space measure (0.718) thus supporting the validity and robustness of our index.

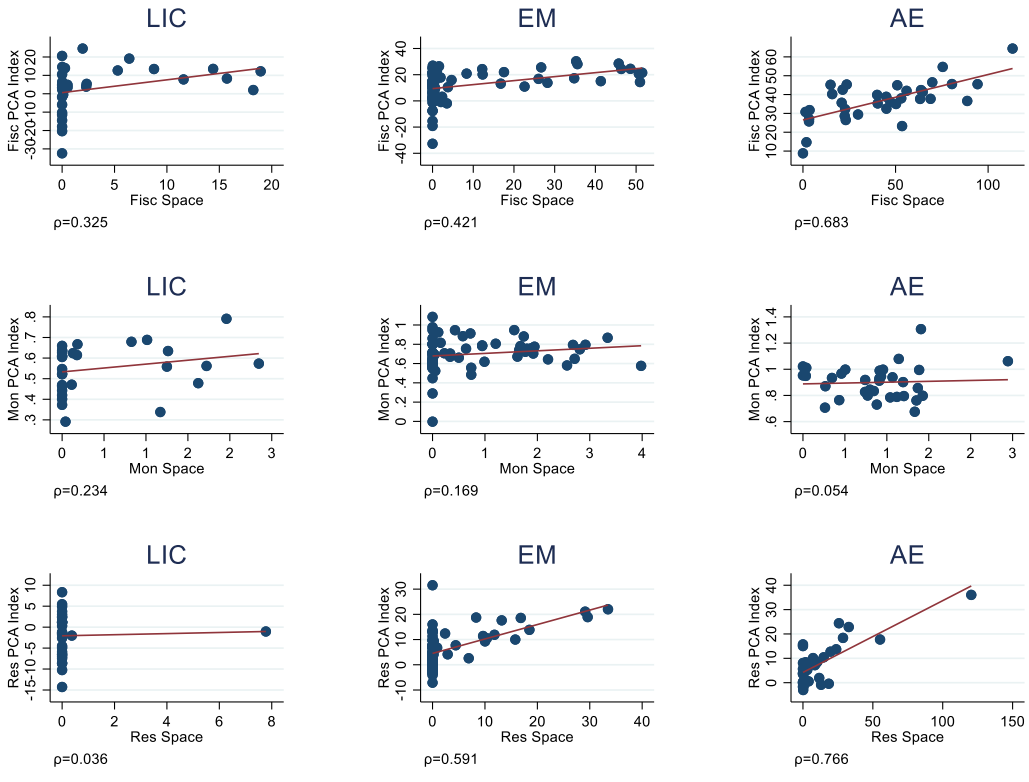
70. Our index seems to be better suited for AEs and EMs than for LICs. Plotting the resulting PCA measure against our policy space index by income group, Figure 10 suggests that our index captures variance within the 11 selected variables quite well in AEs and EMs as correlation between the PCA measure and our index is high (0.69 and 0.59 respectively). However, for LICs our index fails to capture a large share of the variability within the indicators listed above as correlation between the PCA measure and our index falls to about 0.3. This is not too surprising since the assessment of policy space for LICs will most likely be much more country-specific and more difficult to model under the "one-size-fits-all" assumption than for more stable and developed economies. Additionally, there are potential issues with measurement error and low reliability of the data that could, at least partly, explain the poorer performance of our index in LICs. A deeper and more group-specific (or perhaps income group-specific) analysis would be required to create an index that more appropriately captures the concept of policy space in LICs.

Figure 10. Policy Space Index in Principal Component Analysis

a. Overall



b. By Income Group



Source: Authors' calculations

Conclusions

71. The effective policy space index proposed in this paper differs from the IMF's approach to assessing fiscal space. The proposed index can potentially be used to take a snapshot of a country's readiness to address a catastrophic event in the short run. It allows seeing the overall magnitude of policy space and its components available to the authorities. The index also can guide them in taking decisions on how to strengthen their effective policy space and use it rationally in case of a need. Also, the index allows comparing policy space across countries under a single methodology useful for further aggregation to assess the potential financial needs for groups of countries and the world. Finally, the policy space index can also be included as an additional variable in analytical frameworks to examine options available to the authorities to react to unforeseen events.

72. Addition work is needed on the proposed index before it can be used operationally. Nevertheless, an application of the index to the Covid-19 crisis allows illustrating its potential usefulness. First, in the short run, almost 80 countries representing about 90 percent of global GDP and 75 percent of population seem to have enough policy space or can easily mobilize additional resources for an immediate response to the crisis. Second, on the other extreme, 39 countries have no policy space and may need emergency assistance in the form of direct financing and debt restructuring; this assistance is feasible as these countries represent less than 1.5 percent of global GDP but about 5 percent of population. Third, about 59 countries may have some limited policy space and can conditionally mobilize additional short-term resources, but their position is highly vulnerable, even in the short run. In total, some 98 counties, producing about 8 percent of global GDP, home to about 19 percent of global population, most likely will need significant assistance in fighting the crisis. Finally, because of the measures deployed in response to the Covid-19 crisis, all countries on average have lost about 15 percent of their nominal policy space.

73. The impact of the methodology and assumptions on the results need to be better understood before suggesting adding the index to the policymaker's toolkit. The proposed index has limitations and requires several qualifications. The quantitative thresholds for individual index components, such as reserve adequacy and debt sustainability, are highly uncertain, in times of crises. Qualitative assessments of the institutional environment may reflect judgment, and thus distort the outcomes. The usability of the proposed index right after a large shock occurred may be limited given the unusual uncertainty to the near and medium-term outlook. Also, the short-term focus of the index may not be able to capture the fact that the use of monetary policy space should not compromise price stability, an outcome that is only visible beyond the near-term. Finally, the institutional environment itself may also be viewed as a policy instrument, it can be changed and therefore either create or reduce effective policy space. Policymakers may select to react to a crisis by floating the exchange rate, introducing or removing capital controls, accepting higher borrowing costs to gain access to capital markets, or negotiating debt relief. Institutional capacity and multiple other parameters, which inevitably affect policy space, often can be reliably assessed only in a country-specific context.

74. The suggested approach to policy space bodes well for further research. First, while conditioning nominal policy space on institutional characteristics of individual countries has gained acceptance, future research is needed on how to account for the specificity of each country in the proposed index, without weakening its cross-country comparability. Second, using a more granular quantitative definition of fiscal space would allow building better metrics of other components of the index, such as, for example, borrowing space, as fiscal and borrowing space can deviate from each other and the issues of measuring non-borrowing fiscal space in a consistent way for large number of countries will need to be addressed. Third, further research could also expand the set of institutional indicators that condition nominal policy spaces to include more granularity on countries' exchange rate regimes, capital controls, and fiscal and debt distress risks.

Appendix

Table 1: Full regression table for Debt-to-GDP ratio regressions

VARIABLES	(1) GLS RE	(2) POLS
Dummy	6.23***	5.67***
	(0.68)	(2.15)
RCC	27.28***	29.00***
	(8.48)	(2.60)
Fiscal Risk	0.18**	0.31***
	(0.08)	(0.05)
Constant	43.58***	40.63***
	(2.82)	(1.19)
Observations	2,465	2,465
Number of Groups	177	N.A.
Random Effects	Yes	No
F/Chi2	112.6***	48.90***
p-value	0.000	0.000
R2	0.074	0.079

Robust standard errors in parentheses

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

Table 2: Full regression table for Gross Financing Needs regressions

VARIABLES	(1) GLS RE	(2) POLS
Dummy	4.17***	3.90***
	(0.84)	(1.51)
RCC	13.50*	14.34***
	(7.16)	(2.00)
Fiscal Risk	0.03*	0.09***
	(0.02)	(0.02)
Constant	8.21***	6.80***
	(1.36)	(0.51)
Observations	2,474	2,474

Number of Groups	177	N.A.
Random Effects	Yes	No
F/Chi2	52.57***	23.73***
p-value	0.000	0.000
R2	0.0491	0.0525

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Full regression table for quarterly panel regressions (by equation)

VARIABLES	(1) Inflation equation	(2) Output equation
L.lcpi	1.4248***	-0.1015*
	(0.0164)	(0.0578)
L2.lcpi	-0.3983***	0.0402
	(0.0287)	(0.1014)
L3.lcpi	-0.0830***	0.1426
	(0.0282)	(0.0995)
L4.lcpi	0.0449***	-0.0872
	(0.0157)	(0.0551)
L.lrgdp	-0.0110**	0.5770***
	(0.0047)	(0.0166)
L2.lrgdp	-0.0004	0.0450**
	(0.0057)	(0.0212)
L3.lrgdp	0.0076	0.3542***
	(0.0100)	(0.0359)
L4.lrgdp	0.0076	-0.0148
	(0.0079)	(0.0278)
polr	0.0025***	0.0008*
	(0.0001)	(0.0004)
L.polr	-0.0007***	0.0000
	(0.0002)	(0.0006)
L2.polr	-0.0021***	-0.0008
	(0.0002)	(0.0006)
L3.polr	0.0007***	-0.0016**
	(0.0002)	(0.0006)
L4.polr	0.0002*	0.0010**

	(0.0001)	(0.0004)
Dummy	-0.0001	-0.0246***
	(0.0004)	(0.0013)
Constant	0.0133	0.4965***
	(0.0135)	(0.0475)
Observations	3,873	3,855
Number of Groups	86	86
Fixed Effects	Yes	Yes
Rho	0.755	0.933
R2	0.999	0.999

Robust standard errors in parentheses

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

Notes: lcpi is the log of CPI index, lrgdp is the log of real GDP, polr is policy rate in percent.

References

Adrian T. 2020. Opening Remarks at Advances in Monetary Economics Conference. July 13. https://www.imf.org/en/News/Articles/2020/07/13/sp071320-advances-in-monetary-economics-conference.

Blanchard O., Jean Pisani-Ferry, 2020. Monetization: Do not Panic. *VoxEU/CEPR*, April 10 https://voxeu.org/article/monetisation-do-not-panic.

Chang, H., 2006. Policy Space in Historical Perspective with Special Reference to Trade and Industrial Policies. *Economic and Political Weekly*, pp.627-633.

Chen Y. and R. Woo, 2020. Plenty of Policy Room in China to Cushion Coronavirus Impact. Reuters, April 24. https://www.reuters.com/article/us-china-economy-ndrc/plenty-of-policy-room-in-china-to-cushion-coronavirus-impact-says-state-planner.

Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans, 2005. "Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy. *Journal of Political Economy* 113 (1) 1-45.

Gallagher, K.P., Sklar, S. and Thrasher, R., 2019. Quantifying the Policy Space for Regulating Capital Flows in Trade and Investment Treaties. G-24 Working Paper. Intergovernmental Group of Twenty Four. http://www.bu.edu/gdp/2019/04/03/quantifying-the-policy-space-for-regulating-capital-flows-in-trade-and-investment-treaties.

Grabel, I., 2011. Not Your Grandfather's IMF: Global Crisis, 'Productive Incoherence' and Developmental Policy Space. *Cambridge Journal of Economics*, 35(5), pp.805-830.

Greenspan, A., 1999. Currency Reserves and Debt. *Federal Reserve System*. https://www.federalreserve.gov/BoardDocs/Speeches/1999/19990429.htm.

Iancu A., G. Anderson, S. Ando, E. Boswell; A. Gamba; S. Hakobyan; L. Lusinyan; N. Meads; Y. Wu., Reserve Currencies in an Evolving International Monetary System, 2020. *IMF Departmental Paper No. 2020/002*. https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2020/11/17/Reserve-Currencies-in-an-Evolving-International-Monetary-System-49864.

Ilzetzki, E., Reinhart, C.M. and Rogoff, K.S., 2019. Exchange Arrangements Entering the Twenty-First Century: Which Anchor Will Hold? *The Quarterly Journal of Economics,* 134(2), pp.599-646.

IMF, 2010. Creating Policy Space in Low-Income Countries during the Recent Crises. Departmental Paper No. 10/03. https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2016/12/31/Creating-Policy-Space-in-Low-Income-Countries-during-the-Recent-Crises-23397.

IMF, 2011. Assessing Reserve Adequacy. IMF Policy Paper. https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Assessing-Reserve-Adequacy-PP4547.

IMF, 2013. Assessing Reserve Adequacy – Further considerations. IMF Policy Paper, November. https://www.imf.org/external/np/spr/ara.

IMF, 2015. Assessing Reserve Adequacy – Specific Proposals. https://www.imf.org/external/np/pp/eng/2014/121914.pdf.

IMF, 2016a. Macroeconomic Management When Policy Space is Constrained: A Comprehensive, Consistent and Coordinated Approach to Economic Policy. Staff Discussion Notes No. 16/09. https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Macroeconomic-Management-When-Policy-Space-is-Constrained-A-Comprehensive-Consistent-and-44196.

IMF, 2016b. Guidance Note on the Assessment of Reserve Adequacy and Related Considerations. https://www.imf.org/external/np/pp/eng/2016/060316.pdf.

IMF, 2016c. Analyzing and Managing Fiscal Risks - Best Practices. *IMF Policy Paper*. https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Analyzing-and-Managing-Fiscal-Risks-Best-Practices-PP5042.

IMF, 2018a. Assessing Fiscal Space: An Update and Stocktaking. *IMF Policy Paper*, April 11. https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/06/15/pp041118assessing-fiscal-space.

IMF, 2018b. Economic Preparedness: The Need for Fiscal Space. *IMF Blog*, June 28; https://blogs.imf.org/2018/06/27/economic-preparedness-the-need-for-fiscal-space.

IMF, 2018c. Debt Sustainability Analysis for Market-Access Countries. August 15, 2018. https://www.imf.org/external/pubs/ft/dsa/mac.htm.

IMF, 2018d. Guidance Note on the Bank-Fund Debt Sustainability Framework for Low Income Countries. https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/02/14/pp122617guidance-note-on-lic-dsf.

IMF, 2018e, Annual Report on Exchange Arrangements and Exchange Restrictions 2018 (https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions/Issues/2019/04/24/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions-2018-46162).

IMF, 2020a. Currency Composition of Official Foreign Exchange Reserves. https://data.imf.org.

IMF, 2020b. Joint World Bank-IMF Debt Sustainability Framework for Low-Income Countries. https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/16/39/Debt-Sustainability-Framework-for-Low-Income-Countries.

IMF, 2020c. Assessing Reserve Adequacy (ARA) dataset. https://www.imf.org/external/datamapper/datasets/ARA.

IMF, 2020d. World Economic Outlook Databases. https://www.imf.org/en/Publications/SPROLLs/world-economic-outlook-databases.

IMF, 2020e. International Financial Statistics (IFS). https://data.imf.org.

IMF, 2020f. Reform of the Policy on Public Debt Limits in IMF-Supported Programs. *IMF Policy Paper No.20/06*. https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/11/11/Reform-of-the-Policy-on-Public-Debt-Limits-in-IMF-Supported-Programs-49876.

Jeanne, O. and Ranciere, R., 2011. The Optimal Level of International Reserves for Emerging Market Countries: A New Formula and Some Applications. *The Economic Journal*, 121(555), pp.905-930.

Kentikelenis, A., Stubbs, T., King, L., 2016. IMF Conditionality and Development Policy Space, 1985-2014. *Review of International Political Economy*, 23(4), 543–582.

Koivusalo, M., Schrecker, T. and Labonté, R., 2009. Globalization and policy space for health and social determinants of health. In: Globalization and health: pathways, evidence and policy. New York: Routledge, pp.105-30.

Kose, M. and Ohnsorge, F., 2019. A Decade After the Global Recession: Lessons and Challenges for Emerging and Developing Economies. World Bank.

Kozul-Wright R. and K. Gallagher, 2020. Developing Countries Urgently Need More Policy space to Fight COVID-19. https://www.opendemocracy.net/en/oureconomy/combat-covid-19-developing-countries-need-be-granted-more-policy-space.

Landau J.-P. 2020. Money and Debt: Paying for the Crisis. *Vox EU*. June 23. https://voxeu.org/article/money-and-debt-paying-crisis?

Lilley, A. and K. Rogoff, 2020. The Case for Implementing Effective Negative Interest Rate Policy. *Strategies for Monetary Policy* (Stanford: Hoover Institution Press), https://scholar.harvard.edu/rogoff/publications/case-implementing-effective-negative-interest-rate-policythe-case-implementing.

Managing Director Georgieva's Remarks at the Conference on Lessons from the Global Financial Crisis in The Age of COVID-19. November 23, 2020. Available at https://www.imf.org/en/News/Articles/2020/11/23/sp112320md-remarks-oap-on-lessons-from-gfc-in-the-age-of-covid19.

Moody's, 2020. Rating Symbols and Definitions. Moody's Investors Service. January. https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_79004.

Muchhala B. (ed.), 2007. The Policy Space Debate: Does a Globalized and Multilateral Economy Constrain Development Policies? Woodrow Wilson International Center for Scholars, Asia Program Special report, No.136. https://www.wilsoncenter.org/sites/default/files/media/documents/publication/asia_136FINAL.pdf.

Ocampo, J.A. and Vos, R., 2008. Policy Space and the Changing Paradigm in Conducting Macroeconomic Policies in Developing Countries. *Press & Communications* CH 4002 Basel, Switzerland, p.1-28p.

Page, Sh., 2007. Policy Space: Are WTO Rules Preventing Development? https://www.odi.org/publications/82-policy-space-are-wto-rules-preventing-development? Overseas Development Institute (ODI), Policy Brief, January.

Romer, C. and D. Romer, 2018. Phillips Lecture–Why Some Times Are Different: Macroeconomic Policy and the Aftermath of Financial Crises. *Economica,* 85(337), pp.1-40.

Soto A., 2020. With Little Policy Room, Africa Central Banks Fret Over Debt. Bloomberg, February 5. https://www.bloomberg.com/news/articles/2020-02-06/with-little-policy-room-africa-central-banks-sound-debt-alarm.

Turner, A., 2015. The Case for Monetary Finance–An Essentially Political Issue. *In 16th Jacques Polak Annual Research Conference,* IMF, November. https://www.imf.org/external/np/res/seminars/2015/arc/pdf/Turner_pres.pdf.

United Nations Conference on Trade and Development (UNCTAD), 2004. UNCTAD XI: Sao Paulo Consensus, TD/410, June 25, http://www.unctad.org/en/docs/td410_en.pdf.

Wijnholds, J. and Kapteyn, A., 2011. Reserve Adequacy in Emerging Market Economies. IMF Working Paper. WP/01/143 https://www.imf.org/external/pubs/ft/wp/2001/wp01143.pdf.

World Bank, 2020a. Global Economic Prospects, January 2020: Slow Growth, Policy Challenges.

Wu, Jing Cynthia, and Fan Dora Xia, 2016. Measuring the Macroeconomic Impact of Monetary Policy at the Zero Lower Bound. *Journal of Money, Credit and Banking* 48 (2-3) 253-291.

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