HOW TO

NOTES

FISCAL POLICY

How to Select Fiscal Rules

A Primer

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This note provides guidance on how to *select* fiscal rules in a wide range of economies, including advanced, emerging market, and developing economies. It is one of two guidance notes on the design of fiscal rules; the other one focuses on rule *calibration* (IMF 2018). The two exercises are linked: if a fiscal framework had to be built from scratch, rules would need to be selected and calibrated at the same time. However, to simplify the analysis, this note examines the issue of rule selection on its own.

The note is not exhaustive or definitive. There are many approaches to selecting the most appropriate fiscal rule(s) for a country. This note presents principles and methods that are intuitive and easy to implement, and that leave room for policy judgment. The methods are based on past academic and IMF work, including analytic and policy papers, technical assistance missions, and training. Future work might enhance or modify the framework presented here.

The note focuses on the choice of a rule, which is a key element of rule design but not the only issue to consider. Other important features for the effective implementation of rules include monitoring and enforcement schemes (for example, corrective mechanisms, sanctions, role of a fiscal council); type of legislative support (for example, coalition agreement, law, treaty, constitution); and quality of public financial management systems (for example, data reliability, budget reporting and audit, forecasting capacity). See IMF (2009) for a description of these features.

This note also does not discuss the more fundamental (and country-specific) question of whether a rule is needed in the first place. The note assumes that a country wishes to introduce a fiscal rule and provides guidance on how to select it. But, in some cases, rules are not warranted; for instance, if a country is going through large structural changes, rules (which have characteristics of permanence and stability) cannot be implemented immediately.

The note is structured as follows. The first section lays out general principles regarding the design of fiscal rules. The second section reviews the most common rules and describes their pros and cons. The third section presents the various types of analytical tools used to select fiscal rules (some files and manuals accompany this note to implement the methods; they are available from the authors upon request). The last section offers some considerations on rules in developing countries, with a specific focus on commodity exporters. An overview of the theoretical literature is provided in the Appendix.

Principles of Rule Selection

The choice of rules is generally based on ad hoc criteria rather than theoretical considerations—contrary to monetary policy, in which the design of Taylor rules has been largely informed by theoretical models (see the Appendix). This section puts forward a number of key principles to guide the selection of a fiscal rule.

Criteria to Select a Good Rule

Government policies—even those conceived by rational elected policymakers—can have suboptimal outcomes. The reasons for and nature of these deviations from optimality have been widely explored in many policy areas, including monetary policy (inflationary bias) and structural policy (status quo bias). In the fiscal area, deviations from optimal policy primarily take the form of excessive deficits and the tendency of fiscal policy to be procyclical.[1] Although some economic arguments can account for fiscal policy biases, political factors are often the main cause. Thus, the primary function of fiscal rules is to avoid deficits and procyclical biases by constraining the government's use of fiscal discretion.

[1]In principle, fiscal policy could be procyclical without exhibiting a deficit bias, but the deficit bias results in large part from a failure to control spending increases and tax cuts in good times. Thus, the two biases are closely related in practice.

"Good" fiscal rules are generally selected on the basis of desired features initially proposed by Kopits and Symansky (1998). The use of these criteria ensures that the rules will be able to correct policy biases (by ensuring sustainability and economic stabilization) and will perform this task efficiently (through simplicity, operational guidance, resilience, and ease of monitoring and enforcement):[2]

- *Sustainability*: Compliance with the rule should ensure long-term debt sustainability.
- *Stabilization*:[3] Following the rule should not increase (and might even decrease) economic volatility. Economic stabilization requires that the rule lets automatic stabilizers operate and/or allows discretionary countercyclical changes in taxes or expenditures.
- *Simplicity*: The rule should be easily understood by decision makers and the public.
- *Operational guidance*: It should be possible to translate the rule into clear guidance in the annual budget process. Budget aggregates targeted by the rule should be largely under the control of the policymaker.
- *Resilience*: A rule should be in place for a sustained period to build credibility, and it should not be easily abandoned after a shock.
- *Ease of monitoring and enforcement*: Compliance with the rule should be easy to verify, and there should be costs associated with deviations from targets.

In general, fiscal rules should support—or at least not impede—the capacity of fiscal policy to fulfil its three main functions: smoothing the economic cycle, fostering long-term growth, and promoting inclusiveness (IMF 2017).

Combining the Criteria

All of these criteria may not be simultaneously achievable, at least with a single fiscal rule. For exam-

ple, a trade-off is likely to emerge between stabilization and simplicity. The more flexible the rule (to adapt to macroeconomic shocks), the more complex its design is likely to be, as illustrated by rules that correct for the impact of business cycles by targeting cyclically-adjusted balances. Another trade-off could exist between resilience and operational guidance: rules that include flexibility provisions (such as escape clauses) might complicate the budget process, as fiscal targets can change with circumstances. The objectives of stabilization and sustainability might also sometimes be in conflict, but this trade-off is probably less problematic for rule selection than for rule calibration (for example, weak macroeconomic conditions might justify relaxing the fiscal rule's ceiling, whereas risks to fiscal sustainability could argue against it).

To combine the (possibly conflicting) criteria, the rule selection process can go through three steps:

- *Step 1: Identify rules that minimize trade-offs*. Some rules are better than others at fulfilling the six criteria. The first step of the rule selection exercise is therefore to identify or design a rule that minimizes the need for trade-offs. For instance, acknowledging the limitations of the nominal balance rule, the 2005 reform of the European fiscal framework introduced the cyclically-adjusted balance rule to strike a better balance between the objectives of sustainability and stabilization. Later on, the view that most of the stabilization benefits of the cyclically-adjusted balance rule could be achieved with a simpler expenditure rule justified the adoption of the expenditure benchmark in 2011 (Eyraud and Wu 2015).
- *Step 2: Take into account country preferences*. Trade-offs are unlikely to disappear entirely, even with the best-designed rules; therefore, the choice of a rule depends on which criteria are most important in a particular case. For instance, a country in economic transition and with an uncertain fiscal outlook might place a premium on the simplicity principle to maximize the signaling effect of the rule, while a high-debt country might favor rules that focus on sustainability and more tightly constrain fiscal discretion. Countries with poor public financial management systems might consider operational guidance a priority. If the main problem is difficulty saving in good times, stabilization could be a key criterion.

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[2]The list of criteria is not exhaustive or definitive. Other criteria—such as ensuring intergenerational equity—can also be important, especially for commodity exporters. Debrun and Jonung (2017) focus on three main criteria—simplicity, flexibility, and enforceability—which capture features that are broadly similar to those in the Kopits and Symansky criteria but in a more aggregated way.

[3]In this note, the terms *stabilizing policies* and *countercyclical policies* are used interchangeably. They cover both discretionary measures and automatic stabilizers. Countercyclicality means that fiscal policy provides demand support in bad times and consolidates the budget in good times.

- *Step 3: Consider multiple rules.* To achieve multiple objectives, countries can adopt multiple fiscal rules. But they should be aware that too many rules can complicate fiscal policymaking and result in overlap and inconsistency of targets. (The following section addresses general considerations regarding the number of rules a country should have.)

Another interesting avenue to combine selection criteria is to place explicit weights on each objective. There have been several attempts to combine stabilization needs and sustainability needs into a single indicator that could provide a benchmark for fiscal policy and take into account the possible trade-off between them (European Commission, 2016). One example is the "rule of thumb" proposed by Carnot (2014), which defines the fiscal effort (U_t) required in period t as:

$$U_t = (\alpha.P_t + \beta.S_t)$$

namely, a weighted sum of the primary gap (P_t)—the deviation between the actual primary deficit and a norm consistent with a long-term target for debt—and a summary statistic of macroeconomic conditions (S_t) prevailing before the fiscal effort takes place. The latter can be proxied by the output gap but can also be measured by more complex indicators, such as an average of various macro-performance indices, or even by qualitative estimates based on "expert judgment." In Carnot's preferred specification, equal and low weights on the two objectives ensure that the path of fiscal efforts will be relatively smooth over time.

The underlying idea behind Carnot's rule of thumb is to define a simple rule that balances the requirements of debt stabilization and economic stabilization. This rule is broadly comparable in functional form and spirit to the Taylor rule in monetary policy analysis and provides a benchmark against which actual policies can be assessed. It defines the required primary balance trends consistent with the desired debt path and offers room for economic stabilization.

Combining the Rules

Traditionally, the analysis of fiscal rules has focused on the costs and benefits of individual rules. The Kopits-Symansky (1998) criteria have often been used to compare and assess the merits of various rules. What is less well understood and less often analyzed is how rules interact with each other and how to evaluate

combinations of rules. Establishing principles for fiscal frameworks is still very much a work in progress.

Well-designed fiscal frameworks are generally structured around two pillars: (1) a fiscal anchor linked to the final objective of fiscal policy, and (2) one or more operational rules on fiscal aggregates (Andrle and others 2015). A natural fiscal anchor is the debt-to-GDP ratio, which provides a guide for medium-term fiscal expectations and creates an upper limit for repeated fiscal slippages, and whose threshold can be calibrated to ensure the long-term fiscal sustainability of public finances.[4] However, the debt ratio does not offer operational guidance in the short term. The fiscal framework should also include shorter-term operational rules that are under the direct control of the government and that have a close and predictable link to debt dynamics; for instance, an expenditure rule or a budget balance rule.

A key question is whether the fiscal framework should include more than one operational rule. There is no optimal number, but caution is required with multiple rules because of the risks of redundancy and inconsistency. Some general principles can guide the design of fiscal frameworks that combine several operational rules:

- *Fiscal rules do not substitute for good policies.* In selecting fiscal rules, keep in mind that their main function is to mitigate policy biases (in particular, the deficit bias) and prevent the government from misusing fiscal discretion. But fiscal rules are not meant to—and cannot—achieve optimal fiscal policy in every period.[5] Therefore, one should not advise the use of multiple rules on the grounds that a multiplicity of constraints might bring fiscal policy closer to the optimum.
- *The system should not be overdetermined.* Adding too many constraints can impair the ability of the government to achieve its policy objectives (undermining the credibility of the framework) and create inconsistencies between the requirements of different rules. Fiscal frameworks that constrain

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[4]For resource-rich countries, the anchor is generally expressed in net terms (debt minus financial assets, possibly taking into account the net present value of future resource revenues). See discussion in the companion note on rule calibration (IMF 2018).

[5]Fiscal rules impose constraints (ceilings or floors) on fiscal aggregates to contain the discretion of policymakers, but these constraints are not targets, and therefore, are not expected to be binding in every period. In addition, since rules are simple and lasting numerical constraints, they might frequently deviate from first-best policies.

Table 1. Assessment of Fiscal Rules

Budget Balance Rules	
Overall Balance	**Golden**
+ Easy to communicate/monitor	+ Protect public investment
+ Clear operational guidance	+ Intergenerational equity
– Can lead to procyclicality	– Weak link to debt sustainability
– Could lead to changes in composition	– Creative Accounting
Cyclically Adjusted and Structural	**Over the Cycle**
+ Foster economic stabilization	+ Good stabilization properties
+ Good operational guidance	– May entail too loose/tight stance
– Difficult to compute and monitor	– Difficult to monitor and enforce
Expenditure Rules	**Revenue Rules**
+ Easy to communicate/monitor	+ Raise revenues or limit tax burden
+ Allow macroeconomic stabilization	– No direct link to debt sustainability
+ Clear operational guidance	– Can lead to procyclicality
+ Can ensure debt sustainability if well designed	
– Could lead to changes in composition	
– May reduce incentive to mobilize revenues	

Source: IMF staff

revenue, expenditure, and the fiscal balance separately are not uncommon, although this is clearly undesirable. Some forms of overdetermination may be less apparent; for instance, when rules constrain one part of the budget but the other part is composed of nondiscretionary items that cannot be easily modified.

- *Overlap between fiscal targets should be minimized.* Overlap occurs when two rules broadly apply to the same fiscal aggregate but constrain it to differing degrees. For example, one rule might allow the deficit to increase up to 3 percent of GDP, while another rule may require a balanced budget. When overlap occurs, countries have to comply with the most binding rule each period, which can be tricky and suboptimal. Overlap also creates political economy problems, because the authorities might be tempted to neglect some rules on the grounds that they already comply with other (less binding) ones. Some forms of overlap are obvious; for instance, when nominal and structural balance rules coexist. Others are more subtle; for example, (1) when an expenditure ceiling is combined with a cyclically-adjusted balance rule (which also implicitly caps spending by limiting it to the amount of cyclically-adjusted revenues), (2) when national rules transpose supranational rules but some small discrepancies exist in the design, or (3) when there are rules on both the overall balance and the change in public debt.

- *The system should be easy to communicate to the public.* This principle argues for focusing on one or two operational rules. Too many operational rules

can confuse the public and risk unanchoring fiscal expectations.

Pros and Cons of the Main Operational Rules

This section provides an overview of the main strengths and weaknesses of various operational rules (Table 1). It does not cover debt rules, which should not be used as operational rules. For more information, see IMF (2009) and Schaechter and others (2012). For a review of country experiences, see Mbaye and Ture (2018). The IMF maintains a database that describes the types and features of rules adopted by IMF member countries.[6]

Nominal Budget Balance Rules

Nominal budget balance rules impose limits on the headline fiscal balance, possibly with the exclusion of some expenditure or revenue items. These rules are generally expressed in percent of GDP. By constraining a fiscal aggregate that primarily influences debt dynamics, nominal budget balance rules can be very effective in preserving debt sustainability. At the same time, they are not adjusted for the cycle, which limits their ability to foster macroeconomic stabilization. They are also less prescriptive than expenditure and revenue rules.

[6]The database can be found at http://www.imf.org/external/datamapper/fiscalrules/map/map.htm.

Overall Balance Rule

Overall balance rules impose a ceiling on the headline deficit. They are set in nominal terms (that is, without adjusting for the cycle) and in percent of GDP. Overall balance rules are simple and easy to communicate to the public, as headline deficits are a well-known and well-understood fiscal aggregate. The fact that overall balance rules are not subject to specific adjustments or to the exclusion of specific items makes them easy to compute and facilitates monitoring and enforcement. Additionally, the overall budget balance is closely linked to debt dynamics, making the budget balance rule effective in supporting debt sustainability.

On the other hand, overall balance rules do not contain good economic stabilization features, which can lead to a procyclical fiscal stance: in bad times, the rule might force a country to consolidate to offset the cyclical decline in revenues; in good times, the rule cannot prevent a country from spending windfall revenues (Blanchard and Giavazzi 2004).

Overall balance rules can also reduce the quality of the budget composition, because they are silent on the composition of the fiscal adjustment needed to comply with the rule. In particular, they can encourage excessive cuts in capital spending, which are politically easier to pass than current spending cuts (Guerguil, Mandon, and Tapsoba 2017). Long-term growth prospects can suffer if the level or quality of public investment is negatively affected.

A variant of the overall balance rule, called the "primary balance rule," excludes interest payments from the balance. By excluding interest, the rule is more directly under the control of policymakers. But this exclusion weakens the link to debt; in fact, targeting a primary balance can put the debt on an explosive path if the rule threshold is not reassessed regularly.[7]

Golden Rule

Golden rules impose a ceiling on the overall deficit net of capital expenditure (also called *current balance*). With a zero ceiling, borrowing is permitted to finance investment only; current spending must be covered by revenues.

Golden rules are designed to promote and protect capital expenditure, which is seen as more pro-growth and politically easier to cut than other types of spending (IMF 2009). These rules are also more consistent with intergenerational equity than other budget balance rules, since they shift the burden of financing public investment projects from current to future generations, which will be the main beneficiaries of such projects.

The growth-friendly properties of golden rules should not be overstated. The definition of public investment in national account statistics excludes several types of growth-friendly expenditures related to the accumulation of human capital (including health services, training, and research and development) that are usually classified as current spending (Emmerson, Frayne, and Love 2006). Furthermore, without a proper public investment management framework, the possibility of borrowing for investment without restriction can lower incentives for proper cost-benefit analysis, resulting in the selection of projects with low social returns and revenues (Balassone and Franco 2000). In addition, monitoring and enforcement of golden rules is particularly challenging, because the exclusion of capital expenditure favors creative accounting and the reclassification of unproductive expenditures as investment to circumvent the rule (Servén 2007).

A particular concern is that, by excluding capital expenditure, the golden rule can allow excessive borrowing and weaken the link between the aggregate targeted by the rule and debt dynamics, creating possible risks to debt sustainability.[8] There are some precedents. In Mexico, for instance, the government excluded capital expenditures made by the national oil company and the state-owned electricity company from the nominal budget balance in 2009; this impeded an appropriate assessment of the fiscal stance and contributed to adverse public debt dynamics (Valencia 2015). Similarly, Germany's golden rule, in force between 1969 and 2010, was ineffective at slowing the buildup of debt (OECD 2008).

Budget Balance Rules That Correct for the Business Cycle

Cyclically Adjusted Balance Rules

Cyclically-adjusted balance rules impose limits on the overall balance, correcting for the effects of business cycle fluctuations on revenue and expenditure (Fedelino, Horton, and Ivanova 2009). These rules are

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[7]As shown in Escolano (2010), if the initial debt ratio is different from the debt level consistent with the rule's primary balance target and if the long-term real interest rate is higher than the long-term real GDP growth rate, the debt ratio is placed on an explosive path.

[8]Golden rule advocates argue that the growth benefits of capital expenditure could be large enough to offset the initial fiscal cost and improve debt sustainability, but this condition is difficult to fulfill and never guaranteed.

commonly measured in relation to potential output—a natural scaling variable, since cyclically adjusted balances measure what the fiscal balance would be if the output gap were closed. A common approach is to adjust actual revenue and spending for the effect of the deviation of potential from actual output, with corresponding revenue and expenditure elasticities defining the strength of the cyclical effect.[9] Aggregate revenue and expenditure elasticities are commonly assumed at, respectively, 1 and zero, leading the cyclically adjusted balance to be mostly a function of the output gap:[10]

$$CAB = OB - CB \approx OB - g \times gap \qquad (1)$$

where *CAB* is the cyclical adjusted balance in percent of potential GDP, *OB* is the overall balance in percent of GDP, *CB* is the cyclical balance in percent of GDP, *g* is the ratio of total government spending to GDP, and *gap* is the output gap in percent of potential GDP.

Cyclically-adjusted balance rules aim to provide better economic stabilization than nominal budget balances. By disconnecting spending from cyclical revenues and letting automatic stabilizers operate freely, such rules can be used to stabilize the path of expenditure. Specifically, they do not force governments to cut spending in downturns. However, their stabilization capacity is limited by two main factors:

- Automatic stabilizers can be small in some countries; for instance, when the tax system relies predominantly on customs revenue.
- Cyclically-adjusted balance rules do not allow changes in the fiscal stance. Once a country has achieved its targeted cyclically-adjusted balance, complying with the rule requires that the fiscal position remain constant over time. This means that the country cannot use discretionary fiscal policy to mitigate the fluctuations of the business cycle.[11] This is not necessarily a problem as, in normal times, fiscal policy should primarily rely on automatic stabilizers to smooth the economic cycle (IMF 2017). Discretionary fiscal actions should be used only in special circumstances; for instance, during a large and

prolonged recession. These special circumstances can be accommodated using escape clauses.

Compared with the nominal balance rule, the cyclically-adjusted balance rule provides more operational guidance in the sense that its target can be better controlled by the government. Changes in the cyclically-adjusted balance are, in principle, closer to the discretionary fiscal efforts made by the authorities. For instance, a decline in the cyclically-adjusted position of 1 percent of GDP should broadly correspond to 1 percent of new fiscal measures, such as tax cuts. An equivalent decline in the nominal fiscal balance might simply reflect a deterioration in cyclical conditions.[12]

However, monitoring and enforcing cyclically-adjusted balance rules is challenging, owing to technical issues. Monitoring compliance requires timely and reliable estimates of the output gap, which is often hard to estimate, particularly in countries that are undergoing structural changes and those with poor data quality. An important concern is that cyclically-adjusted balances are prone to frequent ex-post revisions resulting from measurement errors of potential output and, thus, output gaps. In the European Union, for instance, empirical evidence shows that output gaps have been underestimated in real time (and revised upward ex post), leading the cyclically-adjusted balances to be overestimated by 0.5 percent of potential output on average (Eyraud and Wu 2015). This means that, in these countries, a cyclically-adjusted balance rule relying on real-time estimates tended to allow deficits exceeding ex post their targeted values by about 0.5 percentage point per year.

Structural Balance Rules

Structural balance rules are an extension of cyclically-adjusted rules (Bornhorst and others 2011). They adjust the overall balance beyond the business cycle by correcting revenue and spending for one-off fiscal measures[13] and other economic cycles, such as

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[9]This approach is referred to as the *aggregate approach*—in contrast with the *disaggregated approach* (also called the OECD methodology)—and is based on the cyclical adjustment of individual revenue and expenditure categories (Girouard and Andre 2005).

[10]See Fedelino, Horton, and Ivanova (2009) for a derivation of equation (1) with respect to the cyclically adjusted primary balance.

[11]The cyclically-adjusted balance cannot decline in a downturn (which would result in a discretionary fiscal stimulus) or increase in an upturn (reflecting a discretionary fiscal tightening).

[12]Discrepancies exist between the aggregation of budget measures and the change in the cyclically-adjusted fiscal balance (see, for instance, Bi, Qu, and Roaf 2013). One reason is that the change in the cyclically-adjusted balance calculates the fiscal effort relative to the previous year, while expenditure and tax measures are typically estimated relative to an unchanged-policy scenario at a given point in time.

[13]One-offs are defined as large, nonrecurrent measures whose impact on fiscal balances usually falls predominantly in the year

those related to asset or commodity prices. One advantage of structural balance rules is that they can provide greater economic stabilization than cyclically-adjusted balance rules. For instance, they prevent countries from spending one-off revenues or revenues related to an asset price boom, reducing the volatility of spending. Such rules are particularly important in countries in which business cycles are not the most important source of macroeconomic fluctuations, such as commodity exporters.

Monitoring and computation are even more complicated than with cyclically-adjusted balance rules. For instance, the designation of one-offs is challenging in practice. It hinges on perceptions about the likely temporary nature of the measures, and policymakers might be tempted to choose them strategically. For instance, they might retain revenue-enhancing measures and exclude balance-deteriorating ones in structurally adjusted fiscal balances. Another challenge is identifying nonstandard cycles, such as the commodity price cycle. Determining whether changes in commodity prices are temporary or structural can be a difficult call and can create numerous technical complications (IMF 2012).

Over-the-Cycle Budget Balance Rules

An over-the-cycle rule requires the attainment of a given nominal budget balance ceiling on average over the cycle (IMF 2009). What distinguishes this rule from other budget balance rules is not the budgetary aggregate it constrains but rather how the limit constraining the budgetary aggregate is assessed. Instead of being defined and assessed annually, the limit is typically set and assessed as an average over the years encompassing all stages of the business cycle, including both expansionary and contractionary stages. The expansionary phase is measured from the trough of the previous business cycle to the peak of the current cycle, while contractions are measured from the peak to the trough of the current cycle.

Over-the-cycle rules tend to have stronger stabilization properties than cyclically-adjusted or structural balance rules (Caceres and Ruiz-Arranz 2010). Indeed,

over-the-cycle rules can accommodate not only automatic stabilizers but also discretionary fiscal measures (stimulus or contraction).[14] However, greater flexibility might come at the expense of credibility: these rules can lead to excessively loose or tight fiscal policy at various times during the cycle; that is, they might allow fiscal relaxation or tightening that is not warranted by cyclical conditions or that could be difficult to reverse later.

Moreover, over-the-cycle rules pose computational challenges that can undermine monitoring and enforcement. Because the peaks and troughs and the distance between them are unknown until the cycle is complete, over-the-cycle rules must be assessed after the cycle is over. Thus, the capacity for real-time monitoring is limited, and corrective measures can be taken only after the end of the cycle. More fundamentally, assessing compliance with the rule requires precise dating of the cycle, which hinges on the methodology used to identify business cycle turning points (peaks and troughs) and the stability of national accounts data. In practice, the dating of business cycles involves a degree of judgment, which can be controversial and can undermine enforcement of the rule. The United Kingdom's former use of an over-the-cycle golden rule provides an example (Chote, Emmerson, and Tetlow 2009).[15]

Expenditure Rules

Expenditure rules set limits on total, primary, or current spending, and the limits apply to nominal or real expenditure. They are typically set in absolute terms (levels) or growth rates and occasionally in percent of GDP, with a time horizon that typically ranges from three to five years (Lledó and others 2017).

Expenditure rules are generally easier to understand, monitor, and enforce than most other rules, because they target a part of the budget the government controls most directly and that is very visible and well known to the public (although perhaps less well known

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when such measures take place and that entail no sustained change in the intertemporal budget position and hence have no implications for fiscal sustainability (Bornhorst and others 2011). Examples of one-offs include revenue windfalls (such as receipts from the sale of concessions), sales of telecommunication licenses, transfers of profits from the central bank, and exceptional spending interventions (for example, emergency relief after a natural disaster).

[14]As discussed above, a cyclically adjusted balance rule achieves stabilization solely through the operation of automatic stabilizers and not through discretionary fiscal actions, which would change the cyclically adjusted balance and conflict with the rule.

[15]As the authority responsible for enforcing the rule, the UK Treasury has been widely criticized for re-dating the cycle in 2005 (the starting period was moved from 1999 to 1997), just two years before the proposed assessment date. Adding two years to the beginning of the cycle put the government back on course to meet the golden rule.

than nominal balance rules). As a result, expenditure rules have higher compliance rates than most other rules (Cordes and others 2015). However, they are not immune to creative accounting, with high compliance rates made possible, for instance, by greater reliance on tax expenditures that are commonly excluded from the rules' coverage.

Expenditure rules can support macroeconomic stabilization, provided that the limits are defined in levels or growth rates (Ayuso-i-Casals 2012). They accomplish this primarily by constraining spending during temporary economic booms, when windfall revenue receipts are high and nominal deficit limits are easy to comply with. Expenditure rules in levels and growth rates allow automatic stabilizers to operate on the revenue side in times of adverse shocks. Even greater countercyclicality can be achieved by excluding cyclically sensitive expenditure items, such as unemployment benefits. On the other hand, expenditure rules set as a ratio of GDP tend to be procyclical. By constraining spending to grow at the same rate as output, such rules allow a fast increase in expenditure in good times, resulting in insufficient savings. Compliance with expenditure-to-GDP limits can also force spending to decline in bad times, which can prevent automatic stabilizers from operating. These problems can be avoided by defining the expenditure rule in relation to potential rather than actual GDP growth: allowing spending to grow at the same pace as potential GDP retains the countercyclical properties of cyclically adjusted balance rules with fewer measurement errors.[16] An example of such a rule is the European Union's expenditure benchmark (Box 1).

To ensure debt sustainability, expenditure rules require specific design features. Basic expenditure rules that do not take the revenue side into account have only a partial impact on debt dynamics. In countries with low revenue-to-GDP ratios, simple expenditure rules can also weaken efforts to improve fiscal sustainability by creating disincentives to enhance revenue mobilization. However, more sophisticated expenditure rules can overcome these limitations. For instance, the European Union's expenditure benchmark allows expenditure to grow above the limit if higher spending is matched by increases in discretionary revenue.

Another issue with expenditure rules is that they can induce lower levels of public investment (Cordes and others 2015). Similarly to overall balance rules, expenditure rules do not specify the kinds of spending that need to be contained to ensure compliance, which leads to excessive cuts in capital spending, which are politically less difficult to introduce. This effect is most striking in developing economies, where weak public financial management systems can be ineffective in preventing policymakers from deferring high-quality capital spending to formally comply with the rule.

For expenditure rules in levels or growth rates, an important decision is whether to set the target in real or nominal terms (Ayuso-i-Casals 2012). A spending target defined in nominal terms is more transparent and easier to monitor and enforce. Nominal targets also have better economic stabilization properties, because they must incorporate inflation developments. For instance, if the business cycle is driven by positive (negative) demand shocks, complying with a nominal expenditure target would require a downward (upward) adjustment to real spending to accommodate rising (decreasing) inflation, which would provide a countercyclical policy response.[17] In comparison, if the expenditure target is in real terms, compliance is not affected by inflation, which reduces the stabilization effect.

Another issue with real rules is that they require to make an assumption about projected inflation to convert real expenditure targets into nominal budget ceilings. The translation from real to nominal ceilings opens the door to strategic manipulation of the deflators to obtain additional spending room in the budget. In addition, inflation projections are subject to forecast errors, which can create conflicts between the constraint imposed by the rule and the constraint imposed by the budget; even if these two constraints are consistent at the time of budget preparation, discrepancies can arise during the fiscal year when inflation forecasts are revised. For instance, if inflation is revised down during the fiscal year, the nominal budget ceiling will allow excessive real spending relative to what is permitted under the (real) rule. To avoid breaching

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[16]This is because ex post revisions are found to be larger on the potential output level than on its growth rate (Balassone and Kumar 2007).

[17]If the business cycle is driven by supply shocks (meaning that inflation responds negatively to output developments), the stabilization benefits of a nominal expenditure rule are less evident. For instance, if there is a positive supply shock and inflation decelerates, real spending growth would not have to contract or could even increase (under the nominal rule) at a time when the output gap closes because of the higher potential output.

Box 1. The European Union's Expenditure Benchmark

The European Union's (EU's) fiscal framework includes a rule called the *expenditure benchmark* that sets a ceiling on annual growth of primary spending equal to the medium-term rate of potential GDP growth (EC 2017). The benchmark was introduced as part of the 2011 reform of the Stability and Growth Pact. Expenditure is defined in nominal primary terms (total spending excluding interest payments) and is corrected for the cycle by excluding unemployment benefits.

The annual limit applies to the net growth of primary spending; that is, the growth in primary spending that is not financed by corresponding changes in discretionary revenue measures. The rationale is that to preserve debt sustainability, any plan to increase spending beyond potential GDP must be properly financed by additional revenue measures. The expenditure benchmark also avoids procyclical fiscal behavior by preventing higher-than-expected revenues from being spent, provided that they do not stem from discretionary tax policy measures.

In the EU framework, the expenditure benchmark is used to assess compliance with the structural balance rule called the *medium-term objective* under the preventive arm of the Stability and Growth Pact. There is indeed a broad (but not exact) equivalence between the two types of rules. If the government has achieved a fiscal position in structural terms that complies with the structural balance rule, it can maintain it by simply letting expenditure grow in line with trend GDP. In other words, compliance with an expenditure rule in growth rate can be sufficient to ensure compliance with a structural budget balance rule.[1]

[1]Assuming the elasticity of structural revenues to trend GDP is 1 (that is, the ratio of structural revenues to trend GDP is constant over time and equal to φ) and that of spending is zero, then the structural balance can be written as $SB = (R^s - E^s)/Y^s = \varphi - E/Y^s$, where R^s, E^s, E, and Y^s denote structural revenue, structural expenditure, actual expenditure, and trend GDP. The equivalence can be seen by first differentiating SB. That is, $\Delta SB = 0 \Leftrightarrow dE/E = dY^s/Y^s$ (where $\Delta SB = SB_t - SB_{t-1}$; dE/E denotes expenditure growth; and dY^s/Y^s denotes trend GDP growth).

the rule, sudden (and possibly unfeasible) adjustments to nominal budget ceilings may be required over the course of the year.[18]

Revenue Rules

Revenue rules set floors or impose ceilings on government's income proceeds. They are relatively rare in comparison with the other types of rules. *Revenue floors* such as those imposed supranationally on countries belonging to the West African Economic and Monetary Union (WAEMU) or nationally, as in the case of Kenya, generally aim to boost revenue collection.[19] *Revenue ceilings* seek to prevent an excessive tax burden, as illustrated by the experiences of Australia and Denmark.[20]

Rules that set ceilings or floors on revenues can complicate macroeconomic stabilization efforts. Revenue floors might require tax hikes in bad times, exacerbating fiscal procyclicality (at least, when the floors are expressed in level, not in percent of GDP). Revenue ceilings can limit revenue mobilization and government savings in good times. Neither revenue floors nor ceilings constrain spending, so they do not ensure fiscal sustainability.

Some revenue rules are also used to dictate the use of higher-than-expected revenues; for instance, by earmarking them for certain purposes. In some cases, windfall revenues are mandated to reduce debt (the Netherlands) or deficit (Lithuania), which helps mitigate the deficit bias as well as the procyclical bias, provided that windfall revenues occur mainly during boom periods.[21]

[18]With a nominal rule, the consistency between the rule and the budget ceiling is ensured and is not affected by the revision of inflation forecasts.

[19]In 2015, WAEMU countries were subject to a revenue floor of 20 percent of GDP. Kenya's limit was set at 21 percent to 22 percent of GDP.

[20]Tax revenues as a proportion of GDP were prevented from being raised in Australia between 1985 and 1988. In Denmark, direct and indirect taxes were capped between 2001 and 2011.

[21]In the Netherlands, a windfall revenue rule was established in 2011. The rule requires that 50 percent of additional tax revenues not anticipated in the multiyear path agreed on by coalition partners at the beginning of a new government should be used to reduce public debt, under certain conditions. In Lithuania, the revenue rule, in force since 2008, requires larger than projected revenues in any given fiscal year to be used to reduce the deficit of the general government.

Figure 1. Public Debt in France
(Percent of GDP)
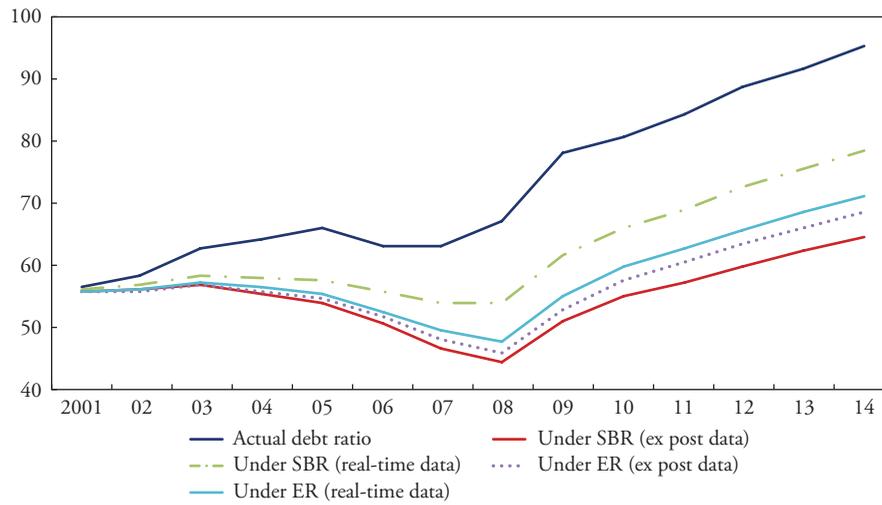
Source: Andrle and others 2015.
Note: SBR = structural balance rule; and ER = expenditure rule

Figure 2. Overall Fiscal Balance under Large Shock
(Percent of GDP)
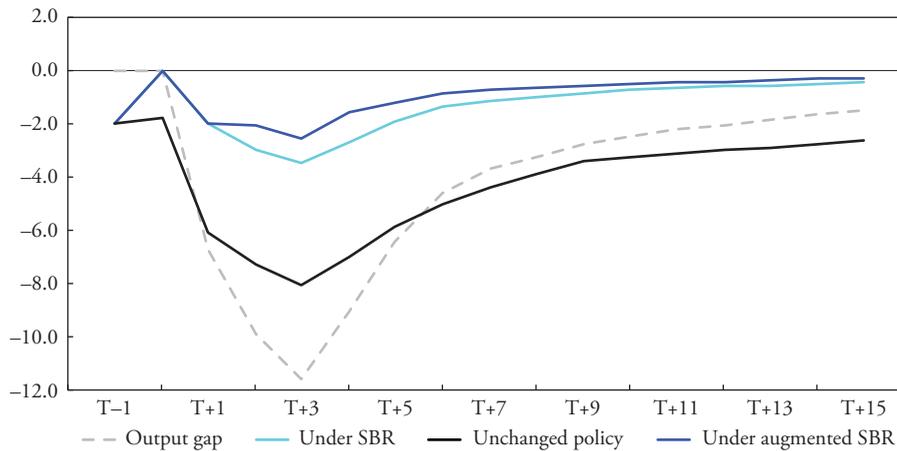
Source: IMF 2009.
Note: SBR = structural balance rule; and augmented SBR = structural balance rule with correction mechanism.
The overall balance under unchanged policy reflects a constant tax ratio and expenditure stable in nominal terms over the forecast period.

Analytical Tools for Fiscal Rule Selection

This section describes tools that have been used in past IMF works to assess the performance of various fiscal rules and inform their selection.[22] Most tools simulate the impact of a rule on deficit and debt dynamics. In some models, the selection also uses other metrics such as the volatility of key macroeconomic variables (output, employment, public expenditure, private consumption) and price dynamics (interest rates and inflation). This note is accompanied by a series of Excel and EViews files that help economists use the first three methods; the fourth method (model-based) requires advanced programming skills to run simulations.

[22]For commodity exporters, rule selection is based on different considerations and analytical tools, which are presented in the next section.

Figure 3. Gross Debt Forecasts under Structural Balance Rule in the United Kingdom
(Percent of GDP)
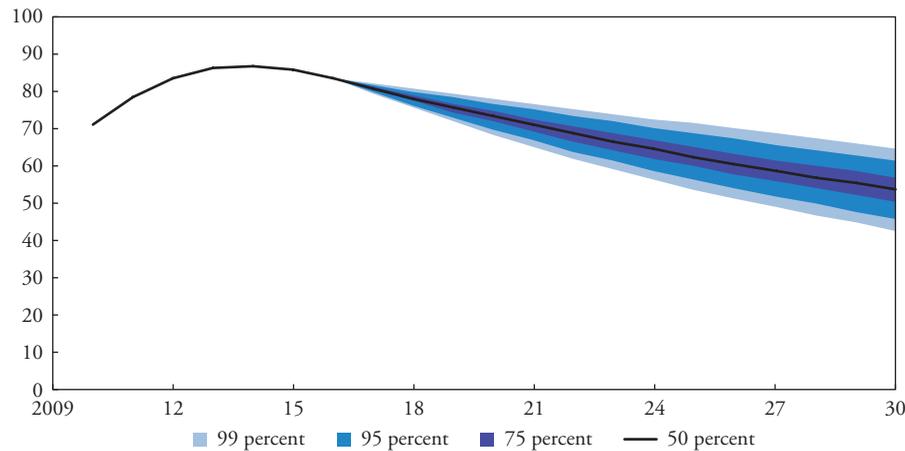
Source: Caceres and Ruiz-Arranz (2010).
Note: Percentages represent confidence bands around the median forecast. The rule is assumed to enter into force at the end of the forecast horizon, which is why there is no counterfactual.

Counterfactual analysis. A first approach consists in "rewriting history" by producing a retrospective scenario in which a rule (or a rule different from the one that prevailed) is assumed to be introduced at some point in the past. The approach analyzes how government behavior and the economic indicators would have changed under the rule and what would be today's outcomes. In general, government spending plays the role of the adjustment factor to comply with the rule. One difficulty is that the counterfactual spending path has implications for other macroeconomic variables, including GDP. For instance, if the introduction of a rule is associated with a tighter fiscal stance, it is likely to have a negative effect on output, at least in the short term. Overlooking this effect could lead economists to overestimate the benefits of the rule; therefore, it is important that the simulations incorporate fiscal multipliers.

Another complication is that some of the macroeconomic variables are subject to large ex post revisions; therefore, a fair assessment of fiscal rules should take into account possible measurement errors.[23] For instance, Andrle and others (2015) compare the performance of the expenditure and structural balance rules if they had been implemented in Italy and France

since the early 2000s. Their analysis incorporates a fiscal multiplier and relies on both real-time and ex post data. Figure 1 shows that public debt would have been significantly lower under the rules; nonetheless, the structural balance rule is more sensitive to measurement errors on potential output.

Scenario analysis. In contrast with the counterfactual approach, scenario analysis is forward-looking and simulates the effect of rules over the forecasting horizon. It was initially developed by Debrun, Espstein, and Symansky (2008) for Israel and further expanded in IMF (2009). The general idea is to simulate the effect of rules under various scenarios, including a baseline (which could be the IMF World Economic Outlook projections) and several shock scenarios.

In IMF (2009), the shock scenarios include a period of low growth (in which real GDP growth remains below trend and the output gap widens throughout the simulation horizon); a large shock scenario (in which the output gap widens rapidly and then narrows progressively); a boom-bust scenario (in which the economy experiences rapid growth for a few years, followed by a sharp decline in activity); and a contingent liability shock (in which debt rises suddenly by 15 percentage points). Figure 2 illustrates the implications of the large output shock scenario on the fiscal balance of a representative economy. As in the counterfactual approach, the challenge is to ensure that the feedback effect from fiscal variables to output is taken into account in the simulations.

[23]The measurement error on potential output provides a good illustration. The cyclically adjusted balance rule is likely to allow excessive expenditure when potential output is overestimated in real time and revised downward ex post. Assessing the performance of this rule using only ex post data may overstate its benefits.

Stochastic simulations. The forward-looking performance of fiscal rules can also be assessed in response to stochastic shocks. Instead of simulating ad hoc deterministic scenarios as in the scenario analysis, the shocks are drawn from a distribution representing the past behavior of the data. This approach builds on the framework developed in Celasun, Debrun, and Ostry (2007) and was applied to the United Kingdom in Caceres and Ruiz-Arranz (2010).[24] In practice, a joint distribution of macroeconomic shocks (for example, output, interest rate, exchange rate) is calibrated to fit the statistical properties of historical data, using a VAR framework or a multivariate (usually normal) law. A consistent path for the macroeconomic variables over the forecast horizon is generated drawing from this joint distribution. Then fiscal policy is allowed to adjust to these shocks according to the fiscal rule; this creates a set of projections for fiscal aggregates (overall balance, revenue, expenditure, and debt paths). Finally, through repeated (for example, a thousand) simulations of random macroeconomic shocks, fan charts are derived representing the frequency distribution of the budgetary aggregates for each fiscal rule and year of projection.

The fan charts, which depict confidence bands for varying degrees of uncertainty around the median projection, allow a probabilistic assessment of the fiscal policy stance and debt dynamics under realistic shock configurations. Figure 3 shows the debt fan chart if the United Kingdom decided to apply a structural balance rule. The debt ratio would follow a declining path over the simulation horizon under the vast majority of shock configurations (extreme cases are not shown). The probability that debt would fall below 60 percent of GDP by 2026 is about 50 percent.

Model-based rule selection. The most elaborate approach to selecting fiscal rules is to use a multi-country macroeconomic model—for instance, a medium-scale DSGE—that incorporates the intertemporal decisions of households and firms as well as the general equilibrium effects of rules, including effects on expectations. The general idea is to apply shocks to the model and analyze how the economy responds in the presence of a rule. Simulations can be conducted around the steady state of the model (as in IMF 2009 and Andrle and others 2015) or around a baseline forecast (as in Petrova 2012). Shocks are calibrated in an ad hoc way (for example, a decline in GDP growth by *x* percent) or, preferably, based on past data. One advantage of models is that they can simulate the impact of a combination of rules, unlike the previous approaches, which assess rules individually.

For instance, IMF (2009) presents GIMF simulations performed for three stylized economies: (1) a small open advanced economy, (2) a large open advanced economy, and (3) a small open commodity-exporting economy. The shocks considered are a domestic demand shock, an exogenous fall in supply (productivity shock), and, for the commodity-exporting economy, an exogenous change in external demand for the commodity. The various rules are assessed by plotting the path of GDP, inflation, debt, deficit, tax revenues, and interest expenditure in deviations from the steady state over a 15-year horizon.

Andrle and others (2015) also use GIMF to simulate the effect of various fiscal rules on European economies. Their model features a representative euro area country, an aggregate of the rest of the euro area, and an aggregate of the rest of the world. The model is calibrated so that the steady state of the three regions matches their average stylized facts (such as the shares of consumption and investment in GDP). The stochastic simulations focus on aggregate demand shocks drawn from their historical estimated distribution, based on the variability of annual output gaps in the past decades. The rule selection relies on the analysis of the variance around the steady state of several key variables (for example, output, debt, fiscal balance, and risk premium) for the representative country, conditional on aggregate demand shocks. The purpose of the simulation is to evaluate the properties of the rules over the course of multiple business cycles.

Rules for Developing Countries

This section of the note describes considerations for developing (emerging market and low-income) economies, where the previous tools can be difficult to use or might require some adaptation. In these countries, rule selection often has to be based on alternative or qualitative analyses.

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[24]This approach is very similar to the debt ceiling calibration method presented in the note "How to Calibrate Fiscal Rules—A Primer" (IMF 2018). The only difference is that the fiscal reaction function here is based on a rule rather than either estimated or calibrated as in the note on rule calibration. More explanations are provided in the manuals describing the files attached to this note.

Commodity Exporters[25]

For commodity exporters, the objectives of stabilization and debt sustainability must be adapted to take into account two important characteristics of these economies: (1) the *volatility of commodity prices*, which creates additional challenges for macroeconomic stability; and (2) the *depletion of natural resources*, which can undermine fiscal sustainability and raises the question of how to allocate resource wealth across generations in an equitable manner. Rules for commodity exporters can be classified in two categories, depending on the rule's main objective (in practice, some rules can address both volatility and depletion). See IMF (2012) and Baunsgaard and others (2012) for a general review.

Rules to Cope with Price Volatility and Achieve Macroeconomic Stability

The first category of rules reduces (and possibly eliminates) the procyclicality of the fiscal stance by delinking expenditure from volatile revenue sources. Using fiscal rules for stabilization purposes is particularly relevant for countries with long reserve horizons, where exhaustibility is not a primary concern.

Several options exist to induce countries to save revenues when commodity prices are high.

- *Revenue split rules* set aside a certain percentage of revenues using an ad hoc criterion. For instance, the rule may require saving revenues above a certain threshold, such as the amount initially budgeted or the average of past revenues. Or the rule may require saving a predetermined percentage of commodity revenues.
- *Price smoothing rules* are also meant to split revenues, but the allocation criterion is more complex and involves the calculation of a reference price. If actual resource revenues exceed resource revenues consistent with the reference price of the commodity, the difference is saved and can be used in periods of shortfall. In other words, only the "reference revenues" are made available to the budget and can be spent. Reference prices are derived from an automatic formula (for example, average of past and future prices) or provided by an independent committee using economic analysis and judgment.
- *Structural balance rules* correct for both economic and commodity price cycles. They can be viewed as a more sophisticated version of price smoothing

rules.[26] A formula is used to correct the nominal balance for the output gap and the commodity gap, which is defined as $\frac{P - P^*}{P^*}$, with P and P^* denoting the current and structural prices for the commodity (the latter can be estimated in different ways, such as with an Hodrick-Prescott filter). Thus, the structural balance measures the fiscal position that the government would display if GDP were at potential and commodity prices were at their long-term/structural level. If the structural balance rule ceiling is set at zero, the government is entitled to spend only its "structural revenues" every year.

- *Expenditure rules* limit the growth of government spending in nominal or real terms or in percent of nonresource GDP. They can be useful to contain spending growth during price booms, reducing the degree of procyclicality. Their advantage lies in their simplicity and visibility compared with the previous three types of rules (which also contain expenditure, albeit indirectly).

An important weakness in the first two types of rules is that they only constrain the allocation of revenues (between savings and spending) but do not impose limits on borrowing. In an extreme scenario, these rules might require saving all commodity revenues, but the fiscal position could still deteriorate significantly if excessive spending is financed from borrowing. Thus, these rules might not be sufficient to achieve macroeconomic stability (as well as fiscal sustainability). In contrast, expenditure rules and structural balance rules can be used more effectively to stabilize the path of expenditure.

Rules to Ensure Fiscal Sustainability and an Equitable Intergenerational Allocation of Resources

While all countries need to ensure the sustainability of public finances, this issue is particularly relevant in countries with a relatively short reserve horizon, where the question of resource exhaustibility features

[25]The main recommendations in this section are also valid for resource-rich advanced economies.

[26]There are several differences between the price smoothing rule and the structural balance rule: (1) the purpose of the price smoothing rule is to smooth the short-term volatility of revenues, not to base the fiscal stance on an assessment of long-term commodity prices consistent with economic fundamentals; (2) structural balance rules also correct for the economic cycle (relatedly, price smoothing rules adjust only resource revenues, while structural balance rules generally adjust total revenues); and (3) structural balance rules impose a constraint on the total amount of expenditure—not only expenditure financed from resource revenues but also the part financed from other revenues and borrowing.

prominently. Given the prospect of resource depletion, the main purpose of fiscal rules in these countries is to determine the amount of savings (and sustainable spending) for current and future generations.

The conceptual framework used to select fiscal rules is the fiscal sustainability analysis for resource-rich countries, meaning the search for a path of fiscal balances consistent with the intertemporal budget constraint, explicitly taking into account future resource revenues (IMF 2012). The permanent income hypothesis (PIH) approach is the most commonly used model. It implies that, for a country with resource revenues, the intertemporal budget constraint is satisfied when the nonresource primary deficit is constant and equal to the return on total (financial and resource) wealth. The PIH provides a fixed benchmark for the nonresource primary fiscal deficit that ensures the preservation of wealth over time, which is one way to achieve intergenerational equity.[27] Depending on the formulation of the PIH, the fixed nonresource primary deficit benchmark can be expressed in real terms, in real terms per capita, or as a share of nonresource GDP. With projections for nonresource revenue, the non-resource primary balance benchmark also provides an estimate of the "sustainable" level of expenditure.

Several rules have been discussed in this framework:

- A natural rule arising from the PIH model is a target on the non-resource primary balance (as a share of nonresource GDP). In the basic PIH framework, this target corresponds to the sum of the real return on financial wealth already accumulated and the implicit real return on the net present value of future resource revenues.

- A tighter version of this rule is the "bird-in-hand" policy rule, in which only the return accruing from accumulated financial assets (interest income) is spent. With this rule, resource revenues are fully saved, except for the interest they generate.

- The previous two rules are often considered to be too conservative. The low level of public spending associated with these rules can create social tensions at a time of high resource revenues. Also, there is a high opportunity cost in terms of forgone social

and infrastructure spending in the early years at the expense of future spending. The PIH has been criticized for preventing countries from expanding their capital budgets in response to rising resource revenues, even when higher investment is consistent with long-term fiscal sustainability. This issue can be addressed by using alternative models (for example, a modified PIH or fiscal sustainability framework) that incorporate the possibility of scaling up investment in an initial period (and relaxing the nonresource primary deficit accordingly) before stabilizing it in the medium term (see IMF 2012). The rule may thus apply only after the initial period of scaling-up.

Other Developing Countries

This section offers further guidance on the design of rules in developing countries, extending the discussion of the previous section beyond resource revenue management. Not all developing countries are commodity exporters, and commodity prices might not be the only factor that needs to be taken into account when designing fiscal rules. The literature on rules in developing countries is relatively limited (Kopits 2004; Dabla-Norris and others 2010; Frankel, Vegh, and Vuletin 2013; Tapsoba 2012; Bova, Carcenac, and Guerguil 2014). In general, developing countries have three characteristics that affect the effectiveness and implementation of rules: (1) a volatile macroeconomic environment, (2) difficulties to stabilize public expenditure, and (3) large development needs. The design of fiscal rules needs to reflect these characteristics.

Coping with a Volatile Environment

One of the characteristics of developing countries is that they operate in a very volatile macroeconomic environment, which results in unstable government revenues (Loayza and others 2007). Not only are recessions deeper and more frequent, but expansions tend to be larger and longer than those in advanced economies (Calderon and Fuentes 2010). Other factors that affect government revenues include exchange rate fluctuations (Hausmann, Panizza, and Rigobon 2006), terms-of-trade shocks (when commodity or trade constitutes a large share of the tax base), weather conditions (in countries with a high share of agriculture and livestock), natural disasters, volatile external financing flows (including foreign aid), and structural

[27]Given that only a fraction of resource revenues is spent every period, financial savings will increase sufficiently to make up for the depletion of resource wealth. Total net wealth is therefore kept constant, although its composition changes over time: the share of resource wealth (present value of future resource revenues) will decline over time, but the decline will be perfectly offset by an increase in net financial wealth.

transformations (such as the process of formalization of the economy).

The high volatility of revenues complicates the choice of fiscal rules by amplifying the traditional requirement that rules should shelter public spending from transitory shocks. Nominal balance rules are not a good candidate in this regard as they transmit all the revenue volatility to spending, possibly creating budget management problems and destabilization effects on the economy. Rules based on the cyclically-adjusted balance are not a panacea either—abstracting from their measurement difficulty, these rules filter out the effect of the business cycle but not important factors such as terms-of-trade shocks or structural changes in output composition. As a result, estimates of cyclically-adjusted revenues can still be very unstable, limiting the appeal of cyclically-adjusted balance rules in developing countries. As discussed previously, one solution could be to introduce structural balance rules that correct for other (non-business-cycle) sources of volatility, but such rules are even more difficult to compute and monitor, and some of the sources of volatility might be too unpredictable to be reflected in the design of a rule. That is why simple spending rules are often seen as offering a better shield to revenue volatility in developing countries (Cordes and others 2015).

Technical and Operational Difficulties with Stabilizing Spending

Not only is the economic environment of developing countries very volatile, but fiscal policy does not seem to be able to mitigate this volatility.[28] A large body of empirical evidence has shown that fiscal policy tends to be procyclical in developing countries. Although some of these countries have been able to implement countercyclical fiscal policy over the past 15 years, revenue and spending policies in the vast majority still tend to exacerbate the already wide amplitude of the business cycle (Frankel and others 2013).

Two main explanations have been provided to account for this bias: (1) imperfect access to international credit markets and lack of financial depth prevent developing countries from borrowing in bad times (Caballero and Krishnamurthy 2004; Konuki and Villafuerte 2016), and (2) good times encourage fiscal profligacy and rent-seeking activities in coun-

tries with weak political institutions (Calderon and Schmidt-Hebbel 2008; Ilzetzki and Vegh 2008). The ability of fiscal rules to correct this procyclical bias depends fundamentally on the source of the bias. If the procyclicality comes from profligacy and the lack of a commitment mechanism, fiscal rules might help. But if the problem comes from inefficient credit markets, fiscal rules cannot be the only solution.

Fiscal rules that are meant to mitigate procyclicality and stabilize spending face several challenges in developing countries (Bova and others 2014; Bergman and Hutchison 2015):

- *Technical issues.* Identifying the state of the business cycle can be difficult from a statistical standpoint. Output volatility and frequent structural breaks complicate the dating procedure of the cycle and the estimation of the output gap. More fundamentally, the concept of "business cycle" might not be relevant in countries that are exposed to weather or aid shocks that do not follow a cyclical pattern and in which shocks to output are predominantly supply shocks, not demand shocks. Data limitations also constrain the use of recent estimation techniques that address the shortcomings of traditional methods such as Hodrick-Prescott filters. The new techniques generally require high-frequency (quarterly) information, in particular on capacity utilization, unemployment rate, consensus forecasts, and consumer price inflation (Blagrave and others 2015).

- *Operational constraints.* Stabilizing public expenditure throughout the business cycle may be challenging from an operational point of view. Many developing countries have poor debt and cash management systems, and, thus, face difficulties with generating a steady flow of funding (which is a necessary condition for smoothing spending). Debt managers may not have the right strategies and instruments to tap international financial markets in bad times and borrow large amounts domestically on a regular basis.[29] In addition, cash managers may not have access to all available liquidities to meet expenses. The objective of smoothing public expenditure is inconsistent with an excessive segmentation of fund sources or a high degree of revenue earmarking.[30]

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[28]The two observations are clearly linked. The high volatility of revenues makes it more difficult for the government to stabilize the economy. But the arguments described in this section would remain valid if government revenues were relatively stable.

[29]This strategy has its own problems, as large-scale domestic borrowing by the government can have a crowding-out effect on the private sector.

[30]Cash managers should ideally manage all public funds in a consolidated way. Maintaining an appropriate cash buffer is also

In countries that face significant borrowing constraints, stabilizing spending can be very difficult, particularly during economic downturns. In this case, the only option could be self-insurance; that is, building financial buffers in good times (for example, setting aside revenue windfalls in a stabilization fund) and using them in bad times. But in countries with easier access to financial markets, expenditure rules can be used to smooth spending and foster economic stabilization (Bova and others 2014). As noted above, certain (but not all) spending rules have good stabilization properties. These rules are simple to design and implement and do not require precise dating of the cycle.[31]

However, even expenditure rules are not completely immune to measurement problems. In developing countries, frequent supply shocks and structural changes complicate the estimation of potential/long-term growth, the incorrect determination of which can result in an unsustainable or suboptimal level of spending over the long run. In addition, a poor public financial management system (for example, the lack of a top-down approach to budgeting, ineffective budget execution systems, weak budget reporting systems) can limit the effectiveness of expenditure controls.

Addressing Large Development Needs

Emerging market and low-income countries often have large development needs (IMF 2016). In this context, fiscal policy should be geared toward protecting, or even increasing, public investment and augmenting the amount and quality of spending on education, health, and social security (Ostry, Ghosh, and Espinoza 2015).

As noted, despite its appeal, the golden rule has some drawbacks: it weakens the link between fiscal targets and gross debt, opens the door to creative accounting, and might constrain some expenditure items (for example, health and education) that could actually raise productivity and potential growth more than spending on physical capital.

An alternative solution is to introduce rules that prevent current expenditure from crowding out public

investment. This can be achieved by imposing a ceiling on current expenditure combined with either a nominal balance rule or a ceiling on total (current plus capital) expenditure. The idea is to indirectly create a floor for capital spending, while allowing it to exceed this floor when current expenditure is contained. But compared to the golden rule, these solutions maintain a limit on capital spending. The specific design of the rule (in nominal or real terms, in level or ratio) would have to incorporate the considerations discussed in the second section of this note titled "Pros and Cons of the Main Operational Rules."

A well-designed medium-term budgetary framework (MTBF) and a strong public investment framework can also help minimize the adverse effects of fiscal rules on public investment. A credible MTBF, which manages expenditure in a multi-year perspective, can ensure that capital spending is not cut merely to comply with fiscal rules. It can promote an effective allocation of resources among sectors and priorities, and create more stable and predictable conditions under which ministries and agencies can plan their expenditures (IMF 2013, 2014). In addition, a strong public investment framework (for example, rigorous and transparent arrangements for the appraisal, selection, and approval of investment projects; strong institutions in charge of funding, managing, and monitoring project implementation; and integration between national strategic planning with capital budgeting) can significantly improve the efficiency of public investment, thereby increasing its economic impact even when fiscal rules impose constraints on the spending envelope (IMF 2015).

Preliminary Assessment

Some of the characteristics of developing countries—in particular, their strong macroeconomic volatility, structural transformations in the economy, and data and institutional shortfalls—limit the set of first-best rules available. In many cases, spending rules or simple revenue-split rules (to build buffers in good times) are the only suitable options, because more sophisticated rules are too complex to implement.

The characteristics of developing countries also expose more starkly the trade-offs among the desired features of fiscal rules. For example, rules that aim to stabilize fiscal balances during the economic cycle can be more difficult to measure, calibrate, and monitor in developing countries than in advanced economies. In the trade-off

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necessary to meet cash outflows, particularly when the ability to borrow is constrained.

[31]This remains true for an expenditure growth ceiling capped by potential GDP growth. Estimating potential output *growth* is less demanding than (and does not require) estimating the potential output *level*.

between simplicity and flexibility, the cost of introducing a simple suboptimal rule could be dwarfed by the risks posed by complex and ill-measured rules.

Although the choice of a rule is country-specific and should be based on simulations and considerations adapted to the individual economy, some general principles emerge from the discussion. In cases in which macroeconomic volatility is great and data gaps are pronounced, an expenditure rule that caps the growth rate of expenditure often strikes the right balance among simplicity, stabilization, operational guidance, and ease of monitoring. But in countries that face strong borrowing constraints and those with weak debt and cash management systems, there may be less room for smoothing expenditure, leaving self-insurance as one of the few feasible options.

Appendix: Lessons from the Theoretical Literature on Fiscal Rules

The theoretical literature has played a central role in the design of monetary policy rules, but there is also a vast literature on optimal fiscal policy. This appendix draws lessons from research papers that are most relevant to the understanding of fiscal rules; that is, papers that (1) analyze large fiscal aggregates (not specific policy instruments, like the personal income tax schedule), (2) draw policy implications that are easy to operationalize, and (3) directly tackle the issues of debt sustainability and/or stabilization—two main motivations behind the adoption of fiscal rules.

Objectives and Design of Rules in Theoretical Models

Researchers and policymakers approach policy rules in fundamentally different ways, in terms of both function and design.

- *Rule objectives.* In the theoretical literature, optimal fiscal policies are defined as policies that maximize social welfare. Most theoretical models assume that public debt is on a sustainable path and that the intertemporal budget constraint is met. However, in the real world, debt sustainability is not ensured and meeting the budget constraint is a key policy objective of rules, which are generally put in place to prevent excessive borrowing and support fiscal discipline.

- *Rule design.* The theoretical literature defines a fiscal rule as a stable policy reaction function; that is, a formula that links fiscal instruments (for example, tax rate, expenditure, borrowing) to macroeconomic indicators in an optimal way. In the context of a theoretical model, a government that follows a rule still adjusts its fiscal position continuously during the business cycle. Following a rule means that fiscal policy reacts in a predictable and optimal way. In contrast, in the policymaking world, fiscal rules are defined as "permanent" constraints on fiscal aggregates (IMF 2009); they limit the use of fiscal discretion and define a perimeter within which fiscal aggregates can evolve. Thus, real rules are fundamentally different from theoretical rules: they constrain fiscal policy rather than prescribe optimal policies.

Public Debt Sustainability Models

A substantial literature shows that a high level of public debt can damage economic welfare (for a survey, see Aguiar and Amador 2014). A key insight from this literature is that sovereign debt involves contracts that are difficult to enforce (compared with contracts between individuals or businesses), because the judicial authorities have limited ability to seize assets or impose actions on contracting parties.

This feature can create self-fulfilling debt crises that reduce welfare and have negative spillovers on macroeconomic variables, including GDP growth. Given the difficulty of enforcing debt contracts, high debt levels can raise creditors' doubts about the ability or willingness of the government to repay, increasing risk premiums and interest rates. This, in turn, can lead to a "bad equilibrium" and default, because the high cost of debt makes it impossible for the government to fulfill its obligations, thus validating the creditors' concerns.

To avoid a bad equilibrium, governments can enact credible fiscal rules that reduce debt soon after a negative shock causes a deviation from the long-term debt target. Lorenzoni and Werning (2013) offer the following example. They consider a theory-based credible fiscal balance rule $s_t = (1 - \gamma)s_{t-1} + \gamma(\alpha_0 + \alpha_1 b_t)$, where s denotes the fiscal surplus in percent of GDP and b the debt-to-GDP ratio, and show that high values for parameter α_1 are sufficient to eliminate bad equilibria.

Economic Stabilization Models

A second group of models—dynamic stochastic general equilibrium (DSGE) models with neo-Keynesian frictions—investigate how stabilization policies can improve welfare by reducing macroeconomic volatility. These models can reproduce key statistical features of macroeconomic time series and can produce accurate forecasts (for a survey, see Fernandez-Villaverde, Rubio-Ramirez, and Schorfheide 2016).

DSGE models can be used to determine the optimal level of fiscal aggregates (tax, deficit, debt, and, occasionally, expenditure[32]) as a function of economic variables (for example, output gap). The literature shows that optimal fiscal policy can be proxied by "simple

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[32]In a majority of models, one of the main sources of business cycle fluctuations is government spending shocks, which are thus treated as exogenous. As a result, a large part of the literature focuses on tax and debt policy responses rather than expenditure policy rules. Exceptions include Adam (2011) and Leith, Moldovan, and Rossi (2015).

policies," meaning simple theory-based rules that can be expressed as linear functions of a limited number of key macroeconomic indicators. The welfare attained by such rules is close to what could be achieved with much more complex ones. For example, the seminal work of Schmitt-Grohe and Uribe (2007) computes the welfare-maximizing tax rate on labor income, $\tau_t = \gamma(l_{t-1} - l^*) + \tau^*$, as a linear function of last period's deviation in employment from its long-term level, l^*, and the long-term level for the tax rate, τ^*.

Another lesson from the DSGE literature is that the optimal (that is, welfare-maximizing) degree of stabilization fiscal policy should achieve depends on the constraints on monetary policy and the initial level of debt:

- In normal times (that is, when monetary policy is not constrained by the zero lower bound) and when the debt ratio is sufficiently low, the optimal reaction of government to a cyclical downturn is to fully offset the cyclical decline in revenues with spending cuts, thus keeping the nominal balance ratio and the debt ratio constant at their preshock levels (see Adam 2011). Spending cuts are typically preferred to tax increases, which are assumed to distort economic choices. In this context, fiscal policy is procyclical and monetary policy is solely responsible for providing macroeconomic stabilization.[33]

- If spending cuts are not feasible or debt is too high, the government should use a mix of higher borrowing and tax rate hikes (as determined by the trade-off between debt and taxation distortions), allowing for a higher but stable debt-to-GDP ratio compared with the pre-shock state (see Schmitt-Grohe and Uribe 2004 or Adam 2011). In practice, this means that fiscal policy should let automatic stabilizers operate, at least partially. The argument in favor of a higher level of borrowing is that expenditure cuts and tax hikes can have large welfare costs, and it is sometimes better to raise debt moderately to smooth out distortions over time, even if the debt ratio is already high.[34]

- When monetary policy is constrained by the zero lower bound, optimal fiscal policy should be more countercyclical: expenditure should not fall as much as in the previous two cases and may even increase, depending on the size of the shock. (See, for instance, Correia and others 2013 and Mankiw and Weinzierl 2011.)

Political Economy Models

The seminal work of Alesina and Tabellini (1990a, 1990b) and the large body of literature that emerged thereafter have shown that fiscal rules can be useful tools to constrain the use of fiscal discretion and minimize the biases toward high deficits and debt accumulation inherent in political economy processes. In contrast to the models of economic stabilization and public debt sustainability discussed above, this literature does not assume that fiscal policy is set by a benevolent social planner that aims to maximize social welfare. Instead, it considers the policies enacted by policymakers with different objectives alternating in office as a result of elections.

Several political economy arguments have been advanced to explain fiscal policy biases (Alesina and Perotti 1999): (1) politicians' reelection concerns and partisanship, leading to a short-term orientation for fiscal policy with opportunistic preelection spending, as well as a tendency to produce optimistic revenue forecasts or unrealistic spending estimates; (2) incentives to deviate from previous promises when economic agents have already adjusted their expectations and behavior (the "time inconsistency" problem, which could, for instance, occur with certain tax announcements); (3) failure by heterogeneous groups such as line ministries, levels of government, or coalition parties to internalize the cost to the community of their competing claims on the government revenue pool (the "common pool" problem); and (4) the population's imperfect understanding of tax and debt finance, combined with a misperception of the government's intertemporal budget constraint ("fiscal illusion").

In this context, a fiscal rule can help attenuate these biases and limit the incentive to spend excessively.

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[33]In most models, monetary policy carries the brunt of stabilization, because demand support through interest rate cuts is less distortionary and can be implemented more quickly than higher public spending, the financing of which requires an increase in current or future taxation.

[34]This result is a bit counterintuitive in the sense that borrowing occurs only when the initial debt level is high (compared to the "normal times" case). The intuition is that, when debt is high, the restoration of debt sustainability following a negative economic shock is more difficult to achieve through expenditure compression

for two reasons: (1) the debt service accounts for a large part of total expenditure, leaving less room in the budget to cut discretionary spending, and (2) a given economic shock has a larger negative impact on debt dynamics when the debt ratio is high (because of the scaling effect) and the expenditure cuts needed to bring down debt would be very high from a welfare perspective.

Political economy models can be helpful in explaining the rationale for rules and justifying their existence in the "real world. Some models derive simple rules (the most prominent example is the annual budget balance rule in Alesina and Tabellini 1990b), but these derivations are often made under specific and simplistic assumptions and the models are very stylized compared with DSGE models, which are more comprehensive and capture more aspects of the economy. The political economy literature also abstracts from fiscal stabilization and debt sustainability issues.

Limitations of Theoretical Models for the Work on Fiscal Rules

The theoretical literature provides valuable insights into the desirable features of sustainable and stabilizing policies, but its practical implications are limited.

- Most theoretical models do not analyze debt sustainability and economic stabilization simultaneously.[35] The vast majority of existing DSGE models consider debt sustainability as just one constraint that must be satisfied for any policy under consideration, while the majority of debt sustainability models are highly stylized and typically do not consider economic stabilization issues. Political economy models do not directly address these two issues.

- Another issue for theoretical models is that they generally assume that governments can credibly commit to set policies today for the indefinite future, although some of the resulting policies may be time-inconsistent (that is, governments may want to change them under certain states of the world, for example, incentives to default on sovereign debt may appear after a large shock hits). Some models explicitly consider the implications for optimal policy of a lack of credible commitment and time inconsistency.[36] However, their recommendations have limited applicability, as they are typically performed in highly stylized settings and produce very complex policies that depend in nonlinear ways on variables that are hard to measure or estimate; for example, a clear understanding of how individuals and businesses would react over time if the government were to deviate from the current policy setting.

These limitations have led policymakers to take a more pragmatic approach to the design of fiscal rules and to base the selection on a set of pragmatic criteria, which are examined in the first section of this note titled "Principles of Rule Selection."

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[35]Notable exceptions include Hatchondo, Martinez, and Roch (2017) and Cuadra, Sanchez, and Sapriza (2013).

[36]The literature that studies time-consistent optimal fiscal policy in standard frameworks for policy analysis (namely, DSGE models with neo-Keynesian features) has just started to develop, so there is as yet no wide consensus on the features of optimal policy. (See Leeper, Campbell, and Liu 2016.)

References

Adam, K. 2011. "Government Debt and Optimal Monetary and Fiscal Policy." *European Economic Review* 55: 57–74.

Aguiar, M., and M. Amador. 2014. "Sovereign Debt." *Handbook of International Economics* Vol 4. Elsevier. (2014): 647–87.

Alesina, A., and R. Perotti. 1999. "Budget Deficits and Budget Institutions." In *Fiscal Institutions and Fiscal Performance*, edited by J. Poterba and J. Von Hagen. Chicago: The University of Chicago Press. (1999): 13–36.

Alesina, A., and G. Tabellini. 1990. "A Positive Theory of Fiscal Deficits and Government Debt." *Review of Economic Studies* 57: 403–14.

———. 1990b. "Voting on the Budget Deficit." *American Economic Review* 80 (1): 37–49.

Andrle, M., J. Bluedorn, L. Eyraud, T. Kinda, P. Koeva Brooks, G. Schwartz, and A. Weber. 2015. "Reforming Fiscal Governance in the European Union." IMF Staff Discussion Note 15/09, International Monetary Fund, Washington, DC.

Ayuso-i-Casals, J. 2012. "National Expenditure Rules: Why, How, and When." Economic Paper 473, European Commission, Brussels.

Balassone, F., and D. Franco. 2000. "Public Investment, the Stability Pact, and the Golden Rule." *Fiscal Studies* 21 (2): 207–29.

Balassone, F., and M. Kumar. 2007. "Addressing the Procyclical Bias." In *Promoting Fiscal Discipline*. M. Kumar and T. Ter-Minassian editors. International Monetary Fund, Washington, DC. (2007): 36–57.

Baunsgaard, T., M. Villafuerte, M. Poplawski-Ribeiro, and C. Richmond. 2012. "Fiscal Frameworks for Resource Rich Developing Countries." IMF Staff Discussion Note 12/04, International Monetary Fund, Washington, DC.

Bergman, U. M., and M. Hutchison. 2015. "Economic Stabilization in the Post-Crisis World— Are Fiscal Rules the Answer?" *Journal of International Money and Finance* 52: 82–101.

Bi, R., H. Qu, and J. Roaf. 2013. "Assessing the Impact and Phasing of Multi-Year Fiscal Adjustment: A General Framework." IMF Working Paper 13/182, International Monetary Fund, Washington, DC.

Blagrave, P., R. Garcia-Saltos, D. Laxton, and F. Zhang. 2015. "A Simple Multivariate Filter for Estimating Potential Output." IMF Working Paper 15/79, International Monetary Fund, Washington, DC.

Blanchard, O., and F. Giavazzi. 2004. "Improving the SGP Through a Proper Accounting of Public Investment." Discussion Paper 4220, Centre for Economic and Policy Research, London.

Bornhorst, F., A. Fedelino, J. Gottschalk, and G. Dobrescu. 2011. "When and How to Adjust Beyond the Business Cycle—A Guide to Structural Fiscal Balances." IMF *Technical Notes and Manuals* 2011/02, International Monetary Fund, Washington, DC.

Bova, E., N. Carcenac, and M. Guerguil. 2014. "Fiscal Rules and the Procyclicality of Fiscal Policy in the Developing World." IMF Working Paper 14/122, International Monetary Fund, Washington, DC.

Caballero, R., and A. Krishnamurthy. 2004. "Fiscal Policy and Financial Depth." NBER Working Paper 10532, The National Bureau of Economic Research, Cambridge.

Caceres, C., and M. Ruiz-Arranz. 2010. "What Fiscal Rule Would Work Best for the UK?" United Kingdom: Selected Issues Paper. IMF Country Report 10/337, International Monetary Fund, Washington, DC.

Calderón, C., and R. Fuentes. 2010. "Characterizing the Business Cycles of Emerging Economies." Policy Research Working Paper 5343, World Bank, Washington, DC.

Calderón, C., and K. Schmidt-Hebbel. 2008. "Business Cycles and Fiscal Policies: the Role of Institutions and Financial Markets." Working Paper 481, Central Bank of Chile, Santiago.

Carnot, N. 2014. "Evaluating Fiscal Policy: A Rule of Thumb." Economic Paper 526, European Commission, Brussels.

Celasun, O., X. Debrun, and J. Ostry. 2007. "Primary Surplus Behavior and Risks to Fiscal Sustainability in Emerging Market Countries: A Fan-Chart Approach." *IMF Staff Papers* 53 (3): 401, International Monetary Fund, Washington, DC.

Chote, R., C. Emmerson, and G. Tetlow. 2009. "The Fiscal Rules and Policy Framework." In *The IFS Green Budget*. Chote, R., Emmerson, C., Miles, D. and Shaw, J. editors. Institute for Fiscal Studies, London. (2009): 81–112.

Cordes, T., T. Kinda, P. Muthoora, and A. Weber. 2015. "Expenditure Rules: Effective Tools for Sound Fiscal Policy." IMF Working Paper 15/29, International Monetary Fund, Washington, DC.

Correia, I., E. Farhi, J. P. Nicolini, and P. Teles. 2013. "Unconventional Fiscal Policy at the Zero Bound." *American Economic Review* 103 (4): 1172–211.

Cuadra, G., J. M. Sanchez, and H. Sapriza. 2013. "Fiscal Policy and Default Risk in Emerging Markets." *Review of Economic Dynamics* 13 (2): 452–69.

Dabla-Norris, E., R. Allen, L.-F. Zanna, T. Prakash, E. Kvitradze, V. Lledo, I. Yackovlev, and S. Gollwitzer. 2010. "Budget Institutions and Fiscal Performance in Low-Income Countries." IMF Working Paper 10/80, International Monetary Fund, Washington, DC.

Debrun, X., N. Espstein, and S. Symansky. 2008. "A New Fiscal Rule: Should Israel Go Swiss?" IMF Working Paper 08/87, International Monetary Fund, Washington, DC.

Debrun, X., and L. Jonung. 2017. "Rules-Based Fiscal Policy: How Sustainable Is It?" IMF Working Paper (forthcoming), International Monetary Fund, Washington, DC.

Emmerson, C., C. Frayne, and S. Love. 2006. "The Government's Fiscal Rules." IFS Briefing Note 16, Institute for Fiscal Studies, London.

Escolano, J. 2010. "A Practical Guide to Public Debt Dynamics, Fiscal Sustainability, and Cyclical Adjustment of Budgetary Aggregates." IMF *Technical Notes and Manuals* 2010/02, International Monetary Fund, Washington, DC.

European Commission (EC). 2016. "Report on Public Finances in EMU." Institutional Paper 045, European Commission, Brussels.

———. 2017. "Vade Mecum on the Stability and Growth Pact, 2017 Edition." Institutional Paper 052, European Commission, Brussels.

Eyraud, L., and T. Wu. 2015. "Playing by the Rules: Reforming Fiscal Governance in Europe," IMF Working Paper 15/67, International Monetary Fund, Washington, DC.

Fedelino, A., M. Horton, and A. Ivanova. 2009. "Computing Cyclically Adjusted Balances and Automatic Stabilizers," IMF *Technical Notes and Manuals* 2009/05, International Monetary Fund, Washington, DC.

Fernandez-Villaverde, J., J. F. Rubio-Ramirez, and F. Schorfheide. 2016. "Solution and Estimation Methods for DSGE Models." NBER Working Paper 21862, The National Bureau of Economic Research, Cambridge.

Frankel, J., C. Vegh, and G. Vuletin. 2013. "On Graduation from Fiscal Procyclicality." *Journal of Development Economics* 100 (1): 32–47.

Hatchondo, J. C., L. Martinez, and F. Roch. 2017. "Fiscal Rules and the Sovereign Default Premium." Unpublished, Washington, DC.

Girouard, N., and C. André. 2005. "Measuring Cyclically Adjusted Budget Balances for OECD Countries., OECD Economics Department Working Paper 434, Organisation for Economic Co-operation and Development, Paris.

Guerguil, M., P. Mandon, and R. Tapsoba. 2017. "Flexible Fiscal Rules and Countercyclical Fiscal Policy." *Journal of Macroeconomics* 52: 189–220.

Hausmann, R., U. Panizza, and R. Rigobon. 2006. "The Long-Run Volatility Puzzle of the Real Exchange Rate." *Journal of International Money and Finance* 25 (1): 93–124.

Ilzetzki, E., and C. A. Vegh. 2008. "Procyclical Fiscal Policy in Developing Countries: Truth or Fiction?" NBER Working Paper 14191, The National Bureau of Economic Research, Cambridge.

International Monetary Fund (IMF). 2009. "Fiscal Rules—Anchoring Expectations for Sustainable Public Finances." International Monetary Fund, Washington, DC. https://www.imf.org/external/np/pp/eng/2009/121609.pdf

———. 2012. "Macroeconomic Policy Frameworks for Resource Rich Developing Countries." IMF Policy Paper and supplements. International Monetary Fund, Washington, DC. https://www.imf.org/external/np/pp/eng/2012/082412.pdf and https://www.imf.org/external/np/pp/eng/2012/082412a.pdf and https://www.imf.org/external/np/pp/eng/2012/082412b.pdf.

———. 2013. *Public Financial Management and Its Emerging Architecture*, edited by M. Cangiano, T. Curristine, and M. Lazare. International Monetary Fund, Washington, DC.

———. 2014. *Fiscal Monitor: Public Expenditure Reform—Making Difficult Choices*. International Monetary Fund, Washington, DC, April.

———. 2015. "Making Public Investment More Efficient." IMF Policy Paper, International Monetary Fund, Washington, DC, available at http://www.imf.org/external/np/pp/eng/2015/061115.pdf.

———. 2016. "Macroeconomic Developments and Prospects in Low-Income Developing Countries—2016." IMF Policy Paper, International Monetary Fund, Washington, DC, available at https://www.imf.org/en/Publications/Policy-Papers/Issues/2017/01/13/PP5086-Macroeconomic-Developments-and-Prospects-in-Low-Income-Developing-Countries-2016

———. 2017. "A Greater Role for Fiscal Policy." In *Fiscal Monitor—Achieving More with Less*. International Monetary Fund, Washington, DC, April.

———. 2018. "How to Calibrate Fiscal Rules. A Primer" IMF How-To-Note, International Monetary Fund, Washington, DC, available at https://www.imf.org/en/Publications/SPROLLs/How-To-Notes

Konuki, T., and M. Villafuerte. 2016. "Cyclical Behavior of Fiscal Policy Among Sub-Saharan African Countries." IMF African Department Paper Series, International Monetary Fund, Washington, DC, available at https://www.imf.org/external/pubs/ft/dp/2016/afr1604.pdf

Kopits, G. (editor). 2004. *Rules-Based Fiscal Policy in Emerging Markets Background, Analysis and Prospects*. Palgrave Macmillan, New York.

———, and S. Symansky. 1998. *Fiscal Policy Rules*. IMF Occasional Paper 162, International Monetary Fund, Washington, DC.

Leeper, E. M., L. Campbell, and D. Liu. 2016. "Optimal Time-Consistent Monetary, Fiscal and Debt Maturity Policy." SSRN Electronic Journal, Social Science Research Network, Rochester, available at https://ssrn.com/abstract=2719457.

Leith, C., I. Moldovan, and R. Rossi. 2015. "Monetary and Fiscal Policy Under Deep Habits." *Journal of Economic Dynamics and Control* 52: 55–74.

Lledó, V., S. Yoon, X. Fang, S. Mbaye, and Y. Kim. 2017. "Fiscal Rules at a Glance." Background note for the publication of the IMF Fiscal Rules Database. http://www.imf.org/external/datamapper/FiscalRules/map/map.htm

Loayza, N. V., R. Ranciere, L. Servén, and J. Ventura. 2007. "Macroeconomic Volatility and Welfare in Developing Countries: An Introduction." *World Bank Economic Review* 21 (3): 343–357.

Lorenzoni, G., and I. Werning. 2013. "Slow Moving Debt Crises." NBER Working Paper 19228, The National Bureau of Economic Research, Cambridge.

Mankiw, N. Gregory, and M. Weinzierl. 2011. NBER Working Paper 17029, The National Bureau of Economic Research, Cambridge.

Mbaye, S., and H. E. Ture, 2018, "What Makes Fiscal Rules Effective: Lessons from Case Studies", IMF Working Paper, International Monetary Fund, Washington.

Organisation for Economic Co-operation and Development (OECD). 2008. *OECD Economic Surveys: Germany*. Paris: OECD Publishing. http://dx.doi.org/10.1787/eco_surveys -deu-2008-en.

Ostry, J., A. Ghosh, and R. Espinoza. 2015. "When Should Public Debt Be Reduced?" IMF Staff Discussion Note 15/10, International Monetary Fund, Washington, DC.

Petrova, I. 2012. "Iceland's Policy Objectives Under a New Fiscal Rule." In *Iceland: Selected Issues*. IMF Country Report 12/90, International Monetary Fund, Washington, DC.

Schaechter, A., T. Kinda, N. Budina, and A. Weber. 2012. "Fiscal Rules in Response to the Crisis—Toward the Next-Generation Rules. A New Dataset." IMF Working Paper 12/187, International Monetary Fund, Washington, DC.

Schmitt-Grohe, S., and M. Uribe. 2004. "Optimal Fiscal and Monetary Policy Under Sticky Prices." *Journal of Economic Theory* 114: 198–230.

———. 2007. "Optimal Simple and Implementable Monetary and Fiscal Rules." *Journal of Monetary Economics* 54: 1702–25.

Servén, L. 2007. "Fiscal Rules, Public Investment, and Growth." Policy Research Working Paper Series 4382, World Bank, Washington, DC.

Tapsoba, R. 2012. "Do National Numerical Fiscal Rules Really Shape Fiscal Behaviours in Developing Countries? A Treatment Effect Evaluation." *Economic Modelling* 29 (4): 1356–69.

Valencia, F. 2015. "Strengthening Mexico's Fiscal Framework." *Selected Issues Papers*. IMF Country Report 15/314, International Monetary Fund, Washington, DC.