Under Threat: Rules-Based Fiscal Policy and How to Preserve it

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CHAPTER SIX

UNDER THREAT: RULES-BASED FISCAL POLICY AND HOW TO PRESERVE IT

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The demise of the Bretton Woods system[1] in 1973 inaugurated two decades of high inflation and rising public debts. As theory linked expansionary policy biases to policymakers' distorted incentives under discretion,[2] interest in rules-based policymaking grew. Even though theory framed the debate in terms of rules versus discretion, it was clear that in practice, a regime predicated on mechanical policy adjustments dictated by a rule would be as suboptimal as unconstrained discretion.[3] Thus, the concrete problem underlying the design of rules-based policy frameworks never was to find the optimal state-contingent rule, but to devise practical mechanisms containing the dark side of discretion—such as a neglect for long-term outcomes—while preserving the bright side of it—that is, the ability to quickly respond to unforeseen developments.

In the monetary realm, failures to stick to quantitative limits on the growth of monetary aggregates in the 1980s favored the spread of inflation targeting. Under inflation targeting, politically independent central banks are primarily mandated to achieve price stability expressed as a numerical goal for the rate of inflation. While policy instruments are not subject to any binding rule, the goal of achieving the inflation target

over the medium term shapes current policy decisions. Since the early 1990s, successful inflation targeting regimes have proliferated, keeping inflation expectations anchored around the target and providing ample room for active stabilization policy in the short term.

Rules-based fiscal frameworks came later,[4] and often after the formal adoption of inflation targeting.[5] Historically confined to subnational governments,[6] fiscal rules only became the norm at the central level among the first group of European countries committed to adopt the euro in the 1990s. Beyond Western Europe, rules-based fiscal policy became increasingly popular after the beginning of the 21st century as more countries felt the need to reduce their public debt.[7]

In their most advanced form, fiscal frameworks combine numerical rules affecting key fiscal indictors with transparency requirements, strict budgetary procedures, and more recently, independent fiscal councils monitoring adherence to the numerical rules and assisting in their implementation. By setting quantitative limits on aggregate indicators such as government debt, the budget deficit, and public expenditure growth, fiscal rules aim to make deviations from these limits sufficiently costly to deter excesses. Costs include both formal sanctions and reputation losses associated with the breach of public commitments. Effective fiscal rules guide discretion in the short term and make future fiscal trajectories more predictable. Hence, successful fiscal rules create policy space in the short run because better anchored expectations reduce the risk of financial market stress whenever significant public-sector borrowing is required.

The potential role of independent fiscal councils to constrain fiscal discretion, often alongside fiscal rules, has been acknowledged more recently.[8] The appetite for such institutions quickly grew after the global financial crisis (GFC) of 2008–2009.[9] Whereas existing institutions operate primarily as watchdogs alerting stakeholders in the budget process, proposals to give them teeth have received new attention, notably in the form of a right to set binding deficit limits for the government[10] or to use specific fiscal levers to preserve public debt sustainability and promote fiscal stabilization.[11]

Our sense of the vast empirical literature on the determinants of monetary and fiscal policies is that explicit institutional constraints on

discretion have on average contributed to improve policy outcomes. Central bank independence—and inflation targeting in particular—is widely credited for maintaining low and stable inflation in advanced as well as developing economies.[12] Although great caution remains in causally linking the adoption of fiscal rules to lower public deficits and less procyclical budgets,[13] the positive association between adequately constrained fiscal discretion and improved fiscal performance is strong.[14]

Despite this apparent success, rules-based fiscal policy has been harshly criticized to the point of facing an existential crisis. After the GFC, fiscal rules have been successively deemed too rigid to support the recovery and too lax to encourage the subsequent consolidation. More broadly, formal compliance with numerical limits has been consistently low, raising questions about the overall usefulness of rules-based frameworks.[15]

Although threats to rules-based fiscal policy can take various forms, they largely reflect the common presumption that fiscal rules, like traffic laws and speed limits, must be enforced. With enforceability seen as critical, efforts to make rules more flexible (i.e., contingent on a broader set of circumstances) result in more complex, less transparent setups. Escape clauses must be well defined; technical refinements must be codified in detail; and the related enforcement loopholes must be closed. Of the three basic properties of good fiscal rules—simplicity, flexibility, and enforceability—only two can be simultaneously achieved. In the end, complex and opaque rules stop being a reliable compass for policymakers, and the temptation to abandon them looms large.

As delegation of fiscal levers to independent institutions is likely to remain off the table in the foreseeable future, effectively constraining fiscal discretion requires more effective rules-based frameworks.[16] In a recent note, International Monetary Fund (IMF) staff see the scope for better combining simplicity, flexibility, and enforceability.[17] They suggest comprehensive reforms that (a) guarantee the internal consistency of fiscal frameworks, (b) exploit simpler ways to make rules more contingent (e.g., a greater reliance on medium-term expenditure ceilings), and (c) promote mechanisms raising the reputational costs of noncompliance. These proposals, however, amount to tweaking existing parameters, an

exercise which, considering recent history, might fall short of mitigating the risk of a return to pure fiscal discretion.

Going beyond parametric adjustments, we propose a less constrained paradigm to guide the design and implementation of fiscal rules. Specifically, we argue that the enforceability of numerical limits should not be a binding constraint. This allows for rules that boil down to quantitative benchmarks whose impact on policy behavior rests solely on tangible reputational costs. In a sense, we suggest being open to so-called Taylor rules in the fiscal realm.[18] To enhance the reputational effects of such fiscal Taylor rules (FTR),[19] independent fiscal councils would have to be ruthless and vocal watchdogs debunking "fiscal alchemy," clearing the public debate of partisan smokescreens, and fostering popular support for sound fiscal policies.

It is worth clarifying two points upfront. First, the FTR idea is not new.[20] However, the originality of our proposal is to place the FTR at the center of a rules-based fiscal framework, without formal enforcement procedure (nor other traditional fiscal rules), and operating in symbiosis with independent fiscal institutions focused on amplifying the reputational effects of the rule. Second, our proposal is not premised on the claim that enforcement per se is useless and ought to be abandoned. Beyond the credibility of sanctions (or lack thereof), there is arguably a signal embedded in the activation of an enforcement procedure. A country willing to risk even elusive sanctions might reveal an intrinsically weaker commitment to fiscal soundness compared to a country unwilling to take such risk. If so, market participants would take note, and risk premiums would adjust accordingly. As such, enforcement procedures could promote market discipline even if actual sanctions are a low-probability event. That interpretation is consistent with the higher sovereign spreads resulting from entering the Excessive Deficit Procedure under the European Union (EU) Stability and Growth Pact.[21]

In the end, our qualm with the central role of enforcement in the current paradigm is that it can produce rules sufficiently opaque and intractable to threaten rules-based policy itself. Thus, the key differences between the current paradigm and our proposal consist in (a) breaking any

mechanical link between the breach of a numerical limit and the threat of sanctions emanating from opaque procedures and arcane numerology and (b) actively amplifying reputational effects of rules through independent watchdogs. Our point is not that an FTR-based framework is always and everywhere preferable, but that it can offer a viable option for countries where the traditional speed-limit view of rules has failed or does not seem politically palatable. Our proposal and the underlying analysis are in the spirit of Bénassy-Quéré and others, who call for "a combination of streamlined rules, stronger institutions, and market-based incentives, with the aim of strengthening national responsibility."[22]

The rest of this chapter first elaborates on the trilemma that makes legally enforceable rules either too rigid or too complicated ("Designing Fiscal Rules: Mission Impossible?"). We then discuss the extent to which such a restricted paradigm can threaten rules-based fiscal policy itself ("Threats to Rules-Based Fiscal Policy"). Then, in the section "Rules-Based Fiscal Policy without Formal Enforcement," we illustrate the properties and potential benefits of simple fiscal Taylor rules.

DESIGNING FISCAL RULES: MISSION IMPOSSIBLE?

This section shows that the enforceability requirement at the core of the paradigm underlying the design of fiscal rules has made them ever more contingent (flexible) in the hope to improve formal compliance. The resulting loss of simplicity illustrates a trilemma between the three essential properties of good-practice fiscal rules: simplicity, flexibility, and enforceability.

ENFORCEMENT, COMPLIANCE, AND EFFECTIVENESS

Fiscal policy rules are generally nested in legal instruments, such as international treaties, constitutions, and fiscal responsibility laws. The dominant view is that the numerical constraints at the core of the rule should effectively bind.[23] This requires enforcement, that is, "the act of *compelling* observance of or *compliance* with a law, rule, or obligation."[24]

As illustrated in the appendix, the basic logic of the argument fits a bare-bones political-economy model of excessive deficits and fiscal rules.

In the classic Alesina and Tabellini two-period "partisan" model of optimal fiscal policy, a deficit bias emerges because citizens and politicians have different motivations.[25] Politicians care about reelection, which is intrinsically uncertain. Electoral uncertainty inflates the incumbent's discount rate (or makes him or her myopic), encouraging excessive expenditure compared to the case of certain reelection. As this extra spending is financed with new debt, it comes at the cost of lower future spending, which is socially undesirable.

Subjecting a myopic politician to a fiscal rule can then be socially beneficial. For instance, Beetsma and Debrun model the existence of a fiscal rule as a utility loss incurred when public debt d exceeds some socially optimal level $d^{\star}$ as follows $-\psi(d-d^{\star})$. The total utility loss is proportional to the size of the fiscal excess and to a parameter ψ capturing the strength of the enforcement procedure (i.e., the marginal disutility of excessive public debt).[26] As formally illustrated in the appendix, there is an optimal value of ψ such that the elected politician will choose the socially optimal level of debt in period 1. Intuitively, the optimal enforcement parameter grows with politicians' incentives to accumulate excessive public debt, which depends on reelection prospects and on the (marginal) social value of future public spending.

However, this result is straightforward only because enforcement per se comes as a free lunch (i.e., it can deliver the first best policy by blindly cutting expenditure to address a debt bias). Experience points to a more realistic scenario where the rule is imperfect so that enforcing it fully would have negative side effects.[27] In this case, strictly sticking to the rule is costly, making it socially optimal to tolerate some deviation of d from $d^{\star}$. De facto, the desirable enforcement parameter ψ will be smaller than the $\psi^{\star}$ characterized under the assumption of no enforcement cost.

This simple example illustrates the difference between the *enforcement* of (and correspondingly, the formal *compliance* to) a fiscal rule and its *effectiveness* in fostering outcomes that dominate equilibrium policies under unconstrained discretion. It also suggests that a fiscal rule meant to be strictly enforced (or fully complied with) must not have any undesirable side effect. In practice, however, fiscal rules are neither

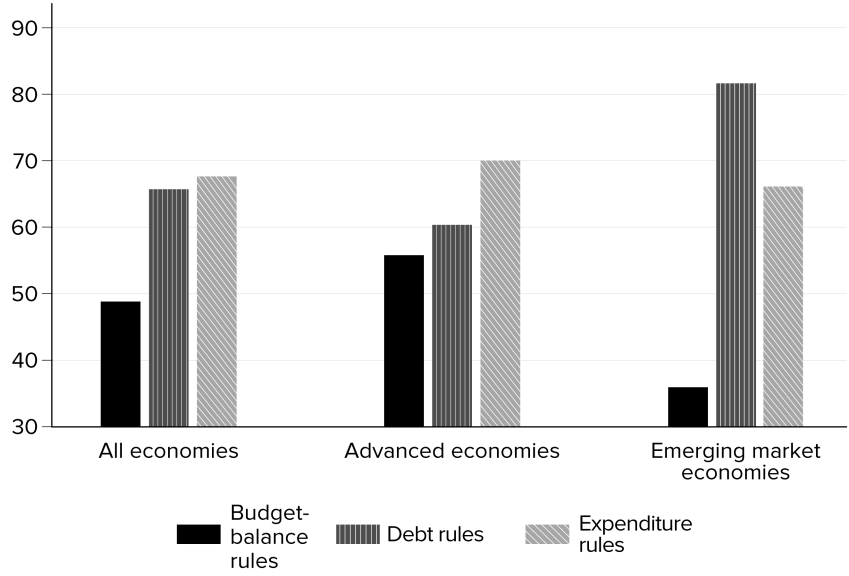
fully state-contingent nor adjusted for possible collateral damage associated with forced policy change, and the economy is arguably better off with imperfect enforcement and compliance. By the same token, attempts to make the rule more contingent (i.e., less costly when enforced) would call for stricter enforcement. Beetsma and Debrun show this in a model where enforcement has adverse composition effects on public spending, and the same conclusion is implicit to Equation (6.A.8) in the appendix.[28]

The positive link between the flexibility of the rule (or its degree of contingency) and the desirable strictness of enforcement helps rationalize common arguments in existing analyses of fiscal rules. First, extreme enforcement options—such as the fines envisaged for EU member states in breach of the Stability and Growth Pact (SGP)—carry little credibility because they are suboptimal in most states of the world. Second, low levels of compliance with numerical rules[29] (see Figure 6.1) can be consistent with empirical evidence showing a broadly positive association between rules-based fiscal policy and fiscal performance.[30] Third, the flexibility-enforcement nexus echoes recent attempts in the EU to tighten the enforcement of rules loaded with a growing number of contingencies, augmenting the overall complexity of the fiscal framework. This suggests a trilemma that we now elaborate upon.

THE TRILEMMA AND AN EVOLUTIONARY TALE OF FISCAL RULES

Since the seminal insights of Kopits and Symansky, it is generally accepted that fiscal rules should ensure a credible commitment to the long-term sustainability of public finances without prejudice to other key policy objectives.[31] With this in mind, Kopits and Symansky argue that a good rule, on top of being discipline-inducing and *enforceable* as defined earlier, should be *flexible* (i.e., contingent enough not to conflict too often with other policy objectives) and *simple*. Simplicity is a key virtue because to foster policymakers' credibility, rules must shape expectations about future fiscal trends. As such, the rules should be clear to policymakers themselves and easy to communicate to markets and the public.

FIGURE 6.1
Compliance rates with fiscal rules by type and country group

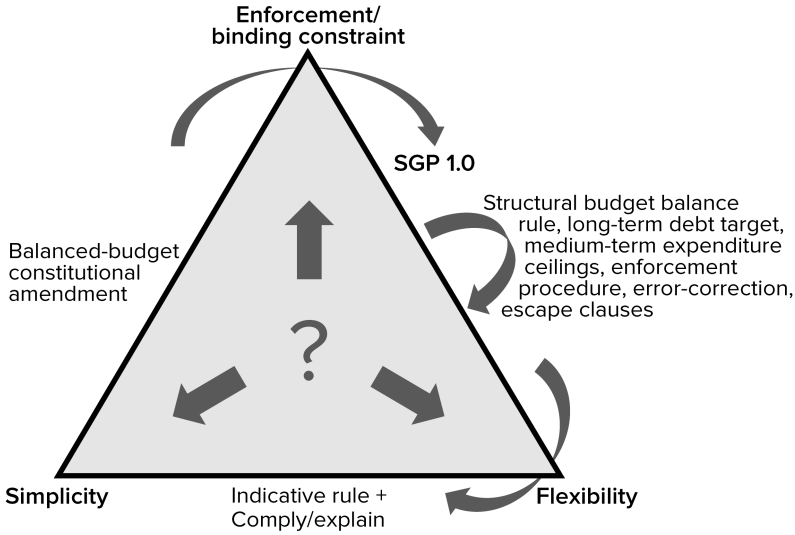


Source: International Monetary Fund (IMF) *Fiscal Monitor* (April 2014).
Note: Bars show the frequency of country-year characterized by compliance with fiscal rules in a panel of IMF member countries by type of fiscal rule.

However, of these three desirable properties, only two can be simultaneously fulfilled. Simple and enforceable rules (such as a constitutional balanced-budget requirement) are often bound to conflict with economic logic; hence they are inflexible. Simple and flexible rules cannot be subject to strict enforcement because, as discussed previously, flexibility itself can only stem from a tolerance for sensible (and potentially sizable) deviations from numerical limits. Finally, flexible and enforceable rules are complicated because many contingencies need to be spelled out, and the enforcement loopholes associated with exceptions, technical refinements, and escape clauses need to be closed. The resulting trilemma is described in Figure 6.2.

The trilemma suggests an evolutionary tale of fiscal rule design in history. *Enforceable* and *simple* rules have been common at the subnational level, where rules historically emerged. Classic examples are the

FIGURE 6.2
Designing fiscal rules (Stability and Growth Pact [SGP] 1.0): a trilemma



Source: Authors' application of trilemma (https://www.investopedia.com/terms/t/trilemma.asp) to the Stability and Growth Pact (SGP).

constitutional amendments banning deficits in most U.S. states since the mid-19th century. Of course, while debt-fearing voters might consider such rules desirable, the lack of flexibility in the short term inevitably challenges strict enforcement. Tolerance for off-budget operations and allowing rules to bind only ex ante are just two common ways to allow for weaker enforcement while remaining formally compliant.

In the early 1990s, central governments started to show interest in rules-based fiscal policy, and greater complexity was allowed. Caps on public debts and deficits were combined with medium-term balanced budget requirements to leave room for short-term fiscal stabilization below the deficit ceiling. The original EU SGP adopted in Dublin in 1997 reflected these conscious efforts to enforce discipline without prejudice to using the budget as a macroeconomic shock absorber. However, by 2003, it had become clear that this arrangement had not been enforced as envisaged and was still perceived as inflexible.[32] This paved the way

for the SGP relaxation in 2005.[33] The result was a more complex framework.

Today, the SGP, revamped once again in the aftermath of the GFC, features limits on the level and the first difference of practically every macro-relevant budget aggregate: debt, budget balance, structural balance, and expenditure growth.[34] Although formally strengthened, enforcement has remained challenging. Voluminous official documents are required to clarify how compliance with myriad potentially inconsistent caps and benchmarks can be assessed. On top of that, euro area member states must now be equipped with their own national fiscal rules that explicitly account for the cycle and must incorporate automatic adjustment mechanisms in case of deviations.

The journey of EU countries in the meanders of the trilemma shows how well-intended attempts to make enforceable fiscal rules more state-contingent lead to an increasingly opaque system as each wave of tensions in the system triggers amendments, refinements, exceptions, and codified interpretations. This process of sedimentation through partial reforms reflects the natural reluctance to overhaul a supposedly permanent system too often, the same dynamic that drives the ever-increasing complexity of tax codes. In fact, the fiscal alchemy famously decried by Leeper now appears to have metastasized from the exercise of discretion itself to the rules supposed to constrain it.[35] This is an impasse.

Interpreting history aside, the trilemma can also help us think about the future of rules-based fiscal policy. First, frustration about the inability to get the rules right and to enforce them motivates many specific arguments against rules-based fiscal policies. We discuss these threats in the next section. Second, accepting that only two of three desirable properties of a good fiscal rule can be simultaneously achieved should encourage us to explore the possibility of relaxing the enforceability constraint and to discuss the scope for simple and flexible fiscal rules. What would they look like and how could they shape the conduct of fiscal policy? The last section of this paper lifts the veil on what remains uncharted territory in the realm of fiscal rules.

THREATS TO RULES-BASED FISCAL POLICY

This section shows that the limitations associated with enforceability expose rules-based fiscal policy to a broad range of threats. First, attempts to get the rules "right" put a premium on finding the adequate calibration of the numerical constraints. After the GFC, uncertainty about the steady state of the economy (notably in terms of potential growth and natural interest rate) has made it potentially easy to build a plausible economic case against any given fiscal rule. Beyond technical issues, enforcement is ultimately about the possibility of forcibly constraining *elected* policymakers. This brings politics, public perceptions, and compatibility with the country's broader institutional setup into the picture. Such considerations can motivate arguments questioning the democratic legitimacy of rules-based fiscal policy.

GETTING THE RULE RIGHT

Because interest rates and nominal GDP growth are key drivers of public debt dynamics, uncertainty about their steady-state levels invites criticisms about the calibration of fiscal rules expected to deliver public debt sustainability.[36] The arguments mainly revolve around the persistently low borrowing costs experienced by many advanced economies post-GFC and the risks related to permanently lower nominal growth.

Lower borrowing costs. In many countries, unconventional monetary policies have been testing the lower bound of nominal interest rates. For governments still considered to be issuing safe securities, this means historically low borrowing costs and the possibility of keeping the dynamics of the public debt-to-GDP ratio under control without running significant primary surpluses, if at all. Expectations of persistently low interest rates could have lasting implications for the relevance of specific fiscal rules and for their resilience in the face of monetary policy normalization. In this context, recalling the basic drivers of debt dynamics is important.

In a deterministic setting, two basic relationships determine debt dynamics and the related assessments of debt sustainability (omitting

time subscripts for convenience). The first is the period public-debt-accumulation equation:

$$\Delta d = \gamma d - p, \tag{6.1}$$

where Δ is the discrete first-time-difference operator, d is the debt-to-GDP ratio, p is the primary balance (also in percentage of GDP), and γ captures the growth-adjusted interest rate paid on public debt $\left(\gamma = \frac{r-\theta}{1+\theta}\right)$, with r the (nominal or real) interest rate and θ the (nominal or real) GDP growth. The second key relationship describes the endogenous (sluggish) response of fiscal policy to public debt developments:

$$p = \lambda p_{-1} + \kappa + \rho d, \tag{6.2}$$

where λ captures the well-documented persistence in fiscal balances, κ is a constant, and ρ is the policy response (in terms of a change in the primary balance) to variations in the public debt. Two key indicators matter when assessing whether public debt is sustainable in the long term. The first is the requirement for stable debt dynamics:[37]

$$\rho > \gamma^{\star}(1-\lambda), \tag{6.3}$$

where a * superscript denotes steady-state values. Equation (6.3) states that public debt will revert to a finite steady-state level $d^{\star}$ if the strength of the primary balance's stabilizing response to variations in the debt ratio more than offsets the automatic debt buildup associated with interest payments. (Note that this is the relevant condition regardless of the sign of $\gamma^{\star}$.) The second indicator is the steady state debt level implied by fiscal behavior as described in (6.2). It is given by:[38]

$$d^{\star} = \frac{-\kappa}{\rho - \gamma^{\star}(1-\lambda)}. \tag{6.4}$$

A priori, the long-term debt level should not matter if it corresponds to a dynamically stable equilibrium—that is, if (6.3) is fulfilled. In practice, however, the level at which debt ultimately stabilizes matters if the

primary balance is bounded upward. This assumption is at the core of the notion of "debt limit."

Ostry and others and Ghosh and others rationalize the existence of a primary balance upper bound by invoking "fiscal fatigue," that is, a limited ability to achieve and sustain high primary surpluses.[39] They provide empirical estimates of Equation (6.2), showing that the marginal response to debt is nonlinear and weakens as debt reaches very high levels—often well above 150 percent of GDP for advanced economies. Bi uses calibrated general equilibrium models to show that the combination of Laffer-curve effects on tax revenues and incompressible floors to public expenditures determines debt limits beyond which default is unavoidable.[40] Her simulations also point to high debt limits in advanced economies.

Formally, if Equation (6.2) is now written as $p = min\left(\lambda p_{-1} + \kappa + \rho d, \overline{p}\right)$, there are *two* relevant long-term equilibria for the debt level: $d^{\star}$, as described in (6.4), which prevails as long as the corresponding primary balance fulfills the condition $p^{\star} \leq \overline{p}$, and a higher debt level $d^{\star\star} = \frac{\overline{p}}{\gamma^{\star}}$. Assuming dynamic efficiency in the long run ($\gamma^{\star} > 0$), this is an unstable equilibrium (because $\rho = 0$). Hence $d^{\star\star}$ is literally the edge of a cliff beyond which the government loses control of debt dynamics.

We see two ways in which rules-based fiscal policy could be threatened by the current low–interest rate environment. The first is that low interest rates can undermine fiscal "prudence"—or encourage profligacy. Mauro and others propose measuring fiscal prudence by ρ, the endogenous response of fiscal policy to public debt.[41] The higher ρ, the more prudent the fiscal policy and vice versa. Using an estimated variant of (6.2), Debrun and Kinda find evidence that the budgetary "footprint" of public debt (i.e., the interest bill) matters for fiscal behavior.[42] Specifically, taking the public debt level and other standard determinants of the primary budget balance as given, the response to public debt is weaker when the interest rate is low than when it is high. If the low–interest rate environment is perceived as *temporary*, pressures to deviate from normal-time fiscal behavior would be short-lived, and they would not put into question the degree of fiscal prudence (and the corresponding long-term debt level) embedded in any given fiscal rule.

However, the damage to existing fiscal rules could be real if lower interest rates were a *permanent* development—that is, if $r^\star$ had fallen as well.[43] To see this, we can use the fiscal behavior specification estimated by Debrun and Kinda:[44]

$$p = \lambda p_{-1} + \kappa + \rho d + \chi rd, \tag{6.5}$$

where rd is the interest bill and $\chi > 0$ (the sensitivity of fiscal policy to the latter), instead of (6.2). The corresponding long-term debt level is

$$d^\star = \frac{\kappa}{\gamma^\star(1-\lambda) - (\rho + \chi r^\star)}. \tag{6.6}$$

Clearly, a change in the estimated $r^\star$ would affect the implicit public debt target $d^\star$, potentially conflicting with the debt norm prescribed by a fiscal rule. A priori, the marginal effect of a change in $r^\star$ on $d^\star$ is ambiguous:

$$\frac{\partial d^\star}{\partial r^\star} = \frac{-\kappa\left(\frac{1-\lambda}{1+g^\star} - \chi\right)}{\left(\gamma^\star(1-\lambda) - (\rho + \chi r^\star)\right)^2}. \tag{6.7}$$

(recall that $\kappa < 0$ for $d^\star$ to be positive).

For lower interest rates to translate into a higher long-term debt level, the marginal impact of the interest burden on fiscal prudence should be large enough (χ high enough), fiscal policy should be sufficiently persistent (λ high enough) or the fall in $r^\star$ should mirror a decline in $\theta^\star$, leaving $\gamma^\star$ broadly unchanged.[45] Econometric estimates suggest that a rise in $r^\star$ would, *all else equal*, leave $d^\star$ unchanged.[46] That said, perceptions that permanently lower borrowing costs take place in the context of a secular-stagnation scenario—bringing a downward adjustment in $\theta^\star$ as well—would suffice to raise the long-run debt anchor implicit to fiscal policy behavior, potentially putting into question fixed prescriptions incorporated in rules.

A second channel through which low borrowing costs could test the resilience of fiscal rules pertains to the rules' basic design. In many cases, and certainly in all euro area countries, the emphasis on capping the overall budget deficit—cyclically adjusted or not—could create stress

when interest rates normalize. A budget-balance rule (BBR) is a special case of (6.5) where $\lambda = 0$, $\kappa = -\overline{b}$, the overall *deficit* cap ($\overline{b} > 0$), $\rho = 0$, and $\chi = (1+\theta^{\star})^{-1}$. The corresponding long-term debt level is

$$d^{\star}_{BBR} = \frac{\overline{b}\left(1+\theta^{\star}\right)}{\theta^{\star}} \ . \tag{6.8}$$

Under a BBR, savings on interest payments can be spent, whereas the costs of rising interest rates must be offset by tax increases or primary expenditure cuts. To the extent that (some of) the fiscal space created by a temporarily lower interest bill is used to finance structural increases in primary outlays, the fiscal rule is bound to come under pressure as soon as interest rate normalization occurs. The intensity of these pressures will depend on the actual maturity structure of existing obligations and on the speed at which the yield curve moves up.

Lower nominal growth. Intimately related to the threat described previously is the prospect of entering a period combining persistently low nominal growth and interest rates, or "secular stagnation."[47] The basic tenet of the secular stagnation story is that too much savings chases too little investment. With interest rates at their effective lower bound, the likely policy advice to exit this trap is for governments to use fiscal measures to invest in public infrastructures. If this strategy for escaping secular stagnation prevails, fiscal rules constraining public borrowing regardless of the quality of spending may quickly be seen as a counterproductive.[48]

Independent of the adequate policy response to an episode of protracted slow nominal growth, structural factors—including shrinking and aging populations—dampening potential growth can have a dramatic impact on the long-run properties of certain fiscal rules. For instance, Equation (6.8) shows that the Maastricht deficit ceiling of $\overline{b} = 0.03$ requires long-term nominal growth of 5 percent per annum ($\theta^{\star} = 0.05$) to be consistent with the convergence of public debt to a maximum of 60 percent of GDP ($d^{\star}_{BBR} = 0.6$). With real growth and inflation struggling to reach 2 percent in many advanced economies, the arithmetic is brutal: either the debt ceiling is too low, or the deficit cap is too lax. Either way, the two rules look increasingly inconsistent, weakening the foundation of rules-based fiscal frameworks.

Changing views about optimal fiscal policy. Aside from changes in the long-term technical properties of fiscal indicators under a given fiscal rule, the calibration and even the existence of a rule can be put into question if views about optimal fiscal policy change. As indicated earlier, the rise of rules-based fiscal policy in the 1990s reflected evidence that unconstrained discretion could lead to excessive deficits and ever-rising debts. Political-economy models of fiscal policy provided formal support to the idea that discretionary policies were plagued by a bias toward deficits because of short-sighted, opportunistic, and vote-maximizing politicians.

However, the first two threats discussed previously (i.e., lower borrowing costs and lower nominal growth)—that point to limited monetary policy space and expanded need for macroeconomic policy support—have started to push the pendulum back in favor of greater fiscal discretion.[49] The GFC and its aftermath have strengthened a pre-existing tendency to view discretionary fiscal policy under a more positive light. The development of New Keynesian and dynamic stochastic general equilibrium models in the 1990s and 2000s brought back to the fore the stabilizing role that discretionary fiscal policy can play.[50] Beyond smoothing the business cycle, fiscal policy is now also seen as a tool to correct external imbalances, as countries with large current account surpluses are explicitly advised to pursue more expansionary policies.

It is hard to say how far the pendulum will swing back toward discretionary fiscal actions, but the raison d'être for rules-based fiscal policy could be under threat.[51] Indeed, as fiscal policy is expected, more than in the past, to achieve multiple objectives (internal and external balance on top of equity and efficiency), tensions between the prescription of fiscal rules and the perceived need for greater discretion are likely to increase. An expanded role for fiscal policy also complicates the formulation of sufficiently simple fiscal rules.

POLITICS, PERCEPTIONS, AND INSTITUTIONS

Adopting a rules-based fiscal framework and enforcing it in a consistent manner remain political decisions that depend on enabling factors being in place. Public support and an institutional ecosystem conducive to the

enforcement of rules strike us as particularly important. Public support is likely to be high if the rationale for constraining elected policymakers' discretion is well understood and broadly shared. At the same time, and perhaps paradoxically, the public is more likely to back fiscal rules if there is a certain level of trust in governments' ability to define such rules appropriately and to ultimately stick to them.

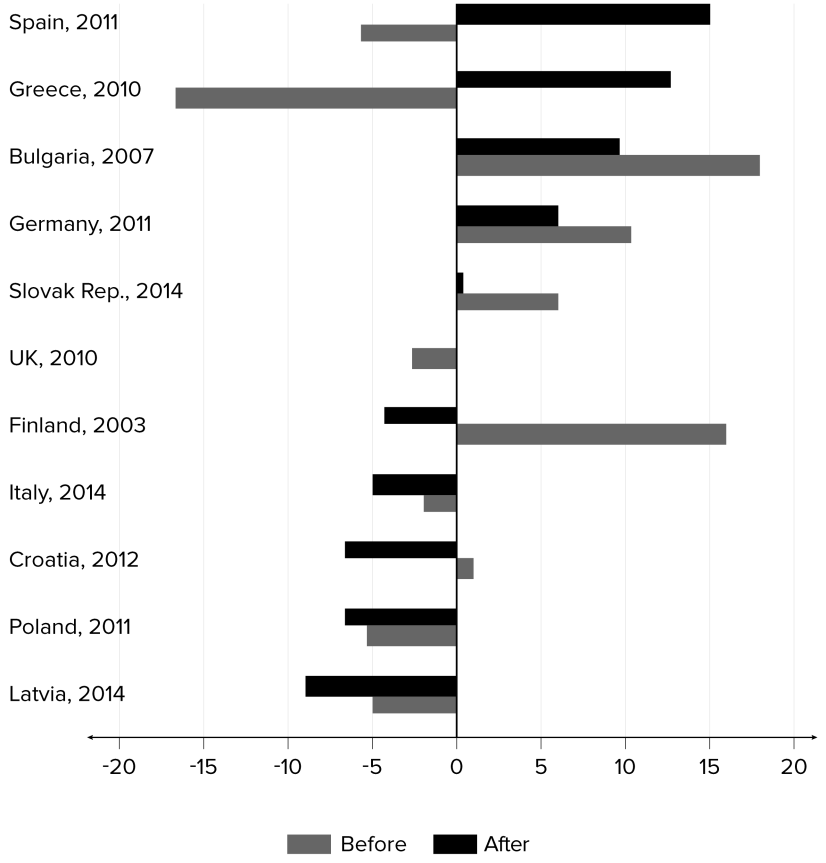
Although these dimensions do not easily lend themselves to a rigorous analysis, we see risks that the publicly perceived rationale for fiscal rules may fade away. Also, we fear that laudable efforts, notably in the EU, to promote common standards for rules-based frameworks aligned on international good practice will meet the harsh reality of certain institutional environments not conducive to the enforcement of fiscal rules.

Perceived rationale for fiscal rules and public support. While shifts in the economic paradigm in favor of greater discretion might escape the public, broader perceptions that rules are introduced to perpetuate "austerity" can undermine the popular support required for their legitimacy and longevity. These perceptions reflect the fact that many fiscal rules and frameworks have been debated and introduced in response to debt overhang and fiscal stress—or at least the risk of it—and the corresponding need to credibly commit to lower debts and deficits. The risk that trust in government is low or falling when such reforms have to be made may further undermines support for rules-based fiscal policy.[52]

To gauge the relevance of the argument, we look at trust in government as measured by the Eurobarometer around 11 recent episodes of fiscal rule adoption at the national level in the EU between 1999 and 2017 (Figure 6.3). For each episode, the bars show the difference between the average level of trust measured during the three years before (gray) and the three years after (black) the adoption of the rule, and the level of trust measured the year of its introduction.

Rules were adopted under severe fiscal stress in only two cases: Greece (2010) and Spain (2011). In both countries, trust in government was falling rapidly during the entire seven-year period. In three other episodes, trust was relatively low at the time of adoption but rebounded thereafter. Finally, among the six episodes where trust at the time of

FIGURE 6.3
Trust in government before and after the adoption of national fiscal rules

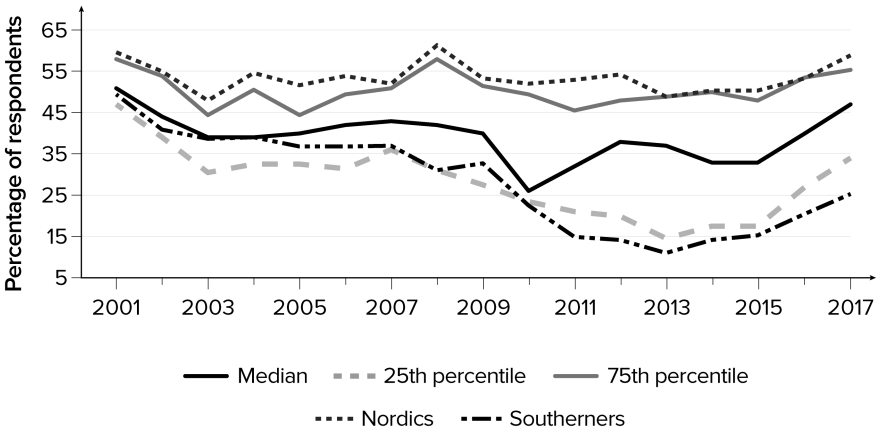


Sources: International Monetary Fund Fiscal Rules Dataset, Eurobarometer, and author's calculations.
Note: Trust is the percentage of positive answers to the question: "Do you tend to trust or not to trust the government?"

adoption was greater or equal to the average of the preceding three years, trust continued to grow in two cases (Finland, 2003, and Croatia, 2012, albeit marginally).

Overall, there is scant evidence that moving to rules-based fiscal policy was systematically done in a challenging context where low trust and an impending fiscal crisis would undermine broad-based popular

FIGURE 6.4
Trust in the national government across European Union member states (2001–2017)



Source: Eurobarometer.
Notes: Trust is the percentage of positive answers to the question: "Do you tend to trust or not to trust the government?" Countries included are Belgium, Denmark, Ireland, Greece, Spain, France, Italy, Luxembourg, The Netherlands, Austria, Portugal, Findland, Sweden, and the UK. Nordics = Denmark, Finland, and Sweden; Southerners = Greece, Italy, Portugal, and Spain.

support from the start. That said, support for the many rules adopted during or in the aftermath of the GFC remains vulnerable to the fading memory of the fiscal stress of that time. Lessons learned under stress may not always endure when normalcy returns,[53] so that even the proponents of fiscal rules may eventually discount their long-run benefits and conclude that they are obsolete or irrelevant.[54]

Institutional ecosystem: Not always enforcement friendly. Beyond a strong rationale for fiscal rules and some trust in a government's ability to design and operate them, some have argued that deeper country-specific factors determine the extent to which a society values compliance with rules—and correspondingly accepts enforcement as needed. These attitudes are partially reflected in the nature of government institutions and the quality of governance, which should ultimately affect the level of public trust in the governance system. Figure 6.4 offers another cut

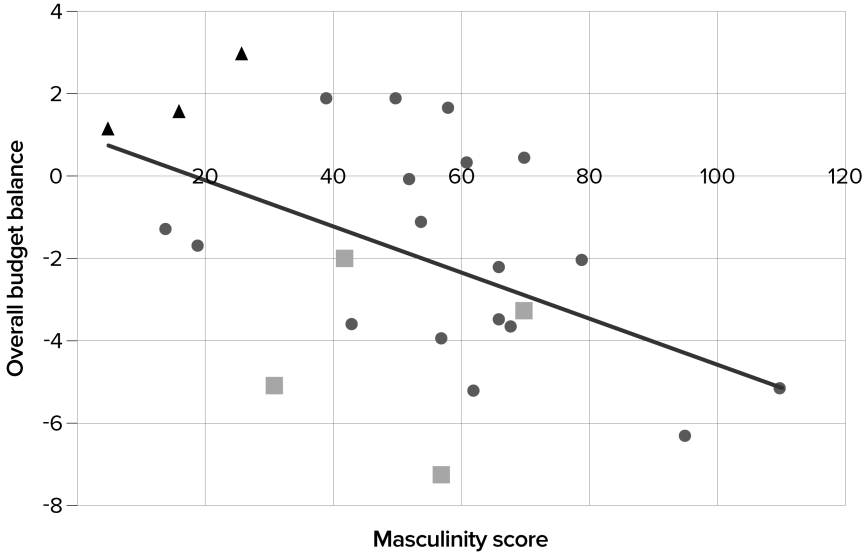
at the Eurobarometer's measure of trust in national governments. Most striking is the cross-country difference in the overall level of trust between two groups of EU member states which we could a priori think of as having different attitudes with respect to rules-based fiscal policy, namely the Southern European members (Greece, Italy, Portugal, and Spain) and the Nordic members (Denmark, Finland, and Sweden).

While trust of government in the Nordic members has remained relatively high and quite stable since 2000, it collapsed among the Southern members, particularly after the GFC. Movements in unemployment and other crisis-related economic pain clearly explain time variations in this gap.[55] However, the possibility that certain cultural features translate into sound institutions and strong public trust is worth exploring. Trust in the democratic system, in the integrity and effectiveness of elected politicians and of civil servants, and in the rule of law arguably increase the chances of survival of an effective rules-based fiscal framework.

Purely for the sake of illustration, Figure 6.5 displays the unconditional correlation between a broad measure of fiscal performance—the average overall budget balance over 2000–2010—and a measurable cultural dimension that may shape attitudes vis-à-vis fiscal soundness as embedded in fiscal rules.[56] This dimension—which Hofstede, Hofstede, and Minkov label "masculinity"—assigns country scores reflecting the extent to which people value assertiveness and individual competition as opposed to cooperation and consensus building.[57] In the context of this paper, one interpretation is that a low masculinity score is likely to be associated with societies showing greater respect for institutions aimed at fostering cooperation and consensus around certain policy objectives. And this is exactly what a fiscal rule is supposed to achieve: coordinate people's expectations about future policy paths anchored in clear and broadly shared goals.

Looking at a broader sample of 25 advanced economies (among which 18 are EU members), we observe a clear negative correlation (−0.49) between the budget balance and the "masculinity" score. The slope of the simple bivariate regression line is significantly different from zero at the 1 percent level. What is also striking is that the two subgroups exhibiting contrasting levels of trust in their national governments in

FIGURE 6.5
Culture and fiscal behavior (in percentage of GDP, 2000–2010)



Sources: Eurobarometer, https://www.eui.eu/Research/Library/ResearchGuides/Economics/Statistics/DataPortal/Eurobarometer; IMF *World Economic Outlook*; and authors' calculations.
Notes: GDP = gross domestic product. Balance = –0.06 (***), Masc + 1.05, $R^2 = 0.24$. Countries included are Belgium, Denmark, Ireland, Greece, Spain, France, Italy, Luxembourg, The Netherlands, Austria, Portugal, Findland, Sweden, and the UK. Nordics (▲) = Denmark, Finland, and Sweden; Southerners (■) = Greece, Italy, Portugal, and Spain.

Figure 6.4 (the Southerners and Nordics) have very different positions in the scatter plot. This is particularly evident in the case of the Nordics.[58] This line of reasoning suggests that a rules-based fiscal framework aimed to anchoring expectations of responsible fiscal policies may have a greater chance to emerge and survive in countries with public trust in governments and in rules.

WRAPPING UP: ENFORCEABILITY AND THREATS TO FISCAL RULES

Enforceable fiscal policy rules are vulnerable to a range of potentially existential threats. First, when their authors try to make them economically sensible, they will end up being to some degree more complex and opaque, obfuscating policy guidance and communication. Second,

uncertainty around the steady state (and especially potential growth and the natural rate of interest) complicates the calibration of sensible binding rules, raising the risk of enforcing undesirable policy adjustments or being too lenient with policy mistakes. As such, they are exposed to widespread criticisms on technical as well as political grounds. Third, the possibility of forcing *elected* policymakers to take certain actions puts a premium on a strong and well-understood rationale for the rule as well as a broad public support for the framework (i.e., ownership).

If, for all these reasons, the voting public ultimately fails to fully grasp the benefits of fiscal rules, deviations from numerical caps will also carry little or no reputational or political costs for governments. Hence, when public support is low, simply abandoning the rule may not appear to be a costly proposition for a government unconcerned with macroeconomically sound policies.[59] As suggested previously, large and persistent cross-country divergences in average levels of trust in government institutions may suggest varying degrees of support for enforceable fiscal rules. Moreover, as fiscal rules tend to be adopted at or around times of fiscal duress, the return to normalcy might further erode the perceived rationale for keeping a rules-based fiscal framework.

To be fair, enforceability also comes with specific advantages to be weighed against the practical relevance of the previously discussed threats. In particular, the impact of an enforcement procedure exceeds the expected value of sanctions punishing violations of the rule. The mere activation of such a procedure could indeed trigger reputational effects. Even if sanctions lack credibility, the apparent readiness of a country to be caught reneging on its own public promises might signal an intrinsically weaker commitment to debt sustainability compared to a country actively avoiding being considered a violator. An enforcement procedure could thus be a useful device to coordinate market expectations, causing risk premiums to react accordingly. The higher sovereign spreads associated with the activation of Excessive Deficit Procedures under the EU Stability and Growth Pact are consistent with that role.[60]

In the end, it is only if attempts at enforcement carry sufficiently serious risks of abandoning rules-based fiscal policy (or if they severely

undermine rule implementation) that consideration should be given to nonenforceable fiscal rules or benchmarks. In the monetary realm, a "rule" that is simultaneously simple, flexible, but not enforceable is a Taylor rule. The next section illustrates how a rules-based fiscal framework centered on a fiscal Taylor rule could work.

RULES-BASED FISCAL POLICY WITHOUT FORMAL ENFORCEMENT

This section expands the universe of possible rules-based fiscal frameworks to include those that do not rely on an enforceable numerical rule. We elaborate on the potential role for Taylor-type indicative rules to formally guide discretion in the short run and promote long-run debt sustainability. In a sense, we wonder whether a good compass might not be more useful than a heavy, unusable stick. After illustrating the basic features of such a rule, we discuss how an effective fiscal framework could leverage nonbinding benchmarks to improve the conduct of fiscal policy.

THE FISCAL TAYLOR RULE

The idea of using a simple formula to benchmark fiscal policy is not new. It directly emulates the use of Taylor rules in monetary policy discussions.[61] Taylor himself proposed such a fiscal rule for the United States based on a simple empirical model of the fiscal balance.[62] The rapidly growing use of dynamic stochastic general equilibrium models allowed characterizing similar policy rules with desirable welfare effects.[63] Other studies built on Taylor's original proposal to devise sensible benchmarks against which to assess the fiscal stance.[64] Here, we only illustrate how a simple formula with well-defined properties can indeed provide relevant benchmarks to assess fiscal policy; we do not look for a desirable—and even less an optimal—calibration.

Under the original fiscal Taylor rule, the nominal budget balance is such that a given structural surplus is maintained over the cycle, while the nominal balance benchmark fully accommodates the estimated effect of automatic stabilizers. In short, the rule makes the standard distinction between the cyclical and structural components of the budget

deficit. That way, fiscal policy is anchored (public debt converges to some number deemed desirable), it provides support to aggregate demand when activity is below potential, and it cools down expenditure growth when the economy is above potential. Taylor's empirical estimates suggest that such a rule provides a good fit for the U.S. federal fiscal balance over the long term; his sample spans 1960–1999. He proposes a simple FTR that can be written as follows:

$$b_t = 0.5\gamma_t, \tag{6.9}$$

where γ_t symbolizes the output gap.

The normative value of (6.9) is even more controversial than its analogue in the monetary Taylor rule because the fiscal policy mandate extends well beyond macroeconomic stabilization under the constraint of debt sustainability.[65] Debt sustainability remains a constraint regardless of policymakers' goals, and short-term output stabilization is usually seen as desirable. And since the idea is to devise a sensible benchmark for good behavior, not a binding constraint subject to enforcement, one can be more relaxed about getting close to a characterization of the optimal fiscal stance.

For the sake of illustration, a more general FTR could be parametrized along the lines of (6.10), which we simulate for the United States and France:

$$b_t = \overline{b}_t + \beta\gamma_t, \tag{6.10}$$

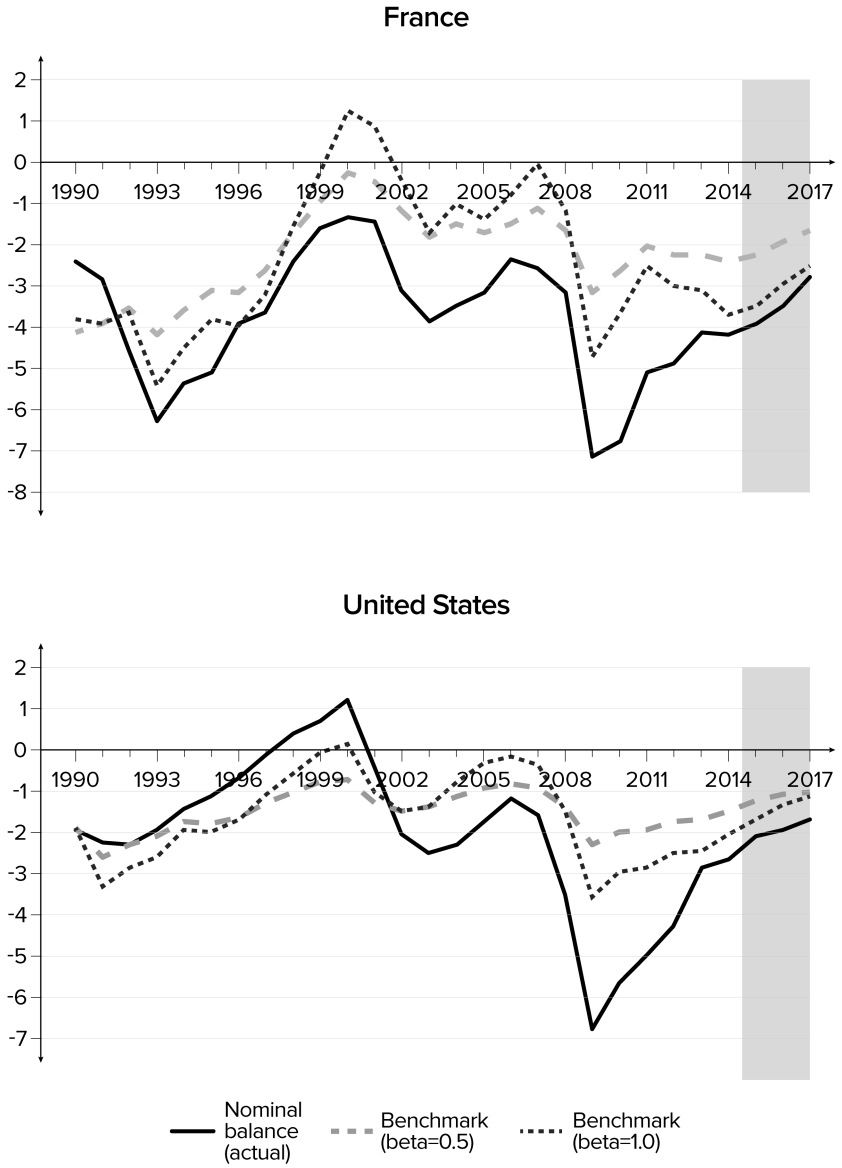
where β is the deficit allowance for cyclical stabilization and $\overline{b}_t = \frac{-\theta_t^\star}{1+\theta_t^\star} d_{FTR}^\star$ is a "long-term" objective defined as the nominal balance ensuring a convergence of the public debt-to-GDP ratio to a given number $d_{FTR}^\star$ if the output gap was always zero. Thus, $\overline{b}_t$ ensures that fiscal policy is *anchored* in the specific sense that public trajectories tend to converge to some desirable public debt level. For our illustrative simulations, we simply assume that $\theta_t^\star$ is the 10-year moving average of nominal GDP growth.

The FTR described in (6.9) is simulated in Figure 6.6 over the period 1990–2017, assuming a desired convergence to a public debt target of 60 percent of GDP ($\overline{b}_t = 0.6$) and two alternative responses to the output gap: $\beta = 0.5$ and $\beta = 1$. The reference value for the long-term public debt target is a rather common benchmark in assessments of long-term adjustment needs.[66] Lower numbers could be envisaged in accordance with precautionary motives, such as the need to create buffers to accommodate uninsurable fiscal risk.[67] For fiscal stabilization, $\beta = 0.5$ is a reasonable proxy for the effect of automatic stabilizers,[68] while $\beta = 1$ presupposes some systematically stabilizing response of discretionary fiscal policy.

Except for the two underlying objectives (debt and output stabilization), every dimension of this highly stylized calibration exercise is debatable. Using the output gap and potential growth, which are unobservable, makes the analysis vulnerable to possibly sizable revisions in potential output.[69] And little guidance exists on acceptable long-run public debt levels, or on the adequate degree of fiscal stabilization. Again, we do not try to define an optimal FTR, we illustrate how simple benchmarks explicitly incorporating desirable properties of fiscal policy suffice to support a meaningful narrative on the adequacy of the fiscal stance.

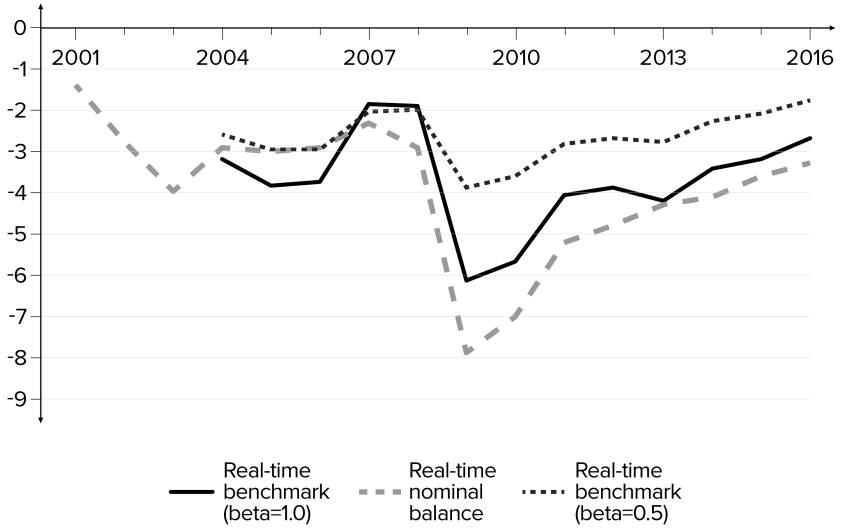
Several interesting lessons emerge from the simulations. First, while the U.S. budget balance oscillates around the benchmarks, France consistently underperforms, with deficits exceeding the benchmark every single year following the adoption of the Maastricht Treaty. Second, while France's performance initially remained close to the benchmark assuming a strongly stabilizing response, a performance gap opened abruptly after 1998, the year euro area candidates had to pass the Maastricht admission test to the currency union. That gap only started to close during the post-2009 adjustment. This suggests that when the Maastricht criteria were generally considered as binding, fiscal policy was broadly in line with the FTR benchmark, but that public finances never made up for the lack of improvement during 1999–2001. Third, in both countries, the FTR benchmarks fail to account for the exceptional fiscal stimulus and revenue losses associated with the Great Recession. Remarkably, however, there is a strong convergence toward the benchmarks after 2010 and in the medium-term forecast, suggesting that, as

FIGURE 6.6
France and the United States: actual fiscal balance versus FTR-based benchmark



Source: Authors' calculations.
Note: FTR = fiscal Taylor rule.

FIGURE 6.7
France: FTR-based benchmarks against actual in "real time"



Sources: Author's calculations and Stability and Convergence Programs.
Note: FTR = fiscal Taylor rule.

output gaps close, deficits are moving back to levels consistent with the long-term debt objective.

As always, any formula-based benchmark is subject to limitations calling for judgment when interpreting deviations. For instance, assessments are sensitive to the data vintage. Figure 6.6 plots series reflecting the most recent data and, as such, they incorporate information on the output gap and the budget balance that was not available at the time policymakers planned and executed the budget or at the time fiscal performance against the rule could plausibly be assessed. To better gauge the relevance of the FTR benchmark, it is useful to look at how fiscal policy fared using the data that was available at the time an official assessment might have been carried out. In Figure 6.7, we use the data vintage of year $t+1$ (the earliest estimates possible during the year) to compare the benchmark to the actual balance estimated for t. As we use data from the Stability and Convergence Programs submitted to the European Commission, the results concern France only.[70]

Real-time benchmarks are generally closer to the estimated balance than when using the latest available data, particularly between 2004–2008. That period exhibits large differences between real-time output gaps—thought to be negative except in 2007–2008—and postcrisis estimates—which often exhibit positive numbers.[71] Symmetrically, real-time postcrisis estimated output gaps were much more negative than the most recent figures, resulting in larger and more protracted benchmark deficits.

Such differences illustrate the already difficult trade-off between maintaining sufficiently simple formulations of the FTR benchmark and the flexibility required in selecting the most relevant factors shaping sound fiscal policies. Still, the FTR could be a novel and constructive part of the communication strategy of a fiscal framework—an issue we turn to next.

FTR BENCHMARKS AND RULES-BASED FISCAL POLICY

The basic simulations discussed previously suggest that FTR benchmarks can identify episodes where fiscal policy is adequate and those where it is problematic. If defining simple and meaningful benchmarks is possible, the framework through which these could influence the conduct of fiscal policy is yet to be defined. In the absence of enforcement, there is no formal commitment device such as the threat of sanctions. Thus, the costs of deviating from an FTR are strictly reputational; any FTR-based framework should exhibit specific arrangements aimed at amplifying the reputational effects of the rule.

The recent emergence of independent fiscal councils (IFCs) suggests a promising avenue to ensure that significant reputational effects are associated with a nonenforceable rule. In most countries, and certainly in EU member states, IFCs are mandated (and in many cases well equipped) to make thorough economic assessments of fiscal policy.[72] By influencing the public debate and clarifying the meaning of traditional signals about fiscal policy—through official budget documents and statements, as well as parliamentary debates—IFCs inform all interested parties in the budget process, from parliaments to markets and the voting public. In doing so, IFCs can trigger meaningful discussions on the broad adequacy of the fiscal stance, and there is suggestive evidence that stronger fiscal performance has followed.[73]

Assessing fiscal policy informed by a simple and transparent FTR with well-defined properties would thus be a natural function of IFCs. A home-grown IFC mindful of the local political landscape should be able to raise alarm bells about unwarranted deviations from an FTR and usefully inform voters, market participants, and veto players in the budget process. Exposing unhealthy trends in public finances should trigger pressures—from members of parliament to civil society and sovereign markets—to correct them.

The approach is relevant in the European context. Heterogeneous political traditions and fiscal cultures are a clear threat to the Maastricht construct of supranational fiscal rules, making the enforcement of these rules complex and uneven across countries. Before some seize that opportunity to bury—de facto if not de jure—rules-based fiscal policy, the potential merits of an FTR-based framework are clear, and the idea has made its way in the debate on EU fiscal governance reforms. For instance, Carnot proposes an FTR-styled benchmark as a complement to existing rules at the EU level.[74] One might even argue that the Medium-Term Objectives embedded in the SGP are a form of FTR, although their role is currently blurred by enforcement-related complexities.[75] As greater reliance on national fiscal frameworks is a pillar of the last wave of fiscal governance reforms in the EU,[76] member states that find it in their best interest should be able to consider an FTR-based framework provided that it complies with the fundamental properties desired at the EU level (i.e., fiscal stabilization in line with automatic stabilizers and convergence of the debt-to-GDP ratio to 60 percent of GDP).

Who should define and periodically review the FTR? While the objectives of fiscal policy result from a political choice, the technical work of defining a benchmark consistent with these objectives belongs to an IFC. In the EU context, the European Fiscal Board—or a beefed-up variant of it—could be involved in the design of country-specific benchmarks consistent with the Maastricht prescriptions. Countries and their national IFCs should then be left with the task of operating national fiscal frameworks in line with the broad patterns of fiscal behavior embedded in the FTR. The specific procedures and means used by the IFC to adequately amplify the reputational effects of a well-defined FTR

depend on the country's political environment. It seems clear, however, that such an IFC should be aligned with leading international practice.[77]

CONCLUDING REMARKS

Rules-based fiscal policy is facing existential threats. We connect these threats to the dominant view of fiscal rules as *enforceable* speed limits. We show that to be socially desirable, enforceability requires rather sophisticated rules that should ideally mimic optimal fiscal policy. Otherwise, weak enforcement (and correspondingly low formal compliance) is preferable, and at the limit simple rules should not be enforced at all. In practice, the focus on enforceable rules appears to have resulted in intractable complexity, to the point of putting rules-based fiscal policy at risk. The evolution of the EU fiscal framework illustrates this outcome and the related risk of de-anchoring fiscal expectations.

Acknowledging that strict enforcement is not a precondition for the effectiveness of a fiscal rule, we suggest that simple, flexible but nonenforceable rules could be potentially useful anchors for fiscal frameworks. Such numerical benchmarks à la Taylor (against which fiscal performance can easily be assessed) can only affect policymakers' incentives through reputational effects. Independent fiscal councils could play a key role in amplifying these effects. Specifically, unwarranted deviations from the benchmarks—if of course the latter are well-defined and receive broad popular support—should prompt the fiscal council to raise alarm, encouraging reactions from parliament, the voting public, and market participants that improve fiscal behavior.

Because enforcement procedures per se can also generate reputational effects, the adoption of a rules-based fiscal framework anchored in nonenforceable rules and benchmarks should result from a cost–benefit analysis. The perceived threats associated with enforcement (and the related risk of abandoning any constraint on discretion) must be weighed against the reputational effects achieved through the activation of enforcement procedures. Overall, a fiscal Taylor rule with strong independent oversight provides a potentially fruitful avenue to increase the set of effective rules-based frameworks.

APPENDIX: COSTLY ENFORCEMENT AND COMPLIANCE—A SIMPLE ILLUSTRATION

To illustrate the basic logic of our argument in the main text, take the bare-bones two-period "partisan" model of optimal fiscal policy, indexed by Equations (6.A.1) and (6.A.2).[78] Citizens value the production of public goods as follows:

$$W = u(g_1) + u(g_2), \text{ with } u' > 0 \text{ and } u'' < 0, \tag{6.A.1}$$

whereas elected officials choose the path of public goods production to maximize their own utility, defined as:

$$U = u(g_1) + \pi u(g_2). \tag{6.A.2}$$

For simplicity, both the rate of interest and the subjective discount rate are equal to 0. The difference between citizens and elected officials is that the latter value their time in office and only extract utility from public goods when they are in charge. Equation (6.A.2) reflects the assumption that elections taking place at the end of period 1 have an uncertain outcome, with π capturing the incumbent's probability of reelection. The production of public goods is subject to obvious resource constraints and public debt (d) can only tilt the intertemporal profile of public consumption:

$$g_1 = \tau^o + d, \tag{6.A.3.a}$$

$$g_2 = \tau^o - d, \tag{6.A.3.b}$$

where τ^o is a given resource endowment of the government every period.

The social optimum (planner solution, denoted by a star superscript) and the political equilibrium (denoted by a two-star superscript) have the usual features:

$$g_1^\star = g_2^\star \text{ and } d^\star = 0; \tag{6.A.4.a}$$

$$g_1^{\star\star} > g_2^{\star\star} \text{ and } d^{\star\star} > 0. \tag{6.A.4.b}$$

In words, the risk of losing an election makes elected officials myopic, leading them to produce more public goods in period 1 than in period 2 and to accumulate public debt in the process.

Now assume a balanced-budget requirement framed in a credible legal instrument that triggers adequate costs for the elected official in case he or she borrows $d > d^{\star}$. A policymaker subject to a fiscal rule defined in this way thus maximizes:

$$V = u(g_1) + \pi u(g_2) - \psi(d - d^{\star}), \tag{6.A.5}$$

where ψ symbolizes the marginal cost of an excessive deficit. That parameter encompasses the utility loss incurred when the rule is breached as well as the strength of the enforcement procedure. Assuming for the sake of the argument that the population—say through a referendum—can directly choose the (socially) optimal enforcement term, it will opt for the following:[79]

$$\psi^{\star} = (1 - \pi)u'(g_2) > 0. \tag{6.A.6}$$

Hence, the fiscal rule characterized by a debt ceiling $d^{\star}$ and an enforcement procedure delivering a marginal cost of deviation $\psi^{\star}$ can eliminate the debt bias because it encourages the provision of future public goods. Clearly, enforcement is instrumental for the effectiveness of the rule.

Now, if enforcing the rule is costly—for example, because spending cuts undermine the quality of fiscal policy—the period 1 resource constraint becomes as follows:[80]

$$g_1 = T(\tau^o, \psi) + d, \text{ with } T_{\psi} < 0;\ T_{\psi\psi} < 0, \text{ and } T(\tau^o, 0) = \tau^o. \tag{6.A.7}$$

Enforcing the fiscal rule would now entail a negative "income effect" denting the gains from improved intertemporal substitution. Thus, citizens would find it optimal to trade off some suboptimal intertemporal substitution (i.e., a deficit) against lower enforcement costs, resulting in a weaker enforcement of the rule.

Formally, this means that the resource constraints now imply $\dfrac{\partial g_2}{\partial \psi} = T_{\psi} - \dfrac{\partial g_1}{\partial \psi}$. The first-order condition for optimal enforcement of the rule when enforcement is costly (denoted by **) then becomes

$$\frac{\partial W}{\partial \psi} = \left((\pi - 1)u'\left(g_2\right) + \psi^{\star\star}\right)\frac{\partial g_1}{\partial \psi} + u'\left(g_2\right)T_{\psi} = 0. \tag{6.A.8}$$

Since $u'(g_2)T_{\psi} < 0$ and $\dfrac{\partial g_1}{\partial \psi} < 0$, then the solution of (6.A.8) must satisfy $\psi^{\star\star} < \psi^{\star}$ by a sufficient margin. (Note that $\psi^{\star\star} = \psi^{\star}$ yields $(\pi - 1)u'(g_2) + \psi^{\star\star} = 0$.) The result

is an upward tilt in the time path of available resources for public good production. Weak enforcement results from the fact that pursuing a balanced budget as prescribed by the rule would not be socially optimal because the induced income loss of strict enforcement would more than offset the benefit from achieving an optimal intertemporal distribution of public consumption.

25. Adrian Martinez, "The Swiss Debt Brake," PowerPoint presentation, Federal Finance Administration, Bern, March 28, 2018; on file with the author.

26. Expertengruppe Schuldenbremse, "Gutachten zur Ergänzung der Schuldenbremse," Federal Department of Finance, Switzerland.

27. Edward Palmer, "Financial Sustainability of Swedish Welfare Commitments," Policy Research Institute, Ministry of Finance, Japan, *Public Policy Review* 10, no. 2 (July 2014).

28. Romina Boccia and Justin Bogie, "How the Federal Government Can Get Its Spending under Control," *Daily Signal*, July 12, 2016; Romina Boccia, "'Penny Plan' Puts the Spotlight on Out-of-Control Federal Spending," *Daily Signal*, April 26, 2018.

29. H.R. 2471, Maximizing America's Prosperity Act of 2015.

30. Justin Amash, "Business Cycle Balanced Budget Amendment," PowerPoint presentation, May 2011.

31. H.R.2560, Cut, Cap, and Balance Act of 2011.

32. A related budget process reform was proposed by the House Committee on the Budget in November 2016. See Committee on the Budget, U.S. House of Representatives, "Proposed Rewrite of the Congressional Budget Process, Summary of Selected Provisions," November 30, 2016, p. 5, https://republicans-budget.house.gov/uploadedfiles/bpr-shortsummary-30nov2016.pdf.

CHAPTER SIX

1. Wikipedia, "Bretton Woods System," https://en.wikipedia.org/wiki/Bretton_Woods_system.

2. Seminal contributions include Finn E. Kydland and Edward C. Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85, no. 3 (June 1977): 473–492; Robert J. Barro and David B. Gordon, "A Positive Theory of Monetary Poicy in a Natural-Rate Model," *Journal of Political Economy* 91, no. 4 (August 1983): 589–610; and Alberto Alesina and Guido Tabellini, "Voting on the Budget Deficit," *American Economic Review* 80, no. 1 (1990): 37–49. More recent studies (e.g., Marina Halac and Pierre Yared, "Fiscal Rules and Discretion in a World Economy," *American Economic Reivew* 108, no. 8 [August 2018]: 2305–2334) keep the assumption of distorted government incentives, such as a socially suboptimal predilection for the short term.

3. Mervyn King, "Changes in UK Monetary Policy: Rules and Discretion in Practice," *Journal of Monetary Economics* 39, no. 1 (June 1997): 81–97.

4. Charles Wyplosz, "Fiscal Policy: Institutions versus Rules," *National Institute Economic Review*, no. 191 (2005): 70–84; John B. Taylor, "Swings and the Rules-Discretion Balance," in *Rethinking Expectations: The Way Forward for Macroeconomics*,

eds. Roman Frydman and Edmund Phelps (Princeton, NJ: Princeton University Press, 2013); Jonathan Portes and Simon Wren-Lewis, "Issues in the Design of Fiscal Rules," *The Manchester School* 83, no. S3 (2014): 56–86.

5. Jean-Louis Combes et al., "Inflation Targeting, Fiscal Rules and the Policy Mix: Cross-Effects and Interactions," *Economic Journal* 128, no. 615 (November 2018): 2755–84.

6. For instance, U.S. states have had constitutional balanced-budget amendments since the mid-1800s.

7. Andrea Schaechter et al., "Fiscal Rules in Response to the Crisis—Toward the 'Next-Generation' Rules. A New Dataset," International Monetary Fund (IMF) Working Paper no. 12/187, July 2012.

8. Centre for Economic Policy Research (CEPR), *Independent Fiscal Councils: Watchdogs or Lapdogs?*, eds. Roel Beetsma and Xavier Debrun (London: CEPR Press, 2018).

9. Xavier Debrun et al., "The Functions and Impact of Fiscal Councils," IMF Policy Paper, July 2013; George Kopits, "Independent Fiscal Institutions: Developing Good Practices," *OECD Journal on Budgeting* 3 (2011): 35–52.

10. Wyplosz, "Fiscal Policy."

11. Henrique S. Basso and James S. Costain, "Fiscal Delegation in a Monetary Union: Instrument Assignment and Stabilization Properties," Banco de España Working Paper no. 1710 (2017); Martin Larch and Thomas Braendle, "Independent Fiscal Councils: Neglected Siblings of Independent Central Banks? An EU Perspective," *Journal of Common Market Studies* 56, no. 2 (March 2018): 267–283, in the context of the European Union; and Nicholas Gruen, "Making Fiscal Policy Flexibly Independent of Government," *Agenda: A Journal of Policy Analysis and Reform* 4, no. 3 (1997): 297–307, among others.

12. See, for example, Carlos Eduardo S. Gonçalves and Alexandre Carvalho, "Inflation Targeting Matters: Evidence from OECD Economies' Sacrifice Ratios," *Journal of Money, Credit and Banking* 41, no. 1 (2009): 233–43; Carl E. Walsh, "Inflation Targeting: What Have We Learned?," *International Finance* 12, no. 2 (2009): 195–233; or Combes et al., "Inflation Targeting."

13. Friedrich Heinemann, Marc-Daniel Moessinger, and Mustafa Yeter, "Do Fiscal Rules Constrain Fiscal Policy? A Meta-Regression-Analysis," *European Journal of Political Economy* 51, no. C (2018): 69–92.

14. See Luc Eyraud et al., "Second-Generation Fiscal Rules: Balancing Simplicity, Flexibility, and Enforceability," IMF Staff Discussion Note no. 18/04, April 2018 for fiscal rules; Roel Beetsma et al., "The Rise of Independent Fiscal Councils: Recent Trends and Performance," IMF Working Paper no. 18/68, 2018 for fiscal councils; and Combes et al., "Inflation Targeting," for the combined effects of inflation targeting and fiscal rules.

15. Eyraud et al., "Second-Generation Fiscal Rules."

16. Alberto Alesina and Guido Tabellini, "Bureaucrats or Politicians? Part I: A Single Policy Task," *American Economic Review* 97, no. 1 (2007): 169–79; Simon Wren-Lewis, "Comparing the Delegation of Monetary and Fiscal Policy," in *Restoring Public Debt Sustainability—The Role of Independent Fiscal Institutions,* ed. George Kopits (Oxford: Oxford University Press, 2013).

17. Eyraud et al., "Second-Generation Fiscal Rules."

18. Taylor's (John B. Taylor, "Discretion versus policy rules in practice," *Carnegie-Rochester Series on Public Policy* 39 [1993]: 195–214; John B Taylor, "A Historical Analysis of Monetary Policy Rules," in *Monetary Policy Rules*, ed. John B. Taylor [Chicago: University of Chicago Press, 1999]) observation that episodes of successful monetary policy in the United States were associated with certain patterns in short-term interest rates prompted curiosity about simple rules of thumb for policy rates. The "Taylor rule" quickly gained traction as an informative metric for sound monetary policy, if only for its ability to proxy optimal monetary policy in certain classes of theoretical models (e.g., Michael Woodford, "The Taylor Rule and Optimal Monetary Policy," *American Economic Review* 91, no. 2 [May 2001]: 232–237). Significant and protracted deviations from the rule often raise questions about the appropriateness of monetary policy.

19. See Jean-Maarc Fournier and Philipp Lieberknecht, "A Model-Based Fiscal Taylor Rule and a Toolkit to Assess the Fiscal Stance," February 14, 2020, International Monetary Fund Working Paper, IMF, Wasington, DC, https://www.imf.org/en/Publications/WP/Issues/2020/02/14/A-Model-based-Fiscal-Taylor-Rule-and-a-Toolkit-to-Assess-the-Fiscal-Stance-49025.

20. See among others John B. Taylor, "Reassessing Discretionary Fiscal Policy," *Journal of Economic Perspectives* 14, no. 3 (2000): 21–36; Jasper Lukkezen and Coen Teulings, "A Fiscal Taylor Rule," CPB Netherlands Bureau for Economic Policy Analysis, CPB Background Document, April 23, 2013; Martin Kliem and Alexander Kriwolusky, "Toward a Taylor Rule for Fiscal Policy," *Review of Economic Dynamics* 17, no. 2 (April 2014): 294–302; Nicolas Carnot, "Evaluating Fiscal Policy: A Rule of Thumb," European Economy—Economic Papers no. 526, Brussels: European Commission, August 2014.

21. Eyraud et al., "Second-Generation Fiscal Rules."

22. Angès Bénassy-Quéré et al., "Reconciling Risk Sharing with Market Discipline: A Constructive Approach to Euro Area Reform," CEPR Policy Insight 91, 2018.

23. The classic definition of fiscal rules as a "permanent constraint on fiscal policy" (George Kopits and Steven A. Symansky, "Fiscal Policy Rules," IMF Occasional Paper no. 162, 1998.) echoes this perceived necessity (as does IMF, 2009). William H. Buiter ("Ten Commandments for a Fiscal Rule in

the E(M)U," *Oxford Review of Economic Policy* 19, no. 1 [March 2003]: 84–99) also considers "impartial and consistent" enforcement as one the Ten Commandments for fiscal rules.

24. As defined at Lexico.com, a project of Oxford University.

25. Alberto Alesina and Guido Tabellini, "Voting on the Budget Deficit," *American Economic Review* 80, no. 1 (1990): 37–49.

26. Roel Beetsma and Xavier Debrun, "The New Stability and Growth Pact: A First Assessment," *European Economic Review* 51 (2007): 453–77.

27. In the appendix, we illustrate this situation by assuming that enforcement entails costs in terms of foregone revenues in period 1, possibly because the constraint imposed by the rule affects the quality of fiscal policy. Ben D. Peletier, Rober A. J. Dur, and Otto H. Swank, "Voting on the Budget: Comment," *American Economic Review* 89, no. 5 (December 1999): 1377–1381 develop a full-fledged critique of the Alesina-Tabellini framework in which cutting high-quality expenditure as a result of a balanced-budget requirement is costly.

28. Beetsma and Debrun, "The New Stability."

29. Wolf Heinrich Reuter, "National Numerical Fiscal Rules: Not Complied with, but Still Effective?," *European Journal of Political Economy* 39 (2015): 67–81.

30. Michael Bergman, Michael M. Hutchinson, Svend Hougaard Jensen, "Promoting Sustainable Public Finances in the European Union: The Role of Fiscal Rules and Government Efficiency," *European Journal of Political Economy* 44 (September 2016): 1–19; Heinemann, Moessinger, and Yeter, "Do Fiscal Rules Constrain Fiscal Policy?"; Eyraud et al., "Second-Generation Fiscal Rules."

31. George Kopits and Steven A. Symansky, "Fiscal Policy Rules," IMF Occasional Paper no. 162, 1998.

32. See, for example, Martin Larch, Paul van den Noord, and Lars Jonung, "The Stability and Growth Pact: Lessons for the Great Recession," European Economy, Economic Papers no. 429, December 2010, on the weaknesses of the SGP.

33. See Lars Calmfors ("What Remains of the Stability and Growth Pact," Swedish Institute for European Policy Studies Report no. 9, 2005) for an analysis of the reformed SGP and Roel Beetsma and Xavier Debrun ("The New Stability and Growth Pact: A First Assessment," *European Economic Review* 51, no. 2 (February 2007): 453–477) for a theoretical appraisal.

34. Luc Eyraud and Tao Wu, "Playing by the Rules: Reforming Fiscal Governances in Europe," IMF Working Paper no. 15/67, 2015.

35. Eric M. Leeper, "Monetary Science, Fiscal Alchemy," Proceedings—Economic Policy Symposium, Jackson Hole, WY, Federal Reserve Bank of Kansas City, 361–434, 2010.

36. Luc Eyraud et al. ("How to Calibrate Fiscal Rules: A Primer," IMF Fiscal Affairs Department How-To Notes, March 15, 2018) discuss at length the "hydraulics" behind the calibration of fiscal rules, and in particular the connection between debt and deficit caps.

37. The stability—or mean-reversion—condition is much stronger than solvency (Henning Bohn, "The Behavior of U.S. Public Debt and Deficits, *The Quarterly Journal of Economics* 113, no. 3 (August 1998): 949–963**)**. It is nevertheless at the core of operational debt-sustainability assessments—such as those performed by the IMF—as well as some workhorse models of the fiscal-monetary policy mix (e.g., Eric M. Leeper, "Equilibria under 'Active' and 'Passive' Monetary and Fiscal Policies," *Journal of Monetary Economics* 27, no. 1 (February 1991): 129–147, and related analyses).

38. Under condition (6.3), the long-term debt level will be positive if $\kappa < 0$. Equation (6.4) can be derived by applying (6.1) and (6.2) to steady-state values of the primary balance ($p^\star$) and the public debt ($d^\star$).

39. Jonathan D. Ostry et al., "Fiscal Space," IMF Staff Position Note no. 10/11, 2010; Atish R. Ghosh et al., "Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economies," *The Economic Journal* 123, no. 566 (February 2013): F4–F30.

40. Huixin Bi, "Sovereign Default Risk Premia, Fiscal Limits, and Fiscal Policy," *European Economic Review* 56, no. 3 (2012): 389–410.

41. Paolo Mauro et al., "A Modern History of Fiscal Prudence and Profligacy," *Journal of Monetary Economics* 76 (2015): 55–70.

42. Xavier Debrun and Tidiane Kinda, "That Squeezing Feeling: The Interest Burden and Public Debt Stabilization," *International Finance* 19, no. 2 (2016): 147–78.

43. See Kathryn Holston, Thomas Laubach, and John C. Williams, "Measuring the Natural Rate of Interest: International Trends and Determinants," *Journal of International Economics* 108, supplement 1 (May 2017): 559–575 for a recent analysis of the determinants of $r^\star$.

44. Debrun and Kinda, "That Squeezing Feeling."

45. In that case, $\dfrac{\partial d^\star}{\partial r^\star} = \dfrac{\kappa\chi}{\left(\gamma^\star(1-\lambda)-(\rho+\chi r^\star)\right)^2} < 0.$

46. Debrun and Kinda, "That Squeezing Feeling."

47. Lawrence H. Summers ("Secular Stagnation and Monetary Policy," Federal Reserve Bank of St. Louis *Review* 98, no. 2 (Second Quarter 2016): 93–110) articulates the forces shaping a secular stagnation scenario.

48. Jonathan Portes and Simon Wren-Lewis, "Issues in the Design of Fiscal Rules," *The Manchester School* 8, no. S3 (2015): 56–86.

49. For example, Blanchard, Dell'Ariccia, and Mauro, "Rethinking Macroeconomic Policy," IMF Staff Position Note no. 2010/3, 2010; or IMF, *Now Is the Time: Fiscal Policies for Sustainable Growth*, Fiscal Monitor, April 2015.

50. Frederick van der Ploeg, "Back to Keynes?," *CESifo Economic Studies* 51, no. 4 (2005): 777–822.

51. See for example Axel Leijonhufvud ("The long swings in economic understanding," in *Macroeconomic Theory and Economic Policy: Essays in Honour of Jean-Paul* Fitoussi, ed. K. Vela Velupillai (London: Routledge, 2004), 115–127) on the long swings in macroeconomic thinking between rules and discretion.

52. As shown by Felix Roth ("Political Economy of EMU: Rebuilding Systemic Trust in the Euro Area in Times of Crisis," European Economy Discussion Paper no. 016, European Commission, September 2015), there is a tendency for trust in governments and public institutions such as parliaments to decline significantly in times of crisis.

53. See Richard Rose (*Lesson-Drawing in Public Policy: A Guide to Learning across Time and Space* [Chatham, NJ: Chatham House Publishers, 1993]) for an account of the process of policy learning across time and Lars Jonung ("Looking ahead through the Rear-View Mirror: Swedish Stabilization Policy as a Learnig Process 1975–1995. A Summary," Lund University Department of Economics, 2000) for a case study of Sweden, showing that every major economic crisis has initiated a process, teaching new lessons for the conduct of stabilization policies.

54. Lars Jonung ("Reforming the Fiscal Framework: The Case of Sweden 1973–2013," in *Reform Capacity and Macroeconomic Performance in the Nordic Countries*, ed. Torben M. Andersen, Michael Bergman, and Svend E. Hougaard Jensen [Oxford: Oxford University Press, 2015], chapter 8) describes the rise of the fiscal framework in Sweden as the outcome of budgetary crises in the early 1990s as well as a method to keep the lesson of the crisis alive in the collective memory.

55. Felix Roth, "Political Economy of EMU."

56. We are grateful to Signe Krogstrup and Sebastien Waelti for that suggestion and for sharing their data.

57. See Geert Hofstede, Gert Jan Hofstede, and Michael Minkov, *Cultures and Organizations: Software of the Mind. Revised and expanded,* 3rd ed. (New York: Mc Graw Hill, 2010). A 2015 update of the dataset is freely available on https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ (accessed October 29, 2019).

58. Going even deeper into the roots of attitudes vis-à-vis institutions, some have argued that religion plays a key role in shaping how citizens look upon rules, with Protestants showing a stronger fundamental belief in the importance of legal institutions, in rules, and, specifically, in the rights of creditors (Adrian Chadi

and Matthias Krapf, "The Protestant Fiscal Ethic: Religious Confession and Euro Skepticism in Germany," Universty of Lausanne Department of Economics Working Paper, March 2015).

59. Such lack of ownership can be even more severe if fiscal rules adoption is the result of outside pressure. Rules perceived as forced upon a country could become easy targets in any political blame-game. The same is true if the fiscal rule results from a strategic attempt by one political party to tie the hands of its opponents when they are in office.

60. Eyraud et al., "Second-Generation Fiscal Rules."

61. John B. Taylor, "Discretion Versus Policy Rules in Practice," *Carnegie-Rochester Series on Public Policy* 39 (1993): 195–214.

62. Taylor, "Reassessing Discretionary Fiscal Policy."

63. Kliem and Kriwolusky, "Toward a Taylor Rule"; or Michael Kumhof and Douglas Laxton, "Simple Fiscal Policy Rules for Small Open Economies," *Journal of International Economics* 91 (2013): 113–127.

64. Lukkezen and Teulings, "A Fiscal Taylor Rule"; or Nicolas Carnot, "Evaluating Fiscal Policy."

65. Ben S. Bernanke, "The Taylor Rule: A Benchmark for Monetary Policy?," Brookings Institution blog, April 28, 2015; Jonathan Portes and Simon Wren-Lewis, "Issues in the Design of Fiscal Rules," *The Manchester School* 83, no. S3 (2015): 56–86.

66. IMF, "Fiscal Exit: From Strategy to Implementation," *Fiscal Monitor*, November 2010.

67. IMF, "Now Is the Time: Fiscal Policies for Sustainable Growth," *Fiscal Monitor*, April 15, 2015.

68. IMF, "Analyzing and Managing Fiscal Risks: Best Practices," IMF Policy Paper, May 4, 2016.

69. David Turner et al., "An Investigation into Improving the Real-Time Reliability of OECD Output Gaps Estimates," Organisation for Economic Co-operation and Development Economics Department Working Papers no. 1294, 2016; or Francesco Grigoli et al., "Output Gap Uncertainty and Real-Time Monetary Policy," IMF Working Paper no. 15/14, 2015.

70. For the United States, there is no real-time equivalent to the fiscal series used in Figure 6.6.

71. Turner et al., "An Investigation into Improving the Real-Time Reliability."

72. CEPR, *Independent Fiscal Councils*.

73. See George Kopits, "Independent Fiscal Institutions: Developing Good Practices," *OECD Journal on Budgeting* 3 (2011): 35–52; Roel Beetsma, Xavier Debrun, and Randolph Sloof, "The Political Economy of Fiscal Transparency and Independent Fiscal Councils," ECB Working Paper no. 2091, 2017; Lars Jonung,

"Reforming the Fiscal Framework: The Case of Sweden 1973–2013," in *Reform Capacity and Macroeconomic Performance in the Nordic Countries,* eds. Torben Andersen, Michael Bergman, and Sven Hougard Jensen (Oxford: Oxford University Press, 2015); Roel Beetsma et al., "The Rise of Independent Fiscal Councils: Recent Trends and Performance," IMF Working Paper no. 18/68, 2018.

74. Carnot, "Evaluating Fiscal Policy."

75. We owe this point to Martin Larch.

76. See the directive on national fiscal frameworks, the "Two-Pack" Regulations, or the Fiscal Compact.

77. Debrun et al., "The Functions and Impact of Fiscal Councils"; Kopits, "Independent Fiscal Institutions."

78. Alberto Alesina and Guido Tabellini, "Voting on the Budget Deficit," *American Economic Review* 80, no. 1 (1990): 37–49.

79. This is obtained as $\psi^{\star} = argmax_{\psi} W$, taking the policymaker's first order condition on Equation (6.A.5) as a constraint. Under a fiscal rule with enforcement ψ, socially optimal enforcement of the rule (denoted by $\psi^{\star}$) has to satisfy $\frac{\partial W}{\partial \psi} = \left(\pi u'\left(g_2\right) + \psi^{\star}\right)\frac{\partial g_1}{\partial \psi} + u'\left(g_2\right)\frac{\partial g_2}{\partial \psi} = 0$. A period 2 resource constraint implies that $\frac{\partial g_2}{\partial \psi} = -\frac{\partial g_1}{\partial \psi}$ it immediately follows that $\psi^{\star} = (1-\pi)u'(g_2)$.

80. Period 2 resource constraint is not directly affected. If it were (as Peletier et al, "Voting on the Budget: Comment"), it would only magnify the negative "income effect" of enforcement.

CHAPTER SEVEN

1. L. Randall Wray, *Modern Money Theory*, 2nd ed. (Basingstoke, UK: Palgrave Macmillan, 2015), pp. 66–67.

2. U.S. Department of the Treasury. "Debt Limit," https://www.treasury.gov/initiatives/Pages/debtlimit.aspx (accessed August 6, 2018).

3. This estimate slightly overestimates the net interest expense of the consolidated federal government in recent years since it does not account for interest that the Fed pays on deposits by commercial banks or interest that the Fed earns from securities held other than those issued by the Treasury, mainly mortgage-backed securities. In 2017, the latter exceeded the former by about $20 billion. If that amount were netted out from federal interest expenses, the estimate of R for 2017 would have been about a tenth of a percentage point lower than shown. Before 2008, this adjustment would have been insignificant, and it seems likely that it will decrease in coming years as the Fed carries out a planned reduction in its holdings of securities.

4. Herbert Stein, "After the Ball," *The AEI Economist* (December 1984): 2.