Changing regimes: The role of fiscal rules in Monetary Policy

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Abstract

Over the past few decades, many countries have adopted fiscal rules. This paper examines their role in shaping monetary policy transmission. Using a panel of emerging economies, I find that, when fiscal rules are in place, prices decrease in response to a monetary tightening. In contrast, in the absence of fiscal rules, monetary tightening often leads to higher price levels. To formalize these empirical results, I develop a dynamic model in which each authority pursues distinct objectives. In line with empirical results, the model reveals that an equilibrium can arise where interest rate hikes lead to price increases. However, binding fiscal rules reduce the fiscal authority's incentive for aggressive expansions that undermine monetary control over prices, making such an equilibrium less likely. Consistent with the data, the model also predicts lower price levels when fiscal rules are binding.

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1 Introduction

Over the past few decades, numerous countries have implemented fiscal rules in various forms, including budget balance rules, debt limits, expenditure ceilings, and revenue rules. These measures have been adopted by both advanced economies and emerging markets (Davoodi et al. (2022)). Despite their widespread adoption, the interaction between fiscal rules and monetary policy remains underexplored in the academic literature. To fill this gap, this document addresses the following question: *Do fiscal rules affect the transmission of monetary policy?*

This paper examines the impact of monetary policy shocks on prices in emerging markets in the presence of fiscal rules, using high-frequency monetary policy shocks. Using a panel of five emerging economies—Brazil, Colombia, Chile, Mexico, and South Africa—from 2000 to 2024, I measure high-frequency unanticipated changes in domestic interest rates using the forward exchange rate premium around monetary policy meeting dates (following Witheridge (2024)), and interact them with fiscal rules.

My findings indicate that when effective fiscal rules[1] are in place, prices will likely decrease upon an increase in interest rates. On the contrary, in the absence of fiscal rules, monetary policy tightening typically leads to higher price levels in emerging markets.

To better understand the role of fiscal rules in monetary policy transmission, I develop a model of dynamic, strategic interactions between fiscal and monetary authorities with fiscal rules. Specifically, my model follows the framework by Barthélemy et al. (2024) in which the fiscal authority maximizes the present value of government spending, while the monetary authority minimizes deviations of realized price levels from its targets. In contrast with Barthélemy et al. (2024), the model features a fiscal authority that issues nominal bonds backed by future taxes and faces a limit on its primary deficit (primary balance fiscal rule). The monetary authority issues the economy's unit of account (reserves) and independently manages its balance sheet. Fiscal default, which imposes costs on both authorities, occurs if the fiscal authority cannot commit to debt repayment. Private investors act as price takers in the markets for reserves and government bonds.

I solve the subgame-perfect Nash equilibrium of the game played between the fiscal and monetary authorities. I define "monetary dominance" as equilibrium scenarios in which the price level aligns with the monetary authority's target. Conversely, "fiscal dominance" occurs when the price level exceeds the target to satisfy the fiscal solvency constraint and avoid default.

The fiscal authority can choose between two strategies: issuing high debt levels that force the central bank away from its price-level objective (fiscal dominance) or issuing lower debt levels that are optimal under monetary dominance conditions. Fiscal dominance is chosen only when the fiscal authority's benefits from eroding public liabilities exceed the costs of front-loading expenditures compared to a smoother fiscal path. Binding fiscal rules limit government expenditure, reducing incentives for excessive debt issuance and

[1] I define *Effective Fiscal Rule* to the period when a country has a fiscal rule and complies with its budgetary limits.

increasing the likelihood of a monetary-dominance equilibrium.

The model also reveals that under fiscal dominance, an equilibrium can arise in which interest rate hikes by the monetary authority lead to price increases, consistent with the empirical evidence. Binding fiscal rules make such an equilibrium less likely. Consequently, as fiscal rules reduce the fiscal authority's incentives for aggressive fiscal expansion, they lead to lower price levels. Consistent with these predictions, I show that price levels are lower in the presence of fiscal rules.

This document is organized as follows. Section 2 presents a brief review of the literature on the monetary-fiscal policy mix and the effects of fiscal rules. Section 3 defines fiscal rules and describes their settings in the sample countries. Section 4 outlines the approach to measuring monetary policy shocks in emerging economies and presents the results. Sections 5 and 6 describe the model and discuss its implications in relation to the empirical evidence. Section 7 discusses an extension. Finally, Section 8 concludes.

2 Literature Review

The interaction between monetary and fiscal policy has been a subject of extensive study. Many scholars have considered the optimal joint design of these policies. Leeper (1991) introduced a seminal framework distinguishing between "active" and "passive" policies, contingent on constraints faced by policymakers.[2] Building on this, Schmitt-Grohé and Uribe (2007) demonstrated that in environments characterized by sticky prices, monetary dynamics, and distortionary taxation, the welfare-optimizing fiscal approach is typically passive. However, empirical analyses challenge the notion of consistently passive fiscal policy in the U.S. postwar era. For instance, Favero and Monacelli (2003) argue against this uniform characterization, while Hall and Sargent (2011) shows that U.S. debt stabilization historically relied on growth, valuation adjustments, and low real interest rates. Accordingly, the literature recognizes that periods of high inflation in the U.S. were often characterized by fiscal dominance. Similarly, in emerging markets, episodes of sustained inflation have frequently been attributed to fiscal regimes (Kehoe and Nicolini (2022), Witheridge (2024)).

The transition between fiscal and monetary dominance has also been a focal point in the literature. Scholars such as Bianchi and Melosi (2017), Bianchi and Ilut (2017), Bianchi and Melosi (2019), Camous and Matveev (2023), and Bianchi et al. (2023) have emphasized the importance of agents' beliefs and the management of rising public debt in determining which regime prevails and how regime switches occur. In

[2]Leeper (1991) defines "active" fiscal policy and "passive" monetary policy as cases where taxes respond by less than one-to-one with changes in government debt, and monetary policy raises the nominal interest rate by less than the increase in inflation. Conversely, "active" monetary policy and "passive" fiscal policy describe cases where taxes respond by more than one-to-one with changes in government debt, and monetary policy responds aggressively by raising the nominal interest rate by more than the increase in inflation. Bianchi and Ilut (2017) and Witheridge (2024) use the terminology *fiscal-led* or *monetary-led* policy to correspond to active fiscal or active monetary regimes, respectively. Finally, Barthélemy et al. (2024) defines monetary or fiscal dominance according to which authority determines the price level. In this document, these terms will be used interchangeably.

much of this research, fiscal or monetary dominance is exogenously specified, as are the regime transitions. By contrast, Bassetto and Sargent (2020) and Barthélemy et al. (2024) provide a theoretical framework where fiscal or monetary dominance emerges as equilibrium outcomes driven by the economy's structural features.

This paper contributes to the growing literature on fiscal and monetary policy interactions in settings where regimes are endogenous. Specifically, I show that fiscal rules can shape equilibrium outcomes by reducing the fiscal authority's incentives to induce fiscal dominance. This increases the likelihood of monetary dominance, where prices remain at target. Additionally, this paper complements the literature on regime changes in emerging economies by demonstrating that fiscal rules enhance the probability that monetary tightening leads to price reductions.

In parallel, a robust body of research highlights the effectiveness of numerical fiscal rules. Such rules enhance fiscal sustainability (Tapsoba (2012)), promote fiscal consolidation (Neyapti (2013)), stabilize government budgets (Dahan and Strawczynski (2013)), improve debt affordability (Gomez-Gonzalez et al. (2024)), and reduce both sovereign default risk and the probability of sudden stops (Gomez-Gonzalez et al. (2022)). Despite these documented benefits, the impact of fiscal rules on monetary policy transmission and inflation remains underexplored. This paper addresses this gap by showing that fiscal rules can mitigate inflationary pressures, foster monetary dominance, and influence the transmission of monetary policy.

3 Fiscal rules

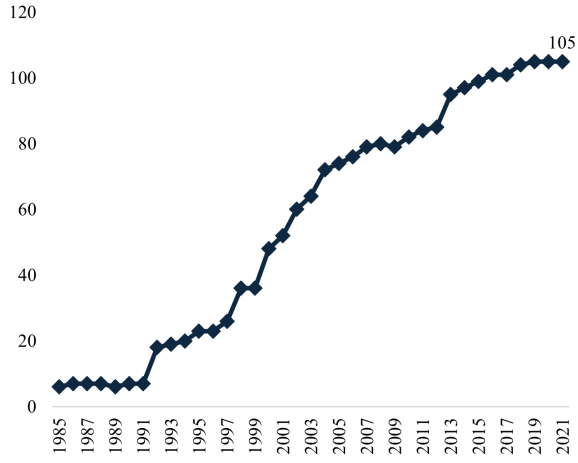
A fiscal rule is a long-lasting constraint on fiscal policy that imposes numerical limits on budgetary aggregates. Fiscal rules typically aim at correcting distorted incentives and containing pressures to overspend, particularly in good times, to ensure fiscal responsibility and debt sustainability (Davoodi et al. (2022)). Depending on the budgetary aggregate that is subject to constraint, fiscal rules can be divided into four different types:

1. **Debt Rules:** Set an explicit anchor or ceiling for public debt, often expressed in percent of GDP.
2. **Budget Balance Rules:** Constrain the budget aggregate by providing a clear operational limit on the overall balance, primary balance, or structural or cyclically adjusted balance.[3]
3. **Expenditure Rules:** Set limits on total, primary, or current government expenditures.
4. **Revenue Rules:** Set ceilings or floors on revenues and are aimed at boosting revenue collection and/or preventing an excessive tax burden.

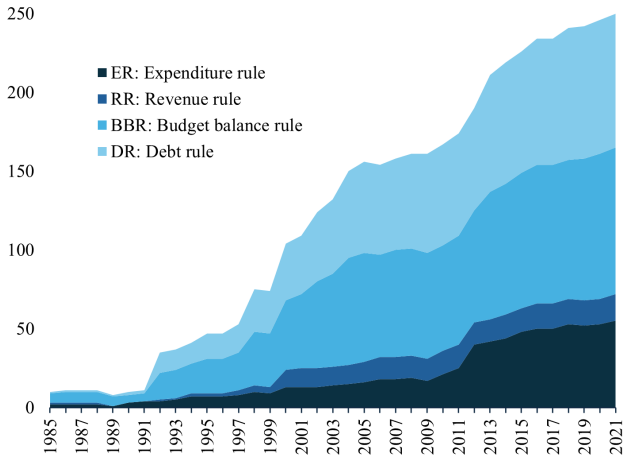
[3]The overall balance is the difference between total revenues and total spending; the primary balance is defined as the difference between revenues and spending, net of interest payments; and the structural or cyclically adjusted balance is the overall/primary balance net of the economic cycle ("the structural balance is the budget balance which a government would have with its current policies if the economy was operating at its full potential" OECD (2021)).

Figure 1: Fiscal Rules dynamics

((a)) Countries with at least one fiscal rule



((b)) Fiscal rules by type



Sources: Authors' calculations using IMF Fiscal Rules Dataset: 1985-2021.

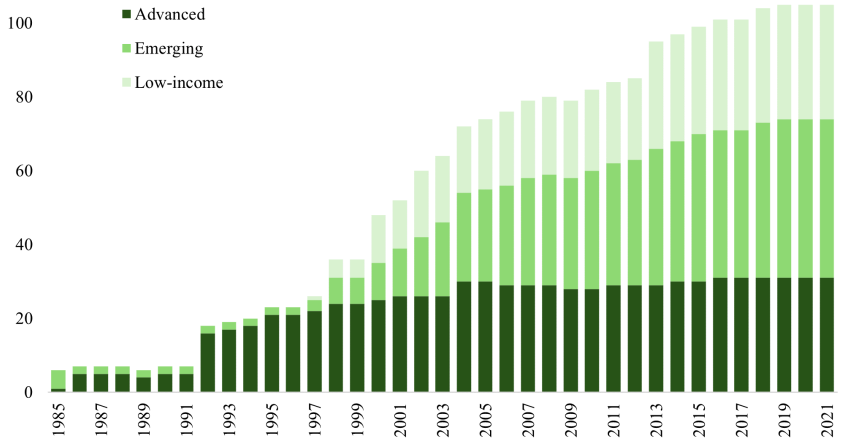
As shown in Figure 1, panel (a), the adoption of rules-based fiscal frameworks has been steadily increasing worldwide. By 2021, 105 economies had implemented some form of fiscal rule. The expansion occurred in several waves, largely driven by the integration of supranational regulations and the establishment of rules following significant economic shocks. Notably, the early 1990s saw a significant increase following the signing of the 1992 Maastricht Treaty, which set debt and deficit criteria for countries wishing to join the European Economic and Monetary Union. Another surge occurred in the early 2000s, prompted by emerging markets and low-income countries adopting national and supranational rules, respectively. In emerging markets, national rules have typically been implemented to ensure fiscal adjustments post-crisis (e.g., Colombia, Brazil), secure the benefits of economic reforms (e.g., Mexico), or curb procyclical spending linked to fluctuating natural resource prices (e.g., Chile) (Davoodi et al. (2022)).

Fiscal rules are not mutually exclusive; countries can, and often do, simultaneously impose constraints on more than one budgetary aggregate. In the early 2000s, the average number of fiscal rules per country (conditional on having at least one rule) was approximately two. Over time, this number has increased; currently, countries typically have around three fiscal rules in place. Among the various types of fiscal rules, the most common combination involves debt rules paired with operational limits on expenditures and/or budget balances (Panel (b)).

However, having a fiscal rule in place does not imply that countries achieve their fiscal sustainability objectives. On the contrary, deviations from the rule are common. Members of the European Union comply with their fiscal rules only in about half of the cases (Larch et al. (2023)).[4] For the case of Latin America

[4]Larch et al. (2023) include 28 European countries from 1998 until 2021.

Figure 2: Fiscal rules by income groups



Sources: Authors' calculations using IMF Fiscal Rules Dataset: 1985-2021

and the Caribbean, the numbers are similar: the average rate of compliance between 2000 and 2022 is 57% for 14 countries (Ulloa-Suarez and Valencia (2022)).

3.1 Fiscal Rules in emerging economies

Fiscal rules began to be systematically implemented in emerging economies towards the middle of the 2000s. By 1996, only two emerging economies had instituted a numerical fiscal limit, in contrast to 21 advanced economies that had already adopted one or more fiscal rules. However, the adoption of fiscal rules in emerging and low-income countries has increased significantly over time. By 2021, 43 emerging economies had established fiscal frameworks that included budgetary limitations (Figure 2).

Emerging economies typically face more limited access to financial markets and higher interest rates due to risk premia. In such contexts, the adoption of a fiscal rule aimed at achieving fiscal sustainability is particularly beneficial, as it can be a signal of good fiscal behavior for agents. This document focuses on five emerging economies: Brazil, Chile, Colombia, Mexico, and South Africa.

Brazil was the pioneer in this group, implementing a budget balance rule in 1998, and expanding this framework in 2000 to include an expenditure rule. Notably, in 2008, Brazil refined its expenditure rule to adhere to a *golden rule*, allowing the government to borrow only for investment purposes, not for current spending. Chile followed with the implementation of a structural balance rule starting in 2001. Mexico introduced a budget balance rule in 2007, which was later modified to a structural balance rule in 2015. Colombia set a limit on its structural balance in 2011 and added a debt ceiling in 2022. In contrast, South Africa remains the only country in this sample without any type of fiscal rule.

4 Empirical Analysis

In this section, I analyze the interaction between fiscal rules and monetary policy shocks in five emerging economies: Brazil, Chile, Colombia, Mexico, and South Africa. In particular, I use daily forward and spot exchange rates.[5] [6]

4.1 High-Frequency Monetary Policy Shocks

To identify monetary policy shocks, I use high-frequency changes in forward and spot exchange rates, leveraging the covered interest parity (CIP) condition, as in Witheridge (2024). The CIP condition is expressed as:

$$(1 + r^c_{t,t+1}) = (1 + r^{\$}_{t,t+1})\frac{F_{t,t+1}}{\varepsilon_t},$$

where $r^c_{t,t+1}$ and $r^{\$}_{t,t+1}$ are the one-period risk-free interest rates in currency c and USD, respectively; $F_{t,t+1}$ is the forward exchange rate, and ε_t is the spot exchange rate, both expressed as pesos per US dollar. Taking the logarithmic approximation of the CIP condition yields:

$$r^c_t - r^{\$}_t = f_{t,t+1} - e_t,$$

where $f_{t,t+1}$ and e_t represent the logarithms of the forward and spot exchange rates, respectively.

Defining the forward premium as $FP_{t,t+1} \equiv f_{t,t+1} - e_t$, the CIP condition implies that changes in the forward premium ($\Delta FP_{t,t+1}$) capture unanticipated changes in the domestic interest rate (Δr^c_t) under the assumption that $r^{\$}_t$ remains constant in the narrow window around monetary policy decisions. Thus:

$$\Delta FP_{t,t+1} = \Delta r^c_t. \tag{1}$$

This approach assumes (i) the USD risk-free rate remains constant within the narrow window of monetary policy decisions for country c, and (ii) CIP deviations remain constant in this window. Both assumptions are supported by evidence in Witheridge (2024). Changes in the forward premium in the window of monetary policy decisions thus serve as a proxy for unanticipated monetary policy shocks.

4.2 Local Projections

To analyze the effect of fiscal rules on the transmission of monetary policy, I estimate local projections *à la* Jordà (2005). Specifically, I exploit the exogenous variation of unanticipated monetary policy tightening on price levels, during episodes with and without fiscal rules. The regression equation is:

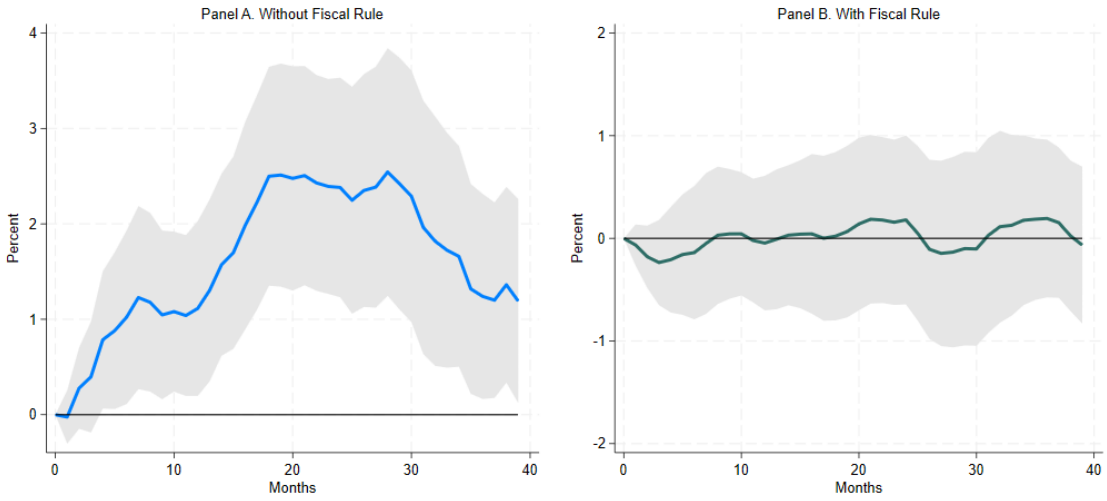
$$\log P_{i,t+h} = \beta MPShock_{i,t} + \alpha FR_{i,t} + \gamma MPShock_{i,t} \times FR_{i,t} + X_{i,t} + \epsilon_{i,t+h},$$

[5] For more details about the data used, see Appendix A.1

[6] Country selection was based on data availability, the presence of inflation-targeting frameworks, and floating exchange rate regimes.

where $P_{i,t}$ is the CPI index in country i in month t; $MPShock_{i,t}$ denotes the monetary policy shock; $FR_{i,t}$ is a dummy that takes the value of 1 if country i has a fiscal rule at time t and 0 otherwise; and $X_{i,t}$ represents control variables, including economic activity, unemployment, year fixed effects and country fixed effects. A positive β implies that monetary policy tightening increases prices in the absence of fiscal rules. When fiscal rules are present, the total effect on prices is captured by $\beta + \gamma$.

Figure 3: Impulse Response Functions to monetary tightening: price changes with and without Fiscal Rules



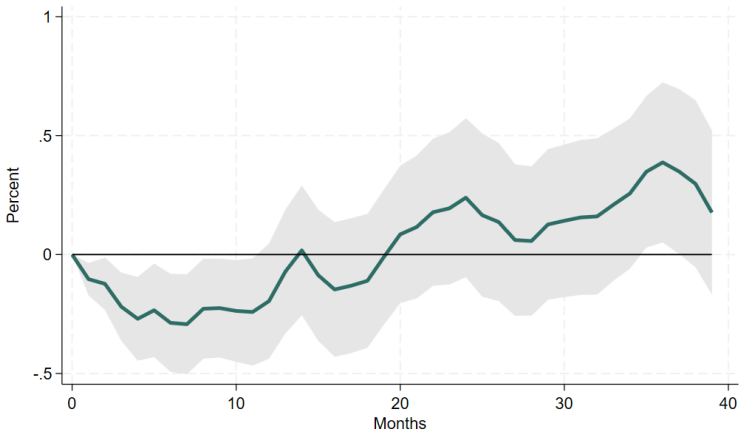
Notes: Authors' calculations using changes in forward premia around monetary policy meetings. Controls include economic activity, unemployment, and fixed effects for years and countries. Results use monthly data.

Figure 3 presents the impulse responses to a 1 percentage point monetary policy shock. Panel A (β) shows that, in the absence of fiscal rules, monetary policy tightening leads to a significant increase in prices, peaking at 2.5% after 20 months. Panel B ($\beta + \gamma$) demonstrates that when fiscal rules are in place, the same shock does not produce any response on prices. This difference highlights that, when a country has fiscal rules, even if it does not comply with them, a monetary policy tightening no longer is related with an increase in prices.

Recognizing that the effectiveness of fiscal rules depends on compliance, I use the fiscal rules compliance dataset from Ulloa-Suarez and Valencia (2022), which includes annual compliance rates based on deviations from rule targets. In particular, the authors gather information from reports and published data from official sources in each country, including characteristics of the fiscal rules, the numerical target of each rule, the executed value for the corresponding macroeconomic aggregate, the deviation between the executed value and the target, and the reasons for deviations. I define a dummy variable, *Effective Fiscal Rule*, which equals 1 when compliance is complete (compliance index = 1) in country i in period t.

Figure 4 shows the results from the regression equation, using *Effective Fiscal Rule* instead. On impact, an increase in the monetary policy interest rate reduces prices throughout the first year. This result is

Figure 4: Impulse Response Functions to monetary tightening: price changes with Effective Fiscal Rules



Notes: Authors' calculations using changes in forward premiums around monetary policy meetings. Controls include economic activity, unemployment, and fixed effects for years and countries. Results use monthly data.

similar to that found for advanced economies (i.e. Nakamura and Steinsson (2018), Aruoba and Drechsel (2024), Witheridge (2024)).

These findings indicate that fiscal rules significantly alter monetary policy transmission. In addition, results show that compliance to the fiscal rules in place plays a significant role in the interaction between monetary and fiscal policy. The next section develops a theoretical model that shows that the positive correlation between interest rates and prices is consistent with fiscal dominance, while a negative correlation is the result of monetary dominance. Hence, from the lens of the model, the empirical results show that effective fiscal rules make an equilibrium under monetary dominance more likely.

5 The Model

I build a model in which the price level is the outcome of dynamic strategic interaction between fiscal and monetary authorities that pursue distinct objectives, as in Barthélemy et al. (2024). In that framework, I include budgetary constraints for the fiscal authority to study the role of fiscal rules in the transmission of monetary policy.

Setup

The model consists of a closed economy where the private and public sectors interact strategically. There are two periods, $t \in \{0, 1\}$. The private sector is composed of a continuum of agents with unit mass, while the public sector includes a monetary authority (M) and a fiscal authority (F).

The economy features three markets: the market for a single consumption good, the market for reserves, and the market for bonds. Reserves serve as the unit of account and are traded between M and the private

sector. Only M can issue reserves, and it sets the interest rate that reserves earn between dates 0 and 1. Bonds are traded between the private sector and F, serving as nominal claims on reserves at $t = 1$. Importantly, F cannot have negative consumption and cannot commit to repaying the bonds it issues.

Timing

At each date $t \in \{0, 1\}$ M issues reserves, and the private sector clears the reserves market, which determines the price level. At $t = 0$, after the reserves market clears, F issues bonds. Then, M transfers its budget to F. At $t = 1$, after the reserves market clears and transfers have been made, F decides whether to repay its outstanding debt.

Extensive-form game

Date-0 market for reserves: There is an exogenous initial stock of reserves, $X_{-1} \geq 0$. M announces a gross nominal interest rate, $R_0 \geq 0$, on reserves between periods 0 and 1, and posts a demand for reserves, $X_0^M \leq X_{-1}$. If $X_0^M < 0$, M issues reserves. The private sector quotes a price level $P_0 \geq 0$, at which it is willing to clear the market with demand $X_0^P \geq 0$, such that:

$$X_0^P + X_0^M = X_{-1}. \tag{2}$$

Date-0 bond market: A one-period nominal bond is available. F posts a demand $B_0^F \in \mathbb{R}$, and the private sector quotes a price $Q_0 \geq 0$, at which it is willing to clear the market with demand $B_0^P \in \mathbb{R}$, such that:

$$B_0^P + B_0^F = 0. \tag{3}$$

Date-0 transfers: M has a date-0 budget of $-X_0^M$ in nominal terms, which it transfers to F.[7] After collecting transactions $(-X_0^M)$ and taxes from the private sector, $(P_0\tau_0 \geq 0)$, both F and M consume.

Date-1 market for reserves: M posts a demand for reserves, $X_1^M \in \mathbb{R}$. The private sector posts a demand $X_1^P \in \mathbb{R}$. As they do not find reserves intrinsically desirable at date 1 then, at most, they want to sell the stock of reserved accumulated from period 0. In other words, $X_1^P \geq -R_0 X_0^P$. If $X_1^P + X_1^M \leq 0$, an unmodelled agent quotes a price $P_1 \geq 0$ and a market clearing demand $P_1\bar{x}$ such that $\bar{x} > 0$

$$P_1\bar{x} + X_1^P + X_1^M = 0. \tag{4}$$

Otherwise, $P_1 = 0$.[8]

Date-1 transfers: M has a date-1 budget of $-X_1^M$ in nominal terms, which it transfers to F.

[7] Barthélemy et al. (2024) assume that M makes a take-it or leave-it offer to F for a transfer between them and if F refuses it, no transfer takes place. This assumption allows both authorities to be able to avoid making a positive transfer to the other authority if they do not wish to do so. In particular, it ensures that F can not be forced to recapitalize M at any date. In equilibrium, this is never the case. Therefore, for simplicity, I assume all of M's budget is transferred to F.

[8] More precisely, if $X_1^P \leq 0$ $(X_1 \leq 0)$, then M (P) is rationed until $P_1 = 0$ clears the market, and otherwise $X_1^P = X_1^M = 0$.

Bond settlement: F collects taxes $P_1\tau_1 \geq 0$, and the private sector repays its bonds, if any. If $B_0^F < 0$, F decides whether to default ($d_1 = 1$) or not ($d_1 = 0$), repaying $-(1-d_1)B_0^F$. Afterward, both F and M consume. Fiscal authority is restricted to consume always a nonnegative amount.

Payoffs

Private Sector: Private agents maximize their consumption stream:

$$C_0 + \frac{C_1}{r}. \tag{5}$$

Agents are endowed with a large quantity of the consumption good at dates 0 and 1 ($E_0 > 0, E_1 > 0$) and always consume positively. Their budget constraints are:

$$t = 0: \qquad P_0C_0 + X_0^P + Q_0B_0^P = P_0E_0 - P_0\tau_0, \tag{6}$$

$$t = 1: \qquad P_1C_1 + X_1^P = P_1E_1 + R_0X_0^P + B_0^P(1-d_1) - P_1\tau_1. \tag{7}$$

Fiscal Authority: F determines public spending ($g_t \geq 0$), bond position (B_0^F) and default decisions ($d_1 = \{0, 1\}$) subject to a predetermined tax scheme. It incurs a cost α^F in case of default. The fiscal authority then seeks to maximize: [9]

$$U^F = g_0 + \beta^F(g_1 - \alpha^F d_1) \tag{8}$$

subject to:

$$t = 0: \qquad P_0g_0 + B_0^FQ_0 \leq \theta_0^M + P_0\tau_0, \tag{9}$$

$$t = 1: \qquad P_1g_1 - (1-d_1)B_0^F \leq \theta_1^M + P_1\tau_1. \tag{10}$$

Here, θ_t^M are transfers from M to F at each period. Additionally, F must comply with a fiscal rule limiting the primary deficit, where $\varphi \in \mathbb{R}$:

$$\tau_t - g_t \geq \varphi. \tag{11}$$

Monetary Authority: M incurs a cost for deviating from its target price level P_t^M at each date and a cost α^M in case of sovereign default. Its utility function is:

$$U^M = -|P_0 - P_0^M| - \beta^M|P_1 - P_1^M| - \beta^M\alpha^M d_1. \tag{12}$$

If two strategies yield the same utility for M, it strictly prefers the one that maximizes F's utility.

Equilibrium

The game is one of perfect information, where each action is conditional on the entire history. The equilibrium concept is subgame perfection in the presence of Walrasian market interactions, where both fiscal

[9] See section 7 for a version of the model with concave preferences.

and monetary authorities lack commitment.

Definition 1. ***(Equilibrium)*** *Given initial reserves X_{-1}, tax scheme τ_0, τ_1, and demand for reserves $\bar{x}$, an equilibrium is a strategy profile $\sigma = \{R_0, X_0^M, P_0, B_0^F, Q_0, X_1^M, X_1^P, P_1, d_1\}$ such that:*

1. *Each action by F and M is optimal given history and their beliefs about future actions following the strategy profile.*
2. *Each saver, taking as given (R_0, X_0^M, P_0, Q_0), and believing that future actions of F and M follow the equilibrium strategy profile, finds it optimal to post individual reserve demand at date 0, X_0^P, satisfying* (2)*. Similarly, they find it optimal to post bond demand B_0^P, satisfying* (3)*, and reserve demand X_1^P at date 1, given P_1 and history.*
3. *Each action by F adheres to the fiscal rule.*

Analysis

The model can be solved using backward induction. In particular, I first study the optimal final default decision by F for all possible histories and then solve for all remaining decisions backwards, given the solution to the subsequent nodes.

Date-1: Default or Repayment

At $t = 1$, the market for reserves has cleared ($X_1^P + X_1^M + P_1\bar{x} = 0$). Since the private sector does not find reserves intrinsically desirable at date 1, it is optimal for them to offload their entire reserve holdings, such that $X_1^P \geq -R_0 X_0^P$. Therefore, by elimination of strictly dominated strategies,

$$-X_1^M = P_1\bar{x} - R_0 X_0^P. \tag{13}$$

Then, the total date 1 budget of the monetary authority is $P_1\bar{x} - R_0 X_0^P$, which it transfers to the fiscal authority. At date 1, F's income is given by:

$$P_1(\bar{x} + \tau_1) - R_0 X_0^P - B_0^P(1 - d_1). \tag{14}$$

For simplicity, assume that the default cost is sufficiently large, such that F always prefers to make good on its debt as long as it does not prevent spending at least $g_1 \geq 0$, which implies that the fiscal authority repays if and only if it has the ability to repay. Then, F repays its debt if and only if :

$$P_1(\bar{x} + \tau_1) \geq R_0 X_0^P + B_0^P. \tag{15}$$

When Does M allow higher prices?

At date 1, M can influence the market for reserves by choosing X_1^M. By strict dominance, $X_1^P = -R_0 X_0^P$, and by the market clearing condition, equation (13) holds. M can then choose P_1, anticipating that for

some price levels, F may choose to default, incurring a cost α^M for the monetary authority. Denote by P^F the minimum price level such that the solvency constraint (15) holds and F repays its debt:

$$P^F = \frac{R_0 X_0^P + B_0^P}{\bar{x} + \tau_1}. \tag{16}$$

Notice that when $P_1 = P^F$, public consumption is at its minimum level $g_1 = 0$.

The date 1 problem of the monetary authority is then given by:

$$\max_{P_1} -|P_1 - P_1^M| - \alpha^M \mathbb{I}_{\{P_1 < P^F\}}, \qquad \text{subject to} \qquad P_1 \geq \frac{R_0 X_0^P}{\bar{x}}. \tag{17}$$

The restriction $P - 1 \geq \frac{R_0 X_0^P}{\bar{x}}$ ensures non-negative budget for the monetary authority. Denote $P^* = \max\left\{P_1^M, \frac{R_0 X_0^P}{\bar{x}}\right\}$ as the optimal price level for M, where P_1^M is the price target. If $P^F \leq P^*$, then M sets $P_1 = P^*$, minimizing its departure from the target. If $P^F > P^*$, then M faces a trade off between minimizing the distance from its target and avoiding the cost of sovereign default. Therefore, M can:

- Set $P_1 = P^*$ and allow the government to default, incurring a cost of $-\alpha^M$.
- Set $P_1 = P_1^F$, avoiding default, with a cost of $P_1^F - P_1^M$.

The utility at date 1 from each case is given by:

$$U_1^M = \begin{cases} -|P^* - P_1^M| - \alpha^M & \text{If default,} \\ -|P_1^F - P_1^M| & \text{If repayment.} \end{cases}$$

Therefore, M prevents default if:

$$-|P_1^F - P_1^M| \geq -|P^* - P_1^M| - \alpha^M \quad \Rightarrow \quad P_1^F \leq P^* + \alpha^M.$$

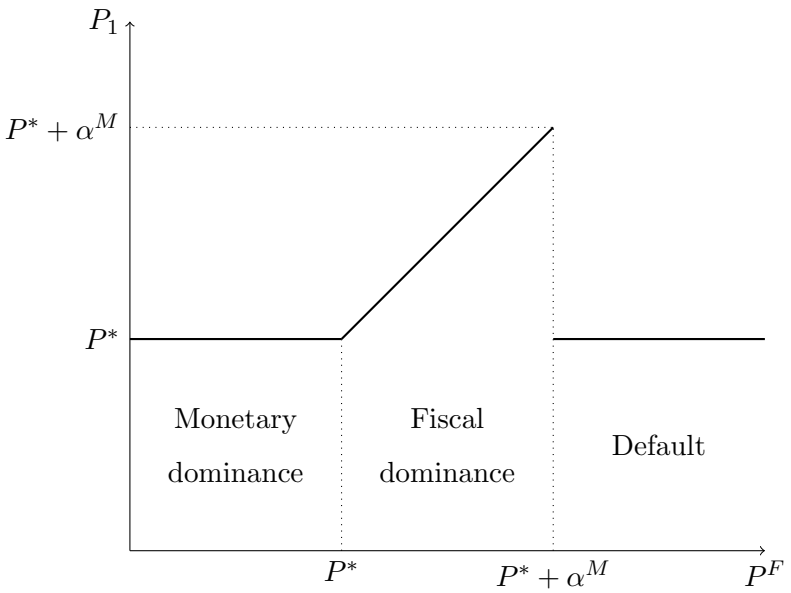
Proposition 1. ***(Regime at terminal date)***

Given history $(R_0, X_0^M, P_0, B_0^F, Q_0)$, date 1 unfolds according to one of the following situations:

1. *Date 1 Monetary Dominance: If $P^F \leq P^*$, M sets $P_1 = P^*$ by choosing $X_1^M = 0$ if $P^* > P_1^M$, and $X_1^M = R_0 X_0^P - P_1^M \bar{x}$ otherwise. F repays its debt and consumes $g_1 \geq 0$. In particular, $g_1 > 0$ if $P^F < P^*$.*
2. *Date 1 Fiscal Dominance: If $P^* < P^F \leq P^* + \alpha^M$, M sets $P_1 = P^F$ by choosing $X_1^M = R_0 X_0^P P - P^F \bar{x}$. F repays its debt and spends $g_1 = 0$*
3. *Default: If $P^F > P^* + \alpha^M$, M sets $P_1 = P^*$ by choosing $X_1^M = 0$ if $P^* > P_1^M$, and $X_1^M = R_0 X_0^P - P_1^M \bar{x}$ otherwise. F defaults on its debt and spends $g_1 = (\bar{x} + \tau_1) - \frac{R_0 X_0^P}{P^*}$*

Figure 5 illustrates the results of Proposition 1 by showing the relationship between the price level and F's solvency constraint. If F only requires a low price level to achieve solvency ($P^F < P^*$), M can set the price at its target P^*, maintaining what I refer to as "Monetary Dominance". If the price level needed for F to avoid default is above P^* but below $P^* + \alpha^M$, M adjusts the price level to ensure fiscal solvency, a regime of "Fiscal Dominance." However, if the required price exceeds $P^* + \alpha^M$, M finds it optimal to allow sovereign default and sets $P_1 = P^*$.

Figure 5: Date-1 price level as function of the solvency constraint of F



Note: The horizontal axis represents the minimum price level necessary for fiscal solvency. The vertical axis represents the date-1 price level. The increasing segment in the fiscal dominance zone reports $P_1 = P^F$, where P^F is given by equation (16).

Date-0 Bond Market

At date 0, F chooses a bond position B_0^F, and savers clear the market with $B_0^P = -B_0^F$ at price Q_0. Savers can save in international markets on risk-free assets and earn a return of r (exogenously given). Hence, for them to be willing to trade in the local market, they require the price to be $Q_0 = \frac{P_0}{P_1 r}$. The fiscal authority recognizes that its actions influence its solvency constraint at date 1 and anticipates three possible scenarios: monetary dominance, fiscal dominance, or default. Both fiscal dominance and default result in zero consumption at date 1, but default entails an additional cost α^F. Therefore, it is strictly optimal for F to avoid default. This analysis considers two scenarios for F: optimal debt under fiscal dominance and optimal debt under monetary dominance.

Optimal debt conditional on date 1 fiscal dominance:
Under fiscal dominance, $P_1 = P^F$, where:

$$P^F = \frac{R_0 X_0^P + B_0^F}{\bar{x} + \tau_1}. \tag{18}$$

This implies $g_1 = 0$. The problem for the fiscal authority is given by:

$$\max_{B_0^F} \quad g_0 \quad \text{s.t.} \quad P_0 g_0 = -Q_0 B_0^F - X_0^M + P_0 \tau_0, \tag{19}$$

$$Q_0 = \frac{P_0}{P^F r}, \tag{20}$$

$$P^* \leq P^F \leq P^* + \alpha^M, \tag{21}$$

$$\tau_0 - g_0 \geq \varphi, \tag{22}$$

$$\text{and (18)}. \tag{23}$$

Since F consumes $g_1 = 0$, it maximizes consumption at date 0, which entails incurring the largest possible debt level while avoiding default. This implies setting $P^F = P^* + \alpha^M$. However, the fiscal rule constraint may limit date-0 consumption, requiring F to issue less debt than optimal. Whether this constraint binds determines F's decision.

The optimal choice for F under fiscal dominance is:

$$g_0 = \begin{cases} -\frac{X_0^M}{P_0} + \frac{1}{r}\left[\bar{x} + \tau_1 - \frac{R_0 X_0^P}{P^* + \alpha^M}\right] + \tau_0, & \text{if} \quad g_0 \leq \tau_0 - \varphi, \\ \tau_0 - \varphi, & \text{otherwise.} \end{cases} \tag{24}$$

In both cases, $g_1 = 0$. If the fiscal rule binds ($g_0 = \tau_0 - \varphi$), the debt level is lower (compared to the case when it does not bind), resulting in $P^F < P^* + \alpha^M$ strictly. Consumption remains zero at date 1, as long as $P^F \geq P^*$, but the equilibrium price level at date 1 is lower.

The utility of F under fiscal dominance is:

$$U^F = \begin{cases} -\frac{X_0^M}{P_0} + \frac{1}{r}\left[\bar{x} + \tau_1 - \frac{R_0 X_0^P}{P^* + \alpha^M}\right] + \tau_0, & \text{if } g_0 \leq \tau_0 - \varphi, \\ \tau_0 - \varphi, & \text{otherwise.} \end{cases} \tag{25}$$

Optimal debt conditional on date 1 monetary dominance:

Under monetary dominance, $P_1 = P^*$. The problem for the fiscal authority is given by:

$$\max_{B_0^F} g_0 + \beta^F g_1 \quad \text{s.t.} \quad P_0 g_0 = -Q_0 B_0^F - X_0^M + P_0 \tau_0, \tag{26}$$

$$P^* g_1 = P^*(\bar{x} + \tau_1) + B_0^F - R_0 X_0^P, \tag{27}$$

$$Q_0 = \frac{P_0}{P^* r}, \tag{28}$$

$$P^F \leq P^*, \tag{29}$$

$$\tau_0 - g_0 \geq \varphi, \tag{30}$$

$$\tau_1 - g_1 \geq \varphi. \tag{31}$$

If $\beta^F \leq \frac{1}{r}$, then the utility loss from delaying consumption is higher than the benefit from waiting. Therefore, F prefers higher consumption at date 0, leading to zero consumption at date 1 and placing M in fiscal

dominance. Then, a necessary condition for monetary dominance is $\beta^F r > 1$, where F prioritizes higher date 1 consumption by minimizing debt issuance at date 0. If the fiscal rule binds, g_1 is set at the limit, with date-0 consumption and debt issuance adjusted accordingly.

The optimal choice for F is:

$$g_0 = \begin{cases} 0, & \text{if} \quad \bar{x} - \frac{X_0^M r}{P_0} - \frac{R_0 X_0^P}{P^*} + \tau_0 r \leq \varphi, \\ -\frac{R_0 X_0^P}{P^* r} + \frac{\bar{x}+\varphi}{r} - \frac{X_0^M}{P_0} + \tau_0, & \text{otherwise}, \end{cases} \tag{32}$$

$$g_1 = \begin{cases} (\bar{x} + \tau_1) - \frac{X_0^M r}{P_0} - \frac{R_0 X_0^P}{P^*} + \tau_0 r, & \text{if} \quad \bar{x} - \frac{X_0^M r}{P_0} - \frac{R_0 X_0^P}{P^*} + \tau_0 r \leq \varphi, \\ \tau_1 - \varphi, & \text{otherwise.} \end{cases} \tag{33}$$

The utility of F under monetary dominance is:

$$U^F = \begin{cases} \beta^F \left[\bar{x} + \tau_1 - \frac{X_0^M r}{P_0} - \frac{R_0 X_0^P}{P^*} + \tau_0 r \right], & \text{if} \quad \bar{x} - \frac{X_0^M r}{P_0} - \frac{R_0 X_0^P}{P^*} + \tau_0 r \leq \varphi, \\ -\frac{R_0 X_0^P}{P^* r} + \frac{\bar{x}+\varphi}{r} - \frac{X_0^M}{P_0} + \tau_0 + \beta^F(\tau_1 - \varphi), & \text{otherwise.} \end{cases} \tag{34}$$

Finally, the utility of the fiscal authority U^F under fiscal and monetary dominance depends on whether the fiscal rule binds. To explore this, consider two cases:

- **Case 1:** $\varphi \to -\infty$ so that the fiscal rule never binds, allowing F unconstrained optimization.
- **Case 2:** φ sufficiently large so that both (30) and (31) are binding.

Case 1: Fiscal rule does not bind F prefers monetary dominance if and only if

$$\underbrace{(\beta^F r - 1)}_{\text{Unit cost of front-loading g}} \underbrace{\left[(\bar{x} + \tau_1) - r\frac{X_0^M}{P_0} - \frac{R_0 X_0^P}{P^*} \right]}_{\text{Net public resources}} \geq \underbrace{R_0 X_0^P \left[\frac{1}{P^*} - \frac{1}{P^* + \alpha^M} \right]}_{\text{Gain from fiscal dominance}} \tag{35}$$

Equation (35) implies that F prefers the monetary dominance regime, in which it accepts the price set by the monetary authority and repays its debt, when it is sufficiently patient ($\beta^F r > 1$) and when it has enough fiscal space. Conversely, if the private sector provides enough resources to F in the first period, F may prefer to front-load consumption, forcing the monetary authority to ensure fiscal solvency by setting $P_1 = P^F = P^* + \alpha^M$.

Case 2: Fiscal rule binds F prefers monetary dominance if and only if:

$$(\beta^F r - 1)\tau_1 + \underbrace{\left[(\bar{x} + \tau_1) - r\frac{X_0^M}{P_0} - \frac{R_0 X_0^P}{P^*} \right]}_{\text{Net public resources}} \geq -\varphi(r(1 - \beta^F) + 1) \tag{36}$$

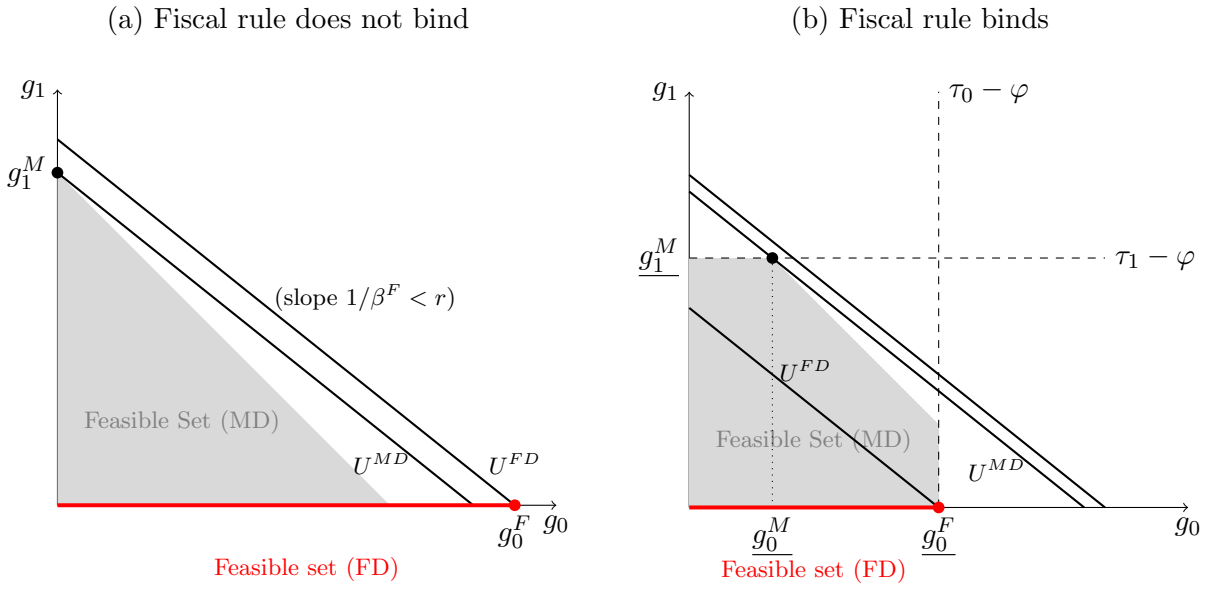
Equation (36) shows that a stricter surplus requirement imposed by the fiscal rule (i.e., a higher φ) increases the likelihood that the constraint holds which implies that fiscal rules make monetary dominance more likely. As in case 1, a large fiscal space and a more patient fiscal authority also contribute to the likelihood of being in a monetary dominance equilibrium.

The following proposition summarizes these results:

Proposition 2. *The fiscal authority (F) allocates resources as follows:*

- *If fiscal rule never binds ($\varphi \to -\infty$) :*
  - ***Monetary Dominance:*** *F issues bonds to optimize consumption, treating the date-1 price P^* as given. It consumes zero at date-0 and $g_1^M > 0$ at date 1.*
  - ***Fiscal Dominance:*** *F issues a significant amount of bonds to front-load consumption, forcing M to adjust prices at date-1. It consumes $g_0^F > 0$ at date 0 and zero at date 1.*
- *If fiscal rule always binds:*
  - ***Monetary Dominance (Constrained):*** *F issues bonds to optimize consumption under the fiscal constraint, treating P^* as given. It consumes $\underline{g_0^M} > 0$ at date-0 and $0 < \underline{g_1^M} < g_1^M$ at date-1.*
  - ***Fiscal Dominance (Constrained):*** *F issues bonds to front-load consumption under the fiscal constraint, forcing M to adjust prices at date-1. It consumes $0 < \underline{g_0^F} < g_0^F$ at date-0 and zero at date-1.*

Figure 6: Optimal consumption under different fiscal rule scenarios



Note: The horizontal and vertical axis represent government spending at date-0 and date-1, respectively. The gray area represents the feasible set under monetary dominance while the red solid line represents the feasible set under fiscal dominance. The downward-slopping curves show F's iso-utility curves.

Figure 6 illustrates these results. Panel (a) represents F's optimal consumption profile when $\varphi \to -\infty$. The gray area corresponds to the feasible set under monetary dominance, while the red line along the x-axis represents feasible set under fiscal dominance. The black dot on the y-axis and the red dot on the x-axis indicate the consumption profiles for monetary and fiscal dominance, respectively. The downward-sloping

line corresponds to F's iso-utility curve for a discount factor β^F. Here, with $\beta^F r > 1$, the monetary dominance case results in a corner solution where F consumes only at date 1. Notice that the red dot associated with the consumption profile under fiscal dominance is outside the feasible set under monetary dominance, since that higher debt level allows F to reduce the real costs of already-issued reserves, and hence achieve a higher date-0 consumption level. In this example, the fiscal-dominance case gives F higher utility ($U^{FD} > U^{MD}$) and is chosen in the date-0 bond market.

Panel (b) illustrates F's optimal consumption profile when a strict fiscal rule binds (large φ). When the constraint $\tau_t - \varphi$ limits the fiscal authority's decisions, the feasible sets shrink. Notably, with φ sufficiently large, F cannot consume g_1^M. Similarly, g_0^F lies outside the feasible set under fiscal dominance. Furthermore, the additional space that the government gains under fiscal dominance by eroding price levels no longer results in a larger feasible set, thereby reducing its incentives to induce fiscal dominance. As a result, the iso-utility curves U^{MD} (monetary dominance) and U^{FD} (fiscal dominance) indicate that monetary dominance provides higher utility ($U^{MD} > U^{FD}$), leading F to prefer $(\underline{g_0^M}, \underline{g_1^M})$ (monetary dominance) in the date-0 bond market.

Date-0 Market for Reserves

M announces a rate R_0 and issues reserves X_0^M. Assume that the real exogenous demand for reserves at date 1 ($\bar{x}$) is sufficiently large so that M can set $P_0 = P_0^M$ without consuming negatively at any date.[10] Then, $X_0^M \leq 0$ and savers clear the market by posting $X_0^P = X_{-1} - X_0^M$ at price level P_0. The price that clears the market is then

$$P_0 R_0 = r P_1, \tag{37}$$

where P_1 can be either P^*, $P^F < P^* + \alpha^M$, or $P^* + \alpha^M$.

The problem of the monetary authority is then:

$$\max_{R_0 \geq 0, X_0^M \leq 0} -|P_0 - P_0^M| - \beta^F |P_1 - P_1^M|, \quad \text{s.t.} \quad (37). \tag{38}$$

First, define the conditions under which M achieves its price-level objective at both date 0 and date 1. For that, M must post $R_0 = r P_1^M / P_0^M$. Using the market clearing condition,

$$P^* = \max \left\{ P_1^M, \frac{r P_1^M (X_{-1} - X_0^M)}{P_0^M \bar{x}} \right\}. \tag{39}$$

For X_0^M sufficiently close to zero, $P^* = P_1^M$. F will prefer monetary dominance for such (R_0, X_0^M) if and only if:

$$(\beta^F r - 1) \left[(\bar{x} + \tau_1) - \frac{r X_{-1}}{P_0^M} \right] \geq \frac{\alpha^M (X_{-1} - X_0^M)}{P_0^M (P_1^M + \alpha^M)} \tag{40}$$

assuming the fiscal rule does not bind. This condition is more likely to hold if M does not issue initial reserves ($X_0^M = 0$).

[10] Specifically, it must be that $\bar{x} > \frac{X_{-1} r}{P_0^M}$. This assumption allows that any date 0 price level deviation from M's objective P_0^M is due only to the fiscal-monetary interaction.

If the fiscal rule binds, F induces monetary dominance if and only if

$$(\beta^F r - 1)\tau_1 + \left[(\bar{x} + \tau_1) - \frac{rX_{-1}}{P_0^M} + (r-1)\frac{X_0^M}{P_0^M}\right] \geq -\varphi[r(1-\beta^F) + 1]. \tag{41}$$

Again, this condition is more likely to hold if M does not issue reserves at date 0 ($X_0^M = 0$).

The equilibrium is such that the price levels are on target at date 0 and date 1 if and only if condition (40) holds, assuming the fiscal rule does not bind. In this case, M issues no reserves, or sufficiently low new reserves, and announces a rate $R = rP_1^M/P_0^M$. The game then unfolds as in the monetary dominance situation with $P_1 = P_1^M$.

When the fiscal rule binds, the equilibrium is that the price levels are on target at date 0 and date 1 if and only if condition (41) holds. This requires that M issues no or sufficiently low new reserves and announces a rate $R_0 = rP_1^M/P_0^M$. The game then unfolds as in the monetary dominance situation with $P_1 = P_1^M$.

Both conditions (40) and (41) show that if M wants to achieve monetary dominance, it should keep the amount of reserves in the economy sufficiently low. In addition, the larger the fiscal space $\left[(\bar{x} + \tau_1) - r\frac{X}{P_0^M}\right]$, the more likely F is to prefer monetary dominance. Finally, binding fiscal rules make it more likely for the equilibrium to result in monetary dominance, where prices are always on target.

Now, let's study the cases when conditions (40)/(41) do not hold. In this scenario, M has three options: surrender, create preemptive inflation, or create reserves overflow.

- *M surrenders:* M accepts that the date-1 price will be $P^F \leq P^* + \alpha^M$ (strictly when the fiscal rule binds) and sets $P_0 = P_0^M$. Therefore, M sets $R_0 = rP^F/P_0^M$ and is indifferent among any level of reserve demand between $X_{-1} - P_0^M\bar{x}/r$ and 0. The date-0 price is P_0^M, and F then chooses consumption consistent with the fiscal dominance profile. The utility cost for M relative to the monetary dominance case is $\beta^M\alpha^M$ when the fiscal rule does not bind. When it binds, its loss in utility is lower, since there is less price deviation from the target ($P^F < P^* + \alpha^M$).
- *M creates preemptive inflation:* Notice that conditions (40) and (41) are more likely to hold at higher P_0. Therefore, M can raise prices at date 0 such that F prefers monetary dominance. Define that price level as $\bar{P}_0$. In this case, the optimal demand for reserves is $X_0^M = 0$, to reduce incentives to inflate reserves away, and M sets $R_0 = rP_1^M/\bar{P}_0$. The reserve market clears, and F then chooses monetary dominance as a strategy, resulting in $P_1 = P_1^M$. The utility cost for M relative to the monetary dominance case is $\bar{P}_0 - P_0^M$. When the fiscal rule binds, the date-0 price required for F to prefer monetary dominance is lower, implying a lower utility cost for M.
- *M creates reserves overflow:* Higher levels of both P_0 and P_1 make it more likely that F prefers monetary dominance. M can set both price levels above their targets so that conditions (40) and (41) hold. Define such price levels as P_0^{RO} and P_1^{RO}. However, M cannot commit at date 0 to a date 1 price level. Instead, it can choose the level of reserves such that it forces the price level at date 1 to

be the desired one. In particular, it is optimal to choose $X_0^M = X_{-1} - \bar{x}P_0/r$. The game then unfolds as a monetary dominance strategy continuation with reserves overflow. Interestingly, a tightening in monetary policy (higher R_0) results in increases in the price level at date 1. This increase is smaller when the fiscal rule binds since the constraint reacts less to increases in P_1.

Notice that the results found in the empirical analysis are consistent with the dynamic in an equilibrium with reserves overflow, where there is a positive correlation between the interest rate on reserves and the prices in the subsequent period. Let's analyze the strategy for M.

Let (P_0^{RO}, P_1^{RO}) solve:

$$\min_{P_0^{RO} \geq P_0^M, P_1^{RO} \geq P_1^M} P_0^{RO} + \beta^M P_1^{RO} \tag{42}$$

$$\text{s.t.} \quad (\beta^F r - 1)\left[(\bar{x} + \tau_1) - \frac{rX_{-1}}{P_0^{RO}}\right] \geq \frac{\alpha^M \bar{x}}{P_1^{RO} + \alpha^M} \tag{43}$$

Equation (43) is the necessary condition for F to find the monetary dominance (price level taking) strategy optimal (40) when choosing $X_0^M = X_{-1} - \bar{x}P_0/r$, so that there is reserves overflow. M chooses $R_0 = \frac{rP_1^{RO}}{P_0^{RO}}$, as it is the rate that clears the market, according to (37). Intuitively, the monetary authority allows higher prices in both periods to ensure fiscal solvency. A higher interest rate on reserves implies, higher debt repayment costs for the fiscal authority, making the minimum price such that F repays its debt higher (see equation (18)). Hence, in date 1, the price that makes the fiscal solvency constraint hold is higher.

Notice that with a binding fiscal rule, it is more likely that F prefers monetary dominance. Hence, the equilibrium is more likely to be one where prices are at the target level. If the condition for F to prefer monetary dominance does not hold, the utility loss for M to deviate from its target is lower, and the necessary price deviations in all three options are smaller, implying lower inflationary pressure when (binding) fiscal rules are in place.

Proposition 3 summarizes the consequences of having a binding fiscal rule in the model:

Proposition 3. ***(Effect of Fiscal Rules)***

- *For given (R_0, X_0^M, P_0), F is more likely to prefer monetary dominance if it has a binding fiscal rule. The more constrained F is by the fiscal rule, the more likely it is to choose monetary dominance, as it lacks incentives to increase its debt levels.*
- *If F prefers fiscal dominance for given conditions, the price required to ensure solvency and avoid default is lower under a binding fiscal rule, implying lower inflation even under fiscal dominance.*
- *As binding fiscal rules make fiscal dominance equilibria less likely, a tightening in monetary policy is less likely to induce an increase in prices.*

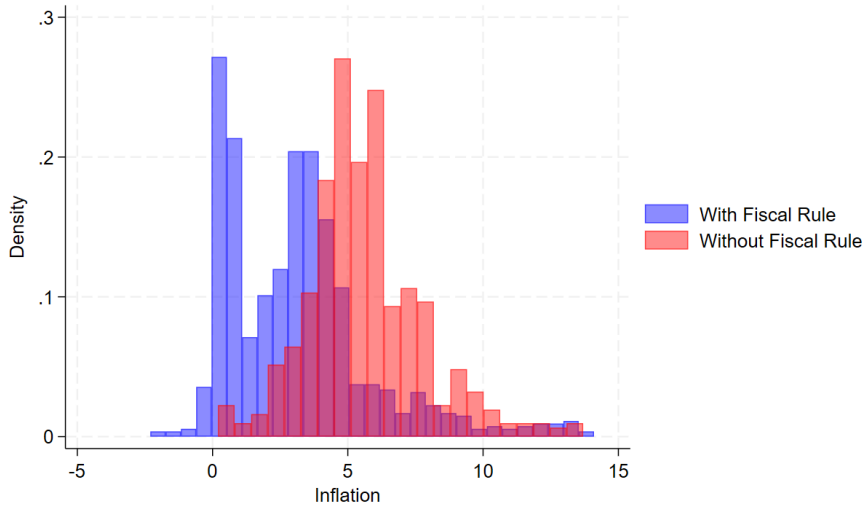
6 Discussion

Empirical evidence demonstrates that in advanced economies, monetary policy tightening (increases in the interest rate) leads to reductions in the price level (i.e. Witheridge (2024), Aruoba and Drechsel (2024)). These results align with an equilibrium in the model in which the monetary authority successfully targets the price level, and the fiscal authority is patient and has sufficient fiscal space to avoid default without inducing fiscal dominance.

In contrast, for emerging economies, empirical evidence indicates the opposite: an increase in the monetary policy interest rate raises prices (as shown in Section 4 and consistent with Witheridge (2024)). This behavior corresponds to an equilibrium in the model characterized by reserves overflow. In this setting, the monetary authority cannot maintain the price level at the target and instead opts to set prices above the target in both periods. Commitment is enforced through higher reserves relative to alternative strategies. Proposition 3 shows that, under binding fiscal rules, such equilibria are less likely to occur. Consistently, the model's results and those shown in Section 3 indicate that, prices are likely to decrease in response to interest rate hikes in countries with effective fiscal rules.[11]

Finally, the model predicts that binding fiscal rules result in a lower equilibrium price level, even under fiscal dominance. Figure 7 confirms this prediction by showing that inflation is lower in countries with fiscal rules, consistent with the model's outcomes.

Figure 7: Inflation distribution by fiscal rule



Sources: Authors' calculations using monthly inflation data from Central Banks, and the Fiscal Rules dataset compiled by the IMF. The sample includes Brazil, Chile, Colombia, Mexico, and South Africa from 2000 until 2024.

[11] Countries without fiscal rules can be interpreted, through the lens of the model, as economies with a fiscal rule that never binds ($\varphi \to -\infty$), which therefore does not constrain the fiscal authority's decisions.

7 Extension

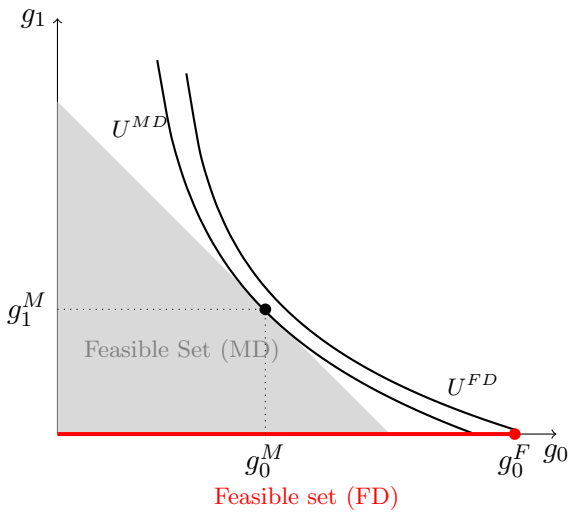
The baseline model shows, with very simple preferences for both the fiscal and the monetary authority, how a fiscal rule affects their interaction and changes the likelihood for certain equilibria to occur. Here I discuss extending the baseline model to one in which the fiscal authority preferences are continuous and concave, such that it has incentives to smooth consumption across periods. In particular, assume that the objective of the fiscal authority is to maximize

$$U^F = \log(g_0 + \bar{g}) + \beta^f(\log(g_1 + \bar{g}) - \alpha^F d_1) \tag{44}$$

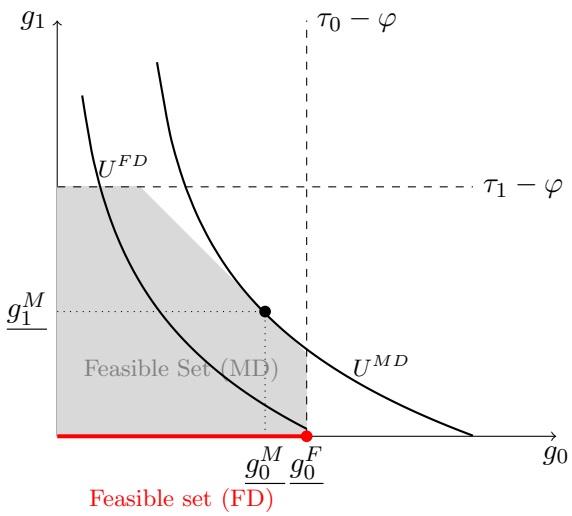
where $\bar{g}$ is an incompressible level of public consumption. The rest of the model is unchanged. Figure 8 shows how the preferences change the equilibrium. Panel (a) presents F's optimal consumption profile when $\varphi \to -\infty$. Different from the baseline model, the monetary dominance case is not a corner solution, since the fiscal authority now has incentives to smooth consumption. However, notice that the consumption profile under fiscal dominance $(g_0^F, 0)$ is outside the feasible set under monetary dominance and gives F higher utility ($U^{FD} > U^{MD}$). Therefore, in this example, F chooses bonds such that it induces an equilibrium under fiscal dominance. Pable (b) illustrates F's optimal consumption profile when φ is large enough such that the fiscal rule binds. The new feasible set under monetary dominance allows for the same consumption basket relative to the case in which the fiscal rule does not bind ($g_1^M = \underline{g_1^M}, g_0^M = \underline{g_0^M}$). On the contrary, the optimal consumption under fiscal dominance does change. In this case, the iso-utility curve U_1^F is lower under fiscal dominance ($U^{FD} < U^{MD}$). Hence, F chooses a consumption basket such that it induces a monetary dominance equilibrium.

Figure 8: Optimal consumption under different fiscal rule scenarios

(a) Fiscal rule does not bind



(b) Fiscal rule binds



Note: The horizontal and vertical axis represent government spending at date-0 and date-1, respectively. The gray area represents the feasible set under monetary dominance while the red solid line represents the feasible set under fiscal dominance. The downward-slopping curves show F's iso-utility curves.

The effect that fiscal rules have in this case is similar to the one in the baseline model: binding fiscal rules make it more likely for the equilibrium to result in monetary dominance, where prices are always on target. All the other effects of fiscal rules summarized in proposition 3 hold.

8 Conclusions

This paper studies the impact of fiscal rules on monetary policy transmission. To do so, I measure high-frequency monetary policy shocks by analyzing changes in forward premia around monetary policy announcements. The findings reveal that, in the absence of fiscal rules, monetary policy tightening in emerging markets typically leads to increased inflation. Conversely, when fiscal rules are in place, inflation decreases, mirroring the patterns observed in advanced economies.

To formalize these empirical results, I extend the framework of Barthélemy et al. (2024) by incorporating fiscal rules. Specifically, I examine scenarios in which fiscal rules either do not bind—analogous to an economy without fiscal rules— and ones in which they bind effectively. The results indicate that the presence of fiscal rules increases the likelihood of achieving a monetary dominance equilibrium, in which higher interest rates lead to lower prices. Moreover, the model shows that under fiscal dominance, an equilibrium can arise in which an interest rate hike by the monetary authority results in higher prices, consistent with the empirical findings. However, when fiscal rules bind, this scenario becomes less likely,

and if it does occur, the resulting price increases are smaller compared to cases without fiscal rules.

These findings have significant policy implications. First, they demonstrate that fiscal rules can enhance the effectiveness of monetary policy by influencing its transmission mechanisms. Second, the results reveal a tangible pathway through which policymakers can increase the likelihood of achieving a monetary dominance regime, which, as noted by Schmitt-Grohé and Uribe (2007), is welfare-enhancing. Finally, the findings underscore the role of fiscal rules as a tool for controlling inflation by diminishing the fiscal authority's incentives to undermine price stability.

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A Appendix

A.1 Data

I collected daily forward and spot exchange rates for 5 emerging economies: Brazil, Chile, Colombia, Mexico, and South Africa from Bloomberg from January 2000 until March 2024. For the same period, I used Break Even Inflation index from Bloomberg for Brazil, Chile, Mexico, and South Africa, and yields of nominal and inflation-indexed government bonds from the Central Bank of Colombia. Finally, I collected the Central Bank's meeting dates from the Central Bank's websites.[12]

For the monthly data, I used CPI and industrial production from IFS-IMF for all the countries in the sample.

Data on fiscal rules comes from the Fiscal Rules dataset of the IMF. Compliance data set is from Ulloa-Suarez and Valencia (2022)

A.2 Compliance Index by Ulloa-Suarez and Valencia (2022)

For each country and corresponding year, the following questions were asked:

1. Does the country have a fiscal rule in place?
2. What is the macroeconomic aggregate it imposes a numerical target?
3. Does the design of the rule include escape clauses?
4. Was the escape clause invoked?
5. To which level of government does the target apply?
6. What is the legal numerical target of the rule?
7. What was the executed value for the corresponding macroeconomic aggregate?
8. Did the executed result meet the target?
9. What was the deviation between the executed value and the target?
10. What were the reasons why the target was not met?

To see more details about the construction of the index of compliance, see Ulloa-Suarez and Valencia (2022)

[12] Thank you to William Witheridge for providing part of this data set.