Staff memo

Monetary–fiscal interactions when Ricardian equivalence fails

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Summary

In this paper, we show that the nature of non-Ricardian behaviour matters for the assessment of monetary–fiscal interactions and for macroeconomic adjustments more generally. Specifically, we show how inflation, output and real government debt—variables central to the analysis of monetary–fiscal interactions—respond when Ricardian equivalence fails. When Ricardian equivalence breaks down because a share of households is liquidity constrained (hand-to-mouth) or because policy operates under fiscal dominance, a clear pattern emerges. Relative to a Ricardian benchmark, a supply shock leads to a stronger inflation response and a weaker output response, while demand shocks generate larger fluctuations in real activity. We further find that real government debt becomes more volatile in economies with hand-to-mouth households, but less volatile under fiscal dominance. Distortionary taxation provides an additional channel through which Ricardian equivalence fails. Under monetary dominance, an increase in the consumption tax tends to reduce core inflation, whereas an increase in the labour-income tax tends to intensify inflationary pressures. In addition, increases in consumption taxes are generally more contractionary for output than equally sized increases in labour-income taxes.

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1 Introduction

The post-pandemic surge in inflation (2021–2023) was a global phenomenon driven by different forces. Textbook intuition points to adverse supply shocks—labour shortages, disrupted logistics, higher trade frictions—and demand shocks, as containment measures during the pandemic constrained production and consumption. When restrictions were lifted, demand rebounded more quickly than supply, creating excess demand and upward pressure on prices.

Monetary and fiscal policies likely amplified these pressures, although the magnitudes are uncertain and varied across countries. Central banks initially underestimated inflation's persistence and tightened less forcefully than standard policy rules would imply. Fiscal policy was highly expansionary and led to large budget deficits, and in many countries sizeable deficits have persisted. As a case in point, global public debt is projected to approach 100 per cent of GDP by 2029, exceeding pre-pandemic levels and reaching heights not seen since the end of the Second World War, see IMF (2025). Looking ahead, several forces are pushing up public expenditure—higher defence outlays, the green transition, infrastructure needs, and demographic pressures—while tax revenues are unlikely to grow at the same pace in the near term.

This raises questions about the future conduct of monetary and fiscal policy. Will inflation revert to the low-inflation regime of the 2010s, or will price pressures re-emerge? Will persistent fiscal deficits be reduced or reversed? And will central banks continue to uphold inflation-targeting frameworks—acting decisively when required—or instead tolerate prolonged deviations from target?

Economists offer different perspectives on these questions. Many adhere to Milton Friedman's dictum that 'inflation is always and everywhere a monetary phenomenon', implying that central banks can maintain price stability through appropriate monetary policy, see Friedman (1956). Eric Leeper, however, argues in a series of influential contributions that this conclusion relies on restrictive assumptions, and that 'inflation is always and everywhere a monetary and fiscal phenomenon', see e.g., Leeper (2023a). Thomas Sargent goes further, stating that 'persistent and high inflation is always and everywhere a fiscal phenomenon', see Sargent (2013).

To remain tractable, models of monetary policy necessarily impose simplifying assumptions. A common assumption is Ricardian equivalence, as in the representative-agent New Keynesian model, see e.g., Clarida et al. (1999) and Galí (2015).[2] In this framework, interest-rate rules alone can deliver inflation and output stabilisation; fiscal policy and the level of public debt are largely irrelevant for monetary outcomes. While analytically useful, this framework has been criticised for, among other things, downplaying monetary–fiscal interactions, see e.g., Leeper (2023a).

When Ricardian equivalence fails, monetary–fiscal interactions become non-trivial. Non-Ricardian policy behaviour can, for example, generate fiscal dominance—a regime

[2] Ricardian equivalence is an economic theory suggesting that financing government spending through debt (deficits) rather than taxes has no effect on aggregate demand, because rational households anticipate future tax increases to pay off the debt and thus save more today.

in which the price level adjusts to stabilise the real value of government liabilities—so that inflation is largely determined by fiscal conditions in equilibrium. Similarly, when a share of households is non-Ricardian (for instance, liquidity-constrained) or when taxes are distortionary, additional debt issuance is no longer neutral. It affects current demand, the allocation of resources, and ultimately inflation dynamics.

This paper examines monetary–fiscal interactions and non-Ricardian behaviour within a standard New Keynesian framework. Although the analysis does not provide new theoretical results, it gives a unified and systematic exposition of monetary–fiscal interactions by using a single framework throughout. The common analytical structure allows the discussion to focus on the economic forces shaping the interaction between monetary and fiscal policy, and to present the relevant intuition in a clear and consistent manner. In this sense, the paper aims to offer a useful point of reference for policymakers at central banks and fiscal authorities, as well as for students and researchers seeking a structured and accessible introduction to the literature.

Because policy interactions depend on the type of disturbance hitting the economy, we distinguish between supply and demand shocks. Supply shocks move inflation and output in opposite directions, creating a monetary policy trade-off between stabilising prices and supporting real activity. Demand shocks, by contrast, move inflation and output in the same direction and therefore do not generate an immediate stabilisation trade-off. In our analysis, the technology shock is classified as a supply shock, while preference, government spending and monetary policy shocks are viewed as demand shocks.

The benchmark framework is a representative-agent New Keynesian model with lump-sum taxes and a regime with monetary dominance, i.e., Ricardian equivalence holds. In this framework, we introduce the following features that break Ricardian equivalence:

1. **Hand-to-mouth (non-Ricardian) households.** These are liquidity-constrained households with limited access to financial markets and can therefore not smooth consumption over time. Hence, they consume current disposable income each period. This breaks Ricardian equivalence, since hand-to-mouth households cannot offset a tax change today by saving or borrowing against future tax changes, creating movements in aggregate demand driven by cash flows.
2. **Fiscal dominance (non-Ricardian policy rules).** A policy configuration in which the finance ministry does not adjust future primary surpluses to stabilise real debt and the price level needs to adjust to ensure government solvency, making inflation fiscally determined in equilibrium. Fiscal dominance breaks Ricardian equivalence because a tax or debt change today is not neutralised by opposite future primary surpluses of equal present value.
3. **Distortionary (non-Ricardian) taxation.** When taxes are proportional (and hence distortionary) rather than lump sum, so-called tax wedges distort behaviour. A debt-financed tax cut today implies higher future tax wedges, preventing households from perfectly offsetting changes in government debt through private saving. This feeds back into current decisions and resource allocation, invalidating Ricardian equivalence.

Introducing a share of hand-to-mouth households into the benchmark model changes shock propagation. Following a positive technology shock, the output response becomes more muted, while the declines in inflation and real government debt are amplified. By contrast, preference, government spending, and monetary policy shocks generate larger declines in inflation, output, and real debt when a sizeable share of households is hand-to-mouth. From a monetary-policy perspective, a given tightening is therefore more contractionary in such an economy, implying that smaller policy-rate adjustments may suffice to stabilise inflation and real activity.

Shock propagation also differs under fiscal dominance. A positive technology shock produces a smaller increase in output, a larger fall in inflation, and lower real-debt variability than under a monetary dominance benchmark. Following a positive government spending shock, both output and inflation rise more under fiscal dominance, while real-debt variability remains lower. A positive preference shock yields a slightly stronger output response, whereas the inflation response is slightly more muted; real-debt variability is again lower. Finally, a positive monetary policy shock (a higher policy rate) is inflationary and largely expansionary under fiscal dominance—a sign reversal relative to monetary dominance—while real debt is more stable.

In the benchmark model, a lump-sum tax is neutral for inflation and real activity. By contrast, a rise in the labour-income tax breaks Ricardian equivalence and is stagflationary: it pushes up inflation while reducing output. With a share of hand-to-mouth households, the qualitative dynamics following a labour-income tax change little, but lump-sum taxes become non-neutral, reducing demand and lowering both inflation and output. Under fiscal dominance, any tax increase—lump sum or labour income—raises the present value of primary surpluses and lowers inflation. With future taxes fixed, it also reduces the lifetime resources of Ricardian households, prompting them to cut consumption and thereby lowering output.

A consumption tax is generally more contractionary than a labour-income tax. Like a labour-income tax, it introduces an intratemporal wedge between the marginal rate of substitution and the marginal product of labour. In addition, by raising the effective price of consumption, it also creates an intertemporal wedge that induces households to defer spending, further weakening inflation and output relative to a labour-income tax increase. With hand-to-mouth households, the qualitative pattern of the consumption tax increase mirrors the benchmark case but is typically more pronounced. Under fiscal dominance, the declines in inflation and output following a consumption-tax increase are stronger than under a labour-income tax.

Real debt follows a common pattern across all three tax shocks. The primary surplus improves on impact, pushing real debt down. Under monetary dominance, tax instruments are subsequently adjusted to bring real debt back to target; under fiscal dominance, debt sustainability is instead achieved through price-level adjustment.

Related literature. The literature on monetary–fiscal interactions is too vast to review here. We thus focus on two seminal contributions that initiated the work on monetary–fiscal interactions and a few recent advances. For comprehensive overviews, see e.g., Cochrane (2023) and Leeper (forthcoming, 2026).

Sargent and Wallace (1981) launched the modern literature on monetary–fiscal interactions and introduced the notion of fiscal dominance. In their monetarist framework, monetary policy is constrained by the government's intertemporal budget. If fiscal policy sets a path of persistent primary deficits without credible tax adjustment in the future, the central bank will ultimately need to create money (seigniorage) to stabilise debt. In that setting, tight monetary policy today can force future monetisation and thus be inflationary tomorrow. The basic message is that inflation control cannot rest on monetary policy alone—a credible inflation target requires fiscal backing, i.e., the finance ministry must pledge to adjust taxes or spending to ensure long-term debt sustainability.

A simplifying assumption in the Sargent-Wallace framework is that government debt is real (fully indexed to inflation). Leeper (1991) relaxes this assumption and considers an environment with nominal government debt and, in line with current practice, assumes monetary policy follows an interest-rate rule rather than a money-growth rule. He shows that inflation and the price level are determined by the policy mix—in his classification, whether monetary and fiscal authorities are active or passive in stabilising inflation and government debt. With active monetary and passive fiscal policy, a sufficiently strong interest-rate response to inflation delivers a unique equilibrium while fiscal policy adjusts primary surpluses to stabilise debt. With active fiscal and passive monetary policy, fiscal behaviour does not stabilise debt, but the price level adjusts to satisfy the government budget constraint. The remaining combinations (active/active or passive/passive) generate indeterminacy or instability.

In more recent advances, Rachel and Ravn (2025) analyse monetary–fiscal interactions in a New Keynesian setting with finite planning horizons, which is another mechanism through which Ricardian equivalence is broken. As in our hand-to-mouth framework, the timing of spending, taxes and the debt path shape household behaviour and real activity. Their emphasis is on existence and uniqueness conditions. Despite the different focus relative to our paper, the policy message lines up: the two policy domains are interdependent.

Bianchi et al. (2023) study monetary–fiscal interactions in a two-agent New Keynesian model that allows monetary and fiscal dominance to co-exist by assigning shock-specific policy rules to each authority. In their set-up, some fiscal shocks—transfers—are unfunded, implying fiscal dominance, while others are funded, preserving monetary dominance. This offers a tractable alternative to modelling discrete regime switches between the two regimes. Applied to US data, they conclude that 'fiscal inflation accounts for the bulk of inflation dynamics', underscoring that the financing of fiscal disturbances—not just their size—shapes inflation outcomes.

Kaplan (2025) surveys how household heterogeneity in heterogeneous-agent New Keynesian models shapes monetary–fiscal interactions. Among other things, he shows how shifts in fiscal policy can, under certain conditions, move the long-run real interest rate. In such cases, a central bank must either adjust the long-run nominal policy rate to remain consistent with a given inflation target or reconsider the target itself. Heterogeneous-agent models also strengthen the case that disinflation often requires joint tightening: contractionary monetary policy is more effective when paired with

contractionary fiscal policy. Moreover, heterogeneity modifies the joint determinacy conditions on monetary and fiscal rules—a point also made by Rachel and Ravn (2025).

Finally, Bergholt et al. (2025) study an open-economy environment in which the policy rate and government spending are jointly set to minimise variability in inflation and the output gap. Their benchmark model assumes monetary dominance and Ricardian equivalence. They show that whether monetary and fiscal policy should move in the same or opposite directions depends on the nature of the shock and on prevailing policy constraints. Notably, introducing non-Ricardian households does not overturn their main conclusions. Their results support a counter-cyclical fiscal stance to dampen variability in inflation and the output gap. More broadly, the analysis underscores that inflation and output are jointly determined by monetary and fiscal policy, rather than by monetary policy alone.

The remainder of the paper is organised as follows. Section 2 sets out the model and calibration, sections 3–5 present the quantitative analysis, and section 6 concludes.

2 Model

The economic environment comprises households, firms, a government (public) sector, and a set of exogenous shock processes. The model is closely related to Galí et al. (2004) and Galí (2015). The main difference is that, instead of assuming Calvo pricing, prices are subject to Rotemberg-style adjustment costs, see Rotemberg (1982).

Households. There are two household types—Ricardian (superscript R) and non-Ricardian or hand-to-mouth (superscript HtM). Ricardian households have access to financial markets, save by holding government bonds, and can therefore smooth consumption over time. Hand-to-mouth households lack access to financial markets and government bonds. Consequently, they consume their entire disposable income each period.

A representative Ricardian household experiences utility from consumption c, disutility from hours worked h, and maximises utility over the infinite horizon,

$$\mathbb{E}_t \sum_{t=0}^{\infty} \beta^t \mu_t \left[\log c_t^R - \chi \frac{(h_t^R)^{1+1/\phi}}{1+1/\phi} \right],$$

where $\mathbb{E}$ denotes the expectation operator, β the subjective discount factor of current and future utility, χ a scaling parameter, ϕ the Frisch elasticity, and μ an exogenous preference shock.

The Ricardian households are subject to the following nominal budget constraint,

$$(1+\tau_t^c) P_t c_t^R + B_t^R + P_t \tau_t^{ls} = \left(1-\tau_t^h\right) W_t h_t^R + R_{t-1} B_{t-1}^R + D_t^R,$$

where P denotes the price level, W the nominal wage rate, B^R a risk-free one-period nominal government discount bond, R the policy rate, τ^{ls}, τ^h, and τ^c lump-sum, labour-income, and consumption taxes, respectively, and D^R dividends from

intermediate producing firms.[3] By defining a stochastic discount factor, which converts future real resources to present values, as $\mathcal{M}_{t+1} \equiv \beta \mathcal{U}'_{c^R_{t,t+1}} / \mathcal{U}'_{c^R_{t,t}}$ where $\mathcal{U}$ denotes the period utility function and the gross inflation rate as $\pi_t \equiv P_t / P_{t-1}$, the household's optimality conditions can be summarised as follows,

$$w_t = -\frac{\mathcal{U}'_{h^R_t}}{\mathcal{U}'_{c^R_{t,t}}} \frac{1+\tau^c_t}{1-\tau^h_t},$$

$$R_t = \mathbb{E}_t \left[\frac{\pi_{t+1}}{\mathcal{M}_{t+1}} \frac{1+\tau^c_{t+1}}{1+\tau^c_t} \right],$$

where the first (intratemporal) condition equates the real wage to the marginal rate of substitution between consumption and hours worked, after accounting for labour-income and consumption taxes. The second (intertemporal) condition is a consumption-tax-adjusted Fisher relation. It links the nominal policy rate to expected inflation and the real interest rate, with the latter given by the inverse of the stochastic discount factor.

The representative hand-to-mouth household also experiences utility from consumption, disutility from hours worked, and maximises utility over the infinite horizon,

$$\mathbb{E}_t \sum_{t=0}^{\infty} \beta^t \mu_t \left(\log c^{HtM}_t - \chi \frac{(h^{HtM}_t)^{1+1/\phi}}{1+1/\phi} \right),$$

subject to the following nominal budget constraint,

$$(1+\tau^c_t) P_t c^{HtM}_t + P_t \tau^{ls}_t = (1-\tau^h_t) W_t h^{HtM}_t.$$

The (intratemporal) optimality condition for hand-to-mouth households has the same representation as for Ricardian households,

$$w_t = -\frac{\mathcal{U}'_{h^{HtM}_t}}{\mathcal{U}'_{c^{HtM}_t}} \frac{1+\tau^c_t}{1-\tau^h_t}.$$

Firms. Production operates at two levels. At the aggregate level, final-good firms aggregate a continuum of differentiated intermediate inputs into a single final good. The final good is allocated across private consumption, government spending, and the resource costs associated with price adjustment. These firms are profit-maximising price-takers in perfectly competitive markets and employ a constant-elasticity-of-substitution technology to combine intermediate varieties indexed by $i \in (0,1)$ into the composite final good,

$$y_t = \left(\int_0^1 (y_{i,t})^{\frac{\eta-1}{\eta}} di \right)^{\frac{\eta}{\eta-1}},$$

[3] In general, uppercase letters denote nominal variables, while lowercase letters denote real variables. A variable without a time subscript denotes a steady state value.

where y is the final good, y_i intermediate goods, and $\eta > 1$ the elasticity of substitution between intermediate goods. The firm's optimality condition gives the demand for each intermediate good i,

$$y_{i,t} = \left(\frac{P_{i,t}}{P_t}\right)^{\eta} y_t,$$

where P_i is the price of the intermediate good and the price index P is given by,

$$P_t = \left[\int_0^1 (P_{i,t})^{\frac{\eta}{\eta-1}} di\right]^{\frac{\eta-1}{\eta}}.$$

At the intermediate level, intermediate-goods firms produce the differentiated inputs used by final-good firms. They operate under monopolistic competition and face price-adjustment costs that generate standard New Keynesian nominal rigidities. Each firm has access to a constant-returns-to-scale production technology, denoted $\mathcal{F}$,

$$y_{i,t} = \mathcal{F}(z_t, h_{i,t}) = z_t h_{i,t},$$

where z is an exogenous technology shock. Profits are maximised subject to the downward sloping demand function of the final good and quadratic price adjustment costs $\mathbb{C}$,

$$\mathbb{C}_{i,t} = \frac{\kappa}{2}\left(\frac{P_{i,t}}{P_{i,t-1}} - \pi\right)^2 y_t.$$

where κ is a parameter determining the cost of adjusting a price. The aggregate optimality conditions can be summarised as follows,

$$mc_t = \frac{w_t}{\mathcal{F}'_{h_t}},$$

$$mc_t = \frac{\eta - 1}{\eta} + \frac{\kappa}{\eta}(\pi_t - \pi)\pi_t - \frac{\kappa}{\eta}\mathbb{E}_t\left[\mathcal{M}_{t+1}(\pi_{t+1} - \pi)\pi_{t+1}\frac{y_{t+1}}{y_t}\right],$$

where mc denotes real marginal costs. The first condition shows how real marginal costs create a wedge between the real wage and the marginal product of labour. The second condition characterises the evolution of real marginal costs over time. This condition is sometimes interpreted as a Phillips curve, demonstrating how real economic factors and expected inflation influence current inflation.

Government (public) sector. The government sector comprises a finance ministry, responsible for taxation, public spending, and debt management, and a central bank, responsible for monetary policy, implemented by setting the short-term nominal interest rate (the policy rate). The nominal government budget constraint is given by:

$$P_t s_t + B_t = R_{t-1} B_{t-1},$$

where $s_t \equiv \mathrm{T}_t - g_t$ is the primary surplus defined as tax income T minus government spending g, which follows an exogenous shock process. Tax income includes incomes from both Ricardian and hand-to-mouth households,

$$\mathrm{T}_t = (1-\omega)\left(\tau_t^{ls} + \tau_t^c c_t^R + \tau_t^h w_t h_t^R\right) + \omega\left(\tau_t^{ls} + \tau_t^c c_t^{HtM} + \tau_t^h w_t h_t^{KtM}\right),$$

where ω is a parameter denoting the share of hand-to-mouth households. The finance ministry follows a fiscal rule,

$$\boldsymbol{\tau}_t = \boldsymbol{\tau}\left(\frac{b_{t-1}}{b}\right)^{\psi_b} f_t,$$

where the vector $\boldsymbol{\tau} = [\tau^{ls}, \tau^h, \tau^c]^{\mathrm{T}}$, $b_{t-1} \equiv B_{t-1}/P_{t-1}$ is real government debt, ψ_b is a parameter determining how aggressive the finance ministry is stabilising debt, and f is an exogenous fiscal rule shock—interpreted as a lump-sum, labour-income, or consumption tax shock depending on which tax is assumed to finance government expenditures.

The central bank follows a monetary rule,

$$R_t = R\left(\frac{\pi_t}{\pi}\right)^{\omega_\pi} m_t,$$

where ω_π is a parameter determining how aggressive the central bank is responding to deviations from the inflation target and m is a monetary policy shock.

Exogenous shock processes. Each exogenous shock follows an AR(1) process,

$$\boldsymbol{x}_t = \boldsymbol{x}^{(1-\rho)}\boldsymbol{x}_{t-1}^{\rho} e^{\varepsilon_t}, \quad \varepsilon_t \sim N(0, \Sigma),$$

where the vector $\boldsymbol{x} = [z, \mu, m, g, f]^{\mathrm{T}}$ contains the exogenous shocks, ρ denotes the persistence of respective shock (same for all shocks), and the covariance matrix Σ is given by the identity matrix.

Market clearing. We ensure the following market clearing conditions hold in equilibrium,

$$\mathrm{c}_t = (1-\omega)c_t^R + \omega c_t^{HtM},$$

$$h_t = (1-\omega)h_t^R + \omega h_t^{HtM},$$

$$b_t = (1-\omega)b_t^R,$$

$$d_t = (1-\omega)d_t^R,$$

$$y_t = c_t + g_t + \mathbb{C}_t.$$

Calibration. The model is not tailored to any specific economy. We adopt standard values from the literature to keep results broadly applicable. Time is quarterly. The discount factor β is set to 0.995, implying a long-run annualised real interest rate of about 2 per cent. The elasticity of substitution across intermediate goods η is set to 5, yielding

a steady-state price mark-up of roughly 25 per cent, see e.g., Jonsson (2007) and references therein. Micro-evidence suggests average price durations of 3–4 quarters, see e.g., Nakamura and Steinsson (2008). In the linearised Rotemberg representation, this corresponds to a price-adjustment cost parameter κ of approximately 59. The utility scaling parameter on hours χ is chosen so that households work about 30 per cent of their time in steady state (set to 12), and the Frisch elasticity ϕ is set to 1, consistent with evidence in e.g., Peterman (2016). We set the share of hand-to-mouth households ω to 30 per cent, see, e.g., Kaplan et al. (2014).

The inflation target is 2 per cent in all simulations. We set long-run government spending at 20 per cent of GDP and an annual debt-to-GDP ratio of about 100 per cent in steady state. All shock processes follow AR(1) dynamics with persistence 0.5, striking a balance between transitory and highly persistent disturbances.

We distinguish between Ricardian and non-Ricardian monetary and fiscal rules. Under Ricardian rules, the weights on inflation stabilisation in the monetary rule and on debt stabilisation in the fiscal rule are both set to 1.5—implying monetary dominance. With non-Ricardian rules, these parameters are set to zero—implying fiscal dominance.

In section 3 and 4, we compare impulse responses from supply and demand shocks in a benchmark Ricardian equivalence model with two non-Ricardian economic environments:

1. **Benchmark model:** Representative-agent New Keynesian model. Lump-sum taxes and a regime under monetary dominance.

2. **Hand-to-mouth model:** A share of hand-to-mouth households. Lump-sum taxes and a regime under monetary dominance.

3. **Fiscal dominance model:** Representative-agent New Keynesian model. Lump-sum taxes and a regime under fiscal dominance.

In section 5, we contrast lump-tax shocks with distortionary tax shocks (labour-income and consumption taxes) in the same three economic environments.

3 Hand-to-mouth (non-Ricardian) households

Introducing a share of hand-to-mouth households into the benchmark model breaks Ricardian equivalence. Under Ricardian equivalence, a change in lump-sum taxes today that is offset by the opposite change in future taxes does not affect current consumption for forward-looking households, because they can undo the timing effect through saving or dissaving. They save a tax cut (or dissave to pay a tax increase), leaving consumption—and thus aggregate demand—unchanged. Hand-to-mouth households cannot use saving and borrowing to smooth consumption in response to temporary income changes. Their consumption therefore tracks current disposable income one-for-one—implying a marginal propensity to consume of one. A lump-sum tax increase consequently reduces their consumption with the decline in disposable income, undermining

Ricardian equivalence. In essence, Ricardian equivalence is an intertemporal neutrality result. Once a share of households cannot adjust consumption intertemporally, that neutrality breaks.

Models with a share of hand-to-mouth households combine elements of traditional Keynesian models—where the marginal propensity to consume is central—with New Keynesian mechanisms that operate through intertemporal substitution. This has implications for the interaction between monetary and fiscal policy and for how the economy responds to shocks. In particular, the standard New Keynesian demand channel is amplified: changes in demand translate more strongly into hours worked, wages, marginal costs, and inflation.

In this section, we examine how inflation, output, and real debt—variables of principal interest for monetary and fiscal policy—are affected by supply and demand shocks when Ricardian equivalence fails due to the presence of hand-to-mouth households. We consider a technology (supply) shock and three demand shocks—preference, government spending, and monetary policy—and a monetary dominance regime. Figure 1 reports the impulse responses to the technology shock, while Figure 2 reports the responses to the demand shocks.

3.1 Supply shock

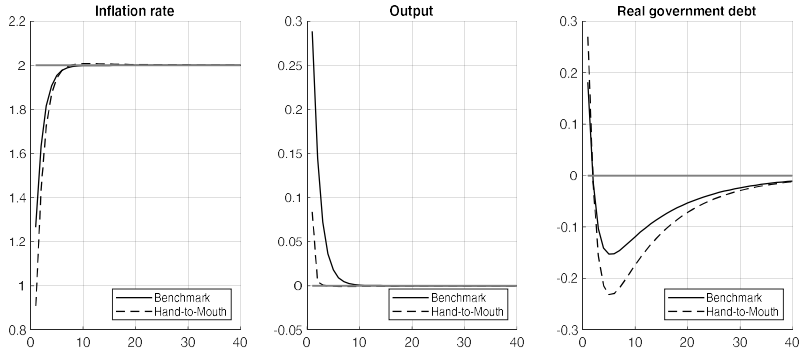
A positive **technology** shock raises the economy's productive capacity. It increases the marginal product of labour and, equivalently, reduces the marginal cost of producing a given unit of output. Two implications follow. First, firms can produce more with a given labour input, which supports higher output. Second, with sticky prices lower real marginal costs put downward pressure on inflation. Monetary policy reinforces the adjustment by lowering the policy rate as inflation declines, reducing real interest rates and providing additional support to aggregate demand. Real debt increases on impact because lower inflation raises the real value of nominal liabilities. Thereafter, the adjustment is shaped by lower debt-servicing costs as real rates decline, providing downward pressure on real debt, allowing lump-sum taxes to be reduced to bring real debt back to its long-run level.

Introducing a share of hand-to-mouth households alters these dynamics. Inflation falls by more while the increase in output is dampened. The dampening is driven by the behaviour of hand-to-mouth households, whose consumption equals current disposable income. Following the technology improvement, firms reduce labour input and real wages decline. At the same time, the initial rise in real debt triggered by disinflation induces an increase in lump-sum taxes. The combination of weaker labour-income and higher lump-sum taxes reduces disposable income, and consumption falls one-for-one. This further weakens demand and puts additional downward pressure on wages and labour income. The drop in hand-to-mouth spending is sufficiently pronounced to pull down aggregate consumption—a weighted average of Ricardian and hand-to-mouth consumption—and thereby dampening output.

The larger decline in real wages and the weaker demand in the hand-to-mouth economy reduce marginal costs more strongly than in the benchmark model, amplifying

disinflation. Real debt therefore rises by more on impact, reflecting the stronger fall in inflation. Over subsequent periods, real debt also falls by more, as lower real rates reduce debt-servicing costs. The fiscal rule induces even lower lump-sum taxes, bringing real debt back to steady state.

Figure 1. Positive technology shock in benchmark and hand-to-mouth models
Per cent



Note. Output and real debt are expressed as percentage deviations from their steady state.

3.2 Demand shocks

The positive **preference** shock operates primarily as an intertemporal demand disturbance. Because the shock scales both the marginal utility of consumption and the marginal disutility of labour, it does not directly shift the intratemporal trade-off between consumption and labour. Instead, it affects the intertemporal optimality condition by increasing the value of utility today relative to tomorrow. Households therefore seek to increase current consumption. The resulting increase in demand generates a positive output gap. Firms meet stronger demand by expanding labour input, which raises real wages and, under sticky prices, increases real marginal costs, pushing inflation up. Monetary policy responds to higher inflation by increasing the policy rate, which dampens the demand expansion.

Introducing a share of hand-to-mouth households leaves the qualitative responses largely unchanged but strengthens the expansionary effect. Because hand-to-mouth households consume the current disposable income, the rise in labour income associated with higher activity translates into higher consumption. This amplifies the initial increase in demand, leading to larger increases in output and inflation than in the benchmark model.

On impact, higher inflation erodes the real value of outstanding nominal liabilities, so real debt initially falls. Over subsequent periods, the higher policy rate increases debt-servicing costs, putting upward pressure on real debt. To stabilise real debt around its long-run target, lump-sum taxes rise in line with the fiscal rule, ensuring convergence back to steady state.

A positive **government spending** shock raises aggregate demand mechanically through the resource constraint, pushing output up on impact. With sticky prices, higher activity

increases marginal costs and inflation. Monetary policy responds by raising the policy rate as inflation rises. This tightening partly offsets the fiscal expansion by increasing real interest rates and crowding out private consumption. In the benchmark model, crowding out is relatively strong because consumption is more sensitive to higher real rates and households internalise the future tax burden implied by higher public spending. These mechanisms dampen the overall increases in output and inflation.

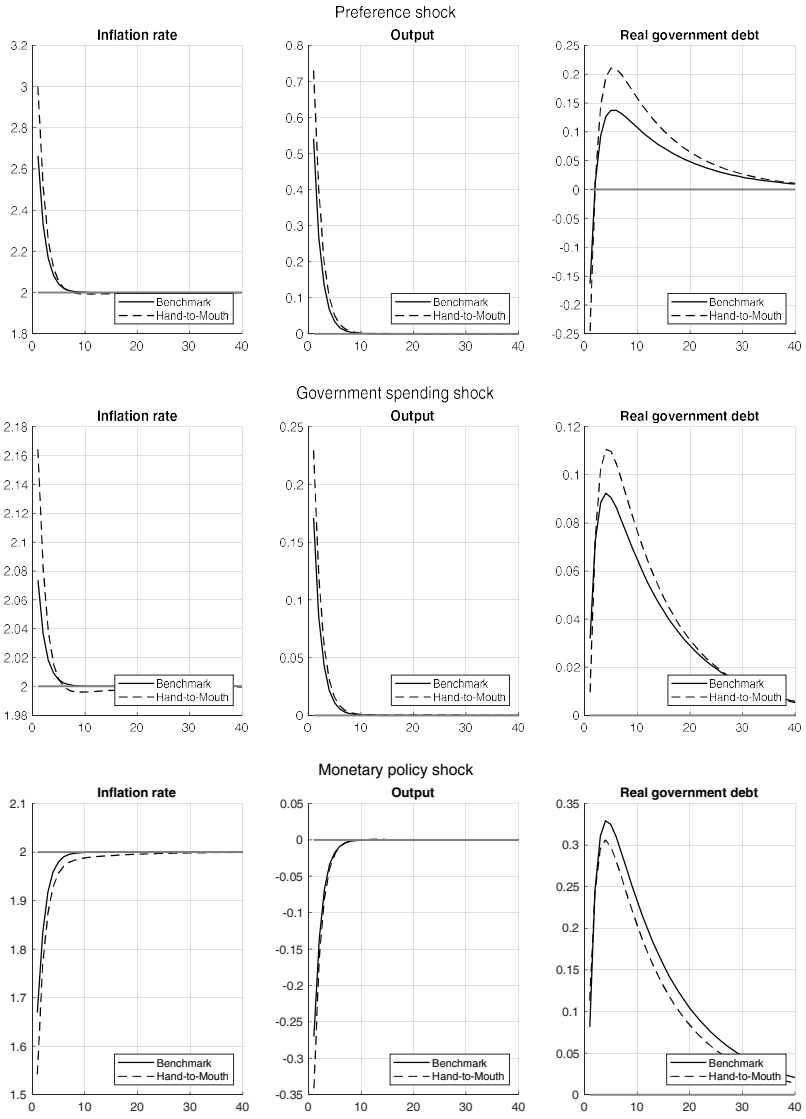
Introducing hand-to-mouth households strengthens propagation. Hand-to-mouth households consume current disposable income and therefore respond directly to changes in labour income and taxes. When government spending raises activity and real wages, disposable income for hand-to-mouth households tends to rise—even if partly offset by higher lump-sum taxes—leading to higher consumption. This income-driven demand component offsets part of the interest rate crowding-out that operates through intertemporal substitution for Ricardian households. The result is a larger fiscal multiplier, with stronger increases in output and inflation than in the benchmark model.

Real debt dynamics reflect the interaction of the primary surplus, inflation-based revaluation of nominal liabilities, and debt-service costs. Because lump-sum taxes do not adjust sufficiently on impact to finance the spending increase, real debt rises initially in both models. However, with hand-to-mouth households inflation increases by more, so the real value of outstanding nominal debt is eroded more strongly, muting the impact increase in real debt relative to the benchmark model. Beyond the impact period, stronger monetary tightening in the hand-to-mouth economy raises debt-servicing costs, contributing to a sharper medium-term increase in real debt. The fiscal rule then responds more forcefully as debt moves above target. This adjustment is especially contractionary in the hand-to-mouth economy because higher lump-sum taxes translate directly into lower disposable income and consumption.

In the benchmark model, a positive **monetary policy** shock raises the policy rate and the real interest rate on impact and induces households to postpone spending. Aggregate demand contracts and the output gap turns negative. Lower production reduces labour demand, so hours worked fall. Given the assumed preferences—log utility in consumption and convex disutility of labour—the real wage is increasing in both consumption and hours. As both decline in the contraction, the real wage falls, and real marginal costs decline with the real wage. With sticky prices, inflation co-moves with real marginal costs, so inflation also falls.

Introducing hand-to-mouth households amplifies the contraction in output and inflation. While hand-to-mouth households do not adjust consumption directly in response to real interest rates, their spending reacts strongly to changes in current labour income. When monetary tightening reduces output and labour demand, disposable income declines and hand-to-mouth consumption falls. This income-driven response reinforces the contraction generated by Ricardian households and is sufficiently strong that the declines in aggregate output and inflation are larger than in the benchmark model.

Figure 2. Positive demand shocks in benchmark and hand-to-mouth models
Per cent



Note. Output and real debt are expressed as percentage deviations from their steady state.

The disinflation induced by monetary tightening raises the real value of outstanding nominal liabilities on impact, so real debt increases in both models. Higher real interest rates also feed into debt-servicing costs, adding further upward pressure on real debt. Over time, lump-sum taxes rise in response to deviations of real debt from target, ensuring that real debt stabilises and converges back to its long-run level.

4 Fiscal dominance (non-Ricardian policy rules)

Fiscal dominance undermines Ricardian equivalence because it breaks the key assumption that the government's intertemporal budget constraint is validated through future primary surpluses that households can anticipate and offset. Under Ricardian equivalence, a lump-sum tax cut today implies higher lump-sum taxes tomorrow (and vice versa), leaving households perceived lifetime resources unchanged and therefore limiting the impact on aggregate demand. Under fiscal dominance, however, fiscal instruments—taxes and spending—do not adjust endogenously to stabilise debt. As a result, a tax change is no longer primarily a shift in timing. It changes the expected present value of primary surpluses and therefore alters households perceived wealth and spending decisions.

This has direct implications for monetary–fiscal interactions. Under monetary dominance, the central bank provides the nominal anchor. Monetary policy reacts sufficiently strongly to inflation—characterised by a Taylor rule with an inflation coefficient above one—so that inflation expectations remain well anchored. Fiscal policy, in turn, adjusts taxes and/or spending through a fiscal rule to ensure debt sustainability given the inflation path implied by monetary policy. In this regime, the price level is largely governed by monetary policy.

Under fiscal dominance, the roles are reversed. Fiscal policy is effectively exogenous or only weakly responsive to debt—for example, taxes do not rise when debt increases—so the adjustment required to satisfy the government's intertemporal budget constraint cannot come from future primary surpluses. Instead, equilibrium requires the price level to adjust, often immediately, to revalue nominal government liabilities so that the real value of debt is consistent with the expected present value of primary surpluses. Monetary policy is 'passive' in the sense that it does not provide a firm nominal anchor, i.e., it does not raise interest rates sufficiently to stabilise inflation. In this regime, the price level becomes a residual that ensures government solvency. A monetary tightening can thus be inflationary if it increases debt-servicing costs without a compensating fiscal response, thereby necessitating a higher price level to restore solvency.

To summarise, monetary dominance and fiscal dominance are two ways of describing which policy authority ultimately determines the price level and, closely related, which authority adjusts to ensure that the government's intertemporal budget constraint is satisfied. Under monetary dominance, fiscal policy adjusts to be consistent with monetary policy's inflation objective, while under fiscal dominance, monetary policy adjusts to accommodate the fiscal path, implying that the price level needs to adjust to ensure government solvency.

In this section, we show how inflation, output, and real debt, variables central for assessing monetary and fiscal policy interactions, are affected by supply and demand shocks when Ricardian equivalence fails. We examine a technology (supply) shock and three demand shocks: preference, government spending, and monetary policy. Figure

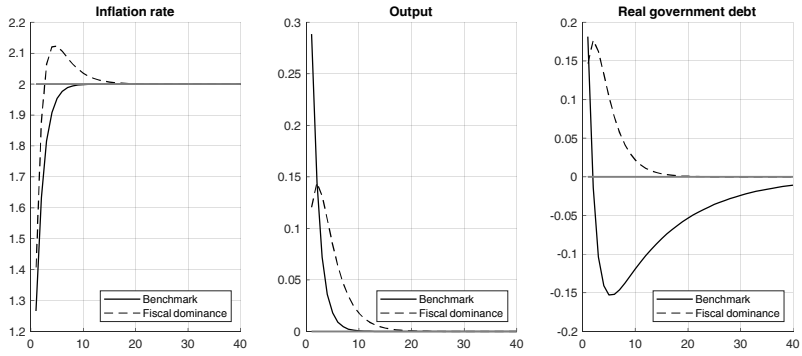
3 reports the impulse responses to the technology shock, while Figure 4 reports the impulse responses to the demand shocks.

4.1 Supply shock

A positive **technology** shock reduces real marginal costs and inflation tends to fall on impact. Under monetary dominance, the central bank stabilises inflation and responds by lowering the policy rate, which mitigates the disinflation. Output rises as productivity improves, and the associated monetary easing supports demand, strengthening the expansion relative to a passive-policy counterfactual. With lump-sum taxation, the primary surplus does not automatically improve as output rises, so real debt dynamics are shaped mainly by inflation-based valuation effects, debt-service costs, and the fiscal rule for lump-sum taxes. On impact, lower inflation raises the real value of outstanding nominal liabilities, pushing real debt up. As policy easing reduces real debt-servicing costs, real debt subsequently declines and undershoots its long-run level, with lump-sum taxes adjusting to return real debt to target.

Under fiscal dominance, the price level adjusts to satisfy the government's intertemporal budget constraint given an exogenous fiscal path. The technology shock still lowers marginal costs, so the immediate impulse is disinflationary. However, monetary policy does not offset the disinflation. With the nominal policy rate held fixed, lower inflation implies a higher real interest rate, which dampens demand and therefore weakens the output response relative to monetary dominance. Real debt rises on impact because disinflation increases the real value of nominal liabilities. As the shock unwinds, the price level must rise—implying temporarily higher inflation—to erode the real value of nominal debt and re-establish the long-run real debt position.

Figure 3. Positive technology shock in benchmark and fiscal dominance models
Per cent



Note. Output and real debt are expressed as percentage deviations from their steady state.

4.2 Demand shocks

A positive **preference** shock operates primarily as an intertemporal demand disturbance. It increases households' willingness to increase current consumption, raising current aggregate demand. Firms accommodate stronger demand by increasing labour

input, so output rises, and marginal costs increase, putting upward pressure on inflation. Given the shock's moderate persistence, these effects are strongest on impact and fade relatively quickly.

Under monetary dominance, the central bank responds to higher inflation by increasing the policy rate. This raises real interest rates and dampens aggregate demand, thereby moderating both the inflation response and the output expansion. Real debt is shaped by offsetting forces. Higher inflation raises the price level and reduces the real value of outstanding nominal liabilities on impact, while higher real interest rates increase debt-servicing costs and place upward pressure on real debt over time. Lump-sum taxes adjust to stabilise real debt and ensure convergence back to its long-run target.

Under fiscal dominance, with the nominal policy rate held fixed, the preference shock becomes more expansionary. Because the policy rate does not adjust, higher inflation and expected inflation lower the real interest rate mechanically, further stimulating current consumption and reinforcing the demand expansion. For real debt, the valuation channel is central. The higher price level erodes the real value of nominal debt on impact. Since taxes do not adjust endogenously to debt in this regime, the return to the long-run real debt position occurs through adjustments of the price level. This typically requires inflation to run below its long-run level for a time after the initial increase, gradually closing the debt gap. With real interest rates moving less under fiscal dominance, debt-servicing costs also fluctuate less, so medium-run debt dynamics are driven primarily by inflation-based revaluation.

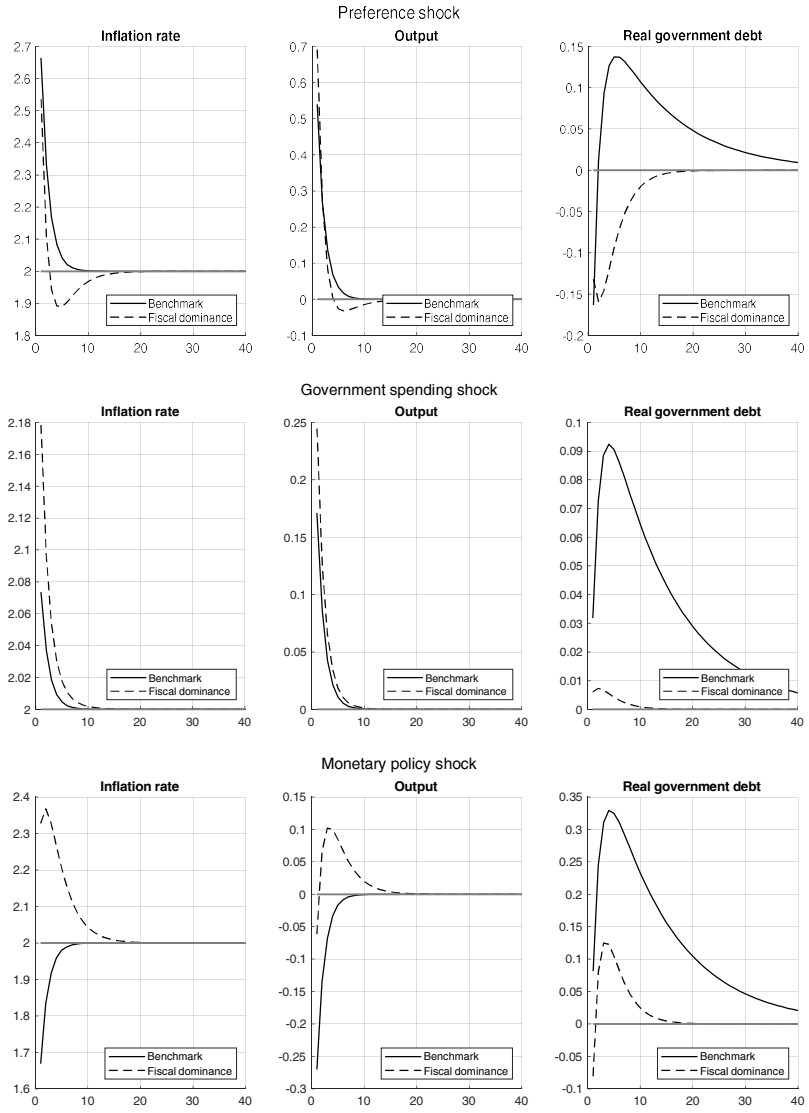
A positive **government spending** shock raises aggregate demand directly, increasing hours worked and lifting output on impact. Stronger demand puts upward pressure on real wages and real marginal costs, so inflation also rises.

Under monetary dominance, the central bank responds to higher inflation by increasing the policy rate, which dampens aggregate demand and limits both the rise in inflation and the expansion in output. Real debt is shaped by offsetting forces. Higher government spending worsens the primary surplus on impact, raising borrowing needs and pushing real debt up. Tighter monetary policy increases debt-servicing costs, reinforcing upward pressure on real debt over time. At the same time, higher inflation raises the price level and mechanically reduces the real value of outstanding nominal liabilities, partially offsetting the debt increase. As the shock unwinds, fiscal policy adjusts lump-sum taxes in line with the fiscal rule to stabilise real debt and ensure convergence back to target.

Under fiscal dominance, higher government spending reduces current and expected primary surpluses. With taxes not adjusting endogenously to stabilise real debt, government solvency is restored primarily through the price level. Weaker fiscal backing therefore requires a higher price level, which reduces the real value of outstanding nominal liabilities. The spending shock is thus inflationary, and often more so than under monetary dominance because monetary policy does not respond to inflation. Output effects are also stronger. Government spending directly raises demand, and with the nominal policy rate held fixed, higher inflation lowers the real interest rate and further stimulates private consumption. In addition, higher deficits are not offset by future

tax increases, so households perceive higher net wealth and raise consumption, mitigating crowding-out and amplifying the expansion. Real debt is again pulled in opposite directions: weaker primary surpluses raise nominal debt issuance, while the higher price level reduces the real value of nominal liabilities. In our calibration, these effects largely offset, leaving a modest net change in real debt.

Figure 4. Positive demand shocks in benchmark and fiscal dominance models
Per cent



Note. Output and real debt are expressed as percentage deviations from their steady state.

A positive **monetary policy** shock is disinflationary and contractionary under monetary dominance. A higher policy rate raises the real interest rate in the presence of sticky prices, weakening consumption and aggregate demand. Lower demand reduces labour input, so hours worked and output fall. Inflation declines on impact as real marginal costs fall, and then gradually returns towards target as the shock unwinds and policy normalises. Real debt dynamics reflect both valuation and flow effects. Disinflation

raises the real value of outstanding nominal liabilities, pushing real debt up on impact. In addition, the higher policy rate increases debt-servicing costs under short-maturity debt, adding further upward pressure on real debt. Lump-sum taxes adjust in response to deviations of real debt from target, ensuring that real debt is stabilised and converges back to its long-run level.

Under fiscal dominance, a monetary tightening can generate markedly different price and output dynamics. With primary surpluses effectively exogenous, the government's intertemporal budget constraint is satisfied through movements in the price level rather than through future fiscal adjustment. A higher policy rate increases the government's financing burden by raising debt-servicing costs and therefore tends to raise real debt. Restoring solvency then requires a rise in the price level to reduce the real value of nominal liabilities, implying higher inflation rather than disinflation. In this regime, the inflationary adjustment occurs because the fiscal stance is not altered to validate higher real debt. Instead, the price level moves to stabilise the real value of government liabilities.

The output response under fiscal dominance is typically weaker than under monetary dominance and can even become expansionary. The policy rate increase raises interest income on government debt hold by households, providing a positive cash-flow and wealth effect that supports consumption. Moreover, as inflation expectations rise, the real interest rate can decline despite the higher nominal policy rate. Following an initial increase in real rates, expected inflation reduces real rates and stimulates spending, reinforcing demand and amplifying the expansion in output.

5 Distortionary (non-Ricardian) taxation

In the benchmark model, Ricardian equivalence prevails because fiscal revenues are represented by lump-sum taxation. This provides a useful reference point: the government can raise revenue without changing relative prices or distorting the incentives faced by households and firms. Households offset changes in lump-sum taxes through saving or dissaving, leaving aggregate demand unchanged. Once Ricardian equivalence fails—because, for example, a share of households is hand-to-mouth or fiscal dominance emerges—lump-sum taxes can have real effects and influence aggregate demand. However, most public revenue is not raised through lump-sum taxes but through proportional—and therefore distortionary—taxes on labour and capital income, corporate profits, and consumption. Such taxes also break Ricardian equivalence and affect aggregate demand by reducing economic efficiency.

This section examines how positive shocks to lump-sum, labour-income, and consumption taxes—implemented as innovations to the fiscal rule—shape the interaction between monetary and fiscal policy. Labour-income and consumption taxes break Ricardian equivalence as they affect private incentives by introducing wedges (inefficiencies) into households' and firms' optimality conditions. A labour-income tax creates an intratemporal wedge between the marginal product of labour, which governs firms' willingness to pay for labour, and the marginal rate of substitution between labour and

consumption, which governs households' willingness to supply labour.[4] When the labour-income tax increases, the after-tax return to work falls, so households require a higher pre-tax wage to supply a given amount of labour. In a sticky-price environment, this raises real marginal costs and strengthens inflationary pressure.

A consumption tax creates an analogous intratemporal wedge by raising the effective price of consumption relative to leisure, weakening labour supply incentives in much the same way as a labour-income tax. However, a consumption tax also introduces an intertemporal wedge by altering the relative price of consuming today versus tomorrow. If a tax increase is anticipated, households have an incentive to increase current consumption to avoid higher taxation later; conversely, an anticipated tax cut encourages households to postpone spending. Temporary or pre-announced changes in consumption taxes can therefore generate larger short-run demand effects than similarly sized changes in labour-income taxes.

Figure 5 reports impulse responses to lump-sum, labour-income and consumption tax shocks. We focus on inflation, output, and real debt—key variables for assessing monetary–fiscal interactions—across three environments: the benchmark, hand-to-mouth, and fiscal dominance models.

In the benchmark model, an increase in the lump-sum tax does not affect households' marginal decisions, so inflation and real activity are unchanged. Real debt, however, adjusts mechanically. The initial tax increase reduces real debt, after which the lump-sum tax is gradually lowered—consistent with the fiscal rule—to return real debt to its long-run target.

A rise in the labour-income tax, by contrast, weakens labour supply incentives and reduces hours worked, so output falls on impact. Because the tax increase is temporary, the initial contraction is modest. As the tax rate subsequently declines—and temporarily undershoots its long-run level—distortions unwind, labour input recovers, and output briefly turns positive before normalising. At the same time, the higher labour-income tax raises firms' marginal costs, putting upward pressure on inflation. Monetary policy responds by increasing the policy rate to contain inflation, which reinforces the short-run decline in output.

An increase in the consumption tax is more contractionary. It creates a similar intratemporal wedge as the labour-income tax. In addition, by raising the effective price of consumption, households are induced to defer spending, weakening demand and output further compared to a labour-income tax. The tax increase, all else equal, puts direct upward pressure on real wages through the households' labour-supply condition. In quantitative terms, however, the decline in aggregate demand and hours worked tends to dominate this effect, pulling real wages down. As a result, real marginal costs fall and core inflation declines.[5] Monetary policy responds to lower core inflation by cutting the policy rate, which partly mitigates the contraction.

[4] This wedge is analogous to the wedge created by wage markups arising from monopolistic competition in the labour market, see, e.g., Jonsson (2007).

[5] When examining effects from the consumption tax, we evaluate core (underlying/producer-price) CPI inflation, i.e. CPI excluding the consumption tax. A rise in the consumption tax mechanically lifts CPI inflation.

Real debt follows a common pattern for all three shocks under monetary dominance. The primary surplus improves on impact, pushing real debt down, and the tax instrument is subsequently adjusted to bring real debt back to target.

In the hand-to-mouth model, a rise in the lump-sum tax reduces disposable income for hand-to-mouth households. Because these households cannot smooth consumption over time, their spending falls one-for-one with the decline in disposable income. This reduction in hand-to-mouth consumption drives the contraction in aggregate demand. Aggregate consumption and hours worked decline, which puts downward pressure on real wages, reducing real marginal costs and, in turn, inflation.

The dynamics following an increase in the labour-income tax differ. Under our utility specification, the labour-income tax does not directly affect hand-to-mouth households' labour supply. Instead, their consumption moves with the after-tax wage. Aggregate hours are therefore determined by Ricardian households, and output dynamics mirror their labour supply decisions. For Ricardian households, the fall in the after-tax wage reduces desired labour input and consumption on impact. As the tax rate subsequently declines—and temporarily undershoots its long-run level as part of the adjustment needed to stabilise real debt—labour input rises before returning to steady state. The higher labour-income tax also puts upward pressure on real marginal costs, increasing inflation. Monetary policy responds by increasing the policy rate to stabilise inflation, which amplifies the short-run decline in output.

A consumption tax increase generates dynamics similar to those in the benchmark model, but typically more pronounced. Aggregate consumption and demand fall by more because hand-to-mouth households cannot smooth consumption when the effective price of consumption rises, implying a large fall in their consumption. For core inflation, the dominant effect is disinflationary. While a higher consumption tax can put upward pressure on real wages through the labour-supply margin, the contraction in demand reduces firms' labour demand and puts downward pressure on wages. In quantitative terms, this latter effect dominates: real wages decline, marginal cost pressures ease, and core inflation falls.

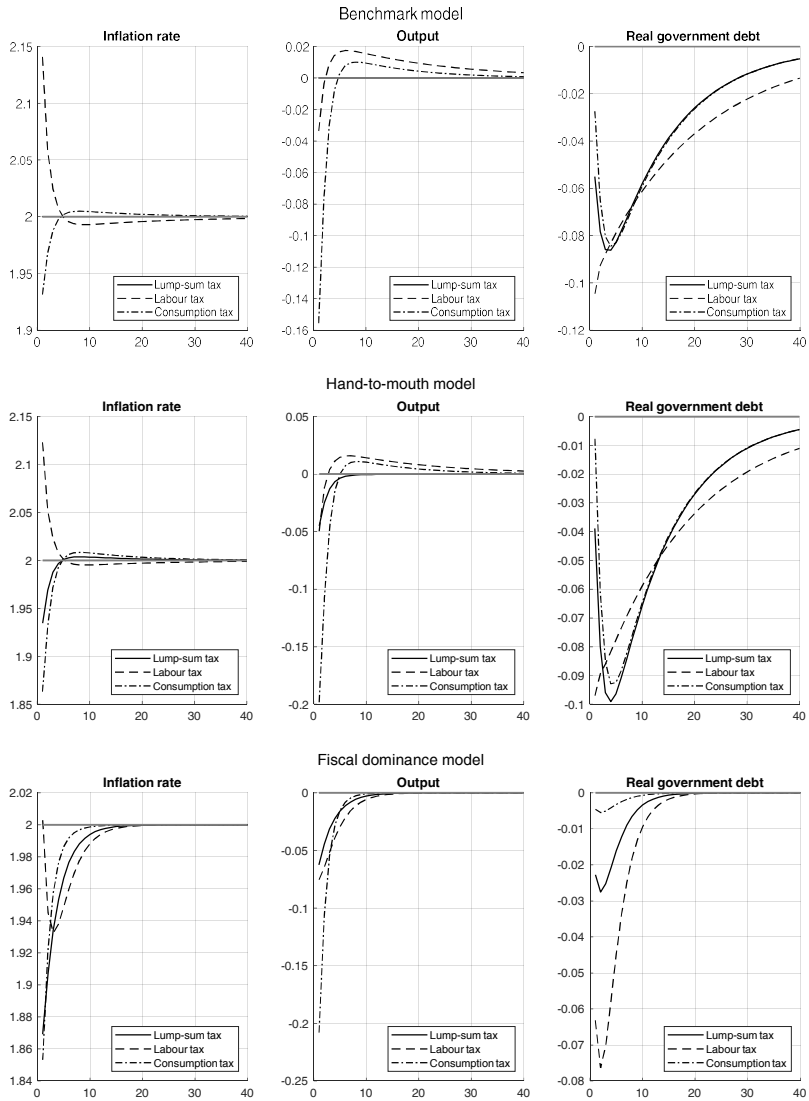
In the fiscal dominance model, an increase in the lump-sum tax raises the expected present value of primary surpluses. Given the government's intertemporal budget constraint, stronger fiscal backing requires an immediate downward adjustment in the price level, so inflation declines on impact. Real debt dynamics reflect two opposing forces. On the one hand, stronger primary surpluses reduce debt accumulation. On the other hand, the fall in the price level increases the real value of outstanding nominal liabilities. The net effect depends on the relative strength of these channels. In our calibration, the flow improvement dominates, so real debt declines over time. Because taxes are not adjusted endogenously to stabilise debt under fiscal dominance, the tax increase reduces households' lifetime resources, dampening demand and lowering output.

Under a credible inflation target and rational expectations, however, the central bank should look through this mechanical increase—and relative-price effects more generally—and instead focus on the indirect demand effects, which are captured by core inflation, see e.g., Bryan (2002).

A labour-income tax increase generates broadly similar disinflationary dynamics. By strengthening current and expected primary surpluses, it again requires a fall in the price level on impact and hence disinflation. As the tax increase unwinds and fiscal backing returns towards its steady state, inflation gradually returns to target. Real debt responds as in the lump-sum case: improved primary surpluses reduce debt accumulation, while the initial price-level decline raises the real value of outstanding liabilities and partly offsets the flow effect. In addition, the higher labour-income tax increases the labour wedge and reduces hours supplied, contributing to a decline in output.

Figure 5. Positive lump-sum, labour-income, and consumption tax shocks in the benchmark, hand-to-mouth, and fiscal dominance models

Per cent



Note. Output and real debt are expressed as percentage deviations from their steady state.

A consumption tax increase likewise raises current and expected primary surpluses and is therefore disinflationary for core inflation. By increasing the effective price of

consumption, it weakens aggregate demand and reduces hours worked and output. With the policy rate unchanged under fiscal dominance, lower inflation translates into a higher real interest rate, reinforcing the demand contraction and making the short-run decline in output more pronounced—and more persistent—than under monetary dominance. For real debt, the lower price level increases the real value of outstanding liabilities, but this is counteracted by stronger primary surpluses. Overall, the net effect on real debt is quantitatively modest.

6 Concluding discussion

Monetary policy is often portrayed as operating independently of fiscal influence. Since the early 1990s, the prevailing consensus has been that central banks manage inflation, finance ministries ensure debt sustainability, and the two policy domains can be treated as largely separate. Yet monetary and fiscal policy are inseparably linked through the government's intertemporal budget constraint. Macroeconomic outcomes therefore inevitably reflect how monetary and fiscal decisions interact—whether or not that interaction is explicit in the policy narrative.

Monetary–fiscal interactions are present even in the representative-agent New Keynesian model, although they are frequently downplayed. In a representative-agent setting, government bonds are not net wealth for the private sector because the same household is both taxpayer and bondholder. Moreover, the primary transmission channel of monetary policy operates through intertemporal substitution. Policy rates affect the timing of spending by changing the relative price of current versus future consumption, rather than by directly shifting household wealth. This can create the impression that monetary policy controls inflation independently of fiscal choices. That impression, however, is misleading.

A genuine wealth effect can arise—in a representative-agent setting—through the fiscal backing required for monetary policy when government debt is outstanding. When the policy rate rises, the discount rate applied to future primary surpluses increases, reducing their present value. To keep the real value of public debt on a stable path, the government must therefore credibly commit to larger future primary surpluses. In practice, this implies some combination of higher taxes, lower transfers, or reduced government spending over time. From the household's perspective, such adjustments lower the present value of net transfers expected over the lifetime.

Unlike the intertemporal-substitution channel, the fiscal-backing channel alters lifetime resources and thereby dampens consumption and aggregate demand. With sticky prices, weaker demand translates into disinflation. In this sense, for a policy-rate increase to reduce inflation, it must be accompanied by sufficiently tight expected fiscal policy, as shown in Caramp and Silva (2023). Monetary–fiscal interactions are therefore embedded even in the simplest monetary economy, underscoring Eric Leeper's point that inflation is a joint monetary and fiscal phenomenon.

The composition of fiscal backing also matters for short-run dynamics. If the adjustment occurs through transfers and lump-sum taxes, the mechanism operates largely as a pure wealth effect: households' lifetime resources fall without introducing additional

distortions. If the adjustment instead relies on cuts to government spending, there is an additional channel through lower public demand, which reinforces the contractionary wealth effect. When the adjustment comes via distortionary taxes, there is an effect operating through reduced economic efficiency.

Departures from Ricardian equivalence generally imply that wealth effects become an integral part of monetary transmission. One prominent channel we examined in this paper is household heterogeneity, i.e., a mix of Ricardian and hand-to-mouth households. In such an environment, changes in the policy rate redistribute interest income across households and therefore affect net wealth and consumption. Non-Ricardian fiscal regimes can generate even starker effects as we have shown. Under fiscal dominance, the finance ministry does not adjust future primary surpluses to stabilise debt. When the central bank raises the policy rate to dampen inflation, debt-service costs increase, generating a wealth effect even in a representative-agent setting. With primary surpluses unresponsive, the price level must adjust to satisfy the government's intertemporal budget constraint and ensure solvency. As a result, rate hikes that are contractionary and disinflationary under monetary dominance can become expansionary and inflationary under fiscal dominance, reversing the conventional relationship between the policy rate and inflation.

While the economy's responses to changes in policy and effects of different shocks differ across monetary and fiscal dominance regimes, neither regime is necessarily superior, see e.g., Leeper (2023b). Inflation is stable and government debt sustainable under either regime. That said, most countries appear to have a revealed preference for monetary dominance.

In our simple framework, the two regimes differ only in the strength of monetary and fiscal responses to their respective targets. In practice, additional factors are likely to matter. Politicians may have incentives to exploit surprise inflation to erode the real value of nominal public debt. However, the private sector anticipates such incentives and incorporates them into wage- and price-setting, resulting in higher inflation—the classic time-inconsistency problem, see Kydland and Prescott (1977). A monetary dominance regime with an explicit inflation target, operational independence, and clear accountability for the central bank, provides an institutional framework that supports credibility and mitigates time inconsistency by constraining political incentives.

Moreover, fiscal dominance typically does not arise as a carefully engineered regime. It is more often a by-product of fiscal stress, weak incentives to generate future primary surpluses, and/or fragile institutions. In such circumstances, relying on inflation as the adjustment margin is likely to be costly and destabilising. These considerations are not merely theoretical. They are reflected in a range of historical episodes. The following three episodes are particularly instructive.[6]

United States, 2021–2022: front-loaded fiscal expansion alongside highly accommodative monetary policy. The pandemic response combined unusually large and rapid fiscal transfers and spending with near-zero policy rates and large-scale asset

[6] See also Bylund et al. (2024) for the Swedish experiences during the 1960s and 1970s.

purchases. These fiscal measures created considerable household cash buffers. As restrictions eased and supply chains remained constrained, aggregate demand rebounded swiftly, putting upward pressure on prices across goods and services while monetary policy remained accommodative. This episode illustrates how, even under a credible inflation-targeting framework, a synchronised fiscal expansion and accommodative monetary policy can generate rapid price pressures. It also suggests that a timely adjustment of the policy mix can re-anchor inflation expectations and stabilise inflation.

Japan, 2013–2019 ('Abenomics'): aggressive monetary easing amid cautious fiscal support. Japan provides a noticeable example of a prolonged low-inflation environment in which sustained monetary accommodation—very low policy rates alongside large-scale asset purchases—coexisted with high public debt, yet inflation remained low. One explanation is 'fiscal pessimism': households and firms expected that any near-term stimulus would ultimately be offset by future tax increases. Those expectations were partly validated by consumption-tax hikes in 2014 and 2019. The tax increases raised headline inflation mechanically but also reduced real disposable income and dampened aggregate demand. In effect, they offset part of the monetary stimulus and contributed to disinflationary pressure. Inflation outcomes therefore repeatedly fell short of the target, underscoring that even very aggressive monetary easing may not durably lift inflation without supportive fiscal policy—especially when potential growth is subdued, and private saving behaviour is strong. While this episode highlights the limits of monetary easing when fiscal expectations are contractionary, the post-war United States experiences illustrate the opposite configuration: monetary policy constrained by fiscal financing needs.

United States, 1942–1951: yield pegs under fiscal dominance, then restored independence. To support wartime finance, the Federal Reserve introduced an upper limit on short rates and pegged long-term Treasury yields, effectively subordinating monetary policy to debt management. While this kept inflation contained, inflation rose sharply in 1946–48 once controls eased, and again around the Korean War. The 1951 Fed-Treasury Accord restored monetary independence and a nominal anchor. The episode highlights that fiscal dominance paired with yield control can amplify inflation pressures, whereas credible separation of objectives strengthens inflation control.

Finally, we have focused on a selected number of implications of monetary–fiscal interactions originating from the government's intertemporal budget constraint. We have not, for example, examined how fiscal multipliers depend on whether monetary policy accommodates fiscal stimulus or leans against it. Nor have we discussed counter-cyclical monetary and fiscal policy, including automatic stabilisers. The broader lesson, however, is that monetary–fiscal interactions are an integral part of the transmission of both monetary and fiscal policy. From this follows that when monetary policy pursues price stability, it needs to take account of the fiscal outlook and the likely fiscal reaction. Likewise, when fiscal policy pursues its goals of, for example, supporting economic activity and an equitable distribution of income, it needs to ensure debt sustainability and taking the likely monetary reaction into account. The key policy implication is thus less one of formal 'coordination' where the monetary and fiscal authorities intentionally align their policy choices to obtain shared objectives and more one of consistency

where monetary and fiscal policies are jointly compatible with macroeconomic stability and government solvency.

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