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Editorial

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Debt Maturity, Term Premia, and Fiscal Inflation

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Abstract

The maturity of government debt affects inflation when bond-market arbitrage is limited. We develop a tractable model in which risk-averse arbitrageurs absorb duration risk, generating a term premium that rises with the supply of long-term debt. Lengthening maturity therefore raises the return on government debt relative to the policy rate. We show analytically that the resulting inflation dynamics depend on the monetary–fiscal regime. Under monetary dominance, inflation falls at every horizon despite monetary easing. Under fiscal dominance, inflation falls on impact but later turns positive, leaving the price level permanently higher. Lower bond prices require the initial deflation to maintain fiscal solvency, while higher borrowing costs eventually require inflation. In a calibrated New Keynesian model, a persistent lengthening of debt duration by one month raises the term premium by 17 basis points, lowers inflation by almost 0.2 percentage points, and contracts output under both regimes. Inflation takes around five years to turn positive under fiscal dominance.

Keywords: Maturity structure; limits to arbitrage; preferred habitat; fiscal theory of the price level; monetary–fiscal interactions; quantitative easing

JEL codes: E31, E43, E44, E63, G12, H63

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1 Introduction

The maturity structure of government debt has become an important policy choice. Central-bank asset purchases since 2008 have shortened the duration of government liabilities held by the public on an unprecedented scale. More recently, activist Treasury issuance has raised the share of bills in marketable debt, a policy described as "stealth QE" (Miran & Roubini, 2024). Such maturity operations affect both the market value and the expected return of government debt. This comes as debt levels and government borrowing costs have risen sharply across advanced economies, calling the monetary–fiscal framework into question. Conventional analysis assumes monetary dominance, in which the central bank controls inflation and the fiscal authority adjusts surpluses to stabilise debt. The fiscal theory of the price level considers the opposite case of fiscal dominance, in which bond prices and inflation must adjust to ensure government solvency (e.g. Cochrane, 2023). This paper asks how debt maturity operations affect bond markets, inflation and economic activity, and how the answer depends on the monetary–fiscal regime.

We develop a tractable model of the bond market with limited arbitrage in the spirit of Vayanos and Vila (2021) and embed it in a general equilibrium framework with monetary and fiscal policy. Households save through yield-seeking preferred-habitat funds and risk-averse arbitrageurs that absorb the residual supply of duration. Increasing the share of long-term government debt forces arbitrageurs to bear more duration risk and raises the excess return they require. This generates an endogenous term premium on long-term bonds.

The term premium drives a wedge between the return on government debt and the policy rate. This return is both what households earn on their savings and what the government pays to borrow. Lengthening maturity widens this wedge through two channels. The *repricing effect* raises the required return on long bonds as arbitrageurs absorb more duration risk, while the *composition effect* shifts the debt portfolio towards an instrument that carries a term premium. The maturity wedge therefore links the bond-market effects of debt maturity operations to household expenditure, inflation and fiscal solvency. With risk-neutral arbitrageurs, the term premium is zero, both channels disappear, and debt maturity is irrelevant.

Under monetary dominance, lengthening maturity operates through the familiar transmission from interest rates to aggregate demand. By raising the return on household savings relative to the policy rate, it acts like a monetary tightening. In an endowment economy, we show analytically that inflation falls at every horizon despite a lower policy rate. In a calibrated New Keynesian model, a persistent shock that lengthens average debt duration by about one month raises the term premium by 17 basis points, lowers inflation by 0.16 percentage points at an annual rate and contracts output by 0.12%. This channel is closely related to Ray et al. (2024), who embed preferred-habitat forces in a New Keynesian model and find that quantitative easing, which shortens maturity, is modestly stimulative for output and inflation.

Fiscal dominance produces a similar response on impact but strikingly different dynamics. Fiscal adjustment is too weak to stabilise debt, so bond prices and the price level must adjust to maintain solvency. Lengthening maturity raises required returns and lowers long-bond prices, reducing the nominal value of government debt. The price level must then fall to keep real debt

stable. But higher required returns also raise the nominal return on government debt, and this must eventually be matched by inflation. In the endowment economy, we show analytically that inflation starts negative and turns positive exactly once, remaining positive thereafter. Moreover, the cumulative response is positive, so lengthening maturity ultimately raises the price level despite the initial deflation. These dynamics resemble "stepping on a rake" (Cochrane, 2018; Sims, 2011), but arise from a change in debt maturity rather than in the policy rate. In the calibrated model, the same one-month lengthening of debt duration initially lowers inflation by 0.18 percentage points at an annual rate and output by 0.20%. Inflation takes around five years to turn positive, by which time the price level has fallen by 0.4% and the cumulative output loss has reached 0.6% of annual GDP. The price level then recovers slowly and eventually settles 3% above its initial level.

Our results under fiscal dominance are most closely related to Corhay et al. (2023), who also study how term premia shape the effects of maturity operations in the fiscal theory. Their mechanism operates primarily through the composition effect. With a positive nominal term premium, lengthening debt maturity raises the expected return on the government debt portfolio and hence expected inflation. In our model, limited arbitrage adds a powerful repricing effect, because arbitrageurs require higher returns to absorb additional duration risk. This changes the dynamics sharply. Lengthening maturity lowers long-bond prices and generates deflation on impact, even though it ultimately raises the price level.

Our paper connects two literatures that have largely developed separately. Preferred-habitat models show how government debt maturity affects term premia and long-term yields, while fiscal-theory models link the maturity and returns of nominal government debt to price-level determination. We bring these mechanisms together by making the term premium in the fiscal channel endogenous to the duration risk absorbed by arbitrageurs. This interaction between bond-market repricing and fiscal solvency is what generates our distinctive inflation dynamics.

Section 2 relates the paper to the literature in more detail. Section 3 develops the bond market and endogenous term premium. Section 4 derives the analytical results in an endowment economy. Section 5 embeds the mechanism in a calibrated New Keynesian model and evaluates its quantitative implications. Section 6 concludes.

2 Related literature

Our paper relates to three strands of literature, on bond-market segmentation, monetary transmission, and fiscal price-level determination.

A large literature studies the maturity structure of government debt as a determinant of bond prices and expected returns. The preferred-habitat framework of Vayanos and Vila (2021) formalises an environment in which investors have maturity-specific demands and risk-averse arbitrageurs absorb the residual supply of duration. In this setting, shocks to bond supply and demand affect bond prices through the price of duration risk. Greenwood and Vayanos (2014) provide corresponding empirical evidence that the maturity-weighted supply of government debt is related to bond yields and subsequent excess returns. More recent work estimates

maturity-specific Treasury demand directly. Jansen et al. (2024) find substantial cross-maturity substitution and show that modelling arbitrageurs is important for obtaining plausible Treasury-market elasticities. Using high-frequency variation around Treasury auction announcements, Bi et al. (2026) identify shocks to the maturity composition of government debt and document their effects on the yield curve and real activity. Our bond market builds on this literature by using arbitrageurs as the marginal holders of duration risk and by allowing the required return on long bonds to respond directly to the maturity composition of government debt.

Related work examines how these bond-market forces transmit to monetary policy and aggregate demand. Early empirical work on quantitative easing, including Gagnon et al. (2011) and Krishnamurthy and Vissing-Jorgensen (2011), shows that large-scale asset purchases can lower longer-term yields through portfolio-balance and related risk-premium channels. Hanson and Stein (2015) emphasise that search for yield and limited arbitrage can make long-term rates respond disproportionately to current short rates. More recently, Ray et al. (2024) use Treasury auction data to identify preferred-habitat demand shocks and embed the resulting mechanism in a New Keynesian model. They find sizeable yield-curve effects but modest effects of quantitative easing on output and inflation. Our quantitative model is close in spirit to this preferred-habitat/New Keynesian approach, but focuses on shocks to the maturity composition of government debt and allows their consequences to depend on the monetary–fiscal regime.

Our paper also relates to the literature on fiscal price-level determination and monetary–fiscal interactions. Leeper (1991), Sims (1994), and Woodford (1995) establish how monetary and fiscal policy jointly determine whether the price level is anchored by monetary policy or government solvency. The maturity structure of nominal debt matters in this setting because it determines the returns and capital gains through which government liabilities can be revalued. Cochrane (2001) studies the role of long-term nominal debt in fiscal price-level determination, while Sims (2011) and Cochrane (2018) highlight the unconventional inflation dynamics, known as "stepping on a rake", that can arise when fiscal policy determines the price level. More recent work studies how debt maturity shapes macroeconomic adjustment under fiscal price-level determination. Liemen and Posch (2022) examine the transmission of monetary and fiscal shocks with long-term government debt, while Chafwehé et al. (2026) study how the maturity composition of government debt affects the inflation–output trade-off when fiscal backing is limited. Our analysis builds on this work by introducing an endogenous term premium that links debt maturity and bond-market repricing to fiscal revaluation. We show that a lengthening of debt maturity then generates dynamics similar to "stepping on a rake".

The paper closest to ours is Corhay et al. (2023), who study the interaction between debt maturity, nominal risk premia, and fiscal price-level determination. They show that maturity operations affect expected inflation under fiscal dominance when government bonds of different maturities carry different expected returns, and quantify this mechanism in a macro-finance model with endogenous bond risk premia. Our paper complements their analysis by introducing a preferred-habitat bond market in which changes in debt maturity alter the term premium through the duration risk absorbed by arbitrageurs. Maturity changes therefore affect government debt through both portfolio composition and the equilibrium price of duration risk. This allows

us to study how the risk-bearing capacity of the financial sector shapes the effects of maturity operations on inflation.

3 Bond market

This section develops a tractable bond market model in which heterogeneous intermediaries absorb government debt. The model embeds readily in a standard linearised general equilibrium framework and generates three departures from the frictionless benchmark: duration risk premia, sensitivity of yields to debt maturity, and amplified transmission of short rates to long yields.

3.1 Government bonds

The government issues two nominal instruments, which are the only assets in the economy. Short-term bonds pay the gross nominal return I_t, equal to the short-term nominal interest rate. Its log is $i_t \equiv \log I_t$. Long-term bonds are perpetuities paying a coupon stream $K, \rho_K K, \rho_K^2 K, \ldots$ with $\rho_K \leq 1$, where K is normalised so that bonds trade at a par value of one in steady state.[1] Letting Q_t^L denote the price of a long-term bond, its gross holding-period return is

$$R_{t+1}^L = \frac{K + \rho_K Q_{t+1}^L}{Q_t^L}. \tag{1}$$

Following Campbell and Shiller (1988), the log return and yield of a long bond are linearised as:

$$r_{t+1}^L \approx \bar{r}^L + \delta q_{t+1}^L - q_t^L, \tag{2}$$

$$y_t^L \approx \bar{r}^L - (1-\delta) q_t^L, \tag{3}$$

where $q_t^L \equiv \log Q_t^L$, $\bar{r}^L \equiv \log(\rho_K + K)$ and $\delta \equiv \rho_K/(\rho_K + K)$. The duration of the long bond is then $1/(1-\delta)$.

Let ω_t denote the long-term share of consolidated government debt, measured at market value.[2] With only two bonds, ω_t summarises debt maturity, which lengthens as ω_t rises. We assume that it follows an exogenous AR(1) process with persistence $\rho_\omega \in (0,1)$:

$$\hat{\omega}_t = \rho_\omega \hat{\omega}_{t-1} + \varepsilon_t^\omega, \qquad \varepsilon_t^\omega \overset{iid}{\sim} N(0, \sigma_\omega^2), \tag{4}$$

where $\hat{\omega}_t \equiv \omega_t - \bar{\omega}$.

3.2 The return on household savings

Households are the ultimate bondholders but neither trade bonds directly nor choose the maturity composition of their savings. They have discount factor $\beta < 1$, save through heterogeneous

[1] Following Greenwood et al. (2024), we model long-term bonds as perpetuities rather than characterise the full maturity structure as in Vayanos and Vila (2021). This keeps the model tractable and allows us to summarise debt maturity with a single variable, namely the share of long-term debt.

[2] As is standard, we consolidate the balance sheets of the fiscal authority and the central bank. The long-term share ω_t therefore reflects the joint policies of the two authorities, which determine the maturity structure of the government debt held by the private sector.

financial intermediaries in fixed proportions, as described below, and take the return on their savings as given.[3] Intermediation is costless, with intermediaries earning no rents and consuming no resources, so households earn exactly the return on the outstanding stock of government debt:

$$R^B_{t+1} = (1 - \omega_t) I_t + \omega_t R^L_{t+1}. \tag{5}$$

Linearising around a zero-inflation steady state in which $\bar{R}^B = 1/\beta$:

$$\hat{r}^B_{t+1} = (1 - \tilde{\omega})\, \hat{\imath}_t + \tilde{\omega}\, \hat{r}^L_{t+1} + \xi\, \hat{\omega}_t, \tag{6}$$

where $\tilde{\omega} \equiv \beta \bar{R}^L \bar{\omega}$ and $\xi \equiv (\beta \bar{R}^L - 1)/(1 - \bar{\omega})$.

The term $\xi \hat{\omega}_t$ is present whenever the returns of short- and long-term bonds are not equal, i.e. $\beta \bar{R}^L \neq 1$ and there is a term premium in steady state. It captures the *composition effect* whereby shifting debt towards the long end mechanically changes the government's average borrowing rate, even if interest rates and term premia do not move at all.[4]

3.3 Intermediaries

There are two types of intermediaries, arbitrageurs and preferred-habitat (PH) funds. Arbitrageurs stand in for primary dealers, hedge funds and dealer banks, while preferred-habitat funds represent pension funds, insurers and money-market funds. A fixed share α of household savings is allocated to arbitrageurs, with the remaining $1 - \alpha$ going to PH funds.

3.3.1 Arbitrageurs

A representative arbitrageur chooses the long-bond share w^A_t to maximise a mean-variance objective over the average log return on its portfolio:[5]

$$\max_{w^A_t} \; \mathbb{E}_t[r^A_{t+1}] - \frac{\gamma}{2} \operatorname{Var}_t(r^A_{t+1}), \tag{7}$$

where

$$r^A_{t+1} = (1 - w^A_t) i_t + w^A_t r^L_{t+1} \tag{8}$$

and γ is the coefficient of risk aversion. Since arbitrageurs are the marginal holders of duration risk, γ serves as a reduced-form proxy for their limited risk-bearing capacity. A higher γ makes the sector less willing to absorb duration, with pricing implications similar to those of a balance-sheet or value-at-risk constraint (Vayanos & Vila, 2021).

The first-order condition gives the required excess return on the long bond:

$$\mathbb{E}_t[r^L_{t+1}] - i_t = \gamma \operatorname{Var}_t(r^L_{t+1}) w^A_t, \tag{9}$$

[3] This reflects the fact that most households do not trade bonds directly but invest through intermediaries such as pension funds, insurers and money market funds. Ray et al. (2024) make a similar assumption.

[4] This composition effect is the driving force behind the results in Corhay et al. (2023).

[5] Mean-variance preferences over simple returns would be the more natural specification, but log returns simplify the exposition at little cost. The difference is a Jensen's inequality term, which is constant in the equilibria we consider and so shifts the steady-state term premium but not the dynamics.

so the compensation for bearing duration risk increases linearly with the share of the arbitrageur's portfolio invested in long bonds.

3.3.2 Preferred-habitat funds

Preferred-habitat (PH) funds invest a fraction w_t^{PH} of their portfolio in long-term bonds according to the demand function:

$$w_t^{PH} = \mu + \eta\, y_t^L - \zeta\, i_t. \tag{10}$$

We assume $\eta > 0$, so the demand for long bonds by preferred-habitat funds increases with the long-term yield y_t^L. This assumption is standard in the literature and broadly consistent with the evidence in Jansen et al. (2024).[6] The coefficient $\zeta > 0$ captures substitution towards short-term bonds when short rates rise, which Jansen et al. (2024) find to be roughly as strong as the own-yield response. We therefore set $\zeta = \eta$ throughout, so that demand depends only on the yield spread:

$$w_t^{PH} = \mu + \eta \left(y_t^L - i_t\right), \tag{11}$$

capturing the search-for-yield behaviour emphasised by Hanson and Stein (2015).

3.4 Market clearing and the term premium

Denoting the real value of government debt by D_t, market clearing for long bonds requires

$$\omega_t D_t = w_t^A A_t^A + w_t^{PH} A_t^{PH}, \tag{12}$$

where A_t^A and A_t^{PH} are the assets under management of arbitrageurs and preferred-habitat funds, respectively. Since intermediaries collectively hold the entire stock of government debt and a fixed share α of household savings is channelled through arbitrageurs, $A_t^A = \alpha D_t$ and $A_t^{PH} = (1-\alpha)D_t$. Substituting (9) and (11) into the market-clearing condition gives

$$\omega_t = \alpha\, \frac{\mathbb{E}_t[r_{t+1}^L] - i_t}{\gamma V_L} + (1-\alpha)\left[\mu + \eta(y_t^L - i_t)\right], \tag{13}$$

where we also used the fact that in any affine equilibrium the conditional variance of long-bond returns is a constant, $\mathrm{Var}_t(r_{t+1}^L) = V_L$.[7] Equation (13) is central to the model. It states that the duration supplied by the government must be absorbed by intermediaries, with long-bond prices (and hence expected returns and yields) adjusting to clear the market.

Evaluating (13) at the risky steady state and using $\bar{y}^L = \bar{r}^L$ gives the average term premium:[8]

$$\overline{tp} \equiv \bar{y}^L - \bar{\imath} = \frac{\gamma V_L \left[\bar{\omega} - (1-\alpha)\mu\right]}{\alpha + (1-\alpha)\eta\gamma V_L}. \tag{14}$$

[6] A negative η recovers the liability-driven demand of insurers and pension funds, which is upward-sloping in prices and downward-sloping in yields, as studied by Domanski et al. (2017) and Carboni et al. (2026).

[7] Following Vayanos and Vila (2021), we restrict attention to equilibria in which log prices and yields of long-term bonds are affine functions of the state.

[8] The risky steady state is the point at which the economy settles when no shocks are realised but agents take the risk of future shocks into account. In the deterministic steady state the variance of long-bond returns, and hence the term premium, would be zero.

The term premium $\overline{tp}$ compensates arbitrageurs for the residual duration risk not absorbed by preferred-habitat funds. We assume throughout that $\bar{\omega} > (1-\alpha)\mu$, so arbitrageurs hold positive duration and the average term premium is positive, as in the data. It increases with the government supply of long-term bonds $\bar{\omega}$ and with the price of duration risk γV_L, and decreases with the level μ and elasticity η of preferred-habitat demand. The average term premium is zero when arbitrageurs are risk neutral, i.e. $\gamma = 0$.

3.5 Bond prices

Substituting (2) and (3) into (13) and expressing variables as deviations from steady state gives the bond-pricing equation:

$$\hat{q}_t^L = \chi\delta\,\mathbb{E}_t\hat{q}_{t+1}^L - \theta\,\hat{\imath}_t - \frac{\chi}{\alpha}\,\gamma V_L\,\hat{\omega}_t, \tag{15}$$

$$\text{where} \quad \chi \equiv \frac{\alpha}{\alpha + (1-\alpha)(1-\delta)\eta\gamma V_L}$$

$$\theta \equiv 1 + \chi\left(\frac{1}{\alpha} - 1\right)\delta\eta\gamma V_L.$$

Three properties are worth highlighting.

(i) *The model nests the Expectations Hypothesis (EH) when arbitrageurs are risk neutral.* When $\gamma = 0$, there is no duration-risk premium and the no-arbitrage condition $i_t = \mathbb{E}_t[r_{t+1}^L]$ holds every period. Then $\chi = \theta = 1$, and the bond-pricing equation becomes

$$\hat{q}_t^L = \delta\,\mathbb{E}_t\hat{q}_{t+1}^L - \hat{\imath}_t. \tag{16}$$

Iterating forward gives

$$\hat{q}_t^L = -\mathbb{E}_t\sum_{k=0}^{\infty}\delta^k\hat{\imath}_{t+k}, \tag{17}$$

so long-bond prices depend only on expected future short rates and not on debt maturity.

(ii) *Yield-seeking amplifies transmission from short rates to long yields.* With $\eta > 0$ (and $\alpha < 1$, $\gamma V_L > 0$), we have $\theta > 1$ and $\chi < 1$. Relative to the EH benchmark, the long-bond price in (15) therefore over-reacts to the current short rate and under-reacts to its expected future path. Yield-seeking thus makes long yields more sensitive to current short-rate movements than the expectations hypothesis implies, in line with the evidence in Hanson and Stein (2015).[9]

(iii) *Debt maturity has a direct supply effect on bond prices,* captured by the final term in (15). Lengthening the maturity of government debt increases the duration risk that arbitrageurs must absorb, lowering long-bond prices and raising yields for any given path of short rates.

[9] Yield-seeking dampens the effects of maturity changes on long yields, as preferred-habitat funds partly absorb shifts in duration supply. For a given variance of long-bond returns, assuming $\eta > 0$ therefore works against our results. However, it is not only consistent with the empirical evidence but also essential for the model to generate realistic bond-return volatility under a plausible calibration in the first place. This is an important difference from Ray et al. (2024), who use the standard preferred-habitat demand specification of Vayanos and Vila (2021).

4 Debt maturity and inflation

We now embed the bond market model in a simple endowment economy that admits an analytical solution. This tractable setting allows us to show how bond market frictions interact with monetary and fiscal policy, and in particular why identical debt maturity operations have qualitatively different effects depending on whether inflation is anchored by monetary policy or by the government's budget constraint.

4.1 The endowment economy

A representative household maximises

$$\mathbb{E}_t \sum_{k=0}^{\infty} \beta^k u(C_{t+k}) \tag{18}$$

and receives a fixed endowment $\bar{Y}$ each period. Prices are fully flexible, and goods-market clearing implies $C_t = \bar{Y}$ for all t. The household's Euler equation therefore reduces to

$$1 = \beta \, \mathbb{E}_t \frac{R^B_{t+1}}{\Pi_{t+1}}, \tag{19}$$

where Π_{t+1} is gross inflation. The expected real return on savings is therefore fixed at the rate of time preference, and linearising around a zero-inflation steady state gives:

$$\mathbb{E}_t \hat{r}^B_{t+1} = \mathbb{E}_t \hat{\pi}_{t+1}. \tag{20}$$

The expected nominal return on savings and expected inflation are therefore linked one for one.

4.2 Monetary policy

Monetary policy sets the short-term nominal rate according to a Taylor rule

$$\hat{\imath}_t = \phi_\pi \hat{\pi}_t + z^m_t, \tag{21}$$

where z^m_t is an exogenous monetary policy disturbance following

$$z^m_t = \rho_m z^m_{t-1} + \varepsilon^m_t, \qquad \varepsilon^m_t \overset{iid}{\sim} \mathcal{N}(0, \sigma^2_m). \tag{22}$$

The monetary disturbance, like the fiscal disturbance introduced below, plays no direct role in the analytical results but is retained for the technical reasons discussed in Section 4.6.

As in Ray et al. (2024) and Carboni et al. (2026), the central bank does not directly control the nominal return on household savings, $\hat{r}^B_{t+1}$, which here is also the cost of government borrowing. Besides the policy rate $\hat{\imath}_t$, it depends on the long-bond return and the maturity composition ω_t, as shown in (6). Under the Expectations Hypothesis, $\mathbb{E}_t \hat{r}^L_{t+1} = \hat{\imath}_t$ and $\xi = 0$, so $\mathbb{E}_t \hat{r}^B_{t+1} = \hat{\imath}_t$, debt maturity is irrelevant, and (20) reduces to a conventional Fisher equation linking expected inflation to the policy rate. With limits to arbitrage, however, the expected return on savings

can diverge from the policy rate, and debt maturity affects the wedge between them.

4.3 The maturity wedge

The analytical results are most transparent when arbitrageurs are the only intermediaries. We therefore set $\alpha = 1$ throughout Section 4, which implies $\chi = \theta = 1$ in (15) without changing the qualitative results.[10] Market clearing (13) then reduces to the arbitrageur's first-order condition

$$\mathbb{E}_t \hat{r}^L_{t+1} - \hat{\imath}_t = \gamma V_L \, \hat{\omega}_t, \tag{23}$$

so the required excess return on long bonds is proportional to the duration arbitrageurs must absorb.

Substituting (23) into (6) makes the gap between the policy rate and the expected return on household savings explicit:

$$\mathbb{E}_t \hat{r}^B_{t+1} = \hat{\imath}_t + \Lambda \, \hat{\omega}_t, \tag{24}$$

$$\text{where} \quad \Lambda \equiv \underbrace{\tilde{\omega} \, \gamma V_L}_{\text{repricing}} + \underbrace{\xi}_{\text{composition}} .$$

The *maturity wedge* $\Lambda \hat{\omega}_t$ is central to the analysis. Its coefficient Λ has two components, both positive since the average term premium $\overline{tp}$ is positive. The repricing component arises because additional duration raises the excess return required on long bonds, increasing the return on household savings for a given portfolio composition. The composition component arises because additional duration shifts the portfolio towards long bonds, which earn the higher average return. Both components are zero with risk-neutral arbitrageurs, since duration risk then has a zero price and long bonds earn no premium.

4.4 Government budget constraint and fiscal policy

The government's real flow budget constraint is

$$D_t = D_{t-1} \frac{R^B_t}{\Pi_t} - S_t, \tag{25}$$

where D_t is the real market value of outstanding debt and S_t is the real primary surplus. With no government spending, the primary surplus consists entirely of lump-sum taxes and transfers.

Linearising (25) around steady state gives

$$\hat{d}_t = \frac{1}{\beta} \hat{d}_{t-1} + \frac{\bar{d}}{\beta} \left(\hat{r}^B_t - \hat{\pi}_t \right) - \hat{s}_t, \tag{26}$$

where the deviations of fiscal variables from steady state are normalised by steady-state output.[11]

[10] With $\alpha < 1$, the required excess return also depends on the yield spread, so the expected return on savings acquires a term in the long-bond price. The model remains solvable but is much less tractable. The main results reported below are qualitatively unchanged.

[11] Specifically, $\hat{d}_t \equiv (D_t - \bar{D})/\bar{Y}$ and $\hat{s}_t \equiv (S_t - \bar{S})/\bar{Y}$. All other lowercase variables with hats denote log deviations, except maturity $\hat{\omega}_t$, which is a level deviation as defined in (4).

Fiscal policy sets the primary surplus according to a standard feedback rule (Leeper, 1991):

$$\hat{s}_t = \tau\, \hat{d}_{t-1} - z_t^f, \tag{27}$$

where τ governs the response of the primary surplus to debt and z_t^f is an exogenous fiscal disturbance (a lump sum tax cut or transfer to households) following an AR(1) process.

4.5 Monetary–fiscal policy regime

Using (2), (6) and (27), the government debt accumulation equation (26) can be rewritten as

$$\hat{d}_t = \underbrace{\left(\frac{1}{\beta} - \tau\right)\hat{d}_{t-1}}_{\substack{\text{Rollover debt net of} \\ \text{fiscal adjustment}}} + \underbrace{\frac{\bar{d}}{\beta}\,\mathbb{E}_{t-1}[\hat{r}_t^B - \hat{\pi}_t]}_{\substack{\text{Expected real} \\ \text{servicing cost}}} + \underbrace{\frac{\bar{d}}{\beta}\left[\tilde{\omega}\delta(\hat{q}_t^L - \mathbb{E}_{t-1}\hat{q}_t^L) - (\hat{\pi}_t - \mathbb{E}_{t-1}\hat{\pi}_t)\right]}_{\text{Surprise revaluation}} + z_t^f. \tag{28}$$

The decomposition separates the underlying dynamics of government debt from surprise revaluations. The first term governs the intrinsic persistence of debt after fiscal adjustment, while the second is the expected real debt service cost, which is zero in this endowment economy by the household Euler equation (20). The final term shows that only unexpected changes in bond prices and inflation revalue outstanding debt, and the two enter with opposite signs.

Following Leeper (1991), fiscal policy is *passive* when $\beta^{-1} - \tau < 1$, so that fiscal adjustment stabilises debt without relying on revaluations. A unique bounded equilibrium then requires monetary policy to be *active*, with $\phi_\pi > 1$, to pin down inflation. We refer to this configuration as the *monetary dominance regime*, or monetary regime for short.

Fiscal policy is instead *active* when $\beta^{-1} - \tau > 1$. The underlying debt dynamics are then unstable, so solvency requires surprise revaluations to offset shocks to the government budget. Without an offsetting adjustment in taxes, for example, a positive fiscal shock would put debt on an explosive path. It must therefore be absorbed either by an unexpected rise in inflation that lowers the real value of all debt or by an unexpected fall in long-bond prices that lowers the value of its long-term portion. To allow inflation and bond prices to provide the required revaluation, monetary policy must be *passive*, with $\phi_\pi < 1$. Otherwise, no bounded equilibrium exists. We refer to this configuration as the *fiscal dominance regime*, or fiscal regime for short.

We will consider these two determinate policy configurations in turn.

4.6 Equilibrium

An equilibrium consists of processes for $\{\hat{\pi}_t, \hat{\imath}_t, \hat{q}_t^L, \hat{r}_t^B, \hat{d}_t\}$ that, given the maturity process (4) and the monetary and fiscal disturbances z_t^m and z_t^f, satisfy the Euler equation (20), the Taylor rule (21), the arbitrageur's first-order condition (23), the long-bond and effective return equations (2) and (6), the government budget constraint (26) and the fiscal rule (27), with V_L consistent with the resulting law of motion. We restrict attention to bounded affine equilibria, in which endogenous variables are linear functions of the predetermined and exogenous states.

The conditional variance of long-bond returns V_L, which governs duration risk and term premia

in the model, is itself an equilibrium object. In a bounded affine equilibrium with homoskedastic innovations, it is constant. The model is therefore solved as a fixed point in V_L, which must equal the conditional variance implied by the solution it generates.[12] Monetary and fiscal disturbances ensure that the fixed point is non-degenerate, although we set their realisations to $z_t^m = z_t^f = 0$ $\forall t$ when characterising responses to maturity shocks below.[13]

4.7 Monetary dominance

Under active monetary and passive fiscal policy the system is block recursive. The Euler equation (20), the maturity wedge equation (24) and the Taylor rule (21) jointly determine inflation and the policy rate, which in turn determine long-bond prices. Debt then evolves according to (28), taking inflation and bond prices as given.

Proposition 1 (Maturity shock under monetary dominance)**.** *Let $\phi_\pi > 1$ and $\tau > \beta^{-1} - 1$, which ensure a unique equilibrium.*[14] *Consider a positive (lengthening) maturity shock $\varepsilon_0^\omega > 0$ at $t = 0$, starting from steady state and holding all other shocks at zero. Inflation falls at every horizon:*

$$\hat{\pi}_t = -\frac{\Lambda \hat{\omega}_t}{\phi_\pi - \rho_\omega} < 0 \qquad \forall t \geq 0, \tag{29}$$

where $\hat{\omega}_t = \rho_\omega^t \varepsilon_0^\omega > 0$ is the path of maturity implied by (4)*. The expected excess return on long bonds rises in direct proportion to maturity, as given by* (23)*, while the long-bond price is*

$$\hat{q}_t^L = \frac{1}{1 - \delta\rho_\omega}\left[\frac{\phi_\pi \Lambda}{\phi_\pi - \rho_\omega} - \gamma V_L\right]\hat{\omega}_t \qquad \forall t \geq 0. \tag{30}$$

Real debt jumps on impact by the surprise revaluation,

$$\hat{d}_0 = \frac{\bar{d}}{\beta}\left[\tilde{\omega}\delta\, \hat{q}_0^L - \hat{\pi}_0\right], \tag{31}$$

and subsequently evolves according to the surplus rule, $\hat{d}_t = (\beta^{-1} - \tau)\, \hat{d}_{t-1}$ for $t \geq 1$.

The deflation follows from the interaction of the maturity wedge with the Taylor principle. Combining (20), (24) and (21) gives a single difference equation in inflation:

$$\mathbb{E}_t \hat{\pi}_{t+1} = \phi_\pi \hat{\pi}_t + \Lambda \hat{\omega}_t. \tag{32}$$

Because $\phi_\pi > 1$, this equation has an explosive root, and inflation would diverge unless current inflation adjusts to offset the maturity wedge. A positive maturity shock raises expected inflation

[12] When there are multiple roots, the standard practice in the literature is to select the root that converges to the frictionless benchmark as $\gamma \to 0$ (see e.g. Greenwood et al., 2024). We follow this practice in the quantitative analysis of Section 5. The analytical results below hold for any given V_L.

[13] Maturity shocks alone cannot sustain positive long-bond return variance because their effect on bond prices is proportional to γV_L. If ε_t^ω were the only innovation, the fixed point would therefore be $V_L = 0$ and the model would collapse to the Expectations Hypothesis. Monetary and fiscal shocks generate bond-price variation independently of γV_L, sustaining a positive V_L. Their realisations can be set to zero when studying maturity shocks because linearity makes shock responses additive.

[14] Here and in Proposition 2, uniqueness is within the class of bounded affine equilibria defined in Section 4.6 and conditional on the selected root of the fixed point in V_L.

for a given level of current inflation, so current inflation must fall to keep the path bounded. The decline is larger when the maturity wedge is larger or the shock more persistent, and smaller when monetary policy responds more aggressively to inflation.

The response of long-bond prices is ambiguous. The higher required excess return pushes prices down, while monetary easing in response to the deflation lowers the expected path of short rates and pushes prices up. The second force is stronger the more persistent the maturity operation and the less aggressive the policy rule, as both deepen the expected deflation that the policy rate tracks. A maturity lengthening can therefore raise the term premium while either raising or lowering the long yield.

4.8 Fiscal dominance

Under active fiscal and passive monetary policy the system is no longer block recursive. The difference equation (32) continues to hold, but with $\phi_\pi < 1$ its root is stable, so it governs the dynamics of inflation without pinning down its initial value. By contrast, with $\tau < \beta^{-1} - 1$, fiscal adjustment is too weak to stabilise government debt and the underlying debt dynamics are unstable. Solvency therefore requires inflation and bond prices to jump and revalue outstanding debt. Since bond prices also depend on inflation through the policy rate, the two are determined jointly from the government budget constraint, the Taylor rule and the bond-pricing equation.

Proposition 2 (Maturity shock under fiscal dominance)**.** *Let $\phi_\pi < 1$ and $\tau < \beta^{-1} - 1$, which ensure a unique equilibrium. Consider a positive (lengthening) maturity shock $\varepsilon_0^\omega > 0$ at $t = 0$, starting from steady state and holding all other shocks at zero. Boundedness requires real debt to remain at its steady-state level, $\hat{d}_t = 0\ \forall t$, implying that inflation equals the realised nominal return on the debt portfolio at every date, $\hat{\pi}_t = \hat{r}_t^B$. The maturity shock has the following effects:*

(i) On impact, the long-bond price falls and inflation is negative:

$$\hat{q}_0^L = -\frac{1}{1-\delta\rho_\omega}\left[\frac{\xi\delta\phi_\pi}{1-(1-\tilde{\omega})\delta\phi_\pi} + \gamma V_L\right]\varepsilon_0^\omega < 0, \tag{33}$$

$$\hat{\pi}_0 = \tilde{\omega}\delta\,\hat{q}_0^L < 0. \tag{34}$$

(ii) Thereafter, inflation evolves according to

$$\hat{\pi}_t = \phi_\pi\,\hat{\pi}_{t-1} + \Lambda\,\hat{\omega}_{t-1} \qquad \forall t \geq 1, \tag{35}$$

where $\hat{\omega}_t = \rho_\omega^t \varepsilon_0^\omega > 0$ is the path of maturity implied by (4).

(iii) Inflation turns positive at a unique date $T \geq 1$ and remains positive thereafter.

Despite fiscal dominance, the impact response is deflationary, because it operates through revaluation rather than through surpluses. As arbitrageurs absorb more duration, their required excess return rises and long-bond prices fall, reducing the nominal market value of government liabilities.[15] The real value of debt, however, must still equal the present value of surpluses,

[15]The fall in long-bond prices in (33) also reflects the expected path of the policy rate, which falls with the

which is unchanged because neither the real discount rate nor surpluses move. The price level must therefore fall by enough to offset the capital loss imposed on bondholders. Equation (34) makes this explicit, with $\tilde{\omega}\delta$ measuring the exposure of outstanding debt to long-bond prices.

After the initial revaluation, inflation follows (35). Because monetary policy is passive, the root is stable and inflation inherits a progressively smaller part of the initial deflation each period, while the maturity wedge pushes it upwards. As the initial deflation fades, the wedge eventually dominates and inflation turns positive.

Corollary 1 (Long-run price-level effect)**.** *Under the conditions of Proposition 2, a positive maturity shock raises the long-run price level. The cumulative inflation response is*

$$\sum_{t=0}^{\infty} \hat{\pi}_t = \frac{1}{(1-\phi_\pi)(1-\delta\rho_\omega)} \left[\frac{1-\delta}{1-\rho_\omega} \Lambda + \frac{\delta\,(1-\delta\phi_\pi)}{1-(1-\tilde{\omega})\delta\phi_\pi} \xi \right] \varepsilon_0^\omega > 0. \tag{36}$$

Corollary 1 underlies part (iii) of Proposition 2. Inflation is negative on impact but eventually turns positive, with a positive cumulative response. The initial fall in long-bond prices reduces the market value of government debt and requires deflation on impact. As bond prices return to steady state, however, the initial capital loss for bondholders is offset by subsequent capital gains. Over the full adjustment, what remains is the higher nominal yield paid on government debt. The maturity shock raises this yield both by increasing long yields and by shifting debt towards the higher-yielding instrument. With real debt unchanged, these additional borrowing costs must be matched by a cumulative increase in the price level:[16]

$$\sum_{t=0}^{\infty} \hat{\pi}_t = \tilde{\omega} \sum_{t=0}^{\infty} \hat{y}_t^L + (1-\tilde{\omega}) \sum_{t=0}^{\infty} \hat{\imath}_t + \xi \sum_{t=0}^{\infty} \hat{\omega}_t. \tag{37}$$

The initial deflation is therefore more than offset by the inflation that follows. The yields in (37) themselves respond to this inflation through the policy rate, which amplifies the cumulative increase by the factor $1/(1-\phi_\pi)$ in (36). The sign reversal in inflation resembles the "stepping on a rake" dynamics of Sims (2011) and Cochrane (2018), but arises here from a maturity shock rather than a change in the policy rate.

5 Quantitative evaluation

The analytical endowment economy isolates the key mechanism but abstracts from broader macroeconomic adjustment. In this section, we embed the full bond market model from Section 3 in a linearised New Keynesian framework with a fiscal sector. We then calibrate the model and quantify the effects of maturity operations under both policy regimes.

initial deflation but eventually rises by more with the inflation that follows. Unlike the monetary dominance case, the two forces reinforce each other.

[16] Equation (37) follows from the fact that $\hat{\pi}_t = \hat{r}_t^B \ \forall t$, established in Proposition 2. Substituting (6), (2) and (3) gives $\hat{\pi}_t = (1-\tilde{\omega})\,\hat{\imath}_{t-1} + \tilde{\omega}\,[\hat{y}_{t-1}^L + \delta(\hat{q}_t^L - \hat{q}_{t-1}^L)] + \xi\,\hat{\omega}_{t-1}$. Summing over $t \geq 0$, the capital gains cancel because bond prices start and end at steady state, which leaves only nominal yields.

5.1 Macroeconomic environment

The macroeconomy is described by New Keynesian Phillips and IS curves[17]

$$\hat{\pi}_t = \beta\,\mathbb{E}_t\hat{\pi}_{t+1} + \kappa\,\hat{x}_t + z_t^{\pi}, \tag{38}$$

$$\hat{x}_t = \mathbb{E}_t\hat{x}_{t+1} - \sigma\left(\mathbb{E}_t\hat{r}^B_{t+1} - \mathbb{E}_t\hat{\pi}_{t+1}\right) + z_t^{x}, \tag{39}$$

where $\hat{x}_t$ is the output gap, κ is the slope of the Phillips curve, σ is the intertemporal elasticity of substitution, and z_t^{π} and z_t^{x} are cost-push and demand disturbances. As before, the return that matters to households is the expected return on their portfolio of government bonds, $\mathbb{E}_t\hat{r}^B_{t+1}$, not the policy rate. Any wedge between the policy rate and the return to households therefore affects aggregate demand through the IS curve.

Relative to the analytical model, the Taylor rule also responds to the output gap:[18]

$$\hat{\imath}_t = \phi_\pi\hat{\pi}_t + \phi_x\hat{x}_t + z_t^{m}. \tag{40}$$

The fiscal block is unchanged, consisting of the government budget constraint (26), the fiscal rule (27) and the debt dynamics (28). The bond market is described by (15) and (6), with $\alpha < 1$ so that both types of intermediaries are active, and maturity continues to follow the process in (4). The monetary, fiscal, demand and cost-push disturbances follow AR(1) processes,

$$z_t^j = \rho_j z_{t-1}^j + \varepsilon_t^j, \qquad \varepsilon_t^j \overset{iid}{\sim} \mathcal{N}(0,\sigma_j^2) \qquad \text{for } j \in \{m, f, x, \pi\}. \tag{41}$$

We continue to restrict attention to bounded affine equilibria, as in Section 4.6. The linear equilibrium conditions admit an affine solution for a given V_L, the conditional variance of long-bond returns. We solve numerically for V_L using damped fixed-point iteration, starting from zero. This selects the stable root that approaches the frictionless benchmark as $\gamma \to 0$.

5.2 Calibration

Table 1 reports the quarterly calibration. All parameters are held fixed across regimes except ϕ_π and τ, whose values determine whether the economy is under monetary or fiscal dominance.

In the bond market, the share of household savings allocated to arbitrageurs is $\alpha = 0.10$, in line with the share of Treasuries held by broker-dealers and hedge funds (e.g. Monin, 2026). The preferred-habitat demand elasticity $\eta = 7$ aggregates the own-yield coefficients estimated across investor groups by Jansen et al. (2024). We choose $\rho_K = 0.987$ to give the long bond a 10-year duration, matching the benchmark maturity at which yields and term premia are commonly measured. Risk aversion $\gamma = 38$ matches the volatility of realised excess returns on 10-year Treasury bonds (about 8% annualised), while the demand intercept $\mu = 0.41$ matches the 1.57% mean 10-year term premium of Adrian et al. (2013) over the post-Volcker period.[19] Finally,

[17] The derivation is standard.

[18] With this rule, monetary policy is active when $\phi_\pi + (1-\beta)\phi_x/\kappa > 1$, which generalises the condition $\phi_\pi > 1$ of Section 4. The condition for passive fiscal policy is unchanged.

[19] The intercept μ enters the model only through the steady-state term premium (14), via the residual duration

Table 1: Calibration

Parameter	Value	Description
	A. Bond market	
α	0.10	Share of intermediated wealth managed by arbitrageurs
γ	38	Arbitrageurs' risk aversion
η	7	Habitat demand elasticity
μ	0.41	Habitat demand intercept
$\bar{\omega}$	0.40	Long-bond share of government debt
ρ_K	0.987	Coupon decay of long-term bond
	B. Macroeconomy	
β	0.99	Discount factor
σ	0.35	Elasticity of intertemporal substitution
κ	0.02	Slope of the New Keynesian Phillips curve
$\bar{d}$	4.0	Government debt, 100% of annual GDP
	C. Policy	
ϕ_π	1.5 / 0.8	Reaction of the policy rate to inflation, MD / FD
ϕ_x	0.125	Reaction of the policy rate to the output gap
τ	0.0135 / 0.0	Reaction of the primary surplus to debt, MD / FD
	D. Exogenous processes	
ρ_f, σ_f	0.65, 0.0065	Fiscal disturbance
$\rho_\omega, \sigma_\omega$	0.95, 0.008	Debt maturity
ρ_m, σ_m	0.5, 0.0006	Monetary policy disturbance
ρ_π, σ_π	0.9, 0.00011	Cost-push disturbance
ρ_x, σ_x	0.8, 0.0032	Aggregate demand disturbance

MD = Monetary Dominance, FD = Fiscal Dominance

the long-bond share $\bar{\omega} = 0.40$ gives the government debt portfolio an average duration of 4.1 years, matching the weighted average duration of marketable Treasury debt net of the Federal Reserve's SOMA holdings.

The macroeconomic parameter values are largely standard. The discount factor is $\beta = 0.99$ and the elasticity of intertemporal substitution is $\sigma = 0.35$, within the range reported by Havránek (2015) for asset holders. The Phillips curve is fairly flat, with $\kappa = 0.02$, consistent with recent evidence.[20] Steady-state government debt is $\bar{d} = 4$, or 100% of annual GDP, close to the current US level. Under monetary dominance, the Taylor rule coefficients take the standard values $\phi_\pi = 1.5$ and $\phi_x = 0.125$, the equivalent of the standard value of 0.5 for our quarterly model, while the fiscal response $\tau = 0.0135$ is in line with the estimates of Bohn (1998). Under fiscal dominance, we set $\phi_\pi = 0.8$, the pre-Volcker estimate of Clarida et al. (2000), and $\tau = 0$, leaving ϕ_x unchanged.

Turning to the exogenous processes, the fiscal disturbance has $\rho_f = 0.65$ and $\sigma_f = 0.0065$, matching the persistence and volatility of the Congressional Budget Office's cyclically adjusted primary balance over 1965–79.[21] The maturity process has $\rho_\omega = 0.95$ and $\sigma_\omega = 0.008$, approximately

$\bar{\omega} - (1 - \alpha)\mu$ absorbed by arbitrageurs.

[20] This is somewhat above the estimates of Hazell et al. (2022), but with lower values a bounded equilibrium does not exist under fiscal dominance.

[21] Fiscal persistence rises to 0.94 after 1985, but this value generates implausibly high inflation and bond-return

matching the behaviour of the long-term debt share ($\geq$ 5 years) in the Monthly Statement of the Public Debt. The monetary disturbance has persistence $\rho_m = 0.5$ and an annualised standard deviation of 25 basis points. Cost-push persistence $\rho_\pi = 0.9$ follows Smets and Wouters (2007), while demand persistence $\rho_x = 0.8$ lies within the range they estimate for preference, investment and government spending disturbances. The corresponding volatilities, $\sigma_\pi = 0.00011$ and $\sigma_x = 0.0032$, target standard deviations of 0.89 and 1.64 percentage points for year-over-year inflation and the output gap.

5.3 Maturity shocks under monetary dominance

We consider the monetary dominance regime first. Figure 1 shows the responses to a one-standard-deviation (0.8 percentage point) lengthening maturity shock, which raises the average duration of government debt by about one month. The solid lines report the calibrated model, while the dashed lines show the risk-neutral benchmark with $\gamma = 0$, in which maturity is irrelevant and all responses are zero. With limited arbitrage, however, the term premium responds strongly, rising by around 17 basis points on impact, and the price of long-term bonds falls by 0.7%. The long yield rises by only 7 basis points because the expected path of the policy rate falls. Despite monetary easing, the real return on household savings rises, producing persistent deflation and a contraction in output. Both responses are substantial, with inflation falling by 0.16 percentage points at an annual rate and the output gap by 0.12 percentage points.

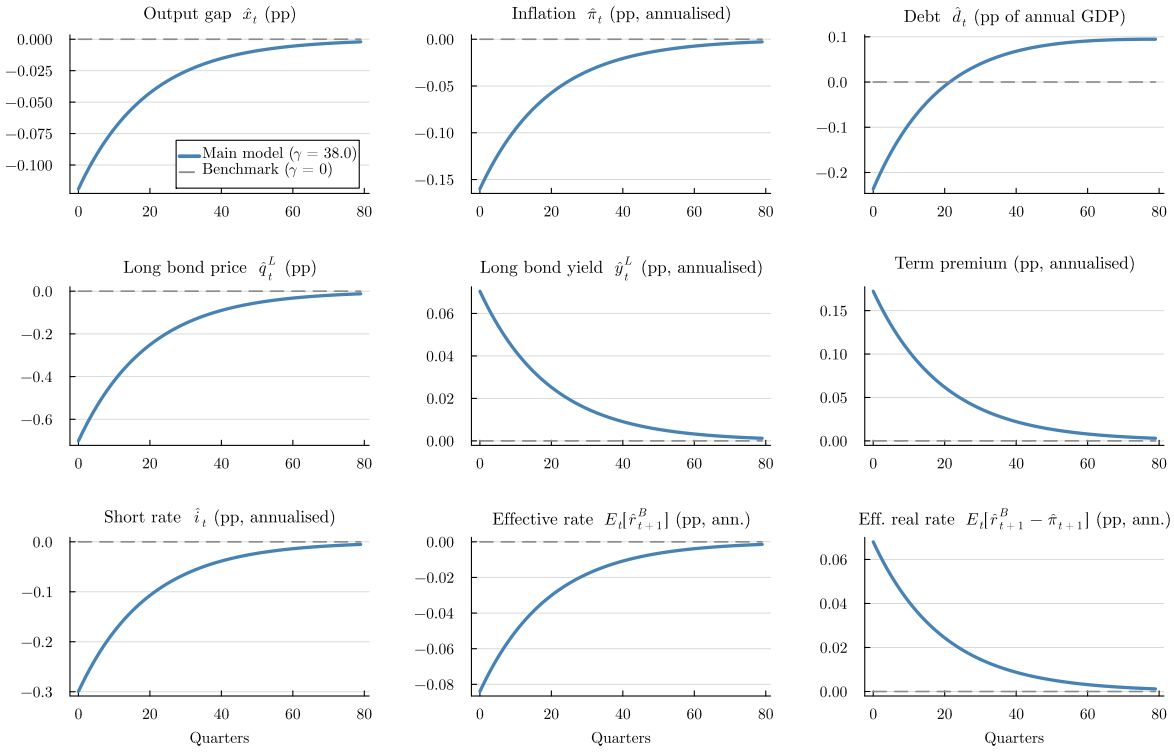


Figure 1: Response to a positive maturity shock under monetary dominance

The quantitative results closely confirm the mechanism identified in the endowment economy. A positive maturity shock shifts the government debt portfolio towards long bonds, raising the

volatility under fiscal dominance.

return required on government debt and generating deflation despite monetary easing. The New Keynesian extension adds the associated contraction in expenditure and output. Government debt also displays new dynamics. It initially falls as lower long-bond prices revalue outstanding liabilities, but later rises above steady state as the higher effective real rate increases debt-service costs, the term in (28) that was zero in the endowment economy.

5.4 Maturity shocks under fiscal dominance

Figure 2 shows the responses to the same maturity shock under fiscal dominance. The solid lines report the calibrated model, while the dashed lines show the risk-neutral benchmark with $\gamma = 0$, in which maturity is irrelevant. With limited arbitrage, the shock raises the term premium by around 17 basis points and lowers long-bond prices sharply on impact, by 1.4%. This corresponds to a 14 basis point rise in the long yield, twice as large as under monetary dominance because the policy rate is expected to increase later. Inflation initially falls by 0.18 percentage points at an annual rate and output contracts by 0.20 percentage points, but both eventually reverse sign and turn positive. The policy rate follows inflation down on impact, falling by 24 basis points, before rising as inflation recovers.

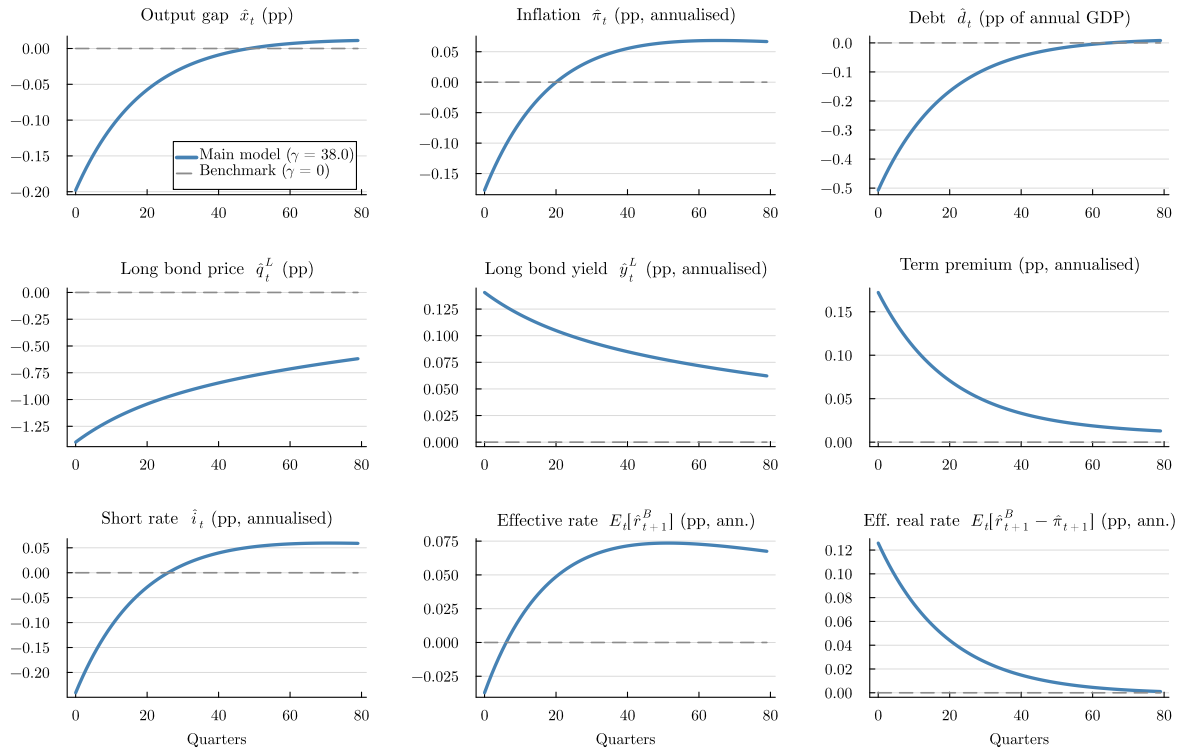


Figure 2: Response to a positive maturity shock under fiscal dominance

The quantitative model largely confirms the mechanism identified in the endowment economy. On impact, the maturity shock lowers long-bond prices and inflation as outstanding debt is revalued. As bond prices gradually recover, higher returns on government debt push inflation upwards, generating the same sign reversal as in Proposition 2. The quantitative model adds a perspective on timing. Inflation remains below steady state for around five years before turning positive. By then the price level has fallen by 0.4% and the cumulative output loss has reached

0.6% of annual GDP. The price level subsequently recovers slowly and eventually settles 3% above its initial level. Real debt also no longer stays constant: it falls by 0.5% of annual GDP on impact because the higher effective real rate lowers the present value of surpluses.

6 Conclusion

This paper studies how government debt maturity affects inflation when term premia respond to the supply of duration. Limited arbitrage makes borrowing costs and bond prices respond to debt maturity, with consequences that depend on the monetary–fiscal regime. Under monetary dominance, lengthening maturity raises real borrowing costs, so inflation and output fall despite monetary easing. Under fiscal dominance, lower long-bond prices reduce the market value of government debt and require deflation on impact, while higher returns ultimately require inflation as bond prices recover. We show analytically that inflation changes sign exactly once and that the cumulative price-level response is always positive. These results survive in a calibrated New Keynesian model, where the reversal from deflation to inflation takes around five years.

The broader implication is that debt maturity is not simply a tool for managing borrowing costs or influencing long-term yields. When arbitrage is limited, changes in maturity affect both the returns paid on government debt and its market value, making their macroeconomic effects inseparable from the monetary–fiscal regime. This also means that central-bank asset purchases and Treasury issuance cannot generally be assessed independently. Operations that change the duration of consolidated government debt may have very different inflationary effects depending on the fiscal response that accompanies them. In our model, shortening maturity raises inflation on impact in both regimes, but under fiscal dominance it ultimately lowers the price level. The interaction between debt maturity, endogenous term premia, and fiscal policy is therefore central to understanding inflation dynamics.

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Appendix

A Proofs

Proof of Proposition 1. With $z_t^m = z_t^f = 0 \; \forall t$ and the economy initially in steady state, the only disturbance is $\hat{\omega}_t = \rho_\omega^t \varepsilon_0^\omega > 0$.

Since $\phi_\pi > 1$, the difference equation (32) is explosive, so its unique bounded solution is proportional to the forcing term, $\hat{\pi}_t = a\,\hat{\omega}_t$. Substituting this gives $a\rho_\omega = \phi_\pi a + \Lambda$, which yields (29). Inflation is negative because $\phi_\pi > 1 > \rho_\omega$, $\hat{\omega}_t > 0$, and $\Lambda > 0$ since $\overline{tp} > 0$ by assumption.

The arbitrageur's first-order condition (23) and the long-bond return (2) give

$$\hat{q}_t^L = \delta\,\mathbb{E}_t \hat{q}_{t+1}^L - \hat{\imath}_t - \gamma V_L \hat{\omega}_t. \tag{A.1}$$

Since $\delta < 1$, the unique bounded solution is again proportional to the forcing term, $\hat{q}_t^L = b\,\hat{\omega}_t$. Substituting gives $b = \delta\rho_\omega b + \frac{\phi_\pi \Lambda}{\phi_\pi - \rho_\omega} - \gamma V_L$, which yields (30).

In the debt accumulation equation (28), the expected real servicing cost is zero by the Euler equation (20), and inflation and bond price surprises arrive only at $t = 0$. With $\hat{d}_{-1} = 0$, this gives (31) on impact and $\hat{d}_t = (\beta^{-1} - \tau)\hat{d}_{t-1}$ for $t \geq 1$, which is bounded since $\beta^{-1} - \tau < 1$.

Analogous arguments apply when the monetary and fiscal disturbances are non-zero, since they enter only as additional bounded forcing terms. For a given V_L the bounded equilibrium is therefore unique, with V_L determined by the selected root of the fixed point described in Section 4.6. □

Proof of Proposition 2. With $z_t^m = z_t^f = 0 \; \forall t$ and the economy initially in steady state, the only disturbance is $\hat{\omega}_t = \rho_\omega^t \varepsilon_0^\omega > 0$, and inflation and bond-price surprises arrive only at $t = 0$. For $t \geq 1$ there are no surprises, so the difference equation (32) holds without the expectation, which is (35). Since $\phi_\pi < 1$, it is stable, and inflation is bounded for any $\hat{\pi}_0$.

In the debt accumulation equation (28), the expected real servicing cost is zero by the Euler equation (20), so $\hat{d}_t = (\beta^{-1} - \tau)\hat{d}_{t-1}$ for $t \geq 1$. Since $\beta^{-1} - \tau > 1$, debt is bounded only if $\hat{d}_0 = 0$, which therefore implies $\hat{d}_t = 0 \; \forall t$. The budget constraint (26) and the fiscal rule (27) then imply $\hat{\pi}_t = \hat{r}_t^B$ at every date, while equation (28) at $t = 0$ with $\hat{d}_{-1} = 0$ gives (34).

As in the proof of Proposition 1 above, long-bond prices satisfy (A.1). Since $\delta < 1$, the unique bounded solution is linear in the two states, $\hat{q}_t^L = b_\pi \hat{\pi}_t + b_\omega \hat{\omega}_t$. Substituting and using $\hat{\imath}_t = \phi_\pi \hat{\pi}_t$ and (32) gives $b_\pi = \delta \phi_\pi b_\pi - \phi_\pi$ and $b_\omega = \delta \Lambda b_\pi + \delta \rho_\omega b_\omega - \gamma V_L$. Evaluating at $t = 0$, using (34) to eliminate $\hat{\pi}_0$ and substituting $\Lambda = \tilde{\omega}\gamma V_L + \xi$ yields (33). Both $\hat{q}_0^L$ and $\hat{\pi}_0$ are negative because $\delta\phi_\pi < 1$, $\tilde{\omega} > 0$, $\gamma V_L > 0$, and $\xi > 0$ since $\overline{tp} > 0$ by assumption.

By (35), $\hat{\pi}_{t-1} \geq 0$ implies $\hat{\pi}_t > 0$, since $\Lambda \hat{\omega}_{t-1} > 0$ for all $t \geq 1$. Therefore, once inflation is non-negative it remains positive, so it changes sign at most once. Summing (35) over $t \geq 1$ gives

$$(1 - \phi_\pi) \sum_{t=0}^{\infty} \hat{\pi}_t = \hat{\pi}_0 + \frac{\Lambda}{1 - \rho_\omega} \varepsilon_0^\omega. \tag{A.2}$$

Substituting $\hat{\pi}_0$ from (34) and using (33), the right-hand side becomes

$$\frac{1}{1 - \delta\rho_\omega} \left[\frac{1 - \delta}{1 - \rho_\omega} \Lambda + \frac{\delta\,(1 - \delta\phi_\pi)}{1 - (1 - \tilde{\omega})\delta\phi_\pi} \xi \right] \varepsilon_0^\omega > 0. \tag{A.3}$$

Cumulative inflation is therefore positive while $\hat{\pi}_0 < 0$, so inflation must turn positive at some unique date $T \geq 1$.

Analogous arguments apply when the monetary and fiscal disturbances are non-zero. The explosive debt equation then has a unique bounded solution, which pins down the surprise revaluation at each date, while inflation and bond prices are solved as above with additional bounded forcing terms. For a given V_L the bounded equilibrium is therefore unique, with V_L determined by the selected root of the fixed point described in Section 4.6. □

Proof of Corollary 1. The result follows directly from the proof of Proposition 2. Combining (A.2) and (A.3) gives (36). □

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