The Austerity Threshold

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Motivation

- Government debt in U.S. is at highest level since end WW2; 100% of GDP
  - Projected by CBO to rise to 155% of GDP by 2055 as of Jan 2025
  - Can we actually reach that level of debt and still avoid default?
  - How long can we delay the fiscal adjustment?
- Common approach in literature is local debt stabilization
  - When economy is hit by shock that causes rise in debt, government responds immediately/locally/linearly through policies that raises surplus
  - Works in theory, but counterfactual, and unrealistic for political reasons
- This paper: fiscal policy is unresponsive to debt/GDP for wide range of values
- **New measure of fiscal capacity**: "austerity threshold" is the highest possible level of debt/GDP above which government must raise surpluses to avoid future default

Approach and Main Findings

- Determine endogenous threshold in quantitative model with nominal frictions, intermediaries, realistic asset pricing
  - Fiscal rule with global regimes, large “inaction region”
  - Intermediary sector: convenience yields in debt
  - Low interest rates due to large precautionary motive to counter aggregate risk
  - Debt safety in spite of risky tax and spending streams

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- Which policies create the highest austerity threshold (= fiscal capacity)?
  - Tax-based austerity threshold is 189%, spending-based austerity 200% of GDP
  - Tax increases: negative supply shock, mon. pol. must fight inflation
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    - ⋆ higher risk aversion: ↗
    - ⋆ lower labor supply elasticity: ↗
    - ⋆ shorter maturity of debt: ↗
    - ⋆ higher liquidity coverage requirements for banks (financial repression): ↗
    - ⋆ hawkish monetary policy in austerity: ↗

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  - Higher fiscal capacity $\not\Leftrightarrow$ higher welfare, due to crowding out
- Uncertainty about the type of austerity policy reduces fiscal capacity
  - Austerity threshold falls to 127% of GDP if each type of austerity occurs w.p. 50%
  - Regime switches cause large bond valuation swings

Simple Model

- Rep. firm with production function $Y_t = Z_t N_t^{\alpha}$
- Rep. household with time-separable preferences and utility

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- Government spends fraction γ_t of GDP and taxes labor income
- Issues one-period bond at price q_t: government budget constraint

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- Tax rate $\tau_t = f(B_t)$ follows rule that depends on current level of debt

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- Tax rate $\tau_t = f(B_t)$ follows rule that depends on current level of debt
- Equilibrium: $N_t = N_t^H$, $B_t = B_t^H$, $C_t = (1-\gamma_t)Y_t$

Debt Dynamics and Upper Bound

- Debt B_t is only endogenous state variable; model closed-form conditional on B_t
- Transition law

$$q_t B_{t+1} = B_t - \underbrace{Z_t \left(\frac{\alpha}{\omega_0} \frac{1 - f(B_t)}{1 - \gamma_t} \right)^{\alpha/(1+\omega_1)} (\alpha f(B_t) - \gamma_t)}_{\text{Primary Surplus}}$$

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- Given preferences, technology, and gov. spending process, a tax policy makes debt safe if it implies an **upper bound** $\bar{B}$ defined by

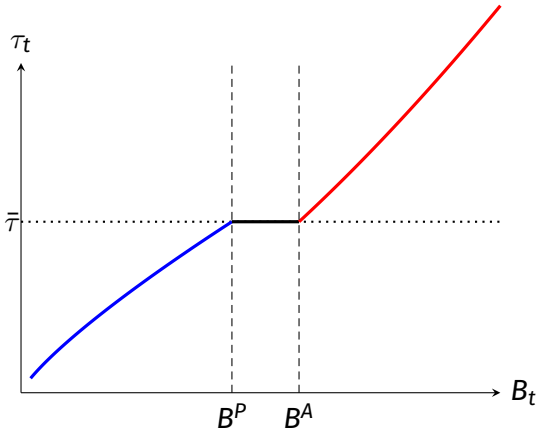
$$(1 - \bar{q})\bar{B} = Z_{min} \left(\frac{\alpha}{\omega_0} \frac{1 - f(\bar{B})}{1 - \gamma_h} \right)^{\alpha/(1+\omega_1)} (\alpha f(\bar{B}) - \gamma_h)$$

  - Once economy is at $\bar{B}$, it stays there as long as worst shocks (Z_{min}, γ_h) realize
  - At upper bound, interest expense on debt $=$ primary surplus

Tax Rule and Austerity Threshold

$$\tau_t = f(B_t) = \begin{cases} \bar{\tau}\left(\dfrac{B_t}{B^P}\right)^{\tau_P} & \text{if } B_t < B^P \\ \bar{\tau} & \text{if } B^P \leq B_t \leq B^A \\ \bar{\tau}\left(\dfrac{B_t}{B^A}\right)^{\tau_A} & \text{if } B_t > B^A \end{cases}$$

- Inaction region between thresholds B^P and B^A; constant tax rate $\bar{\tau}$
- Steep adjustments in tails



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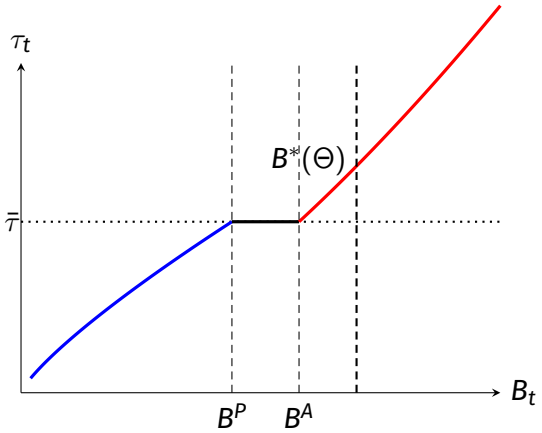
- **Austerity Threshold** $B^*(\Theta)$: highest value of B^A for which upper bound $\bar{B}$ exists
- $B^*(\Theta)$ is function of all model parameters $\Theta = (\mathcal{Z}, \mathcal{G}, \Pi_Z, \Pi_\gamma, \alpha, \beta, \omega_0, \omega_1, B^P, \bar{\tau}, \tau_P, \tau_A)$



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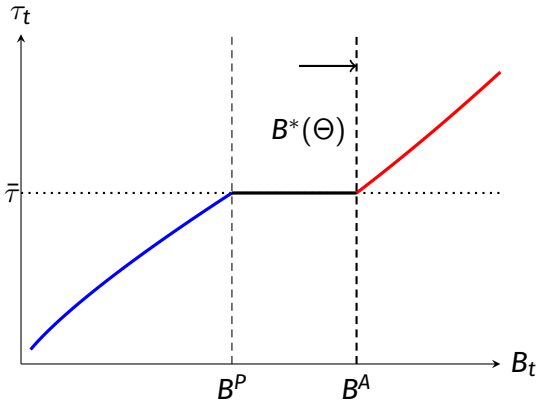
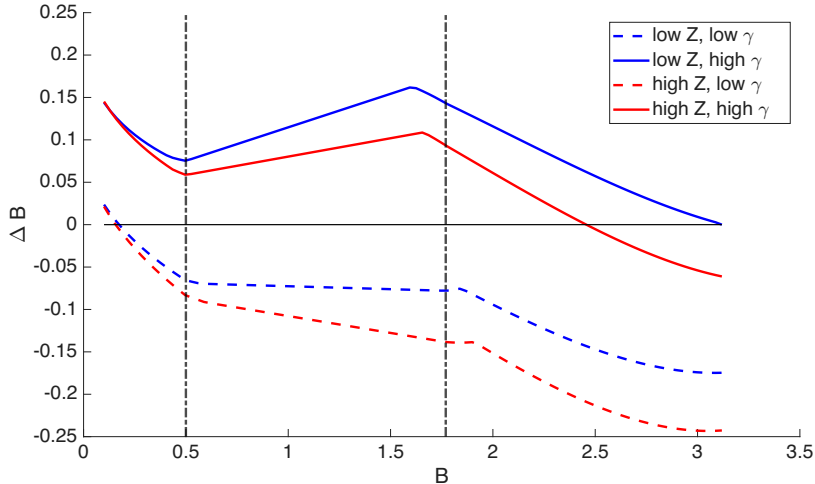
- Solve for $B^*(\Theta)$ by moving up B^A until no further feasible increase



Numerical Example: Law of Motion for Debt B_t

- For (Z_{min}, γ_h), ΔB_{t+1} at upper bound exactly zero



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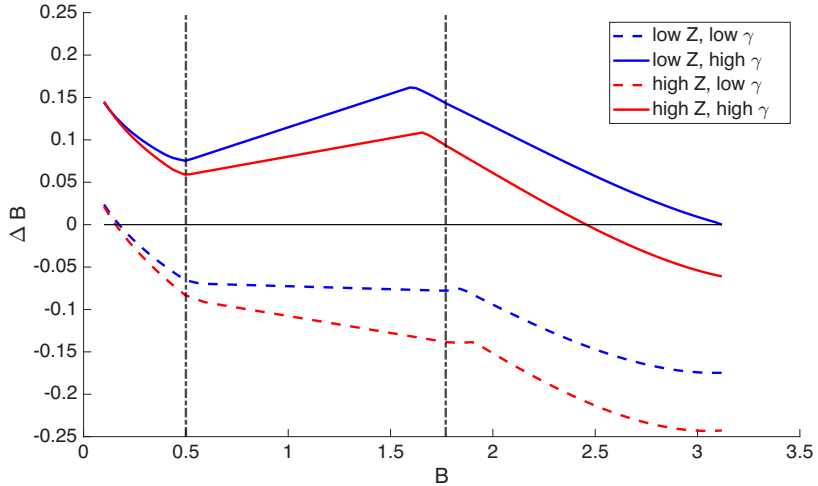
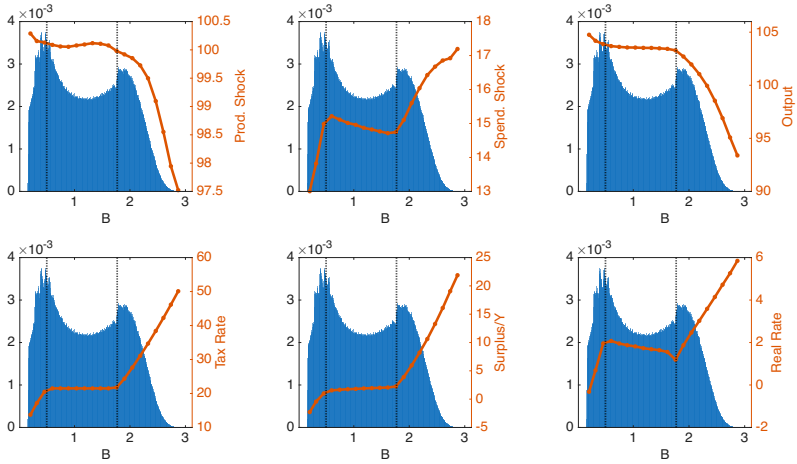
- All other shocks map to interior



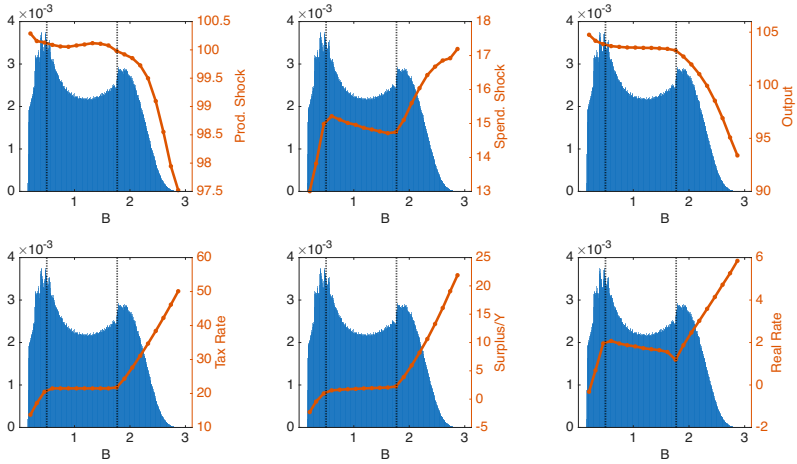
Numerical Example: Ergodic Distribution and Conditional Dynamics

- Bimodal ergodic debt distribution in long simulation



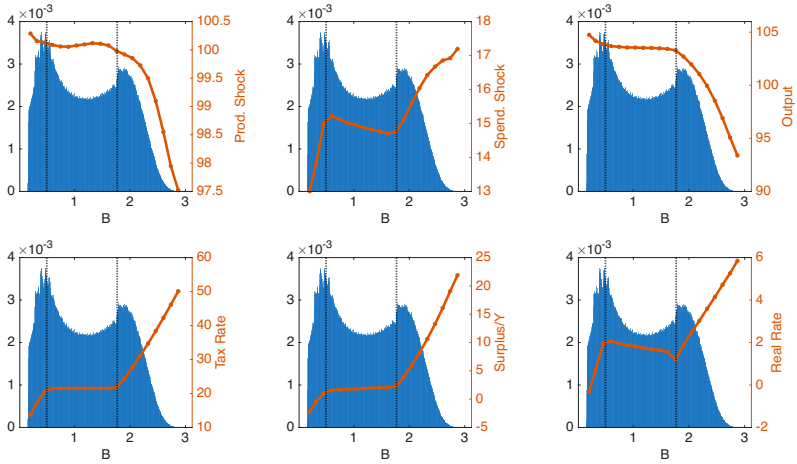
Numerical Example: Ergodic Distribution and Conditional Dynamics

- In austerity region, output drops and interest rate rises: dynamic Laffer curve



Numerical Example: Ergodic Distribution and Conditional Dynamics

- Upper bound 3.12 never reached in 40m periods (highest simulated value 2.98)



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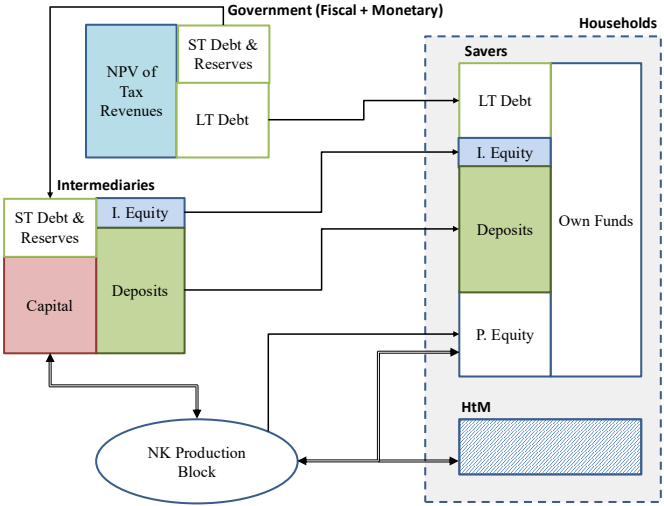
- Quantitative model adds
  1. Permanent shocks, EZ prefs
  2. Capital accumulation
  3. Nominal frictions, monetary policy
  4. Intermediary sector with deposits (convenience yield)
  5. More realistic fiscal policy (transfers, macro stabilization)
  6. Hand-to-mouth agents (fiscal multiplier)

Quantitative Model: Overview



Productivity, Household, and Intermediary

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  - HtM households choose labor supply, consume all labor and transfer income

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- Intermediary is firm owned by households with equity issuance cost, subject to
  - Regulatory capital requirement

$$\text{Deposits} \leq \nu \left(\text{Reserves} + \nu_K \text{Capital}\right)$$

    - ⋆ ν is Supplementary Leverage Ratio (SLR), ν_K capital risk weight
  - Liquidity coverage cost that captures regulatory Liquidity Coverage Ratio (LCR) $\Rightarrow$ deposit convenience yield in ST gov. debt

Monetary and Fiscal Policy

- Monetary Policy
  - Central bank sets **interest rate on reserves** using Taylor rule:

$$i_t^{ST} = \bar{i}^{ST} + \alpha_\pi(\pi_t - \bar{\pi}) + \alpha_y \hat{y}_t$$

  - Interest rates on assets held by households (deposits, long-term bonds) respond in equilibrium with imperfect pass-through

Monetary and Fiscal Policy

- Monetary Policy
- Fiscal policy subject to gov budget constraint

$$W_t^G = \underbrace{\frac{1}{\Pi_t}\left(B_{t-1}^{G,st} + (c + (1-\delta) + \delta p_t^{lt}) B_{t-1}^{G,lt}\right)}_{\text{Real market value of debt}} = \underbrace{S_t}_{\text{Prim. surp.}} + \underbrace{(p_t^{st} B_t^{G,st} + p_t^{lt} B_t^{G,lt})}_{\text{New issuance}}$$

  - Nominal short- and long-term debt issued in fixed proportions over time
  - Primary surplus: $S_t = T_t^w + T_t^{w,H} + T_t^{div,I} + T_t^{div,P} - G_t - \Theta_t - \Theta_t^H$

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- Fiscal policy follows rules with two objectives
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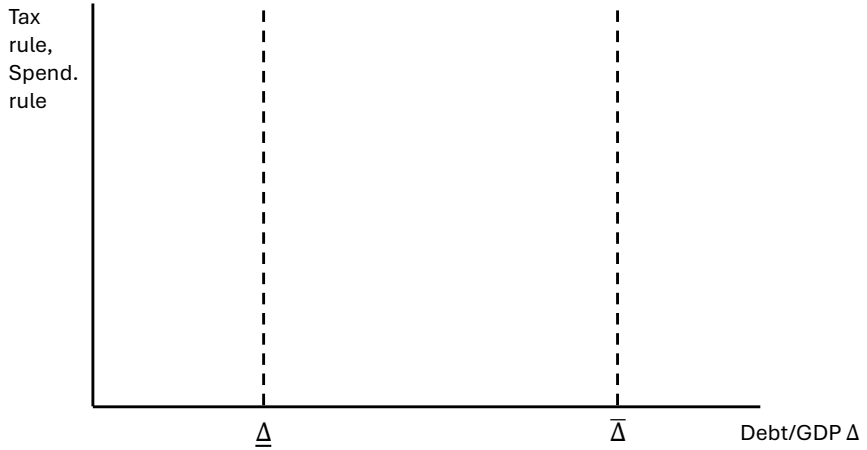
- Exogenous regime switches in fiscal policy
  - Transfer spending shocks ϑ_t with Markov chain Π_ϑ
  - Austerity regime $F_t \in \{0, 1\}$, with Markov chain Π_F
    - ⋆ Leading special case: known austerity regime 0 or 1 with probability 1

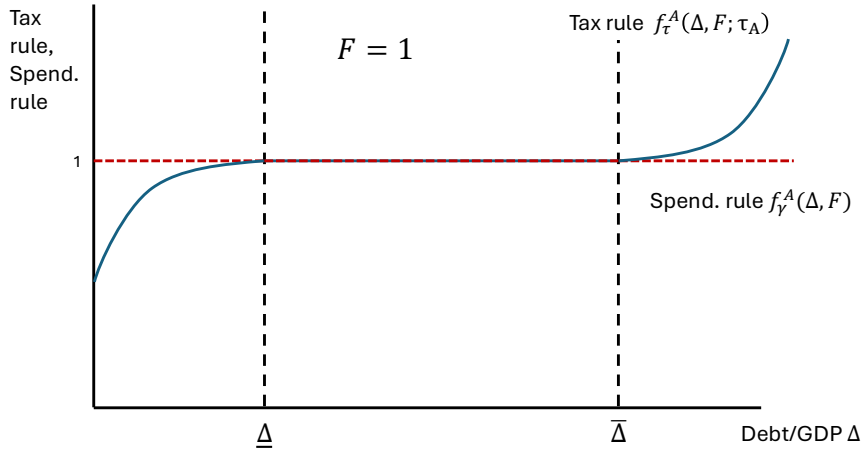
Endogenous Debt Stabilization Regimes

- Inaction region for government between $\underline{\Delta}$ and $\overline{\Delta}$



Endogenous Debt Stabilization Regimes

- Regime 1: adjustment through **taxes** in the tails



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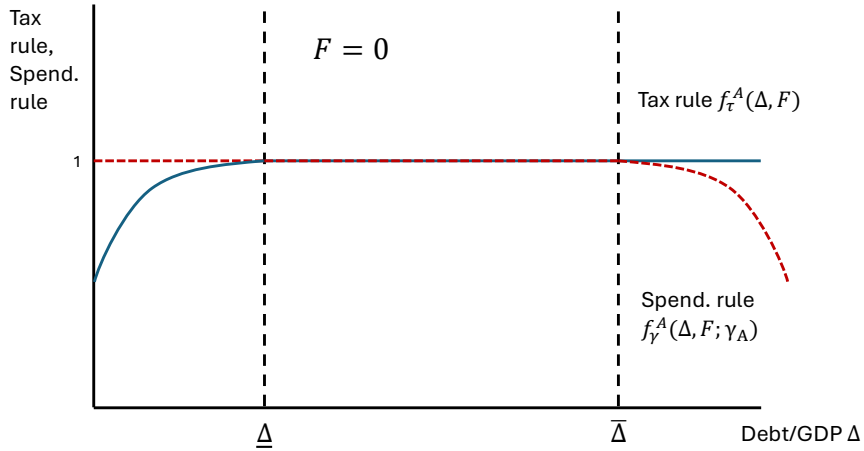
- Regime o: adjustment through **spending** in austerity



Equilibrium, Solution Method and Parameterization

- NK block: final and intermediate goods producers with Rotemberg menu cost
- Competitive equilibrium: agents optimize subject to policy rules, and markets clear
- Global nonlinear solution method
  - State variables: $\{Z_t^L, g_t, F_t, \vartheta_t\}$, $\{K_t, W_t^I, W_t^S, W_t^G\}$
  - Occasionally binding intermediary leverage constraint, global tax/spending rule
  - Large risk premia

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  - Cyclicality of spending, transfers, tax revenue

Equilibrium, Solution Method and Parameterization

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- Competitive equilibrium: agents optimize subject to policy rules, and markets clear
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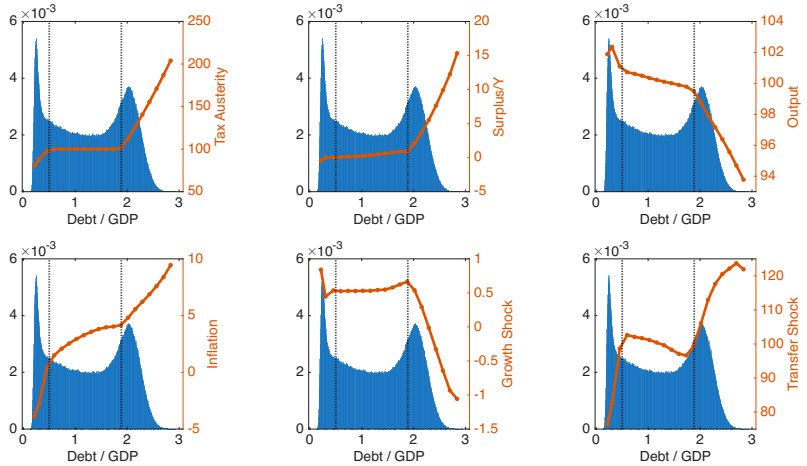
- Key calibration targets
- Austerity threshold $\bar{\Delta}$ determined using **simulation-based** criterion
  - More robust computational algorithm
  - Set $\bar{\Delta}$ s.t. upper bound only (b)reached in 1/50K simulations of 80 year paths
  - Higher implied threshold than analytical bound from simple model

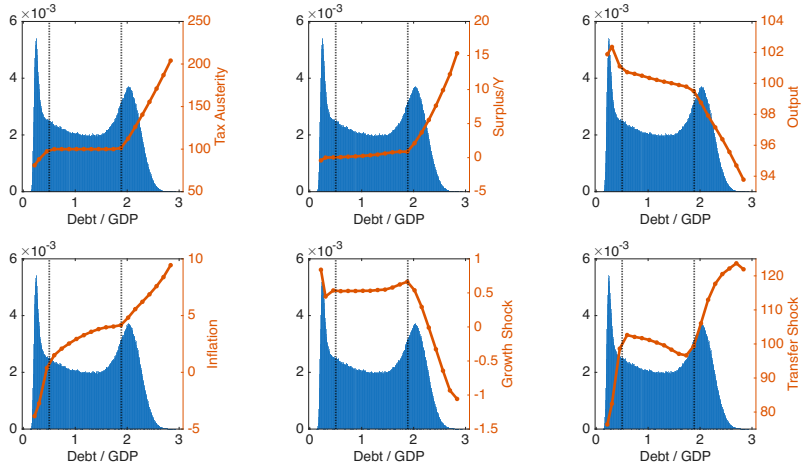
Tax Austerity with Probability 1

- Higher taxes begin when debt exceeds 189% of GDP



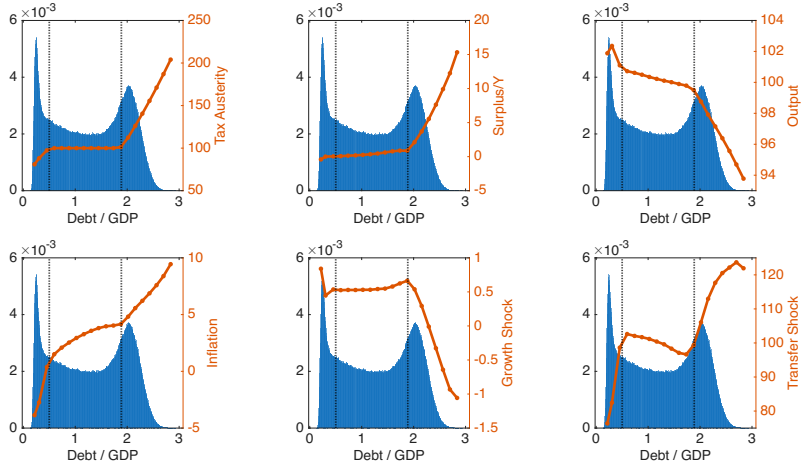
Tax Austerity with Probability 1

- Taxes rise sharply; Laffer curve effects prevent further delay



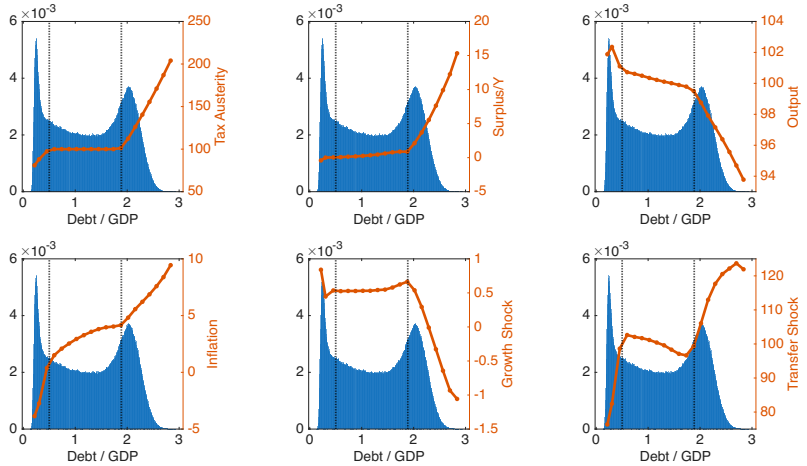
Tax Austerity with Probability 1

- Output declines sharply in austerity, high inflation (neg. supply shock)



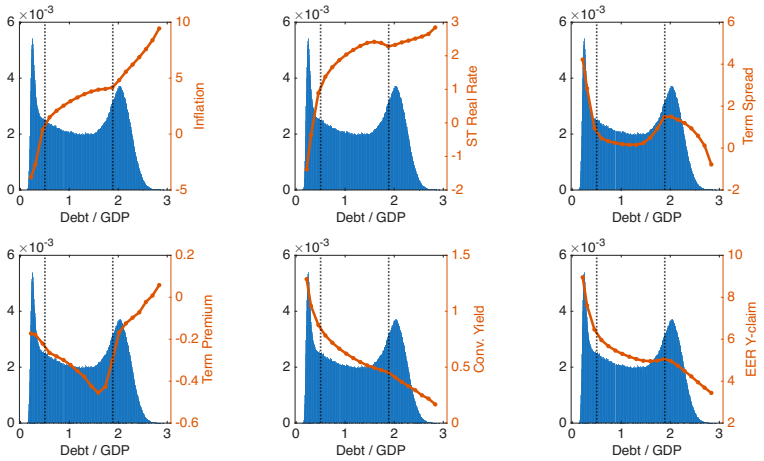
Tax Austerity with Probability 1

- How did we get there? Low growth and high transfer spending



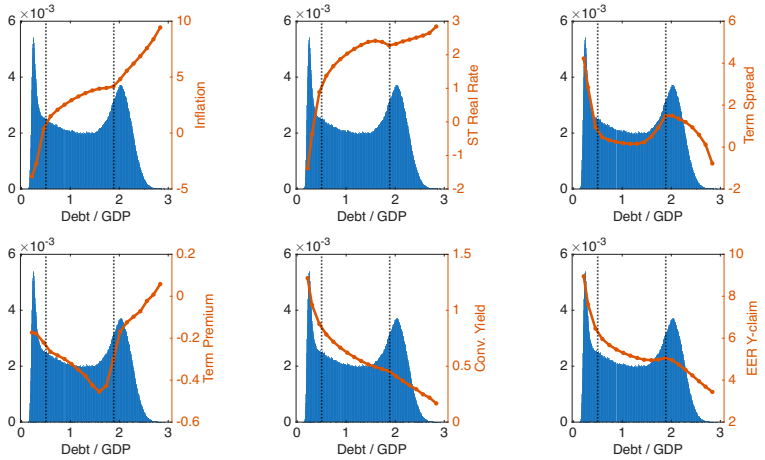
Tax Austerity with Prob. 1: Asset Prices

- Austerity highly inflationary; $r < g$ for low debt, $r > g$ for high debt



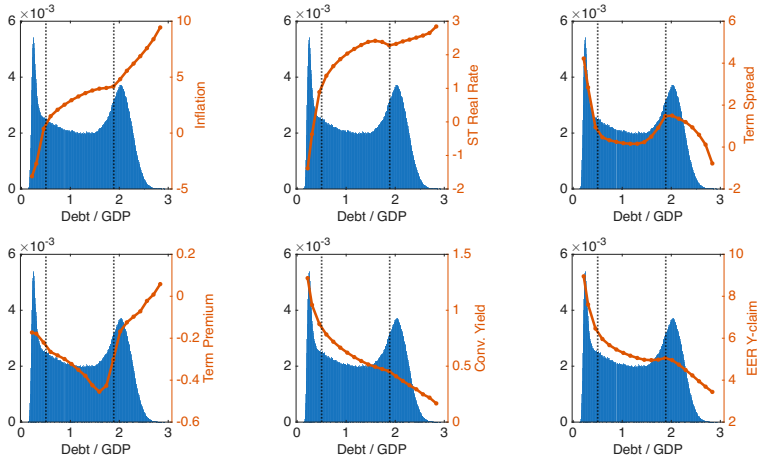
Tax Austerity with Prob. 1: Asset Prices

- Term spread rises leading up to, falls in austerity



Tax Austerity with Prob. 1: Asset Prices

- Conv. yields decline in debt/GDP (Krishamurthy & Vissing-Jorgensen 2012)



Drivers of Austerity Threshold

- Frisch elasticity labor supply 0.5 $\rightarrow$ 1 (higher tax sensitivity)

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
Term spread	1.11	1.68	1.36	0.375	0.579	0.799	1.17	1.09
Inflation	2.72	2.44	7.15	4.01	3.51	2.22	2.49	3.13
K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
L^{HTM}	40.5	-4.83	0.0352	0.0026	0.0030	0.0054	0.0011	-0.003
C^{HTM}/Y	5.26	0.106	0.707	-2.22	-1.91	3.71	-1.29	-2.23
Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- Lower risk aversion, lower precautionary savings, higher r^f, lower K

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
Term spread	1.11	1.68	1.36	0.375	0.579	0.799	1.17	1.09
Inflation	2.72	2.44	7.15	4.01	3.51	2.22	2.49	3.13
K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
L^{HTM}	40.5	-4.83	0.0352	0.0026	0.0030	0.0054	0.0011	-0.003
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Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- ST debt (33→50%), interest expense ↓, fiscal capacity ↑, crowd out K

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
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K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
L^{HTM}	40.5	-4.83	0.0352	0.0026	0.0030	0.0054	0.0011	-0.003
C^{HTM}/Y	5.26	0.106	0.707	-2.22	-1.91	3.71	-1.29	-2.23
Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- Financial repression (LCR↑), interest expense ↓, fiscal capacity ↑, crowd out K

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
Term spread	1.11	1.68	1.36	0.375	0.579	0.799	1.17	1.09
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K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
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Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- MP rule sets 30bps higher rates in austerity, lowers infl exp, fiscal capacity ↑

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
Term spread	1.11	1.68	1.36	0.375	0.579	0.799	1.17	1.09
Inflation	2.72	2.44	7.15	4.01	3.51	2.22	2.49	3.13
K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
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C^{HTM}/Y	5.26	0.106	0.707	-2.22	-1.91	3.71	-1.29	-2.23
Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- More gradual tax hikes, fiscal capacity ↓, welfare ↓

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
Term spread	1.11	1.68	1.36	0.375	0.579	0.799	1.17	1.09
Inflation	2.72	2.44	7.15	4.01	3.51	2.22	2.49	3.13
K/Y	157	0.668	-8.66	-4.70	-5.75	3.71	-0.961	-3.00
L^{HTM}	40.5	-4.83	0.0352	0.0026	0.0030	0.0054	0.0011	-0.003
C^{HTM}/Y	5.26	0.106	0.707	-2.22	-1.91	3.71	-1.29	-2.23
Output (Y)	100			-2.27	-1.96	3.60	-1.31	-2.18
Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- Steeper tax hikes, fiscal capacity ↑, welfare ↓

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
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Welfare Saver				-0.016	-0.023	0.0121	-0.006	-0.006
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

Drivers of Austerity Threshold

- Interior optimum

	Base	LS	RA	ST 50%	F.Repr.	MP	Sm.A.	Agg.A.
Bound	189	155	137	220	228	212	160	222
Debt/Y	129	109	151	161	156	125	107	162
% Aust.	27.0	29.3	79.7	31.9	28.4	18.4	25.0	32.8
Real rate	1.70	1.52	4.31	2.47	2.16	1.63	1.56	1.94
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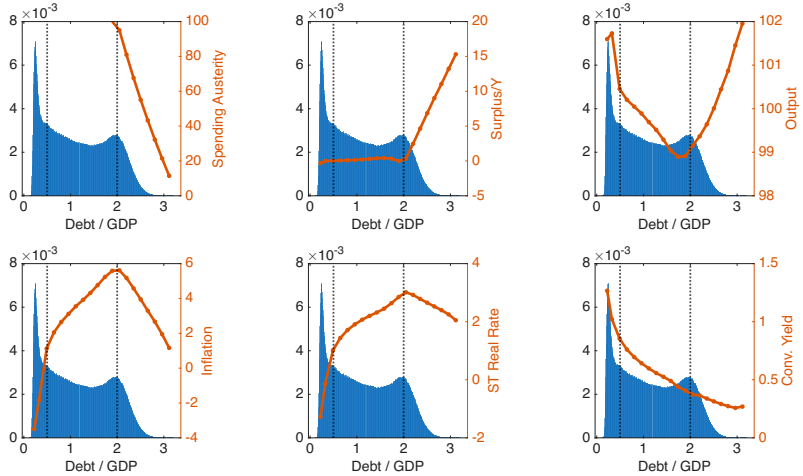
Welfare HTM				-0.002	-0.010	0.0099	-0.001	-0.001

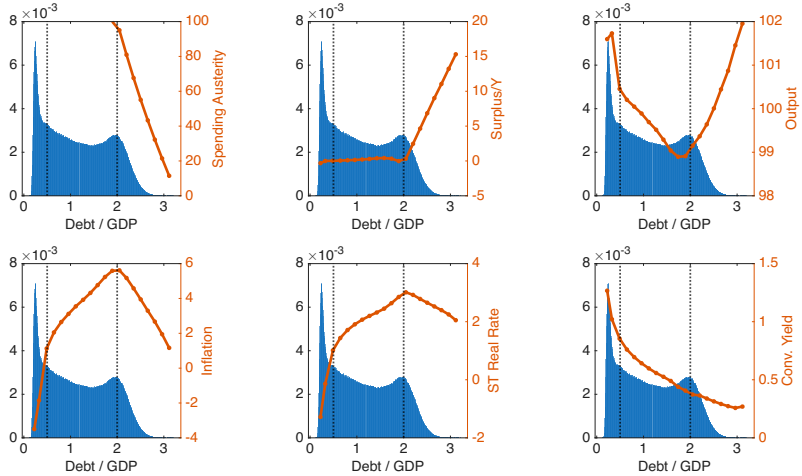
Spending Austerity with Probability 1

- Austerity kicks in at debt/GDP ratio of 200%



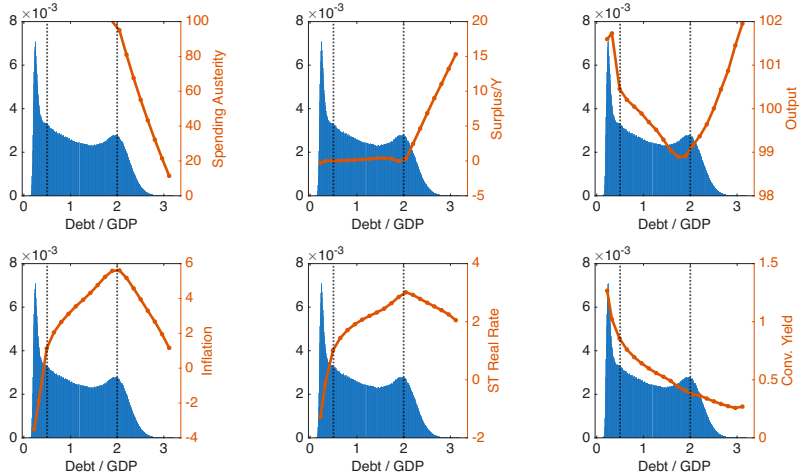
Spending Austerity with Probability 1

- Output remains steady in austerity; CB can stabilize; yields higher fiscal capacity



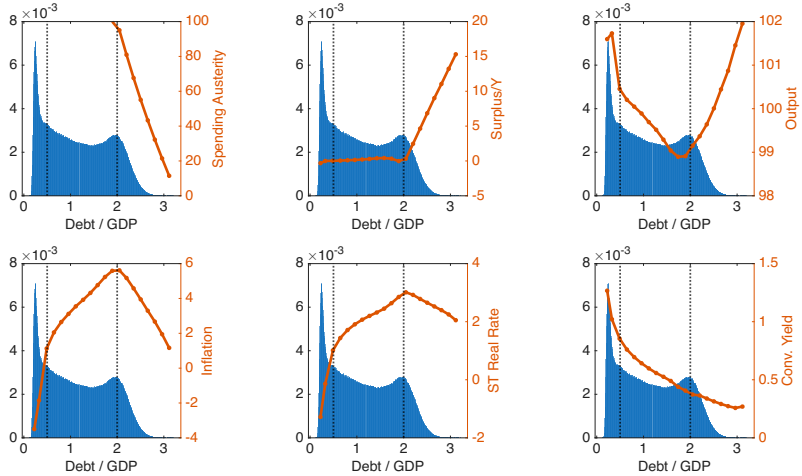
Spending Austerity with Probability 1

- Low inflation, low interest rates (neg. demand shock)



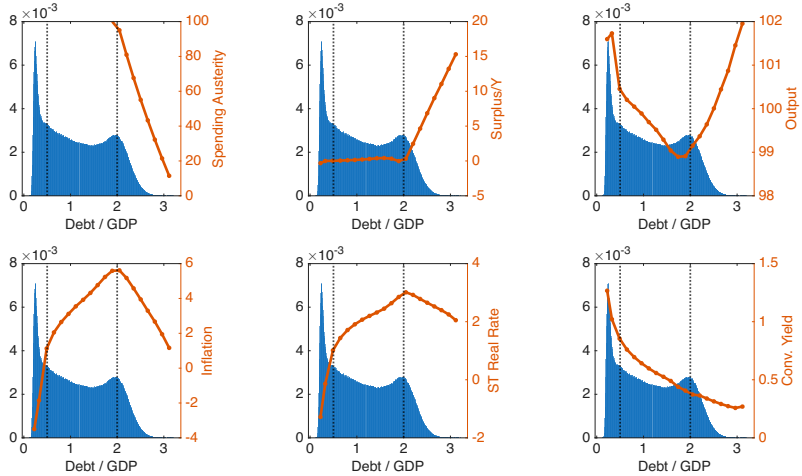
Spending Austerity with Probability 1

- Term spread strongly declining (infl risk premium ↓)



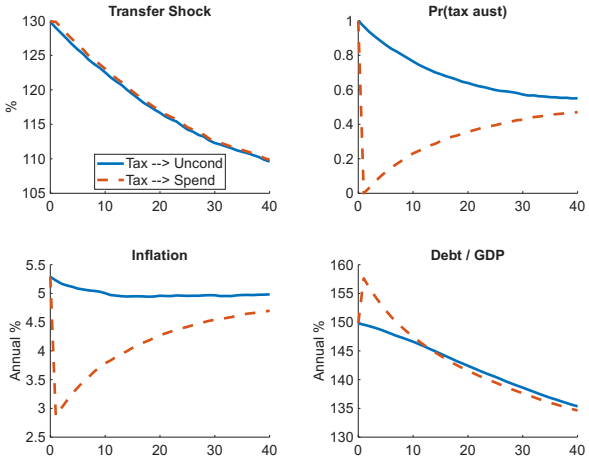
Spending Austerity with Probability 1

- Type of austerity matters for asset prices well before threshold



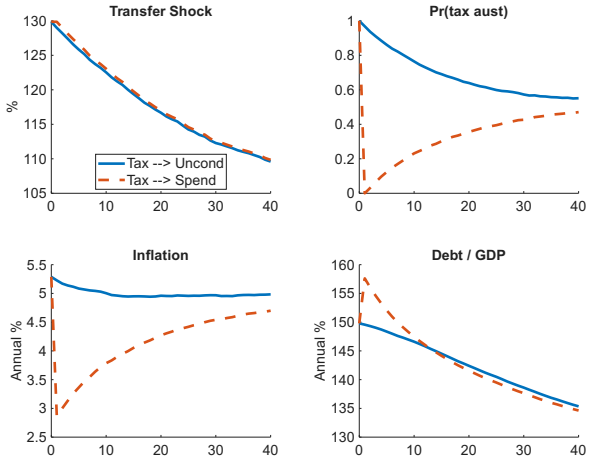
Uncertainty About the Austerity Regime

- Regime with Prob($F_t = 1$) $= 0.5$ lowers threshold from 189% to 120%



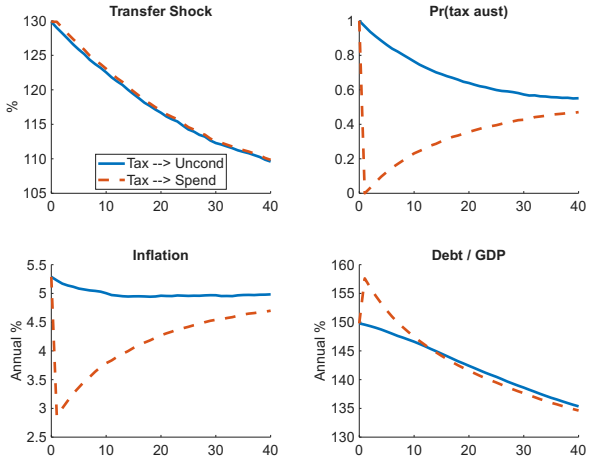
Uncertainty About the Austerity Regime

- Switch from tax to spending austerity: inflation ↓, MV of debt ↑



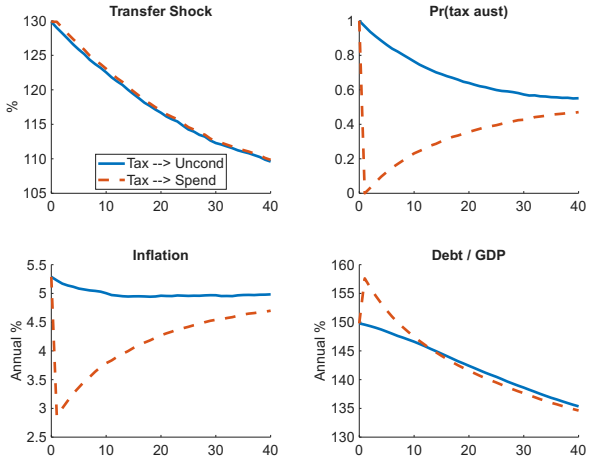
Uncertainty About the Austerity Regime

- When debt already high, “deflation shock” threatens safety of debt, fiscal capacity ↓



Uncertainty About the Austerity Regime

- Political uncertainty large limiting factor for fiscal capacity



Conclusion

- Fiscal expansion raises questions on debt repayment
- At which level of debt does the government need to raise surpluses?
- Answer depends on the type of policy used to raise surplus
- Expectations about the regime in austerity have effects on asset prices away from threshold
- Uncertainty about policy regime reduces fiscal capacity
- Under political uncertainty about type of austerity, bound is about 130% of GDP for U.S., will be breached in next decade according to CBO

Appendix Table of Contents

Saver Household Problem

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$$V_t^S = (1-\beta)u(C_t, D_t^S, N_t) + \beta \mathrm{E}_t \left[(V_{t+1}^S)^{\frac{1-\gamma}{1-\varphi}} \right]^{\frac{1-\varphi}{1-\gamma}}.$$

subject to:

$$\begin{aligned}
&P_t C_t + P_t(I_t + \Phi(I_t, K_t)) + p_t^D D_t^S + p_t^L B_t^{S,L} + P_t Q_t X_t^{S,K} \\
&\quad \leq W_t^S + P_t(1-\tau_t^w) w_t N_t + P_t Q_t I_t + P_t(1-\tau_t^{div})(Div_t^I + Div_t^P) + P_t \Theta_t + \text{Rebates}_t, \\
&W_t^S = P_t \left(r_t^K + (1-\delta) Q_t \right) X_{t-1}^{S,K} + D_{t-1}^S + (c + 1 - \delta^B + \delta^B p_t^L) B_{t-1}^{S,L} \\
&\text{Rebates}_t = Z_t^p P_t \Xi^p(P_t(i)/P_{t-1}(i)) + \frac{P_t}{Z_t^p} \frac{\chi}{2} A_t^2
\end{aligned}$$

Intermediary Problem

back

$$V^I(W_t^I, \mathcal{S}_t) = \max_{A_t, B_t^{I,S}, X_t^{I,K}, D_t^I} \tau W_t^I - A_t + \mathsf{E}_t\left[\mathcal{M}_{t,t+1} V^I(W_{t+1}^I, \mathcal{S}_{t+1})\right]$$

subject to:

$$(1-\tau)W_t^I + P_t A_t + (p_t^D - P_t \varrho_t) D_t^I + \text{Rebates}_t^I \geq p_t^S B_t^{I,S} + P_t Q_t X_t^{I,K} + P_t Z_t^P \frac{\chi}{2}\left(\frac{A_t}{Z_t^P}\right)^2,$$

$$W_{t+1}^I = \exp(-g_{t+1})\left[\left(r_{t+1}^K + (1-\delta_K)Q_{t+1}\right) X_t^{I,K} + B_t^{I,S} - D_t^I\right],$$

$$D_t^I \leq \nu\left(B_t^{I,S} + \nu_K P_t Q_t X_t^{I,K}\right),$$

$$X_t^{I,K} \geq 0,\ B_t^{I,S} \geq 0$$

$$\mathcal{M}_{t,t+1} = \beta \exp((1-\gamma) g_{t+1}) \left(\frac{C_{t+1}}{C_t}\right)^{-1} \left(\frac{C_{t+1}^{1-\psi}(D_{t+1}^H)^{\psi}}{C_t^{1-\psi}(D_t^H)^{\psi}}\right)^{1-\varphi} \left(\frac{V_{t+1}^H}{CE_t}\right)^{\frac{\varphi-\gamma}{1-\varphi}}$$

$$\rho_t(D_t^I, X_t^{I,S}) = \varrho_0 \zeta \rho \left(\frac{X_t^{I,S}}{\zeta \rho D_t^I}\right)^{1-\varrho_1}$$

Debt and Taxes

- Data: high debt/GDP does not coincide higher taxes or surpluses

	Dependent variable:					
	Δ Tax Rev.	Δ Surplus	Δ Tax Rev.	Δ Surplus	Δ Tax. Rev.	Δ Surplus
	Data	*Data*	*Model*	*Model*	*Model*	*Model*
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Debt/GDP	−0.109**	−0.490**	0.000***	−0.017***	−0.020***	−0.038***
	(0.043)	(0.216)	(0.00)	(0.00)	(0.00)	(0.00)
Prof.					0.000***	−0.0002***
					(0.00)	(0.00)
Aus.					0.000***	0.001***
					(0.00)	(0.00)
Δ Debt/GDP × Prof.					-0.008***	-0.029***
					(0.00)	(0.00)
Δ Debt/GDP × Aus.					0.040***	0.043***
					(0.00)	(0.00)
Observations	313	313	3,999,600	3,999,600	3,999,600	3,999,600
R^2	0.137	0.300	0.135	0.146	0.405	0.191
Note:						*p<0.1; **p<0.05; ***p<0.01

back

Drivers of Austerity Bound: Spending Austerity

	Base	LS	HTM	Low RA	ST 50%	Fin.Repr.	MP
Bound	200	205	198	115	212	202	200
Debt/Y	116	126	116	117	146	124	96.8
% Aust.	14.3	17.5	15.1	64.7	25.3	17.3	6.90
Real rate	1.69	1.82	1.74	4.12	2.63	2.16	1.47
Term spread	0.389	0.483	0.350	1.11	-0.497	0.0482	0.340
Inflation	2.70	2.95	2.80	6.81	4.28	3.50	2.20
K/Y	157	-0.263	-0.345	-7.33	-5.19	-6.05	-0.489
L^{HTM}	40.6	-4.71	0.0073	0.723	0.136	0.0374	-0.069
C^{HTM}/Y	5.25	0.0950	16.5	-1.46	-2.23	-1.63	-0.558
Output (Y)	100	-0.040	-0.039	-0.024	-1.91	-1.55	-0.801
Welfare Saver					-0.017	-0.025	-0.006
Welfare HTM					-0.027	-0.022	0.0043

Drivers of Austerity Bound: Spending Austerity

	Base	LS	HTM	Low RA	ST 50%	Fin.Repr.	MP
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Term spread	0.389	0.483	0.350	1.11	-0.497	0.0482	0.340
Inflation	2.70	2.95	2.80	6.81	4.28	3.50	2.20
K/Y	157	-0.263	-0.345	-7.33	-5.19	-6.05	-0.489
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Inflation	2.70	2.95	2.80	6.81	4.28	3.50	2.20
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L^{HTM}	40.6	-4.71	0.0073	0.723	0.136	0.0374	-0.069
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Drivers of Austerity Bound: Spending Austerity

	Base	LS	HTM	Low RA	ST 50%	Fin.Repr.	MP
Bound	200	205	198	115	212	202	200
Debt/Y	116	126	116	117	146	124	96.8
% Aust.	14.3	17.5	15.1	64.7	25.3	17.3	6.90
Real rate	1.69	1.82	1.74	4.12	2.63	2.16	1.47
Term spread	0.389	0.483	0.350	1.11	-0.497	0.0482	0.340
Inflation	2.70	2.95	2.80	6.81	4.28	3.50	2.20
K/Y	157	-0.263	-0.345	-7.33	-5.19	-6.05	-0.489
L^{HTM}	40.6	-4.71	0.0073	0.723	0.136	0.0374	-0.069
C^{HTM}/Y	5.25	0.0950	16.5	-1.46	-2.23	-1.63	-0.558
Output (Y)	100	-0.040	-0.039	-0.024	-1.91	-1.55	-0.801
Welfare Saver					-0.017	-0.025	-0.006
Welfare HTM					-0.027	-0.022	0.0043

Drivers of Austerity Bound: Spending Austerity

	Base	LS	HTM	Low RA	ST 50%	Fin.Repr.	MP
Bound	200	205	198	115	212	202	200
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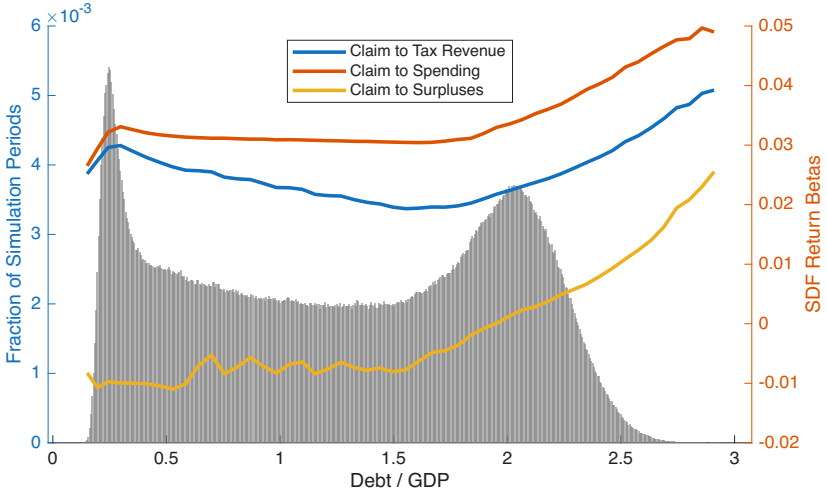
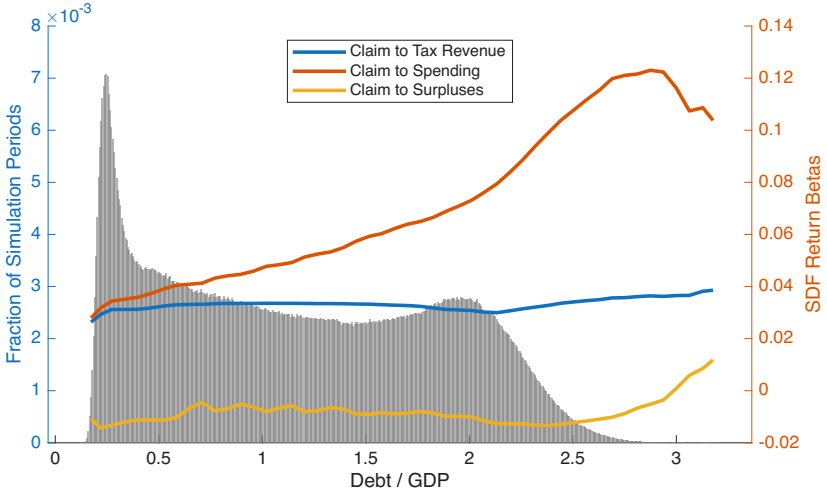
Tax Austerity with Prob. 1: Priced Fiscal Risk

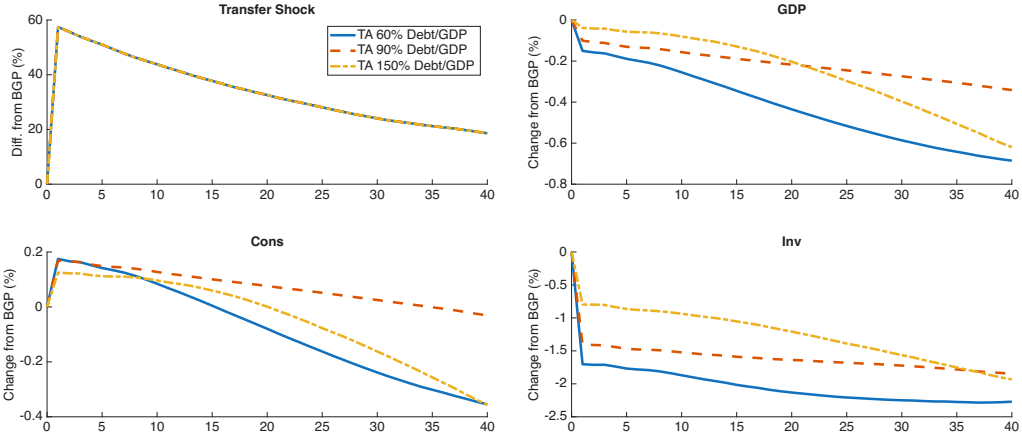


Spending Austerity with Prob. 1: Priced Fiscal Risk



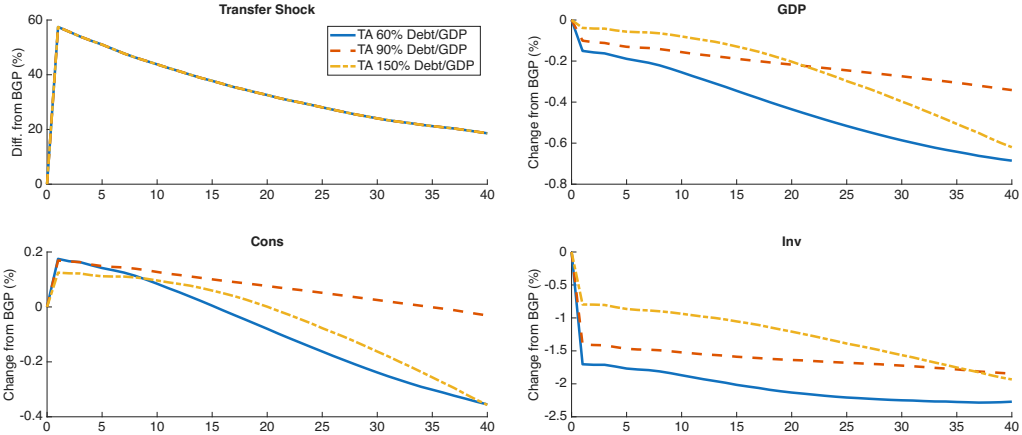
Real Effects of Higher Transfer Spending

- Most savers are “Ricardian” but transfer spending shock has real effects



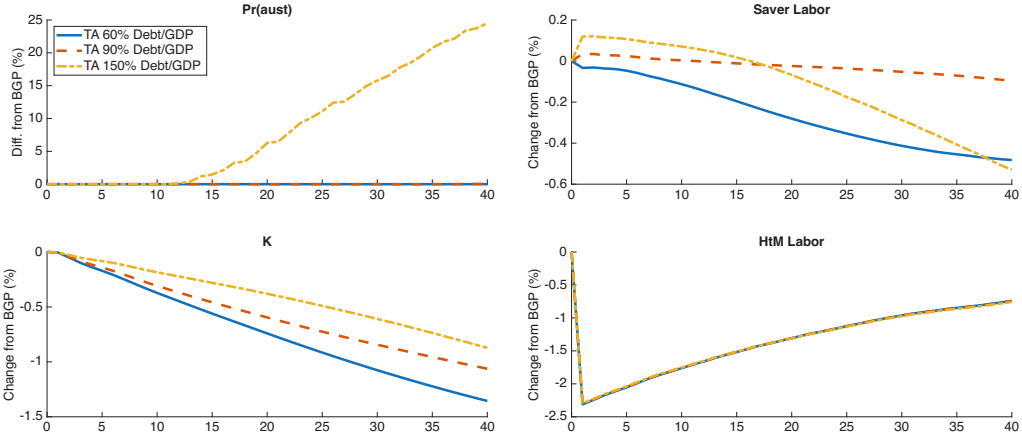
Real Effects of Higher Transfer Spending

- Transfer shock lowers GDP, Cons, Inv; initial effect higher for low debt/GDP



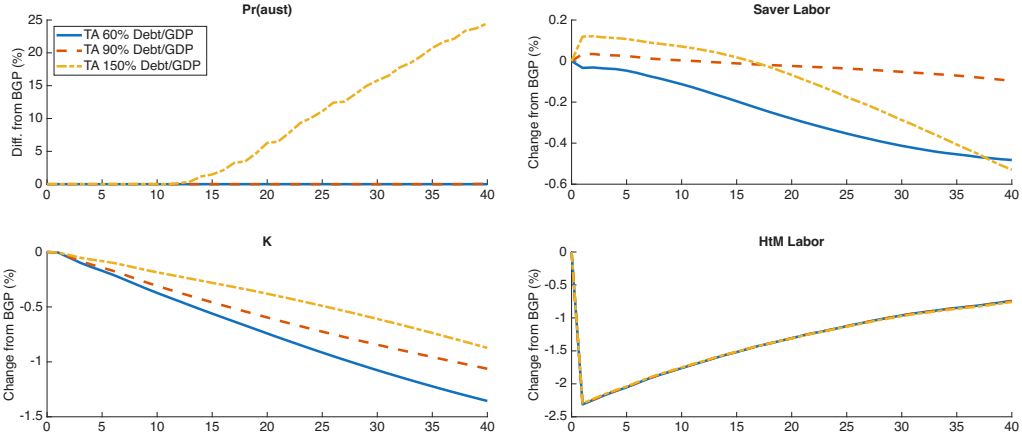
Real Effects of Higher Transfer Spending

- Later: austerity more likely if debt/GDP was high initially; tax ↑ are coming



Real Effects of Higher Transfer Spending

- Crowd out 1: Higher transfers, HtM work less (indep of debt)



Real Effects of Higher Transfer Spending

- Crowd out 2: Higher transfers, more debt lowers savings in K (more for low debt)