Fiscal Consolidations and Finite Planning Horizons

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Finite planning horizons

Agents optimize over a finite planning horizon. They form expectations consistent with the model equations that lie within their horizon.

Households

Households maximize utility in their planning horizon and wealth at the end of their horizon.

$$\max_{C_s^i,H_s^i,B_s^i} \tilde{E}_t^i \sum_{s=t}^{t+T} \beta^{s-t} u(C_s^i,H_s^i) + \beta^{T+1} V\left(\frac{B^i_{t+T+1}}{P_{t+T}}\right)$$

s.t.

$$P_s C_s^i + \frac{B^i_{s+1}}{1+i_s} \le (1-\tau_s)W_s H_s^i + B_s^i + P_s \Xi_s$$

Along with standard first order conditions this yields (with $b_t = \frac{B_t}{P_{t-1}Y}$ and CRRA preferences)

$$(C^i_{t+T})^{-\sigma} = \beta(1+i_{t+T})(\bar{Y} b^i_{t+T+1})^{-\zeta}\Lambda$$

Iterating the log-linearized budget constraint backwards gives

$$\beta^{T+1}\tilde{b}^i_{t+T+1} = \tilde{b}^i_t + \bar{b}\sum_{s=0}^{T} \beta^s(\beta E_t^i \hat{i}_{t+s} - E_t^i \tilde{\pi}_{t+s})$$

$$-(1-\bar{g})\sum_{s=0}^{T}\beta^s(\hat{C}^i_{t+s}) + \frac{\bar{\Xi}}{\bar{Y}}\sum_{s=0}^{T} \beta^s(E_t^i\hat{\Xi}_{t+s})+$$

$$\bar{w} \sum_{s=0}^{T} \beta^s((1-\bar{\tau})(E_t^i\hat{w}_{t+s} + \hat{H}^i_{t+T-s}) - E_t^i\tilde{\tau}_{t+T-s})$$

We use first order conditions to substitute for $\hat{H}^i_{t+T-s}$ and $\hat{C}^i_{t+s}$ and aggregate to get aggregate current consumption. Market clearing then implies

$$(1-\nu_y)\hat{Y}_t = \frac{1}{\rho}\tilde{b}_t + g_t + \nu_\tau \sum_{s=0}^{T} \beta^s(\bar{E}_t \hat{\tau}_{t+s})+$$

$$\nu_g \sum_{s=0}^{T} \beta^s(\bar{E}_t \hat{g}_{t+s}) + \nu_y\sum_{s=1}^{T} \beta^s(\bar{E}_t \hat{y}_{t+s}) + f(i,\pi)$$

Firms and Government

The finite horizon New Keynesian Phillips curve (under Calvo pricing) is given by

$$\pi_t = \tilde{\kappa}\mu_y \sum_{s=0}^{T} \omega^s\beta^s \hat{E}_t \hat{y}_{t+s} + \tilde{\kappa}\mu_g\sum_{s=0}^{T} \omega^s\beta^s\hat{E}_t\tilde{g}_{t+s}$$

$$+\tilde{\kappa}\mu_\tau\sum_{s=0}^{T}\omega^s\beta^s\hat{E}_t\tilde{\tau}_{t+s} + \tilde{\kappa}\sum_{s=1}^{T}\omega^s\beta^s\sum_{j=1}^{s} \hat{E}_t\pi_{t+j}$$

Monetary policy follows a Taylor rule. The government budget constraint is

$$\tilde{b}_{t+1} = \frac{1}{\beta}\tilde{b}_t + \bar{b}(\hat{i}_t - \frac{1}{\beta}\hat{\pi}_t) + \rho_g\tilde{g}_t + \rho_\tau\tilde{\tau}_t + \rho_y\tilde{Y}_t$$

Under spending based consolidations fiscal policy is given by

$$\hat{g}_t = \begin{cases} -\gamma_g\,(b_t - DL_{t-1}) & , \quad if = b_t > DL_{t-1} \\ 0 & , \quad if = b_t \le DL_{t-1} \end{cases}$$

Tax based consolidations analogously.

Anticipated reduction in debt limit

We consider a drop in the debt limit of 5 percent of GDP. Under spending based consolidations the large spending cut leads to a big recession and low inflation. Agents with short horizons (blue) perceive reduction in debt holdings as a loss in wealth, implying relatively lower consumption.

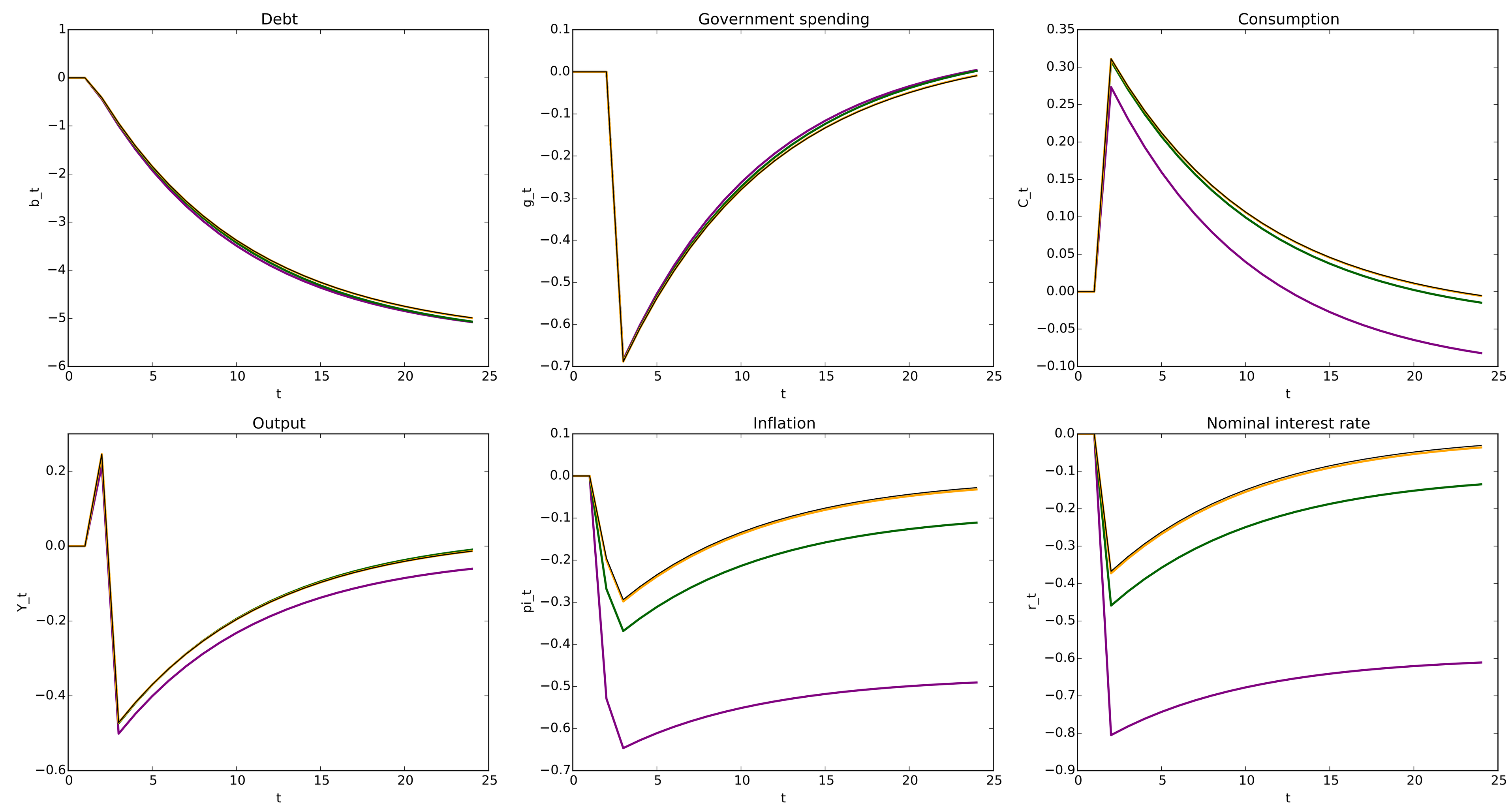

Figure 1: Spending based: T=10 (purple), T=25 (green), T=100 (orange), RE (black)

Tax based consolidations lead to a smaller recession and faster debt reduction in the long run than spending based consolidations. Short horizons again imply a reduction in (steady state) consumption.

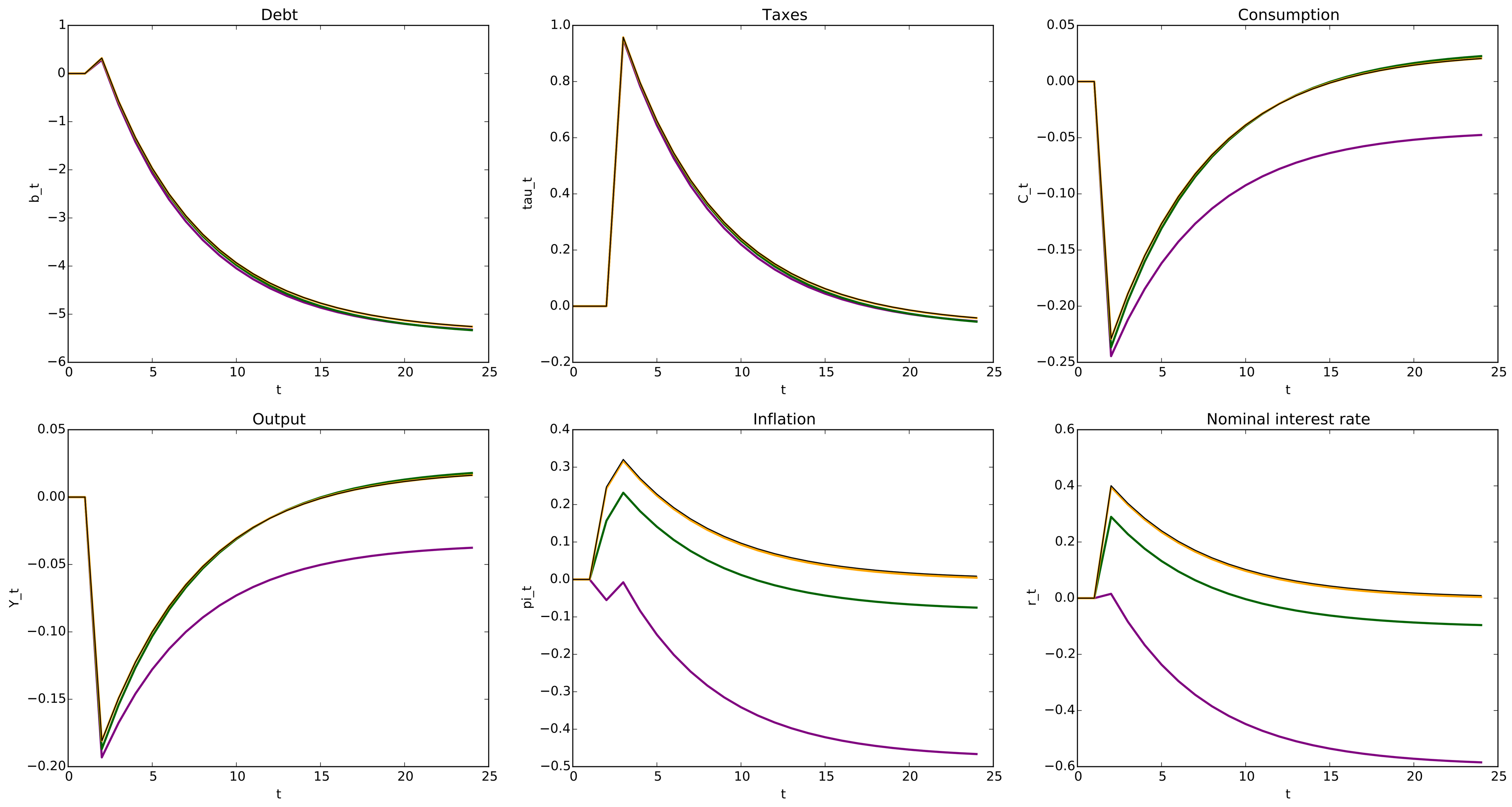

Figure 2: Tax based: T=10 (purple), T=25 (green), T=100 (orange), RE (black)

Anticipation of next periods spending cut leads to higher consumption and output while expected tax based consolidations lead to lower consumption and output (due to consumption smoothing).

Aggressive monetary policy (T=10)

When monetary policy is more aggressive ($\phi_\pi = 1.75$ instead of $\phi_\pi = 1.25$), the lower real interest rates under spending based consolidations imply a reduction in the recession while the tax based recession becomes worse. Spending based consolidations are now also more effective in the long run.

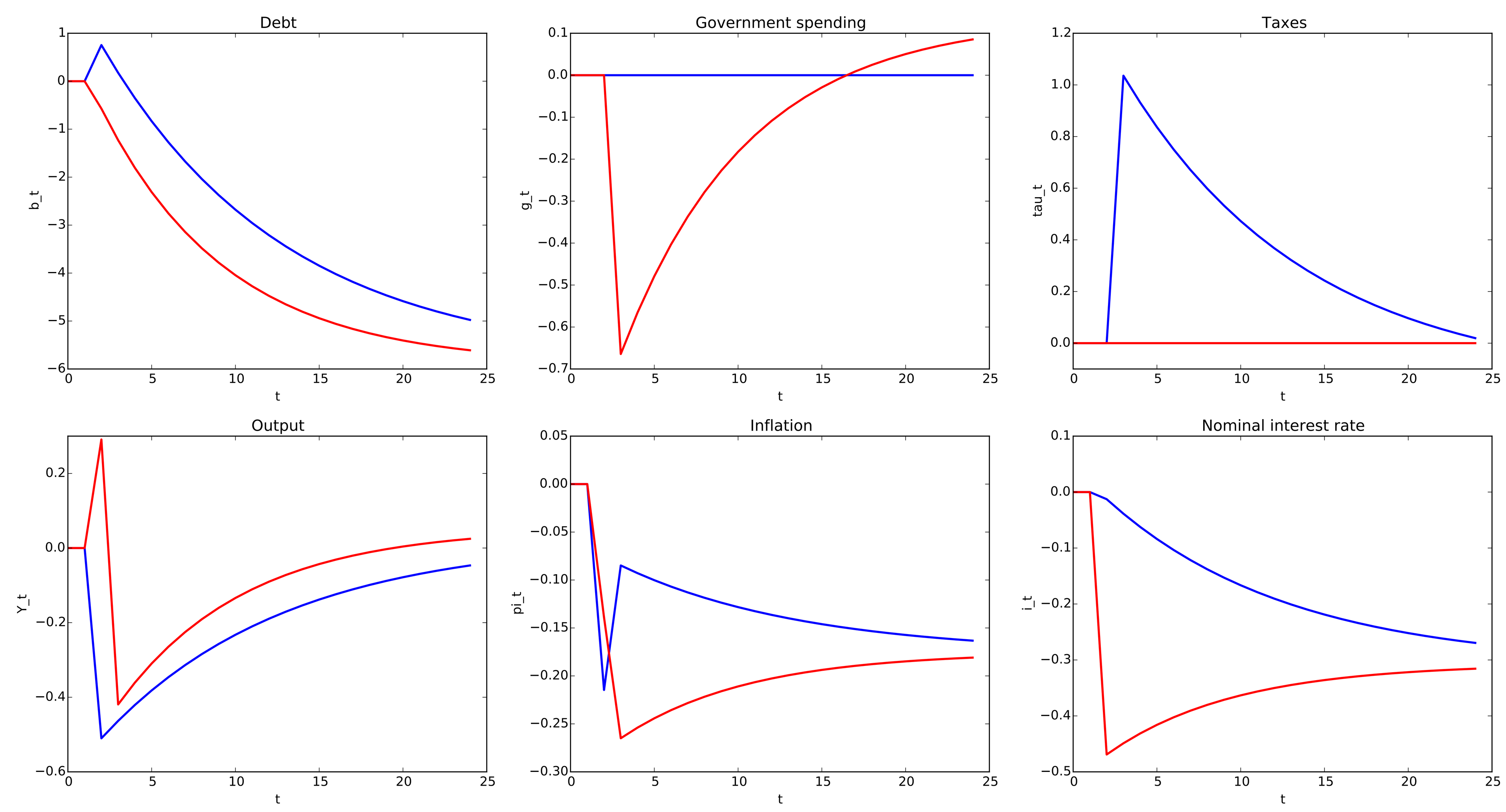

Figure 3: Spending based (red) vs tax based (blue) for aggressive monetary policy and T=10