Financial Repression in a Model of Strategic Fiscal and Monetary Policy Interaction

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Motivation

- Modern financial repression (FR) refers to the non-market public debt placement with the below-market rate of return.
- FR is a feature of both fiscal and monetary policy.
- Government has the power to enlarge the demand for public debt.
- Independent central bank should take into account government's actions while setting the value of interest rate and vice versa.

What we are doing

- Our aim is to explain the phenomenon of financial repression through the mechanism of strategic interaction between Government and Central Bank.
- Also, we want to study whether the instruments of financial repression can be complements or substitutes depending on the particular strategic regime between Government and Central Bank.

Where we are in the literature

- Modelling financial repression, Isakov, Pekarski (2018) consider consolidated government.
- We put financial repression into the literature on strategic fiscal and monetary policy interaction:
  - *Sargent-Wallace (1981), Tabellini (1986)*: monetary seigniorage vs fiscal surplus to stabilize public debt.
  - *Dixit, Lambertini (2001)*: fiscal vs monetary policy to stabilize output and inflation.
  - Financial repression stabilizes public debt but depresses output.

Model

- Based on the model from *Isakov, Pekarski (2018)*.
- Main assumptions:
  - Households receive labour and capital income, pay labour-income tax, choose C and L.
  - Households are forced to invest a certain share of their assets into one-period government bonds.
  - Variables responsible for fiscal policy are exogenous except the one that controls financial repression.
  - Government and central bank are independent agents.
  - Government choose the share of private capital that HH are forced to invest into public debt (tax rate is exogenous).
  - CB controls real interest rate paid on public debt.

Households: utility function

$$\sum_{t=0}^{\infty} \beta^t u(C_t, L_t, G_t) \longrightarrow max \tag{1}$$

$$u(C_t, L_t, G_t) = \gamma lnC_t + (1-\gamma) ln(1-L_t) + klnG_t \tag{2}$$

Households: constraints

$$K_{t+1} = (1 - \delta)K_t + I_t \tag{3}$$

$$B_t \geq \rho\,(K_{t+1} + B_t) \tag{4}$$

$$C_t + I_t + B_t \leq w_t L_t(1 - \tau) + (r_t - 1)\,K_t + r_t^b B_{t-1} \tag{5}$$

Households: first order conditions

$$\frac{1-\gamma}{\gamma}\frac{C_t}{1-L_t} = w_t(1-\tau) \tag{6}$$

$$\beta \cdot \frac{C_t}{C_{t+1}}\left(r_{t+1} - \delta + r^b_{t+1} \cdot \frac{\rho}{1-\rho}\right) = \frac{1}{1-\rho} \tag{7}$$

Firms and production sector

Production function:

$$Y_t = K_t^{\alpha} L_t^{1-\alpha} \tag{8}$$

First order conditions:

$$r_t - 1 = \frac{\partial Y_t}{\partial K_t} = \alpha \left(\frac{K_t}{L_t} \right)^{\alpha - 1} \tag{9}$$

$$w_t = \frac{\partial Y_t}{\partial L_t} = (1 - \alpha) \left(\frac{K_t}{L_t} \right)^{\alpha} \tag{10}$$

Public sector

Government's budget constraint:

$$G_t + r_t^b B_{t-1} = w_t L_t \tau + B_t \tag{11}$$

Government

Government's loss function:

$$L_F = \frac{1}{2}\sum_{t=0}^{\infty}\beta_F^t\left(\left(\frac{Y_t}{Y^*}-1\right)^2+\omega\left(\frac{g_t}{g^*}-1\right)^2\right)\longrightarrow \min_{\rho} \qquad (12)$$

$$\text{where } g_t = \frac{G_t}{Y_t}$$

Central Bank

Central Bank's loss function:

$$L_{CB} = \frac{1}{2}\sum_{t=0}^{\infty}\beta_{CB}^{t}\left(\left(\frac{Y_t}{Y^*}-1\right)^2+\varphi\left(\frac{r_t^b}{r^{b*}}-1\right)^2+\mu\left(\frac{b_t}{b^*}-1\right)^2\right)\longrightarrow \underset{r_t^b}{min} \tag{13}$$

$$\text{where } b_t = \frac{B_t}{Y_t}$$

What are Y^*, g^*, b^* and r^{b*}?

- Y^* is the output in the economy without distortions.
- $b^* \approx 60\%$ *(Stability and Growth Pact 1997)*.
- r^{b*} is market or neutral interest rate that do not create distortions on financial markets. Therefore:

$$r^{b*} = \beta^{-1}$$

- $g^* =$ ... It should be higher than s.s. tax revenues allow.

Policy variables in steady state

$$\overline{Y} = \left(\frac{\frac{1}{1-\rho}\beta^{-1} + \delta - 1 - \overline{r^b} \cdot \frac{\rho}{1-\rho}}{\alpha} \right)^{\frac{\alpha}{\alpha - 1}} \cdot$$

$$\cdot \left(\frac{\alpha}{1-\alpha} \cdot \frac{\frac{1}{1-\rho}\left(\beta^{-1} - 1\right)}{\frac{1}{1-\rho}\beta^{-1} + \delta - 1 - \overline{r^b} \cdot \frac{\rho}{1-\rho}} \cdot \frac{1}{1-\tau} \cdot \frac{1-\gamma}{\gamma} + \frac{1}{\gamma} \right)^{-1}$$

Policy variables in steady state

$$\overline{g} = \tau(1-\alpha) + \left(1 - \overline{r^b}\right)\overline{b} \tag{14}$$

$$\overline{b} = \frac{\rho}{1-\rho} \cdot \left(\frac{\frac{1}{1-\rho}\beta^{-1} + \delta - 1 - \overline{r^b} \cdot \frac{\rho}{1-\rho}}{\alpha} \right)^{\frac{1-\alpha}{\alpha-1}} \tag{15}$$

Government & Central Bank in steady state

$$L_F = \frac{1}{2} \cdot \frac{1}{1-\beta_F} \left(\left(\frac{\overline{Y}(\rho, \overline{r^b})}{Y^*} - 1 \right)^2 + \omega \left(\frac{\overline{g}(\rho, \overline{r^b})}{g^*} - 1 \right)^2 \right) \longrightarrow \min_{\rho} \tag{16}$$

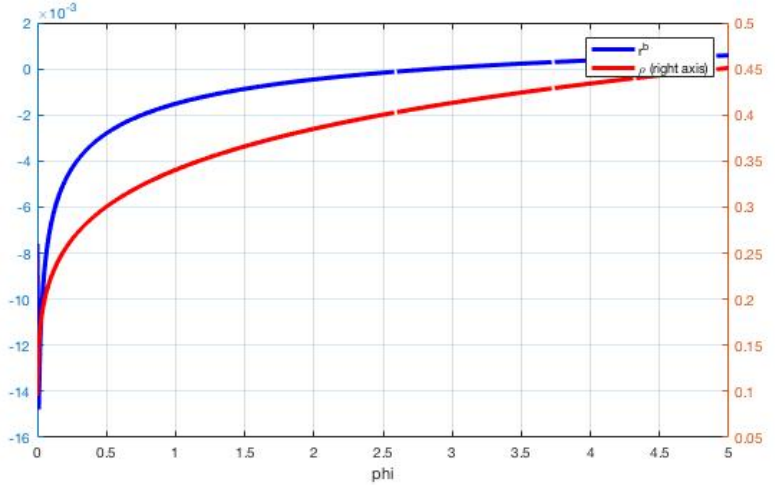
$$L_{CB} = \frac{1}{2} \cdot \frac{1}{1-\beta_{CB}} \left(\left(\frac{\overline{Y}(\rho, \overline{r^b})}{Y^*} - 1 \right)^2 + \varphi \left(\frac{\overline{r^b}}{r^{b*}} - 1 \right)^2 + \mu \left(\frac{\overline{b}(\rho, \overline{r^b})}{b^*} - 1 \right)^2 \right) \longrightarrow \min_{\overline{r^b}}$$

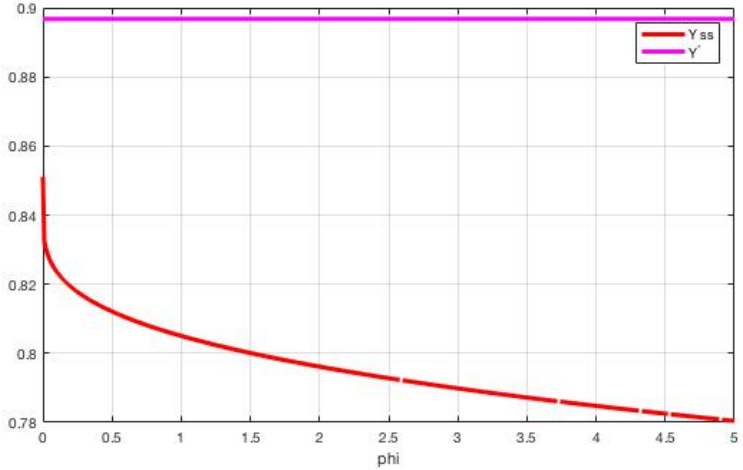
(17)

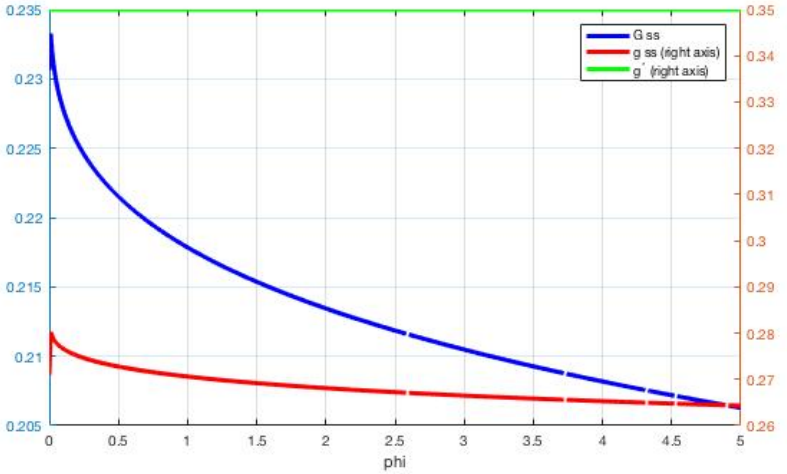
Calibration

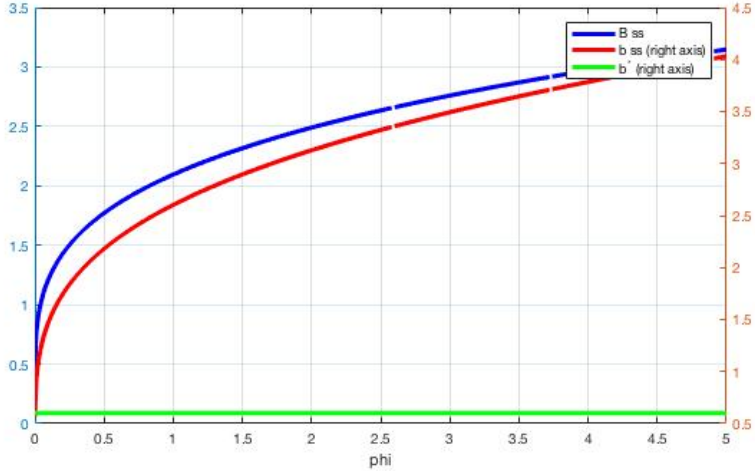
α	1/3
τ	0.4
β	0.99
δ	0.05
γ	0.4
ω	1
φ	1
μ	1
Y^*	Output without any distortions
r^{b*}	0.99^{-1}
g^*	0.35
b^*	0.6

Simulation: Nash equilibrium under dif. values of φ

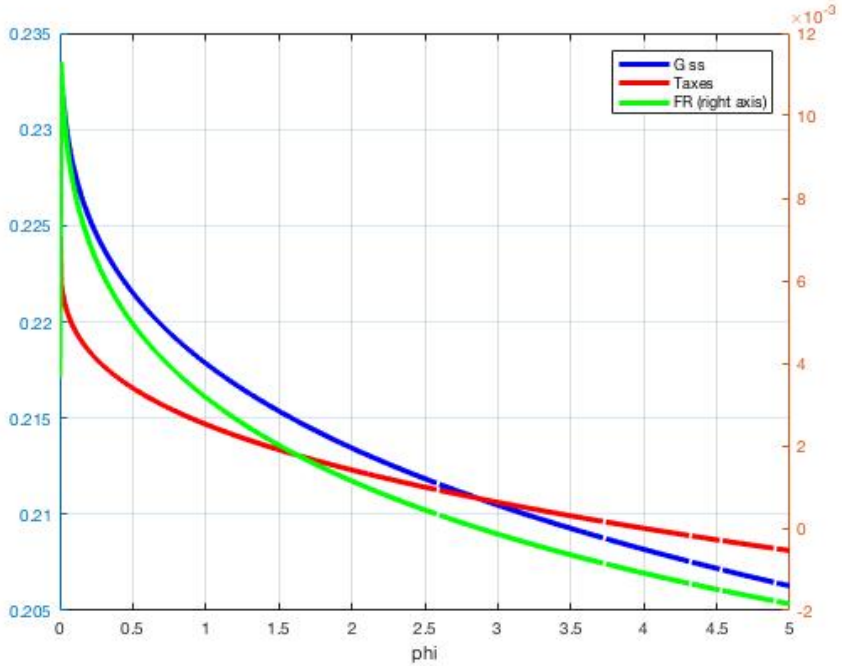


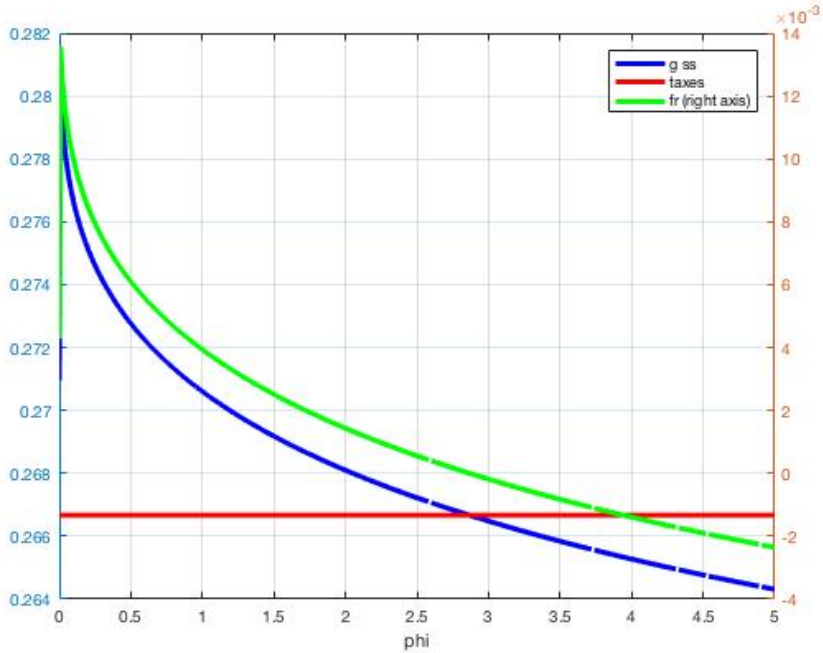




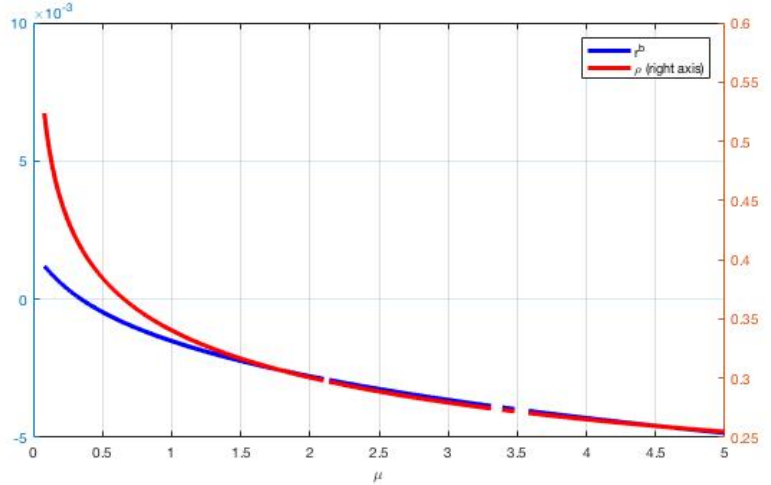


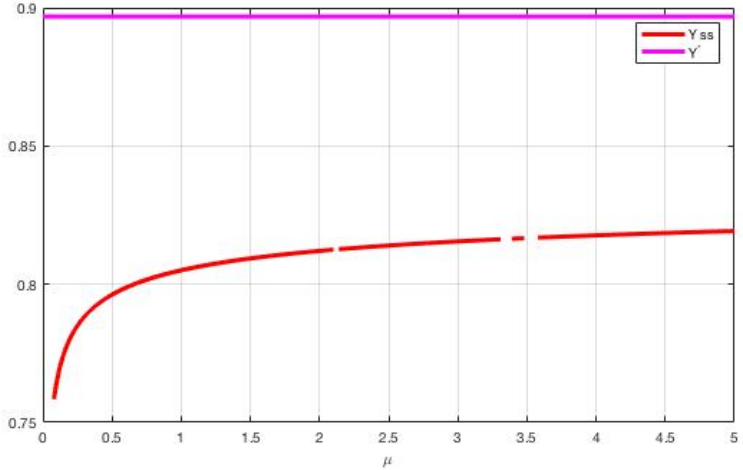
Nash eq. and public finance under dif. values of φ

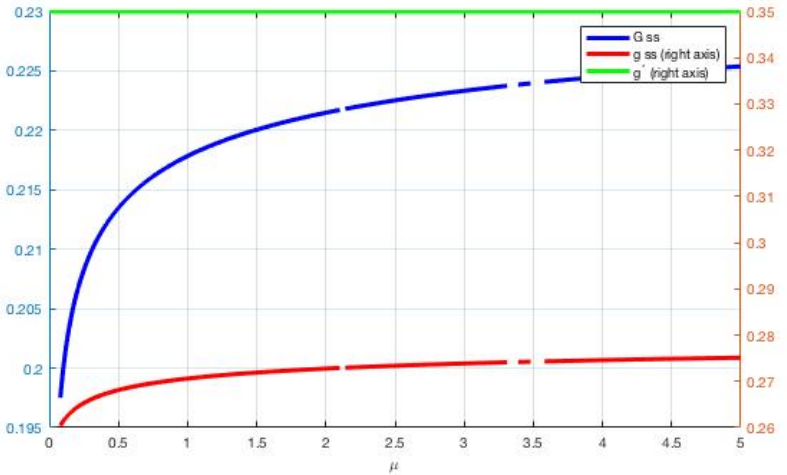


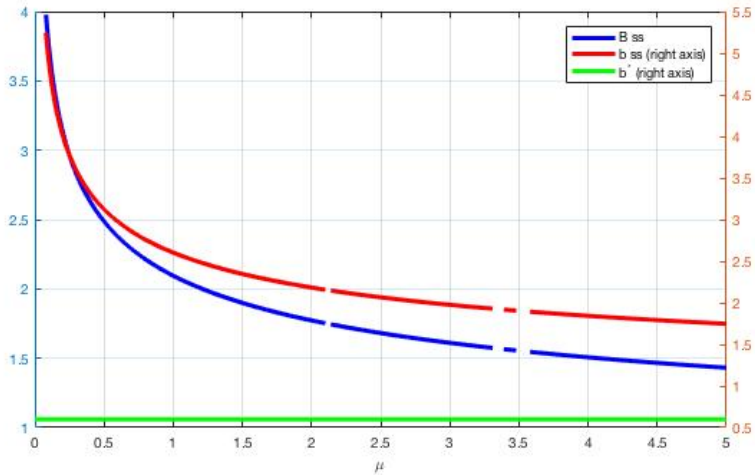


Simulation: Nash equilibrium under dif. values of μ

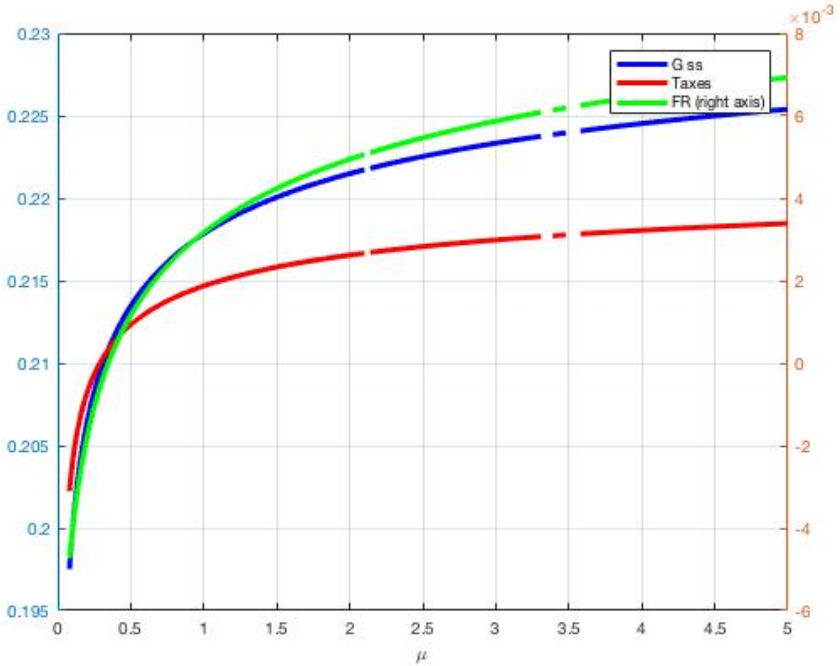


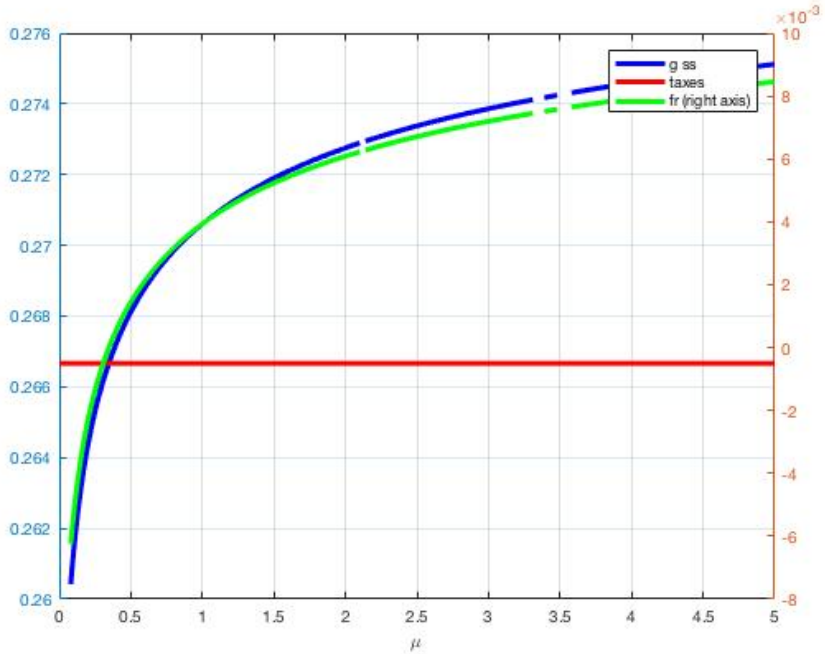




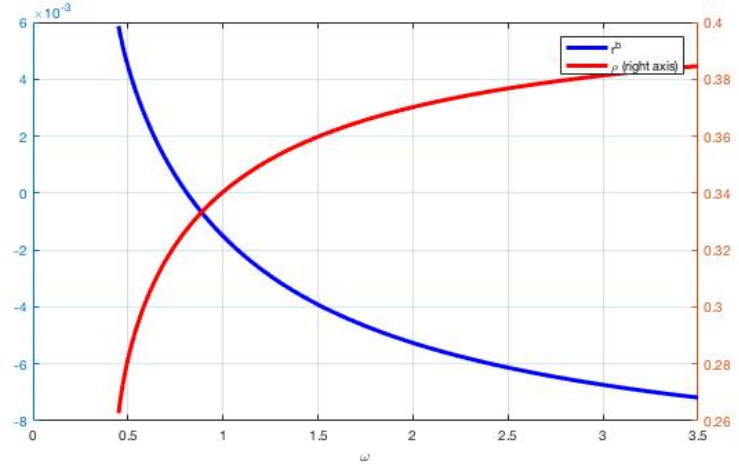


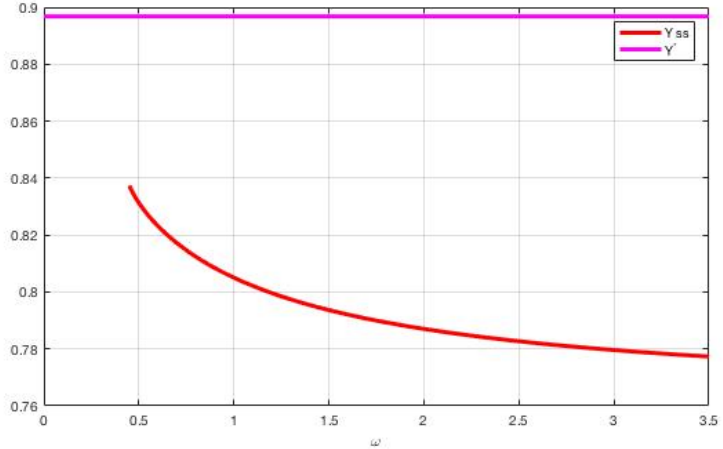
Nash eq. and public finance under dif. values of μ

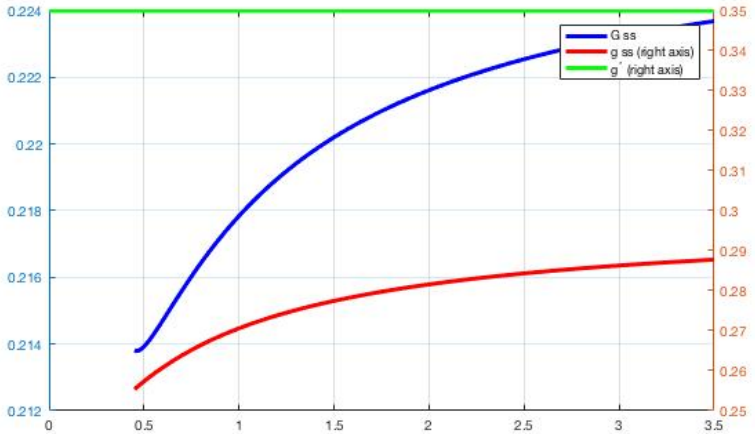


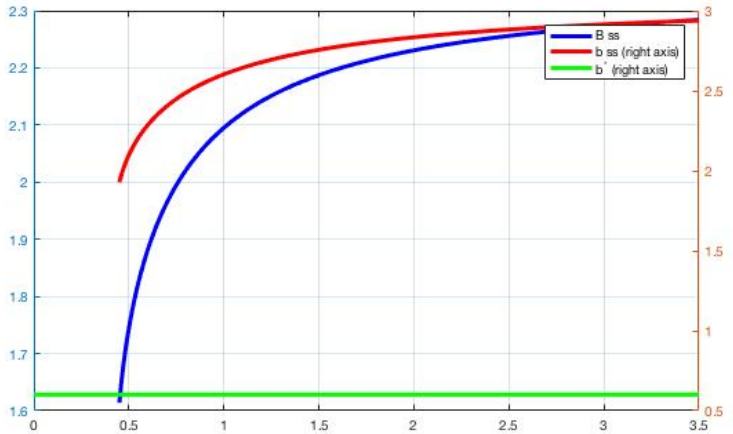


Simulation: Nash equilibrium under dif. values of ω

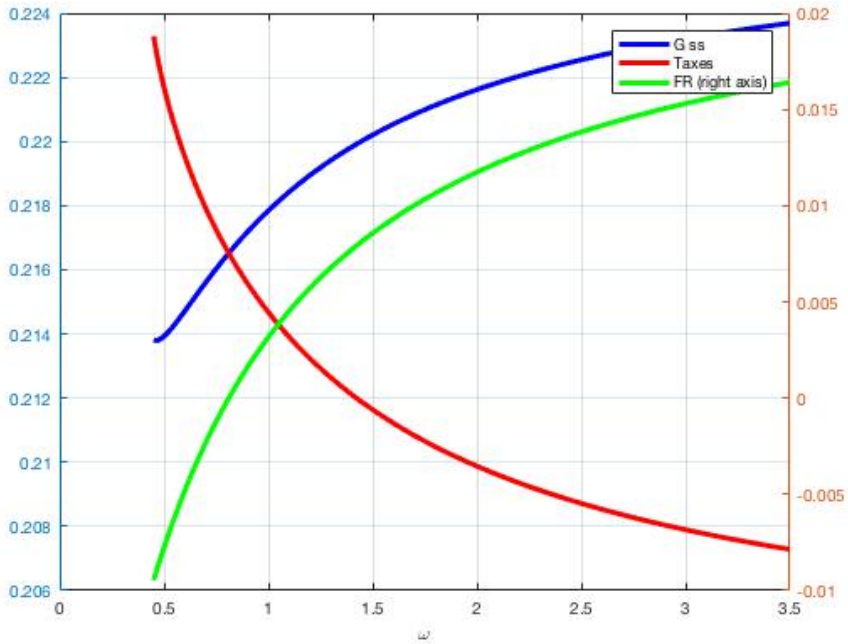


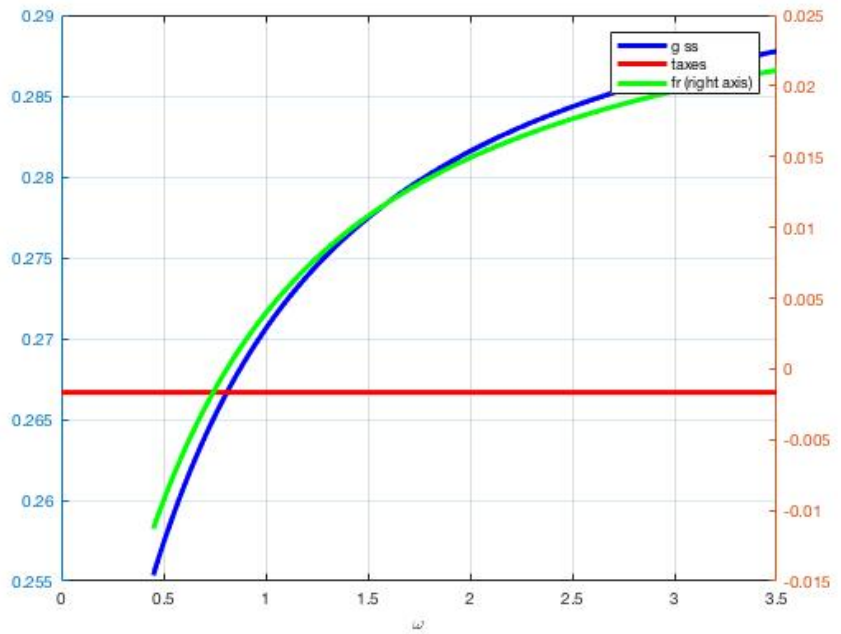






Nash eq. and public finance under dif. values of ω





Next steps

- Compare and interpret results from Nash, leadership and cooperation.
- Discuss welfare implications.
- Dynamic framework?