Simple Analytics of the Government Expenditure Multiplier

by Michael Woodford

Discussion by Marco Bassetto

Federal Reserve Bank of Chicago and NBER

Roadmap

- Review main argument is simple-simple model
- Implications
- Assumption that warrants further scrutiny

Setup

- Preferences:
$$\sum_{t=0}^{\infty} \beta^t [u(C_t) - v(H_t)]$$
C_t: CES aggregator
- Technology for variety i:
$$y_{it} = f(h_{it})$$
- Standard monopolistic competition setup
- $$G_t = \begin{cases} G_0 & \\ 0 & \text{for } t > 0 \end{cases}$$
G paid with lump-sum taxes.

Neoclassical (Flex Price) Equilibrium

- SS from period 1, independent of past (on real side)
- Euler equation: $u'(C_0) = \beta(1 + r_0)u'(C^{SS})$
- Intratemporal (household and firm) optimization: $\frac{v'(H_0)}{\mu f'(H_0)u'(C_0)} = 1$
- Market clearing: $f(H_0) = C_0 + G_0$
- Some equations to determine nominal side

New Keynesian (Calvo Price) Equilibrium

- SS from period 1, independent of past (up to first order, on real side)
- Euler equation: $u'(C_0) = \beta(1 + r_0)u'(C^{SS})$
- Intratemporal optimization: $\cancel{\frac{v'(H_0)}{\mu f'(H_0)u'(C_0)} = 1}$ $\quad \pi_0 \approx \frac{(1-\alpha)(1-\alpha\beta)}{\alpha}\hat{s}_0$
- Market clearing: $f(H_0) = C_0 + G_0$
- Other equations to determine nominal side

Key insight

- In the NK model, CB can affect real rates (r_0);

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- In the NK model, CB can affect real rates (r_0);
- Given r_0, C_0 is pinned down by Euler equation:

$$u'(C_0) = \beta(1 + r_0)u'(C^{SS})$$

- Other equations only matter if they affect CB's choice of r_0

Effect of G on C

$$u'(C_0) = \beta(1 + r_0)u'(C^{SS})$$

- If $r_0 = r^{SS}$, $C_0 = C^{SS} \Longrightarrow \Delta Y = \Delta G$
- If $r_0 > r^{SS}$, $C_0 < C^{SS} \Longrightarrow \Delta Y < \Delta G$
- If $r_0 < r^{SS}$, $C_0 > C^{SS} \Longrightarrow \Delta Y > \Delta G$

Fiscal and Monetary Policy

- Monetary policy rule:

$$i_t = \bar{\iota}(G_t) + \phi_\pi \pi_t + \phi_y \hat{Y}_t$$

- Fiscal multiplier can be anything (1,000,000?)

Fiscal and Monetary Policy

- Monetary policy rule:

$$i_t = \bar{\iota}(G_t) + \phi_\pi \pi_t + \phi_y \hat{Y}_t$$

- Fiscal multiplier can be anything (1,000,000?)
- Caveats:
  1. Zero bound
  2. Nonlinearities

Robustness

- Effect of G on C does not depend on sticky prices vs. sticky wages, other sources of nonneutrality,...
- Only depends on Euler equation
- Euler equation still central when capital is included

Where to Next: Euler Equation Residuals

- Euler equation fails (Hansen and Singleton, 1983);
- When using policy rate, Euler equation residuals are cyclical (Canzoneri, Cumby and Diba, 2007; Atkeson and Kehoe, 2008);
- Euler equation residuals explain a large fraction of consumption variation in DSGE models;
- Are Euler equation residuals fixed when G varies and monetary policy responds?