Fiscal Multipliers

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Course Content

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Fiscal Multiplier in Equilibrium (Woodford (2011))

- Period utility $u(c) = v(1-n)$
- Production function $f(n)$, no physical capital

$$v'(1-n) = wu'(c)$$
$$f'(n) = w$$

- In equilibrium $y = c + g$,

$$h'(y) = u'(y-g)$$

  for $h(y) = -v(1-f^{-1}(y))$ ("disutility" of leisure)
- Elasticities

$$\eta_u = -\frac{u''(c)}{u'(c)} > 0 \qquad \eta_h = \frac{h''(c)}{h'(c)} > 0.$$

- Multiplier

$$\frac{\Delta y}{\Delta g} = \frac{\eta_u}{\eta_u + \eta_h} \in (0,1)$$

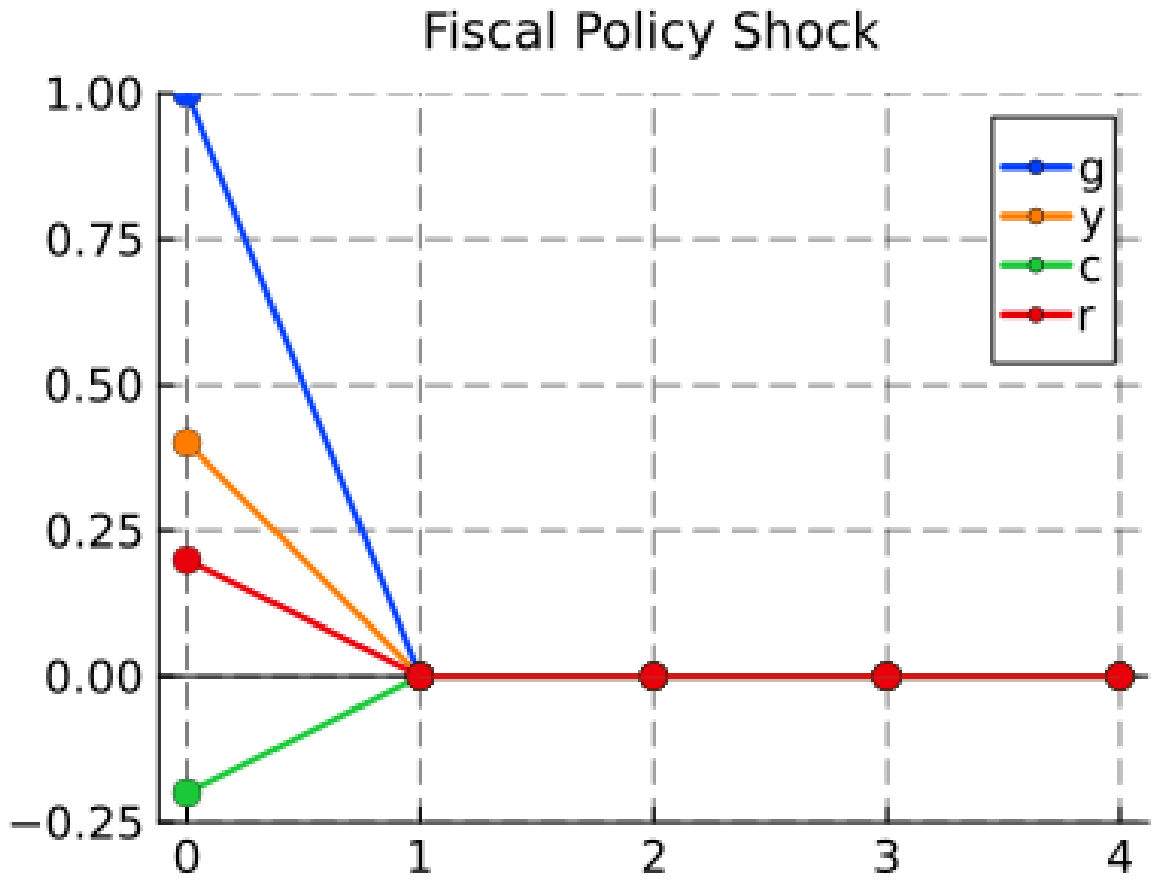
Frictionless Model

- Linearized Model, multiple periods
- Flexible prices

$$
\begin{aligned}
c_t &= E_t c_{t+1} - \gamma r_t \\
0 &= \psi^{-1} n_t + \gamma^{-1} c_t \\
y_t &= (1-\bar{g}) c_t + \bar{g} g_t \\
y_t &= n_t \\
g_t &= \rho g_{t-1} + \epsilon_t
\end{aligned}
$$

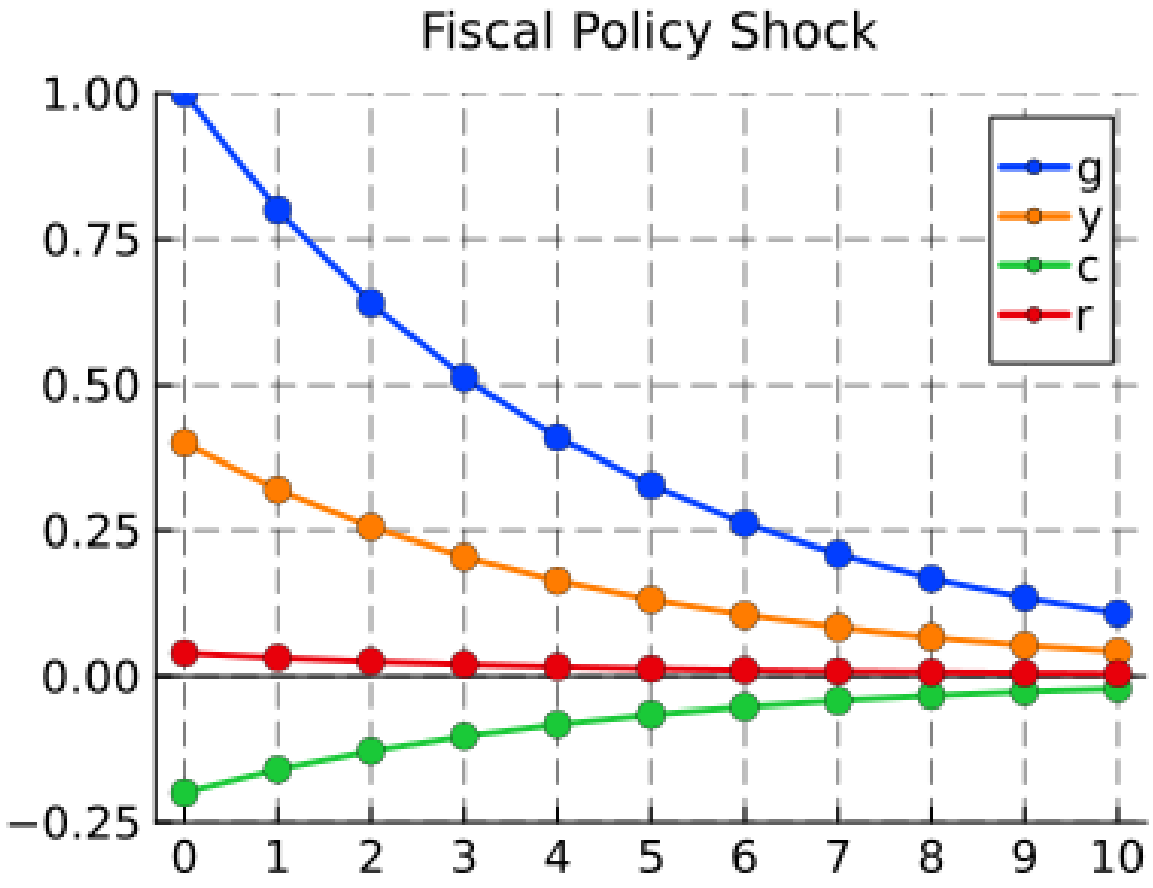
- Fiscal Multiplier $= \frac{\Delta E_t Y_t}{\Delta E_t G_t} = \frac{\Delta E_t y_t \times Y}{\Delta E_t g_t \times G} \approx \frac{\Delta E_t y_t}{\Delta E_t g_t} / \bar{g}$

Frictionless Model



Fiscal Multiplier = 0.8

Frictionless Model



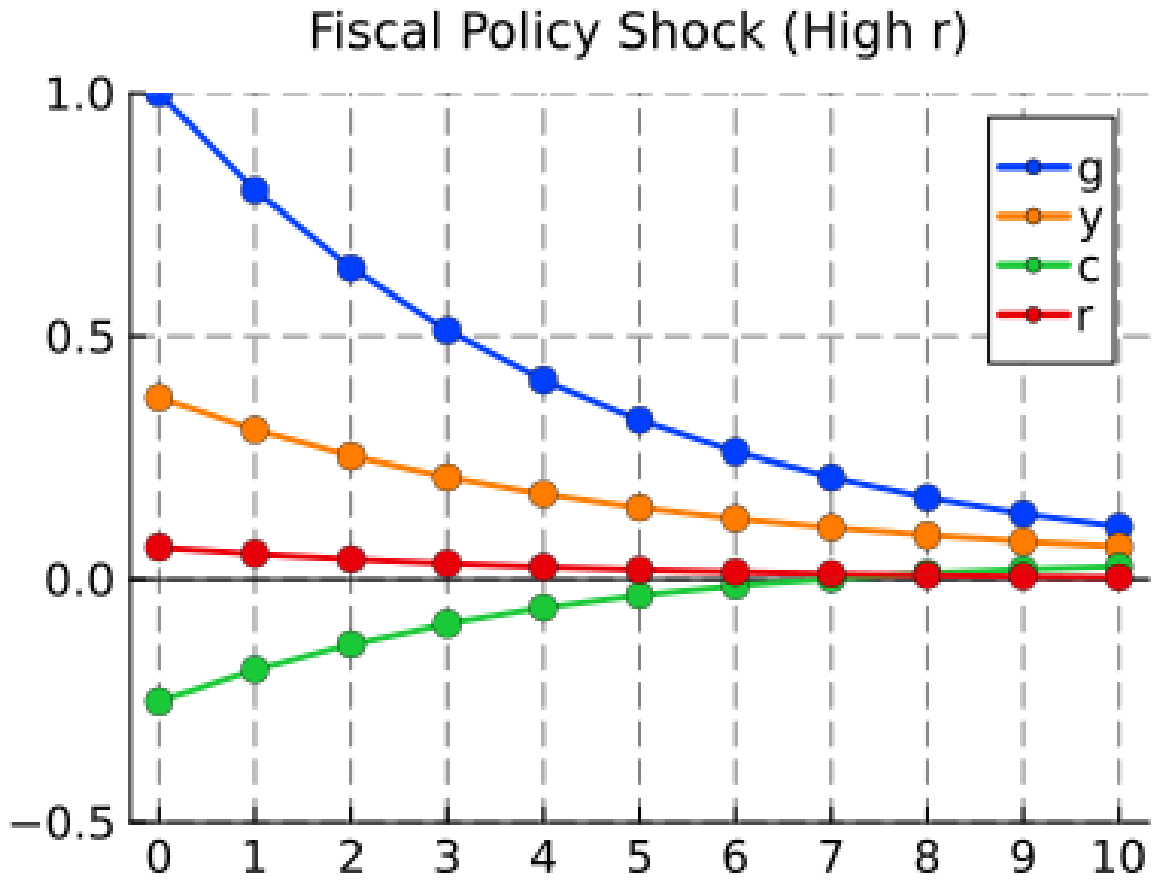
Fiscal Multiplier = 0.8

Price Rigidity

- Monetary policy affects real interest!

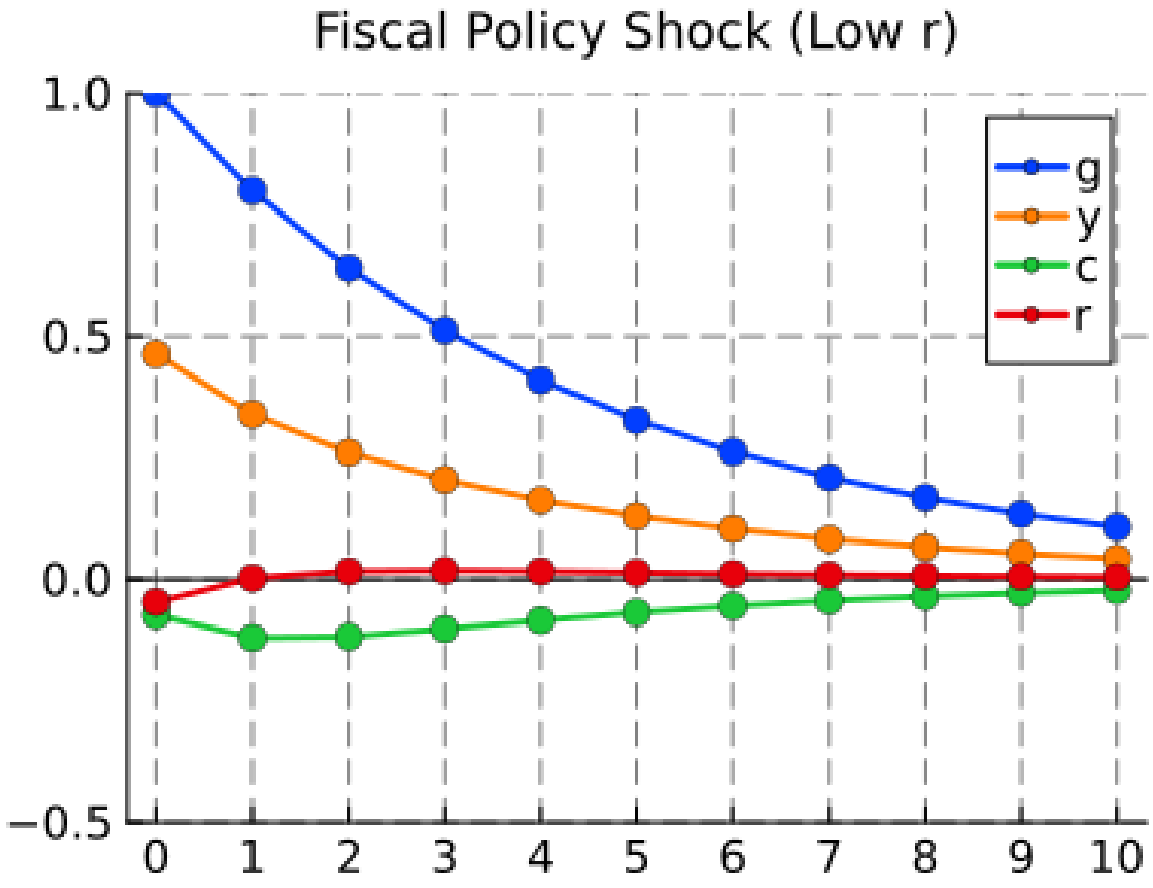
$$
\begin{aligned}
c_t &= E_t c_{t+1} - \gamma(i_t - E_t \pi_{t+1}) \\
w_t &= \psi^{-1} n_t + \gamma^{-1} c_t \\
\pi_t &= \beta E_t \pi_{t+1} + \kappa w_t \\
y_t &= (1 - \bar{g}) c_t + \bar{g} g_t \\
y_t &= n_t \\
g_t &= \rho g_{t-1} + \epsilon_t \\
i_t &= \phi \pi_t
\end{aligned}
$$

Price Rigidity



Fiscal Multipliers: 0.748 (high *r*) and 0.926 (low *r*)

Price Rigidity



Fiscal Multipliers: 0.748 (high *r*) and 0.926 (low *r*)

Empirical Estimates Overview

Table 2. Narrative Approach: First-Year Spending Multipliers[1]

Study	G	Notes
Barro and Redlick (2011)	0.4–0.6	Based on U.S. defense spending news; 1917–2006; Lower multiplier for temporary spending changes, higher end of range for permanent spending changes.
Guajardo and others (2014)	0.3	Overall spending shock. After two years, multiplier reaches about 1.
Hall (2009)	0.6	Based on U.S. defense spending news; 1930–2008.
Owyang, Ramey, Zubairy (2013)	United States: 0.8. Canada: 0.4–1.6	Based on U.S. defense spending news; 1890–2010 for the United States, 1921–2011 for Canada. Two year multipliers; in Canada range of multipliers reflects low unemployment (low multiplier) and high unemployment (high multiplier) regimes. In the United States, multipliers do not differ significantly across regimes.
Ramey (2011)	1.1–1.2	Based on U.S. defense spending news; 1939–2008 "defense-news" reflect changes in the expected present value of government spending in response to military events; peak multiplier after 6 quarters.

[1]Reported estimates correspond to the response of output in percent following an exogenous spending shock of 1 percent of GDP. First year multiplier unless otherwise noted.

Batini, Eyraud, Weber (2014) *A Simple Method to Compute Fiscal Multipliers*

References I

Woodford, M. (2011). Simple Analytics of the Government Expenditure Multiplier. *American Economic Journal: Macroeconomics*, 3(1):1–35.