

ECON 210B
Fiscal Policy in the RBC model

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Overview

Main questions:

- ▶ What are the effects of government purchases?
- ▶ Many aspects to be analyzed
 1. Permanent Increases vs Temporary Increases
 2. Financing decision: Tax vs. Deficit
 3. Type of expenditure: Gov't consumption vs Gov't Investment

Outline:

- ▶ An example in a static framework
- ▶ An RBC model with Public Expenditure
- ▶ Some results

A simple “static” example

A simple model where the government provides a (useless) public good G , financed with taxes T :

Household utility: $U(c, L)$

Household budget constraint: $c \leq w(1 - L) - T$, w is exogenous

Government budget constraint $G = T$

What are the effects of an increase in G on:

1. Consumption
2. Leisure / Hours
3. Output

Question 1: How big is the “fiscal multiplier”?

Question 2: What if we have “distortionary” taxes? ($T = \tau w(1 - L)$)

Question 3: Why do we need a “general equilibrium” model?

An RBC model with public expenditure

- ▶ The household problem

$$c_t + k_{t+1} \leq (1 - \tau_t)(w_t N_t + R_t k_t) + (1 - \delta)k_t - T_t \quad (\text{H.BC})$$

$$-\frac{U_{N,t}}{U_{C,t}} = (1 - \tau_t)w_t \quad (\text{H.1})$$

$$U_{C,t} = \beta E_t U_{C,t+1} [1 - (1 - \tau_{t+1})R_{t+1} - \delta] + TVC \quad (\text{H.2})$$

- ▶ The firms' problem

$$w_t = F_{N,t} \quad (\text{F.1})$$

$$r_t = F_{k,t} \quad (\text{F.1})$$

- ▶ The government: $g_t = \tau_t(w_t N_t + R_t k_t) - T_t$ (G.BC)
- ▶ Feasibility: $c_t + k_{t+1} \leq F(k_t, N_t) + (1 - \delta)k_t$ (Feasibility)

The competitive equilibrium

Definition

Given initial conditions k_0 and the histories of the exogenous process $\{g_t\}_{t=0}^{\infty}$, a CE is given by an allocation $\{c_t, N_t, k_{t+1}\}_{t=0}^{\infty}$, a price system $\{w_t, r_t\}_{t=0}^{\infty}$ and policies $\{T_t, \tau_t\}_{t=0}^{\infty}$ such that:

1. Given prices and policies, $\{c_t, N_t, k_{t+1}\}$ solve the household problem, i.e. they satisfy (H.1), (H.2) and (H.BC), $\forall t$ and in any history.
2. Given prices, $\{N_t, k_t\}$ solve the firm's problem, i.e they satisfy (F.1), (F.2), $\forall t$ and in any history.
3. The policies satisfy (G.BC), $\forall t$ and in any history.
4. Markets clear: (Feasibility) is satisfied, $\forall t$ and in any history.

Note: by Walras' Law, one equation between (H.BC), (G.BC) and (Feasibility) is redundant.

Question 1: Does this model have a unique solution?

Question 2: Is the competitive equilibrium Pareto Optimal?

Summary of Results

from Baxter and King (AER, 1993)

1. Lump - sum taxes

- ▶ A permanent increase in g
 - ▶ Long-Run: "Crowding Out" effect, $k \uparrow$, multiplier ≤ 1 .
 - ▶ Dynamic transition (see figure in next slide)
- ▶ A temporary increase in $g \Rightarrow$ multiplier less than one

2. Distortionary taxes

- ▶ Permanent changes: Negative multiplier
- ▶ Temporary changes: (see figure next slide)

Effect of gov't purchases with Lump-Sum Taxes

from Baxter and King (1993)

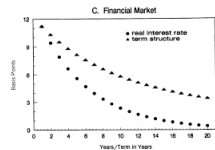
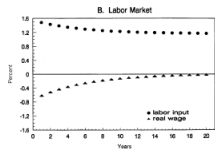
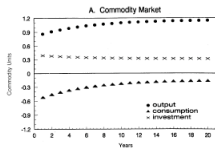


FIGURE 2. MACROECONOMIC EFFECTS OF A PERMANENT INCREASE IN BASIC GOVERNMENT PURCHASES

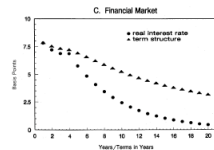
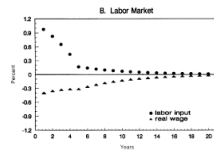
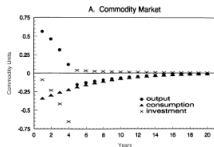


FIGURE 3. MACROECONOMIC EFFECTS OF A FOUR-YEAR WAR

Effect of gov't purchases with Distortional Taxes

from Baxter and King (1993)

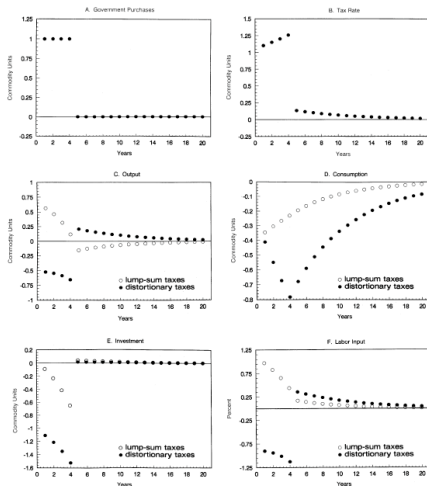


FIGURE 4. MACROECONOMIC EFFECTS OF ALTERNATIVE TAX POLICIES