

# Fiscal and Monetary Policies and Growth

Robert E. Lucas, Jr.

April 11, 2008

- Large volume of high-quality, quantitative analysis of effects of fiscal policies carried out in 1980s
- Leading applications of modern growth theory
- Main contributors include: Chamley (1981, 1986), Summers (1981), Judd (1985, 1987), Auerbach and Kotlikoff (1987)
- Main finding: Elimination of capital taxation at all levels (from rate of  $\sim 35\%$ ) would induce increase in long run capital stock of  $\sim 30\%$  -  $50\%$
- Briefly review basic logic

- Central assumptions of thought-experiment are
  - other taxes (on labor income, consumption) increased to maintain revenues
  - taxes are flat-rate
  - technological change given, exogenous : no LR growth effects
- Center of calculations is LR equilibrium condition for capital-labor ratio:

$$f'(x) = \rho$$

- With flat-rate tax  $\tau$  on net capital income, modify to

$$(1 - \tau) f'(x) = \rho$$

- Solve to express  $x = K/L$  as function of tax rate.

- For example, if  $f(x) = Ax^\alpha$ ,

$$(1 - \tau) \alpha Ax^{\alpha-1} = \rho$$

$$x(\tau) = \left( \frac{(1 - \tau) \alpha A}{\rho} \right)^{1/(1-\alpha)}$$

- Let's see some numbers:

- With  $\alpha = 0.25$  and  $\tau = 0.35$ , we have

$$\frac{x(0)}{x(\tau)} = \left( \frac{1}{1 - \tau} \right)^{1/(\cdot 75)} = 1.776$$

- A 57% increase in  $x = K/L$  from elimination of tax on capital income!

- If labor held fixed when  $\tau$  changes, this translates into 57% increase in steady state capital stock.
- But labor isn't fixed: To maintain revenues, labor income taxes must be raised as  $\tau$  is reduced.
- To evaluate these effects, need to use other equations in general equilibrium model
- Many ways to do this: see cited papers, or Lucas (1990) survey, for details
- Range of 30-50% a fair summary

- Have used simple illustration of where these big numbers come from
- But don't dismiss it as classroom example
- Auerbach and Kotlikoff (1987) monograph, for example, based on careful modeling of U.S. economy, comprehensive knowledge of U.S. tax structure, sophisticated use of frontier theory, computational methods
- Results replicated and variations explored by many independent researchers

- In related work, Prescott (2002) uses cross-country comparisons to estimate effects on labor supply of different marginal tax rates
- Remarkable fact that real GDP per person is now about 30% higher in the U.S. than in France, Germany, some other European countries
- Hours worked per year per adult also much lower in these countries
- Prescott argues that **all** of this difference can be accounted for by higher marginal tax rates (Emphasis on **marginal** rates of **labor** income taxation (in contrast to **average** rate of **capital** income taxation, as above)

- Point is that fiscal policies—in practice, not just in theory—can have large effects on countries' living standards
- But these are all **level** effects
- Estimated using models that **assume** that effects on long term **growth rates** are nil (Of course, growth rates vary in transitional dynamics of responses to tax changes in these models)
- What about role of taxes in models where growth is endogenous?

- Lucas (1990) added endogenous growth (via human capital investments) to Chamley-Judd-type model
- Tax effects were in expected direction but negligible
- Others (King and Rebelo (1990), Kim (1992), Jones, Manuelli and Rossi (1993)) found sizeable—even huge—effects
- Stokey and Rebelo (1995), “Growth Effects of Flat-Rate Taxes,” proposed unifying theoretical set-up, concluded that effects are trivial
- Offered following figure:

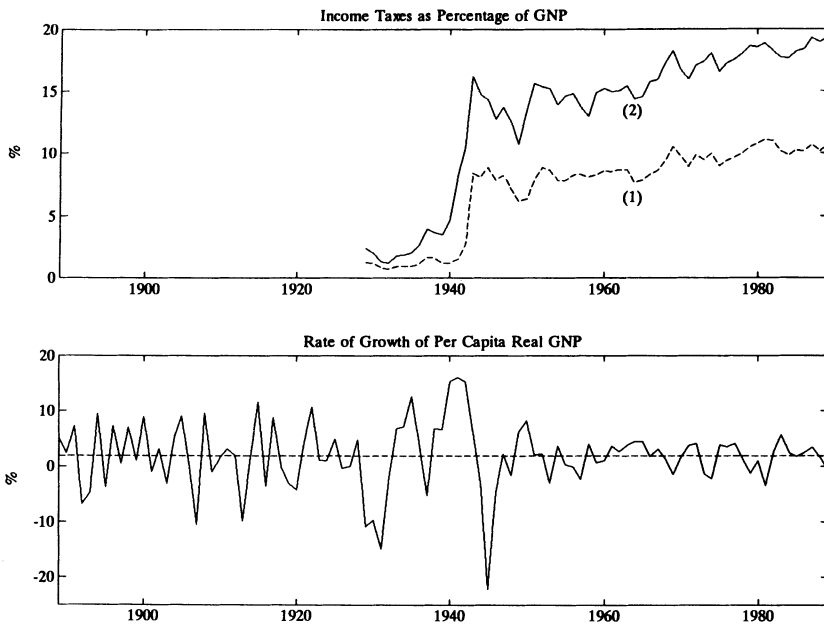


FIG. 4.—U.S. income taxes and growth rates, 1889–1989

- Conclude:
- Differences in tax structure can have large effects on level of living standards
  - large enough (maybe) to explain differences within OECD economies
  - explain differences between OECD and poor Asian, African economies?  
No
- Do not explain differences in long run average rates of growth
- Monetary policy? Inflation tax plays a role—but a minor one