Why do Americans Work So Much More than Europeans?

How Plausible is Prescott (2004) Story?

- What does government do with tax revenue?
- How much does labor supply respond to tax changes?

Role of Government Spending

What does government do with tax revenue?

allows for balanced growth path

- Income and substitution effects
  - With log utlity from consumption, effects offset
- Different types of government spending
  1. Lump-sum transfer
  2. Throw revenue away
  3. Subsidy on consumption
  4. Subsidy on leisure

transfer individual gets from gov't not affected by decision of how much to work

transfer from gov't implicitly or explicitly affected by how much work

Role of Government Spending

Program 1: Lump-sum transfer

$y = Ah$, $A = 1 \rightarrow w = 1$

- Consumer

$$\max \ \log c + v(1-h)$$
$$\text{s.t.} \ \ c = (1-\tau)h + T$$

some generic $v(.)$ function

$\rightarrow \log((1-\tau)h + T) + v(1-h)$

- Government

$$T = \tau h$$

$$\frac{1-\tau}{(1-\tau)h + T} - v'(1-h) = 0$$

$$\rightarrow \frac{1-\tau}{h} = v'(1-h)$$

suppose $v(1-h) = \alpha \log(1-h) \rightarrow v'(1-h) = \frac{\alpha}{1-h}$

$$\rightarrow \frac{1-\tau}{h} = \frac{\alpha}{1-h} \rightarrow 1-\tau = \alpha \frac{h}{1-h}$$

$$\tau \uparrow \rightarrow 1-\tau \downarrow \rightarrow LHS \downarrow \rightarrow RHS \downarrow \rightarrow h \downarrow \rightarrow 1-h \uparrow$$

$$\rightarrow \tau \uparrow \rightarrow h \downarrow$$

Defining feature : perfect substitute for private consumption

Examples : education, health services

Role of Government Spending

Program 2: Throw revenue away

- Consumer

$$\max \ \log c + v(1-h)$$
$$\text{s.t. } c = (1-\tau)h$$

$\log((1-\tau)h) + v(1-h)$

- Government

$$c_g = \tau h$$

$\frac{\cancel{1-\tau}}{(\cancel{1-\tau})h} - v'(1-h) = 0$

offsetting income & substitution effects

$\frac{1}{h} = v'(1-h)$

no effect on h

$c \downarrow$

variations on this policy:

- gov't produces something that's of no value to agent
- — " — valued but doesn't affect MU of private consumption

Example: military spending

Role of Government Spending

Program 3: Subsidize consumption

$$\log \left[\frac{(1-\tau)}{(1-s)} h \right] + v(1-h)$$

$$\rightarrow \frac{1}{\cancel{\left(\frac{1-\tau}{1-s}\right)} h} \cancel{\left(\frac{1-\tau}{1-s}\right)} - v'(1-h) = 0$$

- Consumer

$$\max \ \log c + v(1-h)$$
$$\text{s.t.} \ (1-s)c = (1-\tau)h$$
$$c = \frac{(1-\tau)}{(1-s)} h$$

$$\rightarrow \frac{1}{h} = v'(1-h)$$

no effect on h or c

- Government

$$sc = \tau h$$

Intuition: in a single good model a subsidy on c is like a subsidy on h

Examples: childcare, elderly care

Role of Government Spending

Program 4: Subsidize leisure

$\log((1-\tau)h + s(1-h)) + v(1-h)$

$$\frac{1-\tau-s}{(1-\tau)h + s(1-h)} - v'(1-h) = 0$$

$$\rightarrow \frac{1-\tau-s}{h} = v'(1-h)$$

- Consumer

$$\max \ \log c + v(1-h)$$
$$\text{s.t. } c = (1-\tau)h + s(1-h)$$

like having even bigger tax rate than in lump sum scenario

- Government

$$s(1-h) = \tau h$$

Examples:
unemployment insurance
social security

$\tau \uparrow \rightarrow h \downarrow \downarrow$

Is Scandinavia an Outlier?

Introduction

- Scandinavia used as critique against Prescott (2004)
  - Higher taxes than continental Europe
  - Higher hours worked than continental Europe
- But what government does with tax revenue matters

Is Scandinavia an Outlier?

Quantitative Example

- Compare alternative government spending programs quantitatively
  - Assume preferences

$$\alpha \log c + (1-\alpha)\log(1-h)$$

  - Calibrate α so that when $\tau = 0.4$ $h = 1/3$

Is Scandinavia an Outlier?

Quantitative Example

- Compare Programs 1 and 4 (all spending of one type)

lump sum transfer

subsidy on leisure

Table 2		
Hours Relative to $\tau = .40$		
τ	Program 1	Program 4
.40	1.00	1.00
.45	.94	.92
.50	.88	.83
.55	.82	.75
.60	.75	.67
.65	.68	.58

From Rogerson (2007)

Is Scandinavia an Outlier?

Quantitative Example

- Take as baseline economy with $\tau = 0.4$ and then raise taxes and vary spending patterns
- Compare mix of Programs 3 and 4 and Programs 2 and 4

Table 3					
Effects of Variations in Spending					
Programs 3 and 4			Programs 2 and 4		
τ_3	τ_4	h/h^{US}	τ_2	τ_4	h/h^{US}
.00	.25	.58	.00	.25	.58
.05	.20	.67	.05	.20	.62
.10	.15	.75	.10	.15	.66
.15	.10	.83	.15	.10	.71
.20	.05	.92	.20	.05	.77
.25	.00	1.00	.25	.00	.84

interaction effect of 2 policies

From Rogerson (2007)

Is Scandinavia an Outlier?

What's special about Scandinavia?

- A prominent difference in spending patterns between Scandinavia and continental Europe is that Scandinavian governments spend much more on family services
  - In particular, childcare and elderly care
- To capture this, write down simple multi-sector model like in Rogerson (2007)

Is Scandinavia an Outlier?

Multi-Sector Model

$w = 1$

consumption

family services

leisure

utility $$\alpha_c \log c + \alpha_s \log s + (1 - \alpha_c - \alpha_s) \frac{\overbrace{(1-h)}^{}{}^{1-\gamma}}{1-\gamma}$$

market input into family services

$h = h_m + h_s$

$$c + m = (1 - \tau) h_m + T$$

lump sum transfer

home hours

$$s = [a(m + G)^\rho + (1 - a) h_s^\rho]^{1/\rho}$$

parameter

governs substitutability between m and h_s

$$T + G = \tau h_m$$

Is Scandinavia an Outlier?

Quantitative Assessment of Multi-Sector Model

- Benchmark is US calibration with $\tau = 0.4$ and $G = 0$ (lump-sum transfer)
  - Set $\rho = 0.8$
  - Pick $\overset{\alpha}{\cancel{\alpha}}$, α_c and α_s to match $h_m = 1/3$, $h_s = 0.08$, and $m/(c+m) = 0.05$

Is Scandinavia an Outlier?

Quantitative Assessment of Multi-Sector Model

- Behavior of multi-sector model when raise labor tax rate
  - For now, assume $G = 0$

Table 4						
Effects of Taxes Relative to $\tau = .4$, With $G = 0$						
τ	h_m	h_s	$h_m + h_s$	m	c	s
.40	1.00	1.00	1.00	1.00	1.00	1.00
.50	.86	1.21	.93	.49	.88	1.02
.60	.71	1.40	.84	.18	.74	1.05
.70	.56	1.54	.75	.05	.59	1.10

From Rogerson (2007)

Is Scandinavia an Outlier?

Quantitative Assessment of Multi-Sector Model

Scandinavia

- Now, allow $G > 0$
- Compare $\tau = 0.6$ relative to $\tau = 0.4$ for different values of G

Table 5

Effects of G With $\tau = .60$ Relative to $\tau = .40$

	$G = .00$	$G = .01$	$G = .02$	$G = .03$
h_m	.71	.74	.77	.80
h_s	1.40	1.26	1.09	.95
$h_m + h_s$	.84	.84	.83	.83
$m + G$	.18	.61	1.21	1.82
c	.74	.74	.75	.75
s	1.05	1.05	1.10	1.13

From Rogerson (2007)