

# Chapter 5

A Closed-Economy One-Period  
Macroeconomic Model

## Build a MACRO MODEL

Specs:

- Closed Economy (i.e., no foreign trade)

Agents:

- Representative Consumer (Chapter 4)
- Representative Firm (Chapter 4)
- Government (Chapter 5)

# Government

- Purchase consumption goods  $G$ .
- Finance purchase using Taxes  $T$ .

Captures the idea that government spending uses up resources from the private sector  
(assumption).

For the moment, forget public goods.

# Government Constraint

- **G is exogenous**
- Simply, someone stands up (outside the model) and decides on how much **G** will be. For example, see the state of the Union address. We do not model **G**. We do not ask questions such as: which variable is influential to **G**? which variable, if changed, will subsequently change **G**? Poly-Sci ask these questions.
- In Economics, **G** is given to us, outside the model.
- ***Government Constraint***

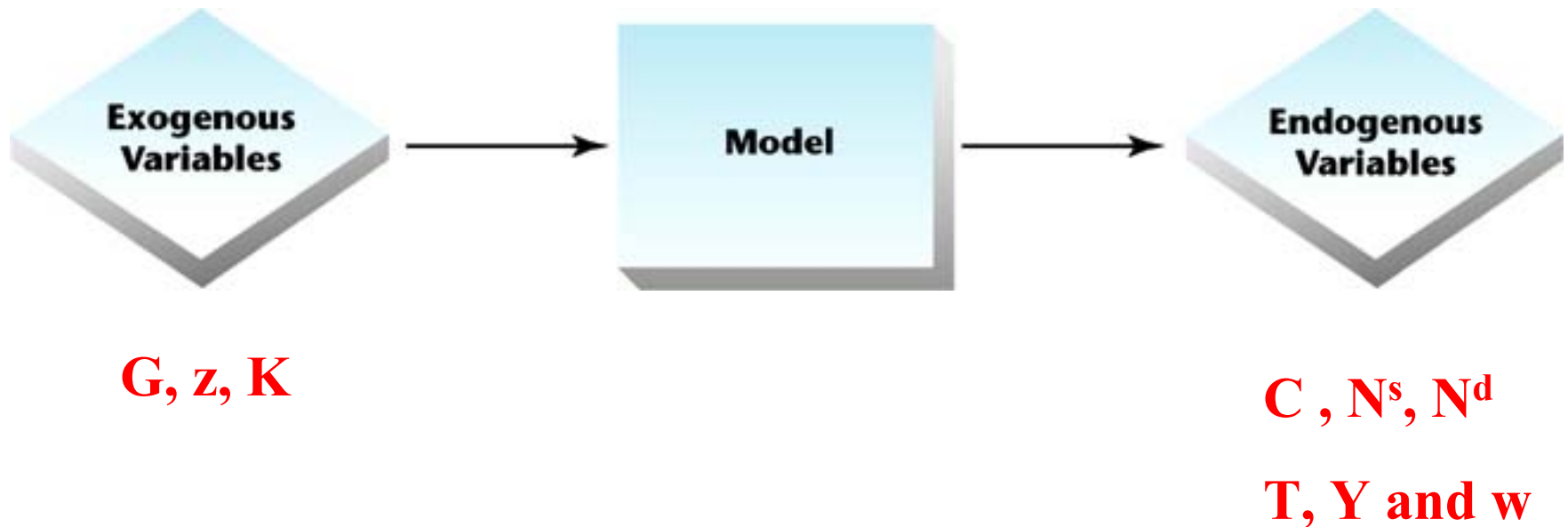
$$\mathbf{G} = \mathbf{T}$$

# Fiscal Policy

Refers to gov' choices over:

- Expenditures (G)
- Taxes (T) ← here must equal G “WHY?”  
Exlpain what will happen if  $T > G$  or  $T < G$
- Transfers ← no production, not part of GDP
- Borrowing ← here gov' can't borrow “WHY?”

# Figure 5-1 A Model Takes Exogenous Variables and Determines Endogenous Variables



# MODEL

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- **Behavior:** Consumer, Firm and Government.
- **Consistency:** given market prices, demand equals supply in each market in the economy.  
Market Clearing.

The actions of the agents must be consistent.

# COMPETITIVE EQUILIBRIUM

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**COMPETITIVE**



**Agents are price-takers.**

**EQUILIBRIUM**



**Economy is in equilibrium,  
when the actions are consistent.  
Markets clear.**

# The CE for this economy

A CE is:

- a set of endogenous quantities:  $C$ ,  $N^s$ ,  $N^d$ ,  $T$  and  $Y$
- and endogenous real wage  $w$ , such that
- Given the exogenous variables  $G$ ,  $z$  and  $k$ ,

**The following is satisfied**

- The consumer max  $U$  s/c budget
- The firm max profits s/c technology
- The labor market clears  $N^s = N^d$
- The government budget is satisfied.

# In General

A CE is:

- A set of endogenous quantities ...
- and endogenous prices ... such that
- Given a set of exogenous variables ...

**The following is satisfied**

- Agents follow an optimizing behavior
- All markets clear and constraints are satisfied.

# Show why the Income-Expenditure identity holds in equilibrium?

Start with the consumer's budget

$$C = wN^s + \pi - T$$

In Equilibrium,  $\pi = Y - wN^d$  (from the firm)

Also,  $G = T$  (from the gov)

Therefore  $C = wN^s + Y - wN^d - G$

Now, add Labor market clearing  $N^s = N^d$

Which gives  $Y = C + G$

# Figure 5-2 The Production Function

$$Y = z F(K, N)$$

Keep Track of changes in the labels of the Y-Axis and the X-Axis

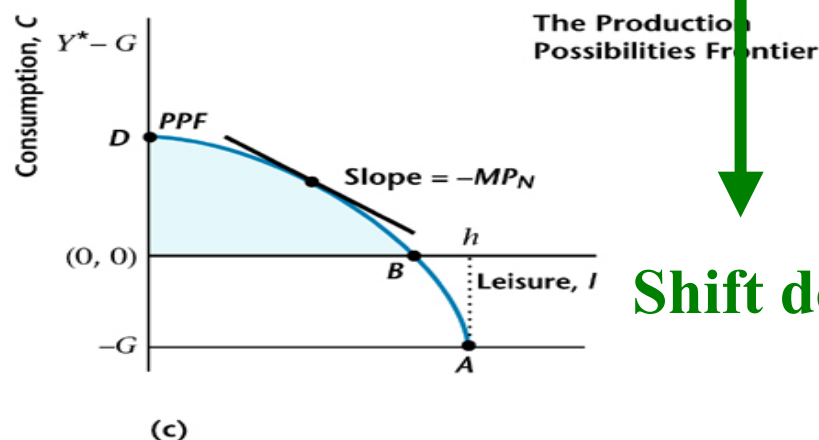
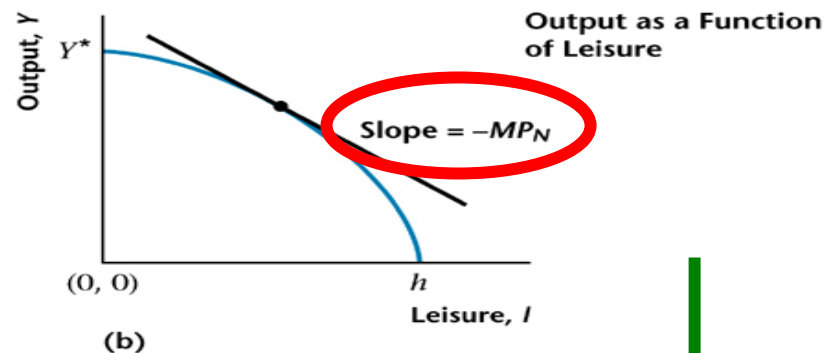
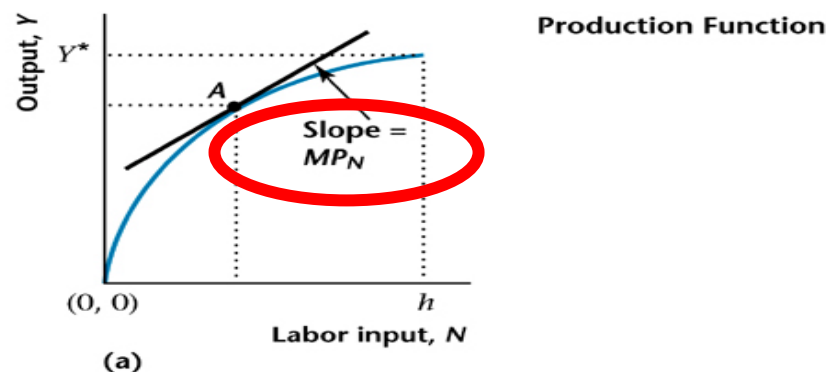
Y as function of Leisure

$$Y = z F(K, h-l)$$

**PPF**

Since  $C = Y - G$  then

$$C = z F(K, h-l) - G$$



Shift down by G

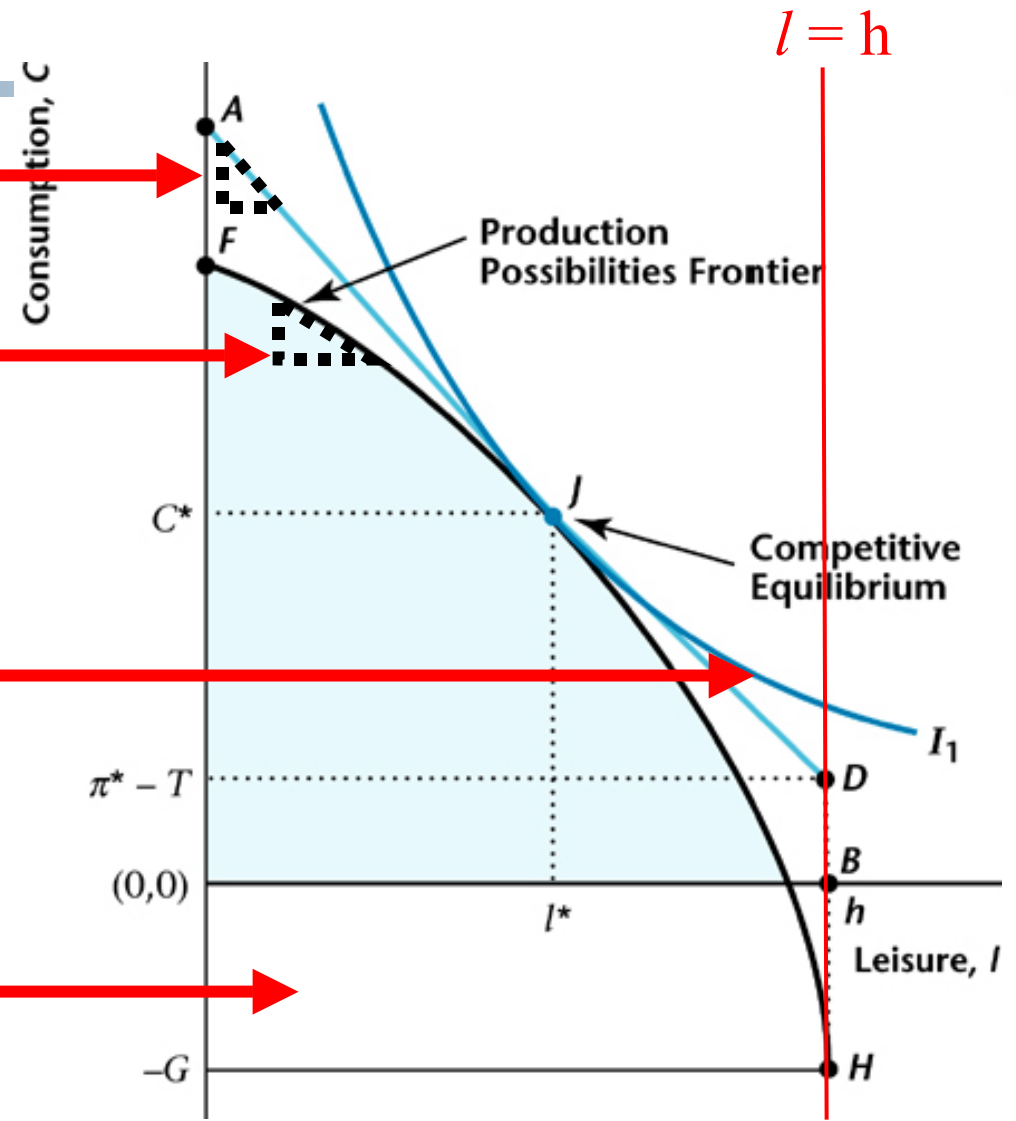
# Figure 5-3 Competitive Equilibrium

Slope of budget =  $-w$

Slope of PPF =  $-MPN$   
also called the  $MRT_{l,C}$

Slope of Utility =  $MRS$

Not Feasible,  $C$  is negative



# Figure 5-3 Competitive Equilibrium

The Firm Problem  
 $MRT_{l,C} = w$

The Consumer Problem  
 $MRS_{l,C} = w$

