

## Lecture 1

# Economic Growth: Theory and Empirical Patterns

(Based on Chapter 2 of Perkins et al.)

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# Basic Concepts

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- GDP / GNP
- Real vs. nominal.
- Purchasing power parity.
  - Exchange rate based GDP of India = US\$ 450 billion (approx)
  - Purchasing power parity based GDP of India = US\$ 2.2 trillion (approx)

# Rostow's Stages of Growth

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- Traditional society
- Transitional stage (preconditions for take off)
- Take off
- Drive to maturity
- High mass consumption

# Basic Growth Model .... 1

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- Production function

- $Y = F(K, L)$  [1]

- Savings function

- $S = s \times Y$  [2]

- Investment

- $I = S$  [3]

- Assumption: Closed economy.

# Basic Growth Model .... 2

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- Capital stock
  - $\Delta K = I - (\delta \times K)$  [4]
  
- Labour supply
  - $\Delta L = n \times L$  [5]
  
- [2] + [3] + [4]
  - $\Delta K = sY - \delta K$  [6]
  
- [1] + [5] + [6]  $\Rightarrow$  growth path of Y

# Harrod-Domar Model .... 1

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- Concepts:

- Fixed coefficient production function

- Ratios:

- Capital-output ratio

- Labour-output ratio

- Model:

- $Y = (1/v) \times K$

- $v = K/Y$

[i]

# Harrod-Domar Model .... 2

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- $\Delta Y = \Delta K/v$  [ii]

- $g = \Delta Y/Y = \Delta K/vY$  [iii]

- [iii] + [6]

- $g = (sY - \delta K)/vY$

- $g = (sY/vY) - \delta(K/vY)$

- $g = (s/v) - \delta$  [iv]

# Harrod-Domar Model .... 3

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- Predictions:
  - Increase in savings rates increase growth.
  - Improvement in efficiency of capital use increase growth.
  
- Policy implications:
  - Given a target growth rate and the level of technology, a government has to ensure that enough savings is generated to achieve the target.
    - Soviet Union
    - East Asia



# Harrod-Domar Model .... 4

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- Strength:
  - Simplicity.
  
- Weakness:
  - Fixed ICOR and labour-output ratio.
    - Knife edge problem.
      - Model in equilibrium only under very special circumstances.
  - No role of technological change.

# Harrod-Domar Model .... 5

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- Knife edge.
  - Fixed coefficient production function  $\Rightarrow$  capital and labour should grow at the same rate.
    - $\Delta K/K = \Delta L/L = n$
  - Constant capital output ratio ( $v$ )  $\Rightarrow$  capital and output must grow at the same rate.
    - $\Delta K/K = g$
  - Equilibrium exists if  $g = n$ .

# Harrod-Domar Model .... 6

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- Knife edge .... continued.
  - $n > g$ 
    - Labour force is growing faster than capital.
    - Not enough capital to employ all labourers.
    - Some labourers will remain unemployed.
  
  - $n < g$ 
    - Capital stock is growth faster than labour force.
    - Not enough labourers to use the capital stock.
    - Some of the capital stock remains unused.