

# ECON20210 (S25): The Elements of Economic Analysis III Honors

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# 1 Introduction

We will view the neoclassical growth model as a benchmark.

## 1.1 Measurement

GDP captures the total amount of production, incomes, or expenditures. More formally, GDP is the dollar amount of “final” goods and services produced per unit of time. It is a flow.

Heuristically, we have:

- GDP captures how well the local economy is doing.
- GNP captures how well the nationals in a country are doing.
- Nominal and real GDP:
  - Nominal GDP values goods and services at current prices.  $Y_t^n = \sum_i P_{i,t} Q_{i,t}$ .
  - Real GDP values goods and services at **constant** prices.  $Y_t^r = \sum_i P_{i,0} Q_{i,t}$ , where  $P_{i,0}$  is the price of good  $i$  in the base year.
  - The GDP deflator is the ratio of nominal to real GDP.  $P_t = \frac{Y_t^n}{Y_t^r}$ .

As an measurement of expenditure, we have

$$Y = C + I + G + EX - IM,$$

where

- $C$  is consumption purchases by households ( $\sim 70\%$ ),
- $I$  is investment (purchases of new capital goods by businesses,  $\sim 15\%$ ),
- $G$  is government spending,
- $NX = EX - IM$  is net exports (what foreigners purchase net of what we buy from them,  $\sim -5\%$ ).

As an measurement of income, we have

$$Y = wL + \pi + rK + T,$$

where

- $wL$  is wage and compensations to workers  $\sim 66\%$ ,
- $\pi$  are corporate profits,  $rK$  are compensations to capital owners. ( $\pi + rK$  take up  $\sim 35\%$ ),
- $T$  are taxes.

As an measurement of output, we may think

$$Y = f(A, K, L, X),$$

where

- $A$  is technology,  $K$  is capital,  $L$  is labor,  $X$  are other factors.

## 1.2 Growth Rate

Discrete growth rate is

$$\gamma = \frac{Y_{t+1} - Y_t}{Y_t}, \quad Y_{t+1} = (1 + \gamma)Y_t.$$

If  $Y$  is exponentially growing, we have by using the approximation  $\log(1 + \gamma) \approx \gamma$  that

$$\log Y_{t+1} - \log Y_t \approx \gamma.$$