

## Lecture 3

# Distribution and Allocation of National Income

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Economic Growth and  
Economic Fluctuations

## Gross Domestic Product

- **Gross Domestic Product (GDP)** is measures the total market value of country's output. It's the:
  - market value of all final goods and services
  - produced within a given period of time
  - by factors of production located within country

### What's In?

- **value of all final goods** (end products)
- **sale of a new car**
- Value of intermediate goods and services are implicitly present in the market value of the final good or service.

### What's Out?

- **value of intermediate goods** (ex. steel used to build a car)
- **sale of a used car** (but the value of labor used to repair a used car is in GDP)
- **sales of stocks, bonds, etc.** (but the value of the broker's services is in GDP)

# Gross Domestic Product

- In the previous lecture, we discussed a firm's profit:

$$\Pi = p \cdot K^\alpha \cdot L^{1-\alpha} - r \cdot K - w \cdot L$$

$$\text{where: } 0 < \alpha < 1$$

- But since we've assumed that economic profit is zero – i.e.:  $\Pi = 0$

$$p \cdot K^\alpha \cdot L^{1-\alpha} = r \cdot K + w \cdot L$$

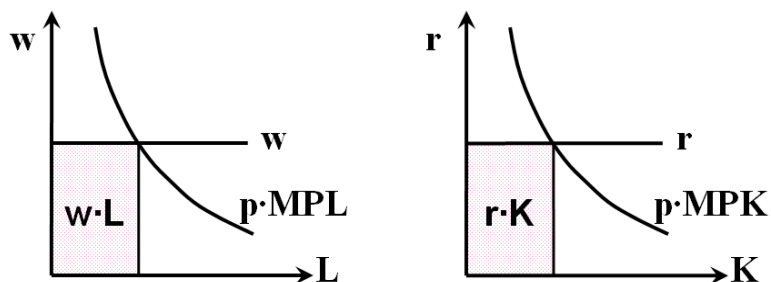
- So the value of a firm's output is equal to the value of its capital and labor inputs.
  - GDP is the aggregate sum of the market value of the output of all firms in the economy
  - GDP is also the aggregate sum of the value of all capital and labor inputs in the economy
- By definition, these two measures of GDP should be equal

## Distributing National Income to the Factors of Production

- So one approach to calculating GDP – the **income approach** – is based primarily on **national income**:

$$\text{national income} \approx r \cdot K + w \cdot L$$

- $w \cdot L$  is the total payments to human labor, where:  $w = p \cdot \text{MPL}$
- $r \cdot K$  is the total payments to physical capital, where:  $r = p \cdot \text{MPK}$



- but National Income only makes up about 80 percent of GDP
- so the income approach consists of more than just summing the incomes accruing to all factors of production

# the Income Approach to GDP

- **In practice, calculating  $r \cdot K$  is impossible because:**
  - most firms own rather than rent the capital they use
  - firms can at times earn economic profit
- **When discussing the concept of **National Income** however, we're interested in how much everyone in the economy has earned**
  - If **economic profit** is approximately zero, then  $r \cdot K$  is approximately equal to the **accounting profit** of the economy's firms (after depreciation).  
$$\text{accounting profit} = \text{economic profit} + r \cdot K - \text{depreciation}$$
- **The difference between national income and GDP consists of:**
  - **depreciation** – decrease in capital's value which occurs as capital wears out or becomes obsolete (which is subtracted from accounting profits)
  - **indirect taxes minus subsidies** – accounts for the difference in price between that which the consumer pays and that which producer receives
  - **net factor payments to the rest of the world** – foreigners own factors of production in America (such as factories), but their income is not counted in U.S. national income since they are not U.S. nationals
- **Each of these are ADDED to national income to arrive at GDP in order to balance our measure of GDP on the income and expenditure side**

## Allocating National Income

- Now, it should be obvious to you that capital and labor won't be paid very much if no output is sold.
- So we also need to examine the purchases of aggregate output – the **expenditure approach** to calculating GDP:
  - **Consumption** – denoted  $C$
  - **Investment** – denoted  $I$
  - **Government purchases** – denoted  $G$
  - **Net Exports** – denoted  $NX$ 
    - net exports is simply total export minus total imports, so
    - we can write:  $(X - M)$ , where  $X$  is exports and  $M$  is imports
- Since we'll frequently use  $Y$  to denote **GDP**, we can write:

$$Y = C + I + G + (X - M)$$

## Consumption

- **Consumption** – refers to the aggregate personal consumption expenditures of households in the economy and consists of:
  - **Durable goods** – cars, refrigerators, furniture (things that will last a few years)
  - **Non-durable goods** – food, gasoline, paper (things that don't last very long)
  - **Services** – legal, medical (things that we value, but that do not represent the production of a tangible item)

## Investment

- **Investment** – consists of goods that firms and households purchase for future use – as opposed to present use
  - **Non-residential fixed investment** – purchases of new plants and equipment by firms
  - **Residential fixed investment** – purchases of new housing by households and landlords
  - **Inventory investment** – investment to meet future demand, this component is negative when firms run down their inventories
    - **GDP is the market value of total production in a period, not sales**
    - $GDP = \text{final sales} + \text{inventory investment}$

## Government purchases

- **Government purchases** – consist of the goods and services bought by federal, state and local governments
  - military equipment
  - highway construction
  - services of government employees
- **Government purchases do NOT include transfer payments, such as Social Security payments, AFDC, etc.**
  - such payments reallocate income from some households to others
  - they do not represent the production of a good or service

## Net Exports

- **Since U.S. expenditures include purchases of goods produced abroad, we must subtract those purchases from U.S. expenditures to find the value of goods and services produced in the U.S.**
- **Similarly, since foreign consumption includes purchases of goods produced in the U.S., we must add those purchases to U.S. expenditures to find the value of goods and services produced in the U.S.**