

CHAPTER 6

Production, Income and Employment

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Summary

Summary: This chapter deals with the following macroeconomic concepts:

- 1) **National income accounting:** how to measure the value of goods and services or national income.
- 2) **Unemployment:** how to measure the rate of unemployment.

What is microeconomics?

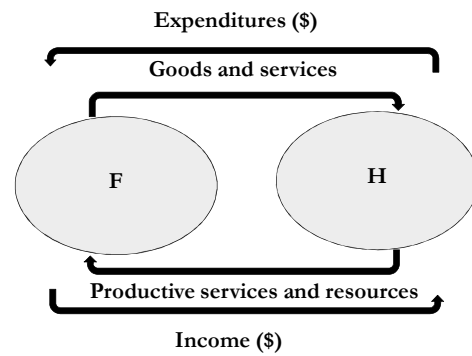
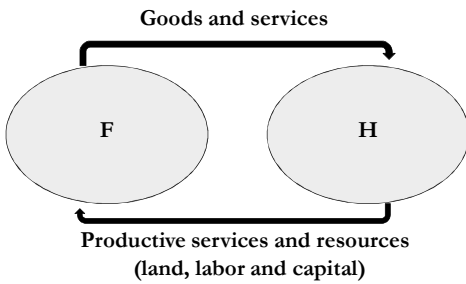
National Income Accounts

We begin with what is called a “circular flow of spending,” which does not appear in this chapter (see Chapter 3).

Circular Flow of Spending

Firms:
Units of production

Households:
Factors of production



Flows and Stocks

Def. a **flow** measures something per unit of time.

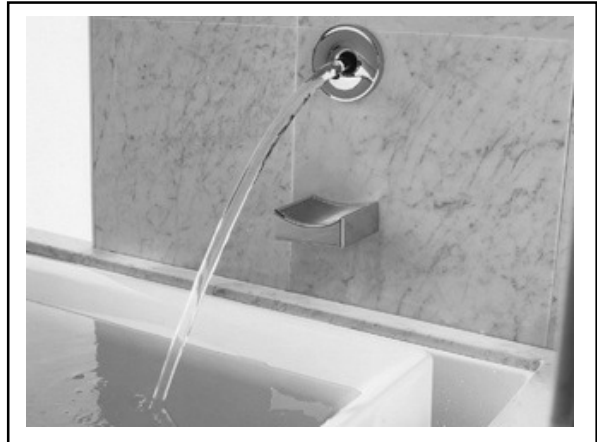
Example:

the flow into the bathtub is 2 gallons per minute.

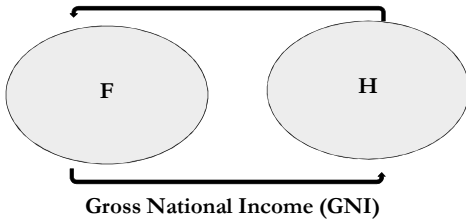
Def. a **stock** measures something at a given time.

Example:

the stock of water in the bathtub is 10 gallons.



Gross National Product (GNP)



GNP \equiv GNI

We will define Gross National Product and Gross National Income shortly.

But first, let us define Gross Domestic Product (GDP).

Def. GDP

is the value of all goods and services produced.

Gross Domestic Product (GDP)

More technically,

Def. **GDP** is the **monetary value** of all **final goods and services** produced for the **market place** in **one year, within a country**.

The meaning of each word:

Monetary value:

We need a unit of measurement, a common denominator.

Final goods and services:

We must avoid **double counting** by excluding all the intermediate stages of production and sales.

Example:

Consider a gallon of gasoline:

| Stages of production and sales | Sales value | Value added |
|--------------------------------|-------------|-------------|
| Oil drilling | \$.50 | \$.50 |
| Refining | .65 | .15 |
| Shipping | .80 | .15 |
| Retail sale | 3.00 | 2.20 |
| | | \$3.00 |

Note that one can calculate the GDP by adding up the values added.

This is called **the value added approach to GDP**.

Market place:

We set aside those goods and services that are not bought or sold, for example:

Housework: work that you do at home. If you hire a person to do the work, it enters the GDP.

Underground economy: illegal drugs, gambling, prostitution, etc.

Barter: direct exchange of goods and services.

One year:

All goods and services must be produced in the given year. Thus items produced in the previous years are excluded.

This means that GDP is a flow, since it measures something per year.

Within a country:

We don't care whether the goods and services are produced by foreign or domestic firms, as long as they are produced in the country.

The Expenditure Approach to GDP: The Components of GDP

We can look at how money is spent on goods and services by dividing GDP into four components:

$$\text{GDP} = C + I_g + G + (X-M)$$

C: Personal consumption

This is the total amount of spending by consumers on goods and services.

It is the **largest component** of GDP (about 66% or 2/3 of GDP)

1) C consists of

- 1) **durable goods** (goods lasting 3 years or more), such as cars, refrigerators, computers, etc.
- 2) **non-durable goods** (goods lasting less than 3 years), such as food, clothing, soft drinks, etc.
- 3) **services**, such as transportation, education, health, etc.

2) **I_g: Gross Private Investment**

This is the total spending on goods that are used to produce other goods.

It consists of :

- 1) **structures and equipments**,
- 2) **residential structures**
- 3) **changes in business inventories (ΔI)**

Changes in business inventories (ΔI) can be

- **positive**, if some goods produced by the firms remain unsold: economy contracts.
- **negative**, if the firms have not produced enough: economy expands.
- **zero**, if the firms have produced just the right amount of goods and services: economy is **stable**, there is no expansion or contraction.

Actual Investment and Planned Investment

Since some of the investment is unintended changes in inventories, then

$$\text{Actual investment} = \text{Planned investment} + \text{Unintended changes in inventories}$$

$$I_a = I_p + \Delta I$$

Gross Investment versus Net Investment

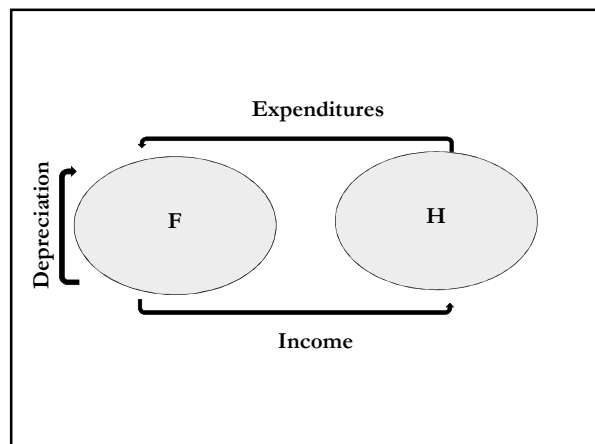
Net investment = Gross Investment (I_g) – Depreciation

$$I_n = I_g - \text{Depreciation}$$

Or

$$I_g = I_n + \text{Depreciation}$$

Def. **Depreciation** (or “capital consumption allowances”) is **capital used up** in the production process.



3) G: Government purchases:

This is government expenditures on goods and service.
It consists of

- 1) **Federal expenditures** on:
 - a) **Defense** (the biggest component)
 - b) **Others**
- 2) **State and local** government expenditures.

Note

G does not include “**transfer payment.**”

Def. **Transfer payments** transfer income from one group of people to another, such as social security, welfare, unemployment compensation, etc.

Q: Why are transfer payments not in in G?

A: Because by definition G is government expenditure on goods and services and transfer payments are not expenditure on goods and services.

4) X-M: Net exports:

This is the difference between total exports and total imports of goods and services, that is

$$X-M = \text{exports} - \text{imports}$$

X-M could be negative, positive or zero.

Summing up: $GDP = C + I_g + G + (X-M)$

C: Personal consumption

- 1) durable goods
- 2) non-durable goods
- 3) services

I_g: Gross Private Investment

- 1) structures and equipments
 - 2) residential structures
 - 3) changes in business inventories (ΔI)
- (Also, I_a, I_p, I_g, I_n, and depreciation)

G: Government purchases

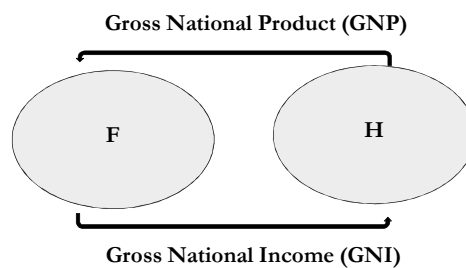
- 1) Federal expenditures
 - a) Defense
 - b) Others
- 2) State and local government

X-M: Net export

See Econ 50 Website [BEA Expenditures](#)

The Income (Factor Payment) Approach to GDP

We now look at the lower part of the flow, measuring the income or what the factors earn or receive:



Before discussing Gross National Products and Gross National Income identity, we look at Net National Income.

Net National Income (NNI) or National Income (NI)

Def. NNI or NI is the income earned by factors of production (labor, land and capital).

$$\text{NNI} = \text{Wages \& Salaries} + \text{rent} + \text{interest} + \text{profit}$$

1) **Wages & salaries** (or “compensation to the employees”): income earned by the employees.

2) **Rent**: income earned for owning rental properties, imputed or otherwise.

3) **Interest**: interest earned by household from firms.

4) Profit:

i) Corporate profit:

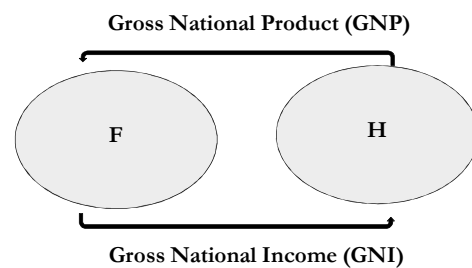
- a) dividends
- b) retained earnings
- c) corporate taxes

ii) Income of unincorporated businesses, or proprietors' income:

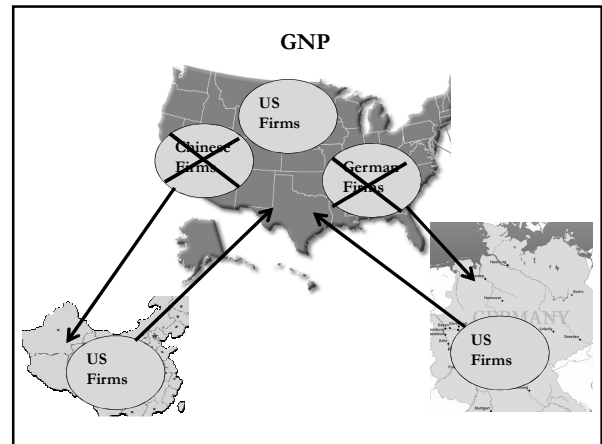
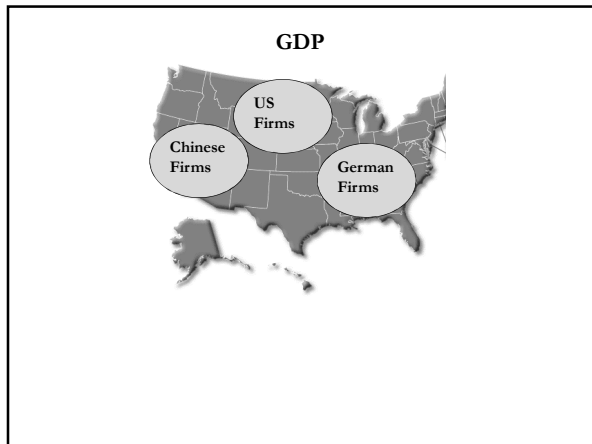
Income of small businesses, partnerships, and self employed individuals, such as doctors and lawyers.

NNI flow is **not** equal to GDP flow!

In order to equalize the output flow with income flow we need to look at GNP and GNI.



$$\text{GNP} \equiv \text{GNI}$$



Gross National Product (GNP)
 $GNP = GDP$
 -
 Income earned by foreign firms in the US
 +
 Income earned by the US firms in foreign countries

NNI and GNI

NNI is income *earned* by factors of production.

But factors **don't earn**

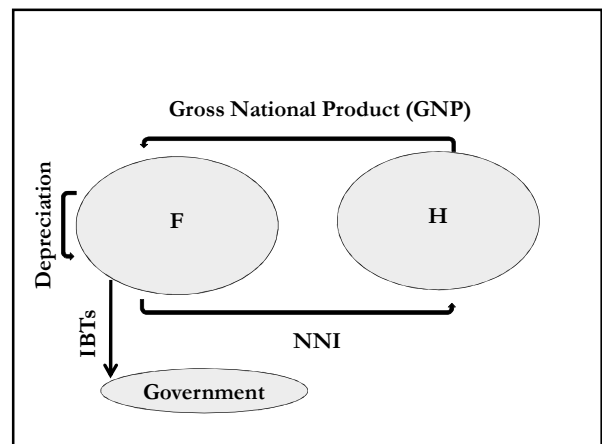
- 1) **Depreciation** (capital used up)
- 2) **Indirect Business Taxes**

Def. **Indirect Business Taxes (IBTs)**:
 These are mainly **sales taxes, excise taxes, and utility taxes.**

$NNI = GNI - \text{Depreciation} - \text{IBTs}$

Or

$GNI = NNI + \text{Depreciation} + \text{IBTs}$



Other Important National Income Categories

Def. Personal Income (PI): income received as opposed to income earned.

Some people receive (but don't earn) some income, such as
transfer payments

Some people earn (but don't receive) some income, such as
retained earnings

Therefore:

$$PI = NNI + \text{Transfer payments} - \text{retained earnings}$$

Def. **Disposable Personal income** (DPI): personal income after direct taxes:

$$DPI = PI - \text{Direct taxes}$$

Example of direct taxes:

Income tax, property tax, and inheritance tax

Real and Nominal (Money) GDP

Def. **Nominal GDP**:

GDP measured in current prices, i.e., GDP unadjusted for inflation.

Def. **Real GDP**:

GDP measured in constant prices, i.e., GDP adjusted for inflation.

We will see how the adjustment is made in the next chapter. But in general:

$$\text{Real GDP} = \text{Nominal GDP} / \text{GDP Price Deflator}$$

We will define "GDP Price Deflator" in the next chapter

Symbolically:

$$y = Y / \text{GDP Price Deflator}$$

Note: You are expected to know the current values of nominal and real GDP.

Visit [US Department of Commerce](http://www.bea.gov)
[BEA: GDP](http://www.bea.gov) on your website!

Is GDP a good measure of social welfare?

No, not necessarily!

Per capita GDP, i.e., GDP divided by the population is slightly a better measure.

Even the latter is not a very good indicator of the quality of life, such as leisure, clean air, and water.

UNEMPLOYMENT

Labor Force

Def. Labor force consists of people (16 years or older) who either have a job or who are *actively* looking for a job.

Given the definition of the labor force, **discouraged workers** are not in the labor force but part-time workers are.

Def. **Discouraged workers**: those people who have given up actively looking for jobs.

Def. **Unemployed**: those workers who are actively looking for jobs but can't find them.

Def. **Unemployment rate**:

Unemployed workers/ Labor force

Example:

Unemployed: 3 million people

Employed: 9 million people

Unemployment rate = $3 / (3 + 9) = 3/12 = 25\%$!

Types of Unemployment

1) Frictional unemployment:

unemployment due to **changing jobs**.

2) Seasonal unemployment:

unemployment due to **patterns of production or sales**, such as production in agriculture or retail sales.

Note: Unemployment reports are seasonally adjusted.

3) Structural unemployment:

unemployment due to changes in the structure of the economy or the workforce.

Examples: technological changes, making some jobs obsolete, or the "baby boom" of the 1950s.

4) Cyclical unemployment:

unemployment due to "business cycle": a downturn in the economic activity.

Full Employment

- Full employment is when cyclical unemployment is zero.
- Full employment does not mean zero unemployment, since we still have some other types of unemployment.
- It is argued that such unemployment as frictional unemployment is voluntary, while **cyclical unemployment is involuntary**.

Note: You are expected to know the current rates of unemployment.

Visit [US Department of Labor](#) and [BLS: Employment](#) on you website!

Summing up: $GDP = C + I_g + G + (X-M)$

C: Personal consumption

- 1) durable goods
- 2) non-durable goods
- 3) services

I_g : Gross Private Investment

- 1) structures and equipments
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- 3) changes in business inventories (ΔI)

(Also, I_a , I_p , I_g , I_n , and depreciation)

G: Government purchases

- 1) Federal expenditures
 - a) Defense
 - b) Others
- 2) State and local government

$X-M$: Net export

Summing up:

$NNI = \text{Wages \& salaries} + \text{rent} + \text{interest} + \text{profit}$

Profit

i) **Corporate profit:**

- a) dividends
- b) retained earnings
- c) corporate taxes

ii) **Income of unincorporated businesses, or proprietors' income**

$GNP = GDP - \text{Income earned by foreign firms in the US} + \text{Income earned by the US firms in foreign countries}$

$NNI = GNI - \text{Depreciation} - \text{IBTs}$

$PI = NNI + \text{Transfer payments} - \text{retained earnings}$

$DPI = PI - \text{Direct taxes}$

Next stop: Chapter 7