

4. Investment and Saving

Investment is the portion of final product that adds to the nation's stock of income-yielding physical assets or that replaces old, worn-out physical assets. The goods and services produced by firms that are not resold as intermediate goods to other firms or consumers during the current period (year) are final product. Final goods not sold are called "private investment" or private capital formation, which consists of:

- *inventory investment*: all changes in the stock of raw materials, parts, and finished goods held by firms. The *change* in inventories between the beginning and end of the year is included in GDP.
- *fixed investment*: all final goods purchased by business that are not intended for resale, such as structures and equipment; newly produced houses and units are also counted as fixed investment.

4.1 Investment and Saving

The figure shows a simple imaginary economy in which households spend 80% of their income and save 20%. Firms' investment accounts for 20% of total expenditure. We assume no taxes, no government spending, and no foreign sector.

The portion of household income that is not consumed or paid in taxes is called *personal saving*. Income that is saved can be channelled to firms in two basic ways:

- households buy bonds (debt) and shares (equity) issued by the firms, which can use the money to invest, or
- households deposit the unused income (savings) in banks, which lend the money to firms ...

The effect is the same: the “capital market” corresponds to the transfer of personal savings to firms for investment. Investment purchases must be equal to saving, from the following definitions:

$$\text{income } (Y) \equiv \text{expenditure } (E)$$

$$\text{expenditure } (E) \equiv \text{consumption } (C) + \text{investment } (I)$$

$$\text{saving } (S) \equiv \text{income } (Y) - \text{consumption } (C),$$

or rearranging

$$Y \equiv C + S.$$

Eliminating E from the second equation, and eliminating Y from the third, we get

$$S \equiv I$$

In Gordon's words, saving is a leakage from the income spent on consumption goods, which must be balanced by an injection of non-consumption spending in the form of private investment.

Saving decisions are made by households, investment decisions are made by firms; the mismatch between household savings plans and business investment plans has been a major source of instability between output and income.

There is a different implication between consumption and investment for the economy's ability to produce output in the future: consumption is for the present, but saving and investment reward present sacrifice (in terms of consumption forgone) with higher future capacity to produce, after the formation of capital assets — factories, office buildings, computers, other equipment — which add to the nation's natural real GDP for the future. High rates of saving and investment may result in high rates of productivity growth.

5. Net Exports

Exports are expenditures for goods produced within one country and shipped for sale to another. These expenditures create income domestically but aren't part of the consumption or investment of domestic residents. *Imports* are expenditures by domestic residents for goods and

services produced elsewhere, which thus don't create domestic income. If exports exceed imports, the net effect is a higher level of domestic production and income. *Net exports* (exports minus imports) is a component of final product and GDP.

The third equation above can be rewritten:

$$E = C + I + NX,$$

where *NX* equals net exports, or exports minus imports.

Another name for net exports is *net foreign investment*, since both domestic and foreign investment are components of domestic production and income created. Foreign investment creates domestic claims on foreigners that yield us future flows of income. And the opposite, if net exports are negative.

An Australian export to Japan is paid for with yen, which can be used to buy a Japanese bank account or part of a Japanese factory. Or if Australian exporters want payment in Aussie dollars, then they buy dollars from the Australian government in trade for yen. The increased government holdings of yen and other currencies can be held, thus counting as foreign capital assets, or can be used to pay off Australian foreign debts, thus reducing Australian liabilities to foreigners.

5.1 The External Accounts

Australia's external accounts track transactions between Australian residents and people overseas.

The *trade balance* or the *balance on goods and services account* for a particular period (usually a year) is the value of Australia's exports of goods and services less the value of Australia's imports and goods and services.

The *current account* is equal to the trade balance plus interest and dividend payments received by Australian residents from abroad minus interest and dividend payments made by Australians to people overseas. It also includes some minor items, such as foreign aid. Recently Australia's current account has been in deficit, reflecting a deficit in the trade balance and an excess of interest and dividends payments out of Australia over those coming into Australia.

Australia's *net overseas debt* or *net foreign debt* is the amount of money owed by Australian residents to people overseas minus the amount of money owed by people abroad to Australian residents.

Recently, Australia's current account deficits have been financed mainly by *overseas borrowing*, which has led to rapid accumulation of the net overseas debt. Another way to finance the current account deficit is *foreign equity inflow*, which is money paid by foreigners for Australian assets.

The *terms of trade* is an index of the prices of exports divided by an index of the prices of imports. As a relatively small country, Australian firms have little market power on world markets, and so we have little or no control over our terms of trade.

6. The Government Sector

Governments collect taxes from the private sector and make two kinds of expenditure:

- purchases of goods and services that generate production and create income, and
- transfer payments directly to households (pensions, allowances, the dole), which aren't included in GDP

The figure adds the government to our simple economy, which now contains households, firms, the capital market, foreigners, and the government. Households consume (C), save (S), and pay taxes (R); they receive income from sale (Y) of factor inputs to firms (labour) and from

government transfer payments (F). Firms pay households for productive inputs (Y) and purchase imports; they receive income from the sale of production from households (C) and foreigners (exports) and the government (G); they also receive investment funds (I). The government levies taxes on households (R) (and perhaps on firms too), spends on purchases of goods and services from firms (G) and on transfer payments to households (F), and finances its budget deficit from the capital market.

Algebraically, total income created (Y) equals total expenditure on final product (E):

$$Y \equiv E$$

$$E \equiv C + I + G + NX \quad (\text{firms})$$

$$Y + F \equiv C + S + R \quad (\text{households})$$

$$\therefore Y \equiv C + S + R - F$$

$$\therefore Y \equiv C + S + T,$$

where net tax revenue (T) is taxes (R) minus transfers (F):

$$T \equiv R - F$$

Since

$$Y \equiv E,$$

it follows that

$$S + T \equiv I + G + NX,$$

so that savings and investment don't have to be equal, instead:

Since income is equal to expenditure, the portion of income not consumed (savings plus net taxes) must be equal to the non-consumption portion of expenditure on final product (investment plus government spending plus net exports).

Or leakages from the income available for consumption must be exactly balanced by injections of non-consumption spending. This rule helps explain how the economy finances the *government budget deficit*. Subtracting S and G from both sides of the above, we get:

$$T - G \equiv I - S + NX,$$

or the government budget surplus equals investment minus savings plus net exports. Changes in the government's position must be reflected in changes in the private sector. How? (Consider the mooted US constitutional amendment to require a balanced budget.)

7. Types of Spending

The table lists the different types of expenditure. Items under A are included in GDP; items under B, C, D, and E are excluded, except E.2.a, the value of housing services. Why?

8. Gordon's Plumbing Diagram

On page 48, 5th ed., Gordon has a much more complicated diagram of the flows of money in the US economy, showing the relation of the spending streams between households, firms, the capital market, the government, and foreigners.

- A. Final goods and services
 - 1. Consumption
 - a. Durable goods
 - b. Non-durable goods
 - c. Services
 - 2. Private investment
 - a. Change in business inventories
 - b. Producers' durable equipment
 - c. Structures
 - i. Non-residential
 - ii. Residential
 - 3. Government purchases of goods and services
 - a. Consumption
 - b. Investment
 - 4. Net exports
- B. Government interest and transfer payments
- C. Private intermediate goods
- D. Private purchases of used assets
- E. Non-market activities
 - 1. Value of leisure time
 - 2. Services from existing durables
 - a. Housing
 - b. Other durables
 - 3. Costs of pollution
 - 4. Illegal activities

A new deduction from income is *depreciation* or *capital consumption allowances* are for the part of the capital stock used up due to obsolescence and physical wear. Depreciation must be included in GDP to show the expenditures of final users on the national output, but must be excluded from *net domestic product* (NDP), to show the incomes actually earned by the factors of production.

A *gross* magnitude includes capital consumption allowances, whereas a *net* magnitude excludes them.

Taxes on business (*indirect business taxes*) are included in the prices paid by the consumer, but are not available for payment as income to workers or firms. *National income* is the earnings of factors of production, computed as NDP minus indirect business taxes, taxes levied on business sales.

What remains of national income after deducting undistributed profits and company income taxes is paid out to individuals in the form of wages, salaries, rent, interest dividends, and the profits of unincorporated enterprises.

Personal income is the income received by households from all sources, including earnings, transfer payments, and interest payments on the government debt (government bonds). (These last two items are not included in GDP, NDP, or the national income.)

Personal disposable income is personal income minus personal income tax payments.

9. Measuring Prices

How do the national accounts take the recorded nominal income and expenditure (X) of two years in which prices were different and compute real GDP (Y) adjusted for all effects of price changes?

9.1 Implicit GDP Deflator

The implicit GDP deflator (P) is the ratio of nominal GDP (X) to real GDP (Y):

$$P \equiv \frac{X}{Y}$$

Gordon (p.49) works through calculation of nominal GDP, real GDP, and the GDP deflator for a simple economy in two years with different prices. The implicit GDP deflator is just one price index, the most important of which is the Consumer Price Index (CPI).

10. Two further sets of definitions

10.1 Employment and the Labour Force

People in Australia are said to be *employed* if they fulfil various conditions including the following:

- they must be aged 15 or more;
- they must have worked for one hour or more, for pay or profit, or they must have been on leave from a job where they receive pay or profit.

Unemployed are those aged 15 years or more who are not employed but are actively seeking employment. The *labour force* are all who are either employed or unemployed. The

unemployment rate is the number of unemployed people expressed as a percentage of the labour force.

The *participation rate* is:

$$\frac{\text{labour force}}{\text{population } >15, <65} \%$$

10.2 Productivity

Total labour productivity is real GDP divided by employment. *Labour productivity in the non-farm sector* is real non-farm product divided by employment (not by total employment excluding farm workers, although that would be preferable). New machines and inventions tend to raise labour productivity by helping workers produce more.

Simple Keynesian Theory of Income Determination

How is GDP determined? We care about this in order to understand the determination of unemployment and inflation. The simple theory shows how unexplained changes in investment spending are transmitted to consumption spending and real GDP as a whole. We enrich the theory later, to explore the effects of monetary and fiscal policy on real GDP, and the behaviour of the interest rate, the government budget deficit, and the foreign trade deficit.

1. Income and Unemployment

The unemployment rate has exhibited business cycle, which mirror business cycles in the gap between actual real GDP and natural real GDP: when actual real $<$ natural real, unemployment rises. Understanding business cycles in real GDP is the key to understanding business cycles in unemployment.

Endogenous variables are explained by economic theory. *Exogenous variables* are not, although relevant; their values are taken as given. Ideally want to include as many variables as possible in the former category.

Assume (for this chapter) that the interest rate is exogenous and constant (which means that we ignore monetary policy); and that the price level is exogenous and constant.

At the end, remaining exogenous variables include unpredictable changes in consumption and investment spending by private individuals and firms, changes in government spending caused by wars etc., and changes in the prices of oil and other raw materials.¹

2. Consumption and Saving

By definition, household disposable income (Y_D) is divided between consumption expenditures (C) and saving (S). How?

2.1 *The Consumption Function and the Marginal Propensity to Consume*

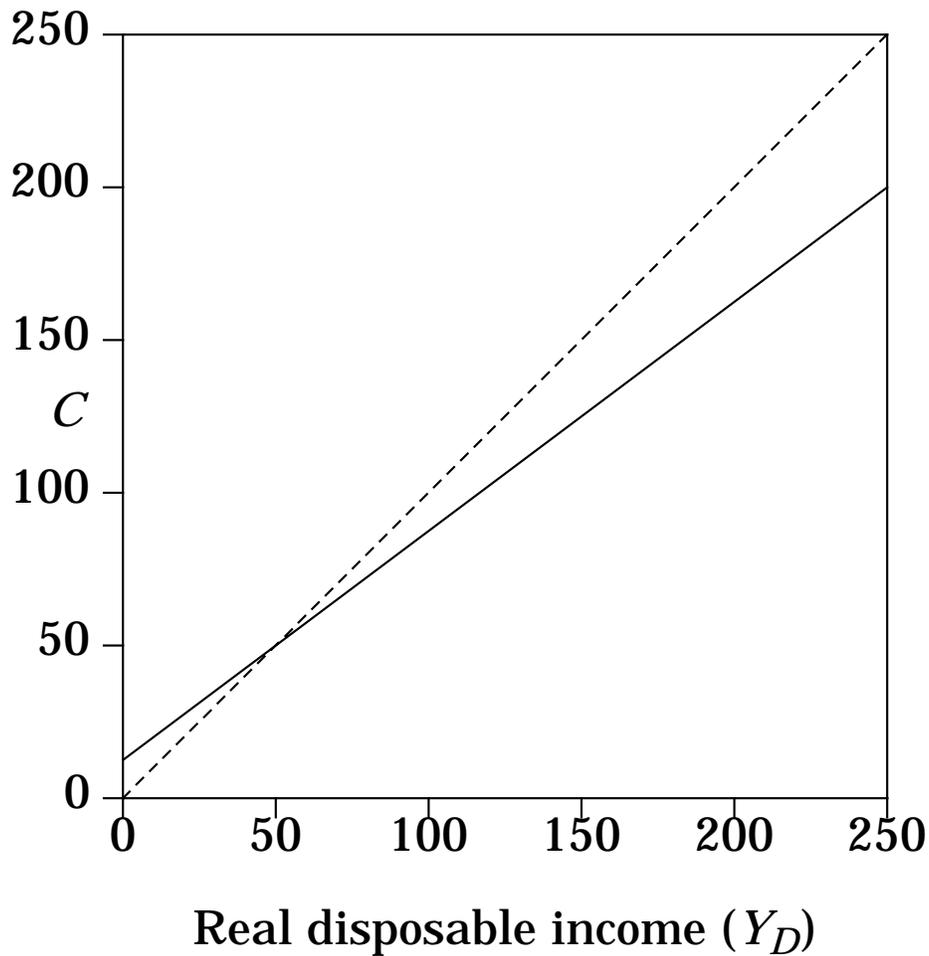
An *autonomous* magnitude is independent of the level of income (or completely income inelastic). If consumption were entirely autonomous, things would be simple, once we had determined the level. But we know that people tend to consume more as their disposable income increases, as reflected by their *marginal propensity to consume*: the proportion of additional income which is consumed (the *induced consumption*).

In general we speak of consumption having an autonomous component (a) and an induced component (cY_D):

$$C = a + cY_D.$$

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1. Recent research in economics has attempted to explain these: to make them endogenous.

Graphically, the consumption function is shown:



When income is zero, consumption is the autonomous level of \$12.5 billion; as real disposable income rises, consumption rises at 75¢ per dollar, or a marginal propensity to consume of 0.75

$$C = 12.5 + 0.75 Y_D.$$

or autonomous consumption, $a = \$12.5 \text{ bn/yr}$,
and the marginal propensity to consume $c = \frac{3}{4}$.