CHAPTER 5

Measuring A Nation's Income

Major elements of chapter 5

- Circular flow model gives basic structure of macroeconomy
- Major components of national income
  - Injections and Leakages
    - This distinction not made explicitly in the text
- National accounting
- Nominal versus real quantities
- Interpretation of real GDP

Circular flow model

- Gives the structure, or the skeleton, of the macroeconomy
- The textbook gives a simple version, which is fine with me

- Some definitions
  - A flow quantity is an amount per unit of time, like a current of water passing through
  - A stock is an amount observed at a point in time, like the volume of water in a tank
    - Think of a snapshot
    - no time frame

- Value of stock at time t = value of stock at time t - 1 + value of inflow - value of outflow
  - Leakages and injections are both flow quantities

- More Definitions
  - An injection is any addition to the circular flow
    - investment, export, and government spending
  - A leakage is any withdrawal (drainage) from the circular flow
    - taxes, import, savings

Basic concept

- Flows of expenditures and incomes circulating through the markets that comprise the macroeconomy
  - Analogous to the cardio-vascular system of blood circulating through the human body

The concept of twos

- Two by two by two is simplest version, which is what the textbook does
- Two types of markets
  - Factor markets (inputs)
  - Goods and services markets (outputs)

- Two types of actors
  - Households
  - Producers (firms, businesses)
- Two types of economic activity (Flows)
  - Income flows from services rendered
  - Expenditure flows from G & S produced

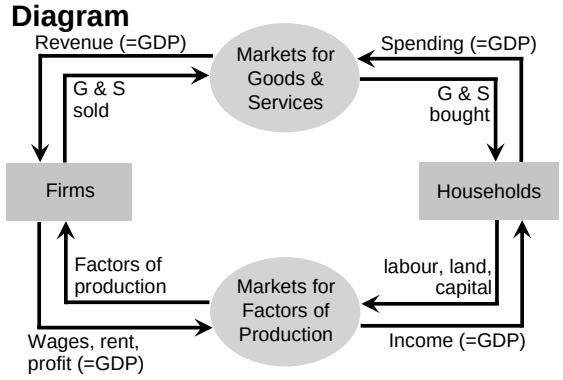
- In the diagram coming up:
  - the green arrows denote financial flows
  - The red arrows denote the REAL flows of either factors being rendered or goods and services being exchanged

The structure of the model

- In the *factor* market (on bottom)
  - Households are the sellers and earn income
  - Firms are the buyers and spend
- In the *goods and services* market (on top)
  - Households are the buyers and spend

  - Firms are the sellers and earn income

FIGURE 2.1: The Circular-Flow Diagram



Key Point

- Expenditure for one actor is income for another within each of the 2 markets
  - Every dollar which *circulates* is both income and expenditure
  - Every dollar has a double identity
  - as a result, total (aggregate) expenditure = total (aggregate) income

Complication

- Add a money market to the model
- Savings leak out of the G & S market to enter the money market, which transforms them into investment spending, and they are injected back into the G & S market

- The foreign sector and the government sector are parts of the G & S market, and would appear on top

National Accounting

- The objective is to measure GDP
- The circular flow model gave the Structure or the anatomy, which is the relationship of the flows. Now we want to discover the size of them.
- Similar to accounting at a firm level
  - The idea is to track and measure economic activity

- Two major approaches
  - Expenditure approach
  - Income approach
- Recall income and expenditure are distinct flows within the macroeconomy, and are equal in the aggregate

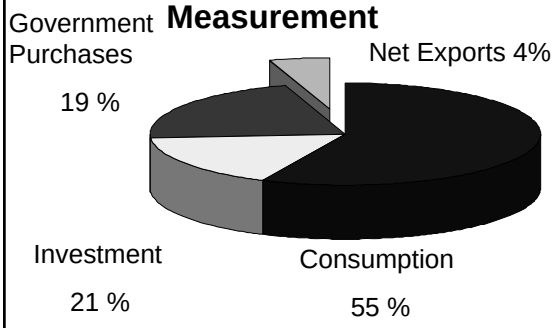
Expenditure Approach (Table 5.1)

- Expenditure approach is the easiest. All spending activity is broken down as:
  - Consumption spending
  - Investment spending
  - Net export spending
    - Exports minus imports
  - Government spending

- GDP = C + I + G + X – Imports
  - These % figures are for the year 2005
  - C is relatively stable but has declined in relative terms in recent decades (about 55 % of GDP)
  - I is unstable and is the hardest to model (about 21% of GDP)
  - G refers only to government purchases, and does not reflect transfer payments.
    - It has grown in relative terms in recent decades to about 19 % of GDP

  - Imports reflect Canadians' spending on foreign goods - the spending LEAKS from the circular flow
    - about 34 % of GDP
  - Exports reflect foreigners' spending on Canadian goods - the spending is INJECTED into the circular flow
    - about 38 % of GDP
  - NX = X - Im is NET EXPORTS
    - + 4 % of GDP

GDP Components of Measurement



- Injections enter with + signs
  - Government spending
  - Investment spending
  - Export spending
- Leakages enter with - signs
  - Imports
  - Savings and taxes are leakages, but since they are not <u>expenditures</u>, they don't appear in this equation

- Savings and Taxes
  - Saving (S) is consumption spending (C) postponed into the future
  - In the current accounting period, think of S as a transformation of consumption spending into investment spending.
  - Think of Taxes (T) as a transformation of private consumption spending into public spending (G) and investment spending (I).

- Three types of investment activity, or capital spending.
  - residential investment
  - plant and equipment
  - inventory accumulation (is a flow)
    - inventory levels are a stock

- It is possible for one economic agent to contribute to C, I, Im, G spending simultaneously.
  - i.e. I am a consumer, an investor, and an importer
- Therefore, in order to classify spending as C, I, G, X, or Im, it is not the IDENTITY of the spender that matters, but rather the NATURE of the good or service being purchased

Factor Incomes approach (Table 5.2)

- This time, the focus is on income EARNING activity, not on SPENDING activity. The question now is 'How was this dollar earned?'
- Y (aggregate income) broken down into:
  - factor payments
  - indirect taxes
  - depreciation
- In 2005 it amounted to about $ 42,000 per capita

- NDP (net domestic production) = Factor incomes + indirect taxes
- GDP (same as Y) = NDP + depreciation (capital consumption allowance)

- factor payments include:
  - salaries and wages to labour
    - About 50 % of GDP in 2005
  - rent to landlords and landladies
  - interest and dividends to investors
    - About 4 % of GDP in 2005
  - profits to entrepreneurs
    - About 14 % of GDP in 2005
    - The difference between these last 2 items is not always clear
- These quantities give income at factor cost. This is not total income at market prices.

- Indirect taxes fill this gap.
  - PST, GST, excise taxes
  - Incurred only upon act of purchase
- Depreciation refers to what is required in order to maintain the capital stock in its existing condition

- It is possible for one economic agent to earn income from land, labour, and/or capital simultaneously
- Therefore, it is not the IDENTITY of the earner that matters, but rather the MANNER in which the income is earned

APOGEE

- GDP, as calculated by the expenditure approach, should equal Y, as calculated by the factor income approach
  - Statscan does it both ways
  - Note how the 'bottom line' in Table 5.1 is consistent with the 'bottom line' in Table 5.2
- GDP = Y, or gross domestic product = national income
  - This equality consistent with the circular flow model

Real versus nominal GDP

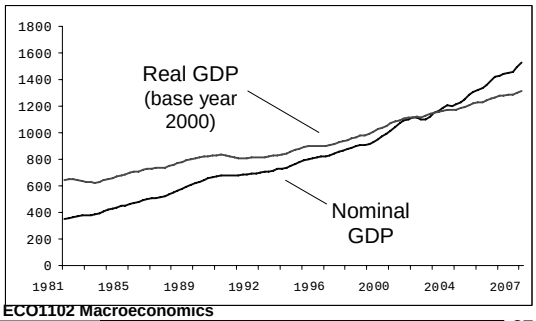
- Real GDP is nominal GDP adjusted for inflation
- The objective is often to measure changes in the VOLUME of economic activity, as economic well-being depends on the quantity of G & S produced BUT…..

- GDP has to be measured by VALUE, not physical VOLUME, and VALUE depends on both VOLUME and prices.
  - Nominal GDP increases because prices rise
  - Nominal GDP also increases because production—real GDP– increases
- Have to find a way to disentangle changes in volume from changes in prices

- A price deflator (index) is a time series of numbers that measure inflation.
- They are used to DEFLATE nominal quantities into real ones

- To this end, deflators account for the inflation that is embodied in nominal quantities
- % change nominal = % change real + inflation rate
  - no inflation means real value = nominal value
- real GDP = (Nominal GDP / deflator) * 100
  - take logs of both sides and differentiate this in order to obtain the expression above
  - memorise

Real GDP in Canada – like figure 5.2



How good a measure of economic welfare is GDP?

- In some ways, it underestimates it, so actual economic welfare is higher than the official numbers indicate.
  - the underground economy : activity is not reported (all untaxed, but not all illegal)
  - non-market activities: activity might be reported, but is not traded and not valued
  - It does not reflect time allocated to leisure

- In some ways it overestimates it, so economic welfare is actually lower than the official numbers indicate
  - economic <u>bads</u>: by-products of economic activity, especially pollution and congestion
    - The economic activity which generates the pollution is included in GDP, but the pollution is not accounted for.
  - The value of some activities which do not promote economic welfare are included in GDP, such as criminal justice, national defense, and environmental cleanup
    - i.e. the value of spending to address "necessary evils" IS included in the official GDP figures

- No single statistic will resolve this issue
- Economic well-being and the value of GDP growth are somewhat subjective
  - 'Left-wing' types stress distributional issues: what good is GDP growth if the lion's share goes to capital (read 'the rich') rather than labour?
  - 'right-wing' types say 'plenty', because 'the rich' are the goose that lays the golden egg for all of us, and 'the poor' would be even 'poorer' if 'the rich' were not so rich

- Interesting figures in Table 5.4
  - Figures are old (2001)
  - On average it is estimated that GDP per capita adjusted for local prices is about 82 % in Canada what it is in the USA.
    - We are slightly better off than the Japanese, the French, the Germans, the Italians, and the British
  - Canada has a more equal distribution of income
  - Life expectancy in Canada is 3 years longer