ECON1102 Complete Subject Notes

Macroeconomics

Week 1 | Chapter One: Aggregate Production and Prices

1.1 GROSS DOMESTIC PRODUCT

- **GDP** is the monetary value of final goods and services produced in a country during some period of time
- only measures the value of a subset of the entire production activities and transactions occurring in an economy because non-market production is excluded like household production
- focus is on *newly* produced goods (no second-hand or used goods)
- GDP can be measured by multiplying quantity by price
- the contribution particular goods and services (G&S) make to GDP is influenced by market values
- some G&S have no market prices, such as the police
  - statisticians address this in two ways:
    1. estimating a market value for the G or S (e.g. estimating the dollar value of services provided by owner-occupied dwellings)
    2. using the cost of providing the good or service in place of its market value (e.g. the cost of police is measured by the costs of labour and capital inputs)
- an **intermediate good** is a good used in the production of another G&S (i.e. not a final good)
- **value added** for a business is equal to the total value of its sales less the cost of purchasing intermediate inputs
- important to count the value of each good only once in GDP, which is why we use value added
- example (right table) : to measure the market price of a hamburger you can (1) use market price of $5 or (2) add-up the value added of each producer who contributes to the final product, also $5

Producer	Intermediate goods ($)	Sales ($)	Value Added ($)
Beef farmer	0	1.5	1.5
Wheat farmer	0	0.5	0.5
Butcher	1.5	2	0.5
Baker	0.5	1	0.5
Café	(2+1) = 3	5	2

Table 1.3: Value Added in the Production of a Hamburger

- the **production method** to calculating GDP is the summation of value added for all business operating in an economy
- GDP measures the production within a county regardless if it is undertaken by the country's citizens or not
- GDP is measured over a period of time typically in quarters (three months)
- the **expenditure approach** to calculating GDP entails the summation of expenditures on domestically produced final goods and services by households, businesses, governments and by the rest of the world

$$Y \equiv C + I + G + X - M$$

  - **Y** = GDP / income
  - **C** = consumption (household expenditure)
  - **I** = investment (business expenditure)
  - **G** = government spending / public demand
  - **X** = exports
  - **M** = imports
- the ABS obtains a single headline figure for quarterly GDP by taking a simple average of the three measures (production, expenditure and income)
- the level of private investment is defined to include the change in the level of inventories that are held by businesses and is counted as a component of investment expenditure
  - **inventories** are currently unsold stocks of goods held by businesses (can be positive or negative)
- government expenditure can be classified into current/consumption spending and capital/investment spending because governments can purchase goods that are used immediately (e.g. food for the office) or that provide future consumption (e.g. a new airport)
- the value of second hand goods are not included in the calculation of current GDP because they would've been included (if domestically produced) when they were newly produced and sold

- the **income approach** to measuring GDP is obtained as the sum of payments to labour and capital plus any net indirect taxes
    - the sum of payments to labour and capital is known as *GDP at factor cost* (i.e. the cost of purchasing the factors of production)
    - to obtain GDP we need to account for any indirect taxes levied on G&S and any subsidies paid)
    - thus GDP at market prices or just GDP is the sum of GDP at factor cost plus net indirect taxes
    - if we assume net indirect taxes are zero, we can write GDP as
        - **Y = (W x L) + (R x K)**
        - **W** is wage per unit of labour
        - **L** is labour
        - **R** is rate of return on capital
        - **K** is capital
        - the same as writing **GDP = labour income + capital income**
    - this is why GDP is sometimes called national income
    - the income approach gives a GDP estimate slightly larger (by $1.8b) than the headline measure
- **gross national income** is the income measure of GDP plus any net factor income receivable from non-residents
    - GNI is based on where the factors of production originate e.g. some countries have a lot of foreign labour which is subtracted from measured GDP
    - in Aus, the difference is due to foreign ownership of capital used in domestic production
    - GNI = GDP — net primary income of non-residents
- **real GDP** uses final G&S for a common base year to value quantities produced in other years
    - used because the value of nominal GDP could vary due to changes in prices without a change in actual production
    - real GDP removes the impacts of aggregate price changes
    - if we multiply the quantities of goods produced in 2015 by their 2016 prices and then add-up the values we get 2015 real GDP in 2016 prices
    - the growth rate can be calculating the percentage change in real GDP from one year to another (at different base prices)
    - estimated real growth rates tend to become larger for years that are further away from the base year
    - the ABS uses **chain weighting** to improve the quality of real GDP estimates
        - taking the average of the growth rates obtained using each year in turn as the base year
        - than use this in a 1.0 form to calculate a chain-weighted real GDP

Good	2015			2016		
	Quantity	Price ($)	Value ($)	Quantity	Price ($)	Value ($)
Bikes	1,000	250	250,000	1,100	260	286,000
Burgers	5,000	5	25,000	4,600	7	32,200
Nominal GDP			275,000			318,200
Real GDP (at 2015 prices)			275,000			298,000
Real GDP (at 2016 prices)			295,000			318,200

Table 1.9: Nominal and Real GDP in 2015 and 2016

Given the figures for real GDP we can calculate the percentage change in the value of real GDP between 2015 and 2016.

Using real GDP at 2015 prices we obtain a growth rate of:

$$\left(\frac{298000 - 275000}{275000}\right) \times 100 = 8.36 \tag{1.7}$$

Using real GDP at 2016 prices we obtain a growth rate of:

$$\left(\frac{318200 - 295000}{295000} \times 100 = 7.86\right) \tag{1.8}$$

- **nominal GDP = real GDP x GDP price index**
- **GDP price index = nominal GDP**
  real GDP
- real GDP has frown over time due to increased economic growth in Australia
    - from 1960-2015, the level of real GDP has increased by a factor of 6.5
- **real GDP per-capita** is a country's real GDP divided by its population and is a measure of the average volume of final G&S produced per person
    - has grown over time from $24k in 1960 to almost $70k today, reflecting growth in production of G&S and improvements in the quality and variety of G&S
- GDP is an incomplete measure of economic welfare because it doesn't account for many non-market activities like household production, pollution externalities or income inequality

- despite this, GDP indicates a country's general ability to produce G&S and is likely to be a good proxy for many of the factors that ultimately provide us with utility like housing, education, safety and security
- the **business cycle** measures fluctuations in the level of real GDP in the economy
  - the 'great moderation' is a phenomenon observed in many high income economies whereby the volatility of real growth rates have declined over time
- a **technical recession** is defined by the simple rule of at least two consecutive quarters of negative growth in real GDP
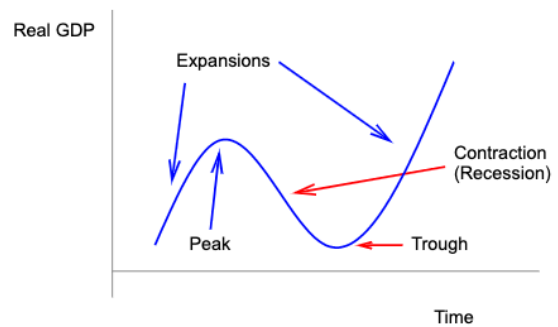

Figure 1.5: Classical Business Cycle

1.2 CONSUMER PRICE INDEX

- the **consumer price index (CPI)** provides a measure of changes in the cost of living and in the level of prices faced by an average consumer based on a fixed basket of G&S
- is a measure of how the cost of purchasing the fixed basket of G&S changes in other years relative to the base year
- we use π to represent the rate of inflation, which is calculated using the formula to the right (whereby CPI-1 is the CPI of the previous year)
- **inflation** is a situation in which the general price level in an economy is rising, while **deflation** represents a situation in where the general price level is falling

$$CPI = \frac{\text{Cost in Current Year}}{\text{Cost in Base Year}}$$

$$\pi = \left(\frac{CPI - CPI_{-1}}{CPI_{-1}}\right) \times 100$$

- there are biases in CPI
  - (1) quality improvements: when improvements in quality are widespread and not taken into account, the CPI suffers from **quality adjustment bias** and will tend to over-estimate the increase in prices
  - (2) **substitution bias** occurs when there's price changes in one of the G&S in the CPI basket and this means consumption will change, which means the CPI will tend to overstate the true cost of living by assuming the consumption stays the same as in the base year
- general pattern for developed countries is relatively low inflation in the 60s, high inflation in the 70s and 80s and a period of low inflation beginning in the 90s until today
- most inflation targets for monetary policy is between 1-3%
- costs of unanticipated inflation
  - unexpected inflation tends to transfer resources away from people with fixed incomes and can cause a transfer from lenders to borrowers
  - can cause people to find it hard to identify if a change in wages and prices is a *real* or *relative* change or if it simply reflects a general economy-wide change in prices
  - indexing the inflation rate to marginal tax rates assured individuals' won't pay additional taxes if their real income isn't increasing
- costs of anticipated inflation
  - **menu costs** are any real resource costs associated with changing prices due to inflation (name refers to having to reprint menus to reflect higher prices in times of high inflation)
  - **shoe leather costs** refer to the cost of time and effort that people expend trying to counteract the effects of inflation such as holding less cash (name refers to making trips to the bank wearing our your shoes)
- optimal rate of inflation
  - we need some level of inflation, because:
  - (1) it gives flexibility in reducing real wages: with positive inflation it is possible to reduce real wages if the general price level grows at a faster rate than wages
  - (2) higher inflation rates produce higher nominal interest rates which gives banks greater scope to cut their policy interest rates before they hit the zero lower bound
  - (3) deflation is associated with stagnant or negative economic growth and high rates of unemployment (however, a good deflation can occur in which increases in G&S production causes a fall in the general price level)