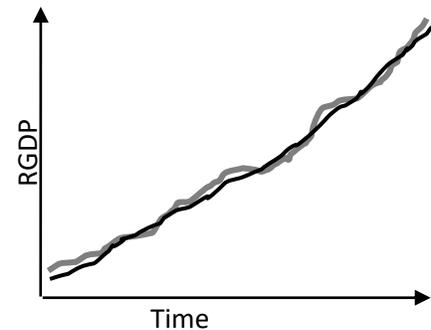




Macroeconomics: Aggregate Demand & Aggregate Supply

The level of real GDP attained when an economy is at full capacity is called the **full capacity GDP** or **potential output GDP** and has the symbol, Y^* . An economy functioning at full capacity has fully employed all of the economy's resources at their normal utilization rates (no overtime, and unemployment level = NAIRU level). In general, the long-term GDP for an economy (Y^*) will increase over time. In the short term, the actual GDP, Y^0 , fluctuates around the potential GDP, Y^* .



In the graph to the right, potential GDP is the black line, and actual GDP is the gray line. These fluctuations in GDP are expansions and contractions in the business cycle. The high points of the fluctuations are called peaks and the low points are called troughs. Where the real GDP is compared to the potential GDP defines whether an economy is in a **recessionary** ($Y^0 < Y^*$) or **inflationary gap** ($Y^0 > Y^*$).

We can look at these periods of recession or inflation (disequilibrium in the market) more closely by introducing the concepts of aggregate demand, short-run aggregate supply, and long-run aggregate supply.

Aggregate demand (AD) is the total demand for goods and services from the four sectors of the economy (think of the demand curve from micro, but now on a larger scale); it is the planned expenditures for the entire economy. The AD curve shows the quantities of all goods and services demanded (RGDP) at varying price levels.

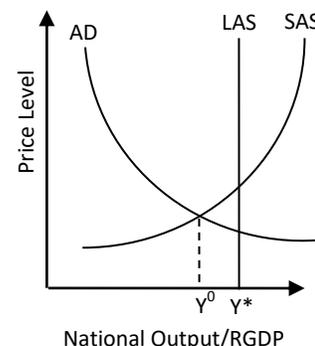
$$AD = C + I + G + (X - M)$$

Aggregate supply shows the relationship between the planned total output of goods and services and the cost per unit of producing that output. Aggregate supply consists of both the **short-run aggregate supply (SAS)** curve, where not all inputs/costs can be varied, and the **long-run aggregate supply (LAS)** curve, where all factors of production can be varied.

Short-run aggregate supply shows the upward sloping relationship between price level and the total quantity of goods and services that firms will produce (RGDP) assuming constant factor prices and fixed capital/equipment. The positive slope reflects the increasing average cost with each additional unit of good produced.



The long-run aggregate supply curve shows the relationship between planned quantity of output and price level when full employment occurs: it shows Y^* , the full capacity/full potential output. The LAS curve is a vertical line, independent of price level, since for a given level of supply and demand for workers and a given amount of technology and capital, there is only one possible level of output that can be achieved.



The intersection between AD and SAS is called the market equilibrium or **short-run equilibrium**. It also shows the **actual output** of the economy (Y^0). When all three curves intersect at the same point, this is called **the long-run equilibrium**. Notice the different axes for a country's economy: y axis is price level (or CPI) & x axis is real GDP.

In the graph above, the actual output (Y^0) is not the same as the capacity output (Y^*). Anytime this happens (due to an AD or SAS shock), there is a **GDP gap**. The GDP gap is either recessionary ($Y^0 < Y^*$) or inflationary ($Y^0 > Y^*$). Understanding the determinants for SAS and AD will allow us to predict what will happen in the economy.

Determinants of SAS

- (1) Costs of inputs (factor prices) – ex. wage rates, energy prices, resource prices
- (2) Change in productivity – ex. new technology, improved education for workers

Determinants of LAS

- (1) Change in productivity
- (2) Better quality resources
- (3) Change in human or physical capital capacity (size of labor force, more oil discovered)

A change in the costs of input **shifts** the SAS curve, but not the LAS. A change in productivity **shifts both** SAS and LAS curves. Any shift of the LAS (right or left) will cause a corresponding shift in SAS.

Determinants of AD

Each sector of aggregate demand has its own determinants. A good approach is to understand how each determinant impacts a sector's expenditure and the resulting effect on AD. The only determinant that results in movement along the AD curve (or SAS) is a change in the price level. All others shift the AD curve.

Household Consumption (C)

- (1) Disposable Income (Y_d): income left after taxes; most important determinant for C. Increase in disposable income means people willing to spend more ($C \uparrow$, $AD \uparrow$).
- (2) Wealth: the value of assets owned by the household (e.g. house, investments etc.) As wealth increases, people will be willing to spend more ($C \uparrow$, $AD \uparrow$).



- (3) Interest rate (r): as r increases, the cost of borrowing money increases as well as being charged more interest on existing debts. People will spend less on consumer goods ($C\downarrow$, $AD\downarrow$).
- (4) Expected future income (or consumer confidence): if people expect their future income to increase, they will be willing to consume more now ($C\uparrow$, $AD\uparrow$).
- (5) Expected future prices: if people expect prices to increase in the short-term future, they will consume more now while goods are cheaper ($C\uparrow$, $AD\uparrow$).
- (6) Debt: as debt increases, people will be less willing to spend money ($C\downarrow$, $AD\downarrow$).

Investment (I)

- (1) Interest rate (r): same trend as for consumption expenditure. Most important determinant for investment expenditure.
- (2) Expected input prices: if input prices are expected to increase, less money is available for investment ($I\downarrow$, $AD\downarrow$)
- (3) Expected output prices: if output prices (price a good is sold for) are expected to increase, more money is available for investment ($I\uparrow$, $AD\uparrow$)
- (4) Business confidence: if businesses anticipate growing demand for their good/service in the future, they will be more likely to invest now ($I\uparrow$, $AD\uparrow$)

Government Expenditure (G)

No determinants, but as G goes up AD goes up and the reverse is true. Government can also use fiscal policies to indirectly affect C and I , which would affect AD .

Net Exports ($X - M$): exports minus imports

- (1) Foreign income: only affects exports. When foreign income increases, spending on exports will increase and so will net exports ($X\uparrow$, $X - M\uparrow$, $AD\uparrow$)
- (2) Domestic vs. foreign prices: relative prices of goods abroad versus at home affect the levels of imports and exports: if Canadian prices are relatively higher, $X\downarrow$ and $M\uparrow$, and therefore net exports decrease, and so $AD\downarrow$
- (3) Tariffs: taxes imposed on imports or exports. Higher tariffs make imports (or exports) more costly and the people will import (or export) less. Ex: import tariffs are raised 15%, $M\downarrow$, $X - M\uparrow$, $AD\uparrow$
- (4) Exchange rate: refers to the exchange rate from Cdn\$ to another currency. If the value of the Cdn\$ decreases (or the exchange rate decreases/depreciates), relative to the other currency, it is more expensive for Canadians to import goods ($M\downarrow$), but cheaper for other countries to buy Canadian exports ($X\uparrow$). Net effect is $X - M\uparrow$ and $AD\uparrow$



Practice Problems

- How would each of the following events affect aggregate demand in an economy?
 - Consumer debt decreases by half
 - Personal income taxes are increased
 - Consumer confidence decreases
 - Interest rates decrease
 - Corporate taxes on profits are reduced
 - The price level has increased this year
- If short-run aggregate supply increases while aggregate demand stays constant, what happens to the price level and national output?
- Identify which of the following events cause a shift in the position of the LAS curve and explain why.
 - A tsunami decimates oil rigs, factories, and ports along the coast of a nation
 - Deflation has occurred in the last year as a result of leftward shifts of the AD curve.
 - New deposits of ores are discovered and mined
 - There is an increase in the amount of money in circulation (this means less savings.....)
- If the natural rate of unemployment is 6% and the current rate of unemployment is 8%, then the economy is currently:
 - Producing real GDP that is greater than full-employment output and there is a recessionary gap
 - At full-employment output and there is no GDP gap
 - Producing real GDP that is less than full-employment output and there is an inflationary gap
 - Producing real GDP that is greater than full-employment output and there is an inflationary gap
 - Producing real GDP that is less than full-employment output and there is a recessionary gap
- Describe and graph the effects on a short-run macro-equilibrium of the following events: (a) Businesses expect that they can sell their goods for a higher price (b) The price of crude oil rises (c) Canadian worker productivity increases (d) Canada increases import tariffs
- The economy of Algernon is described by the following equations. For AD, $P = -0.40Y + 14$. For SAS, $P = 0.10Y + 2.6$. For LAS, $Y^* = 25$. (a) Find the short-run equilibrium output and price level. (b) Is the economy operating at full capacity? (c) If there is a shift in AD such that $P = -0.42Y + 15.6$, find the new equilibrium output and price. (d) Now is the economy operating at full capacity?



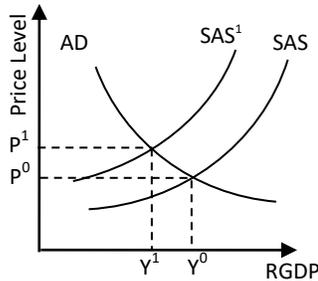
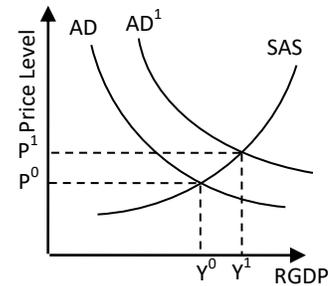
7. At a point on the short-run aggregate supply curve that lies to the left of where the SAS crosses the LAS, what can you say about the relative size of the actual unemployment rate and the natural rate of unemployment (NAIRU)?
8. The relationship between consumption expenditure and interest rate is:
 - a) positive
 - b) exponential
 - c) negative
 - d) non-existent

Solutions

1.
 - a) AD would be increased as consumers increase spending and borrowing since debt is under control
 - b) AD would decrease as consumers have less disposable income to spend.
 - c) AD would decrease because consumers are less willing to borrow and more likely to save believing that their economic future is at risk
 - d) AD would increase as both consumers and businesses are more willing to borrow
 - e) AD would increase as businesses have more money to reinvest.
 - f) No shift in AD. A change in price level means a movement along the curve. Increase price level means moving along the AD curve to the left.
2. The price level decreases while national output increases.
3.
 - a) Yes, there is a shift in the LAS to the left. The capacity for production has been reduced.
 - b) No shift; as the AD curve shifts to the left there is downward movement along the LAS curve. (price level falls but capacity output stays the same)
 - c) Yes, there is a shift in LAS to the right. New resources increase the capacity for production.
 - d) No shift; as the AD curve shifts to the right there is upward movement along the LAS curve (price level rises but capacity output stays the same).
4. e

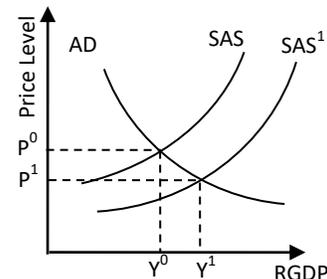


5. (a) If businesses expect to get a higher price for their goods, it will increase their amount of investment spending ($I \uparrow$). An increase in I will increase AD . Curve shifts to the right, resulting in an increase in equilibrium price and increase in RGDP.



- (b) Price of crude oil rising affects the short run aggregate supply curve since it is a factor of production. SAS decreases, therefore price level increases and RGDP decreases.

- (c) An increase in labour productivity means that the unit costs of production will fall and the SAS curve will increase, shifting to the right. RGDP increases and price level falls. Graph to the right.



- (d) An increase in import tariffs will affect the value of net exports. As import tariffs increase, it becomes more expensive to buy imported goods, therefore $M \downarrow$ and the value of net exports \uparrow . When net exports \uparrow , then $AD \uparrow$ and the curve shifts to the right. Equilibrium price increases and RGDP increases. [graph is same as (a)]

6. (a) RGDP = 22.8, price level = 4.88
 (b) No, since RGDP (Y) is less than Y^* , the economy is operating below capacity (recessionary gap).
 (c) RGDP = 25, price level = 5.1
 (d) Yes, since RGDP (Y) is equal to Y^* , the economy is operating at full capacity
7. A point on the SAS to the left of the LAS would indicate a recessionary gap. So the actual unemployment rate must be greater than the NAIRU at this point since the economy is producing a level of output below its full capacity.
8. c

