INTRODUCTION TO THE DEVELOPMENT OF MACROECONOMICS & THE AS-AD MODEL

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I. Development of Macroeconomics: A Brief Exposition

1. Mercantilism

Mercantilism is an economic system or philosophy developed during the rise of modern nation-states and it preceded the Industrial Revolution.

Mercantilism prevailed during the 16th, 17th and 18th centuries, and was primarily designed to increase the power and wealth of the state. There were only monarchies and often absolute monarchies at the time in Europe, where mercantilism prevailed. French King Louis XIV’s famous saying, ‘état c’est moi’ (‘The State is I’ or ‘I’m the State’), is indicative of the political systems during that period. Thus the other primary purpose of mercantilism was to increase the wealth of the monarchs themselves.
In order to accumulate wealth, especially in the form of bullions (i.e. precious metals such as silver and gold), governments intervened in the economy pervasively. They imposed strict regulations on their entire national economies. Domestically, they promoted the development of agriculture and manufacturing, and regulated production.

In order to achieve a favourable balance of trade, they imposed tariffs and quotas to discourage foreign exports to their own countries. At the same time, they sought to expand foreign markets and acquire raw materials through colonialism.

Monies, in the form of gold, silver or other precious metals, earned through the above practices, could then be used to purchase or manufacture military weapons or supplies. This thus enhanced the state’s power, which in turn enabled the state to pursue mercantilism further.
There was an important assumption underlining mercantilism. Mercantilists believed that the volume of trade was \textit{limited}. If any country expanded its trade it would be at the expense of other countries. It was a zero-sum game. Thus, a state wanted both to expand its own exports and at the same time limit imports from other countries. The assumption that the volume of trade was limited was later corrected by Adam Smith.

It is noteworthy that the extraction of raw materials by the colonial power from the colonies did not really qualify as ‘trade’. This is because the colonial power either did not provide any compensation to the colony for the resources extracted or, even if it did, the compensation was nominal. Thus the trade is \textit{not free and voluntary}.

Some representative writers, mainly from Europe, of mercantilism include Thomas Mun (1571-1641), Gerard Malynes (1586-1641), and Charles Davenant (1656-1747).
2. Classical School

2.1 General Features

In mid-18th century, the industrial revolution had just began. England gained supremacy in industrial and commercial development, ahead of her 17th century competitors, Holland and France. Adam Smith (1723-1790) and his contemporaries, including Thomas Malthus (1766-1834), David Ricardo (1772-1823), Jean-Baptiste Say (1767-1832) and John Stuart Mill (1806-1873), tried to put forward systematic reasoning of the substantial growth of manufacturing, trade, inventions, and the division of labour. Their main body of thought can be summarized as follows:
Major Tenets of the Classical School

- **Minimal government involvement.** The first principle of the classical school is that the best government governs the least. The free competitive market would guide production, exchange, and distribution. The economy is self-adjusting (or self-correcting) and tending towards full employment without government intervention. Government activity should be confined to enforcing property rights, providing for the national defence, and providing public education.

- **Self-interested economic behaviour.** The classical economists assumed that self-interested behaviour is basic to human nature. Merchants produce goods and services for making profits; workers offer their labour services to obtain wages, and consumers purchase products as a way to satisfy their wants.


**Harmony of interests.** The classicists emphasize the natural harmony of interest in a market economy. By pursuing their own individual interests, people serve the best interests of society, such as wealth creation in the economy.

**Importance of all economic resources and activities.** The classicists pointed out that all economic resources – land, labour, capital, and entrepreneurial ability – as well as all economic activities – agriculture, commerce, production, and international exchange – contribute to a nation’s wealth.

**Economics laws.** The classical school made tremendous contributions to economics by developing a number of influential economic theories or “laws”. Examples include the law of comparative advantage, the law of diminishing returns, the Malthusian theory of population, Say’s law, the Ricardian theory of rent, the quantity theory of money, and the labour theory of value. The classicists believed that the laws of economics are universal.
In macroeconomic analysis, Smith propounds that division of labour and capital accumulation were the two primary sources for growing a nation’s wealth. His arguments can be summarized by the Figure 1.

Figure 1: Smith’s Theory of Economic Development

Source: Bruce and Grant (2013: 87)
Smith argues that the division of labour increases capital accumulation (arrow a) and labour productivity (arrow b).

Capital accumulation reinforces the rise in labour productivity (arrow c).

The rise in labour productivity increases national output (arrow d), which widens the market and allows further division of labour and capital accumulation (arrow f).

As a result of the capital accumulation, the wages fund increases (arrow g) and wages rise (arrow h). Higher wages motivate further productivity growth (arrow i) through enhanced living standard and better health.

The rise in national output increases the goods available for consumption, which for Smith, constitutes the wealth of a nation (arrow e).
3. Keynesian Theory


The crux of the Keynesian theory lies on the belief that the private sector does not always possess the self-correcting mechanism as put forward by the classical economists. It therefore justifies a degree of state intervention to influence the economy, most notably to manage the effects of the business cycle of growth and recession.

Keynes’s ideas were given added impetus when he witnessed the Great Depression, which started in 1929, in the United States, which rendered millions of people unemployed. He advised governments that during recession or depression, governments need to adjust their fiscal policies to mitigate the situation.
3.1 Highlights of Keynesian Theory:

- **Rigid Prices**: Keynes presumes that prices are inflexible or rigid, which can prevent markets from achieving equilibrium. Markets, especially resource markets, do not automatically achieve equilibrium, meaning that full employment is not guaranteed.

- **Effective Demand (Aggregate Expenditure)**: Keynes bases his economic theory on the notion of effective demand, the principle that consumption expenditures are based on the disposable income actually available to the household sector rather than income that would be available at full employment (long run potential output level).

- **Saving and Investment Determinants**: Keynes presumes that on top of the interest rate, household saving is determined by household income and business investment is based on the expected profitability of investment (i.e. marginal efficiency of capital).
Business Cycle: The primary source of business-cycle instability is changes in aggregate demand (or aggregate expenditures).

Unemployment: Persistent unemployment problems, especially those occurring during the Great Depression, was due to the lack of aggregate demand.

Fiscal Policy: Active fiscal and monetary policy aim to fine tune the aggregate demand, which in turn changes the output level.
3.2 Keynesian Model

The Keynesian model, commonly presented as the Keynesian cross intersection between the aggregate expenditures line and the 45-degree line, was the standard macroeconomic analysis from early 1950s to 1980s.

The Keynesian cross is a graphical depiction created by Paul Samuelson in order to elucidate Keynes’s basic ideas, which first appeared in Samuelson’s very popular textbook *Economics: An Introductory Analysis* (1948). Samuelson was nicknamed as “American Keynes” who invented the 45-degree line with its C+I+G in 1939, three years after Keynes’s *General Theory* was published.

While it was largely replaced by aggregate market analysis (or AS-AD analysis) in the 1980s, the Keynesian cross continues to provide important insight into the workings of the macroeconomy.
Let's take a closer look at the features in the Keynesian model.

Keynesian equilibrium is a balance between aggregate expenditures and aggregate production. Aggregate expenditures are the sum of consumption expenditures, investment expenditures, government purchases, and net exports. Aggregate production is the total market value of all final goods and services, as measured by gross domestic product.

Figure 2 Keynesian Cross.
The adjustment mechanism in Keynesian model that achieves and maintains equilibrium is aggregate production. *If aggregate expenditures are not equal to aggregate production, then aggregate production changes to restore balance.*

(In contrast, the adjustment mechanism for the AS-AD model is the price level. If aggregate demand is not equal to aggregate supply in the aggregate market, then the price level changes to restore balance. In the Keynesian model, the price level is treated as an external force, an exogenous variable.)

Keynesian equilibrium is ONLY a balance between aggregate expenditures and aggregate production. Other aggregate markets, especially resource (factor) markets, need not be in equilibrium. Shortages and surpluses can exist and persist in resource markets. In other words, full employment is NOT automatically achieved with Keynesian equilibrium.
One year after the publication of *The General Theory*, John R. Hicks published an important journal article, “Mr. Keynes and the classics: A suggested Interpretation.” (1937) Hicks pointed out that Keynes’s theory of the interest rate – and therefore his theory of equilibrium income – was indeterminate.

Keynes viewed the interest rate as being determined by liquidity preference (the demand for money) and the supply of money. Once the market rate of interest is determined, then the level of investment becomes known. Together with consumption expenditures, investment determines aggregate expenditures and thus the level of national income and domestic output.
However, Hicks correctly noted that Keynes’s liquidity preference schedule *itself* depends on the level of national income. At higher income levels, people desire to hold more money to buy the greater volume of goods and services available; they have a greater transaction demand for money.

As mentioned above, the level of income depends on the interest rate, but the interest rate depends on money supply and money demand (i.e. liquidity preference). But money demand is, in turn, determined by income level. The circular flow of analysis makes income level indeterminate.
Hicks suggested a way to resolve this indeterminacy and in so doing developed a unified economic model that synthesized the Keynesian and neoclassical perspectives. Alvin H. Hansen elaborated on Hicks’s article in his *Monetary Theory and Fiscal Policy* (1949) and in chapter 7 of *A Guide to Keynes* (1953). Today we refer to the Hicks-Hansen synthesis as the IS-LM model.

The IS symbolizes equality between investment (I) and saving (S); the LM symbolizes equality between the demand for money (L) and supply of money (M). All values in the IS-LM model are in real, rather than nominal, terms.

**The IS curve.** The IS curve represents all the combinations of interest rates and level of income at which planned investment equals planned saving. The curve represents potential points of equilibrium in the *goods market* (as distinct from the *money market*). The IS curve is derived in Figure 3.
The IS curve (d) shows all combinations of interest rates and income at which saving equals investment. It is derived from the investment demand function (a), a 45° line (b), and saving function (c).

Figure 3
Deriving the IS curve
**The LM curve.** The LM curve (Figure 4) shows potential points of equilibrium in the money market; it indicates all combinations of interest rates and levels of income at which money supplied and demanded are equal. It is derived from the speculative demand for money (a), the money supply (b), and the transaction demand for money (c).

Fig. 4 Derivation of LM Curve
The intersection of IS and LM curve determines the equilibrium interest rate and income level. These are the only interest and income levels at which both goods and money markets are simultaneously at equilibrium (Figure 5).

**Figure 5 Equilibrium in Goods and Money Markets**
IS-LM model examines the macroeconomic equilibrium by aggregating the economy into a market for money balances and a market for goods and services. However, IS-LM model would be more complete if it could capture impact of the resource markets on macroeconomic equilibrium. *The IS-LM model solves the problem of income indetermination in Keynesian mode, but its negligence in resource market remains.* Aggregate supply-aggregate demand (AS-AD) model supplements the IS-LM model in this respect.

The aggregate demand curve is derived from the IS-LM model. As illustrated in Figure 6 below, equilibrium income is $Y_1$ when the price level is $P_1$. When the price level rises to a higher level, from $P_1$ to $P_2$, it reduces the supply of real balances, with a constant amount of money. The aggregate demand curve connects the output levels at both $P_1$ and $P_2$, as shown in the bottom panel of Figure 6.

The aggregate supply curve is determined by resource/factor market (labour, capital and land). When the output level reaches the maximum capacity and prices are finally fully adjusted, price level should have no effect on the amount of resources supplied, and thus no effects on output level.
Figure 6 Deriving the Aggregate Demand Curve
AS-AD model overcomes some of the limitations of IS-LM model. It includes price level as a variable, and it shows that resource markets affect the output level in short run and long run. It allows the analysis of disturbances originated in a resource market, such as a disruption of oil supplies, which IS-LM model cannot handle.

Aggregate supply and aggregate demand gives insight into the adjustment process. It tells how AS and AD suddenly change will affect the output level. It also elucidates how output changes initially are more than price changes due to considerable delay of prices adjustment. It finally points out that changes in AD do not have impact on output level due to perfect prices adjustment and capacity constraint in the long run.
Conclusion

‘Where we frequently go wrong as economists is to look for the “one right model” – the single story that provides the best universal explanation. Yet, the strength of economics is that it provides a panoply of context-specific models. The right explanation depends on the situation we find ourselves in. Sometimes the Keynesians are right, sometimes the classicals. Markets work sometimes along the lines of competitive models and sometimes along monopolistic models. The craft of economics consists on being able to diagnose which of the models apply best in a given historical and geographical context.’ (Rodrik, 2014)
References:


‘Keynesian Model’


II. 1. Aggregate Demand

1.1 What is aggregate demand (AD)?

GDP (Y) is made up of consumption (C), investment (I), government expenditure (G), and net exports (NX).

Each of the four components is a part of aggregate demand (AD).

\[ Y = C + I + G + NX \]

1.2 What is an AD curve?

An AD curve shows the relationship between price and the quantity of output (real GDP) demanded by the households, firms, the government and foreign sectors.
1.3 Why is the aggregate demand curve downward sloping?

A downward sloping AD curve which indicates that, other things remain constant, a fall (rise) in the price level raises (reduces) the quantity of goods and services demanded.
I. The Wealth Effect: The Price Level and Consumption

Wealth is the difference between the value of assets and the value of debts.

For example, if you hold all your $10,000 assets in cash and you have no debt, your wealth is $10,000.

Suppose that the price level unexpectedly drops by 20%, the real value of your wealth will increase by 20% as your purchasing power has increased.

Price level $\downarrow$ $\rightarrow$ Wealth $\uparrow$ $\rightarrow$ Consumption expenditure $\uparrow$ $\rightarrow$ quantity of goods and services demanded $\uparrow$. 
II. The Interest-Rate Effect: The Price Level and Investment

When the price level is lower, households need less money to buy goods and services. They withdraw less and borrow less money from the banks. They need to sell less financial assets, such as bond, in the market. All these add liquidity (i.e. funds) in the financial market and interest rates will fall.

A fall in interest rates encourages borrowing by firms that want to invest in new plants and equipment.

Price level $\downarrow \Rightarrow$ interest rate $\downarrow \Rightarrow$ investment expenditure $\uparrow \Rightarrow$ quantity of goods and services demanded $\uparrow$
Suppose a fall in the price level in the United States lowers the U.S. interest rate. American investors will gain higher returns by investing abroad. Increasing U.S. capital outflow raises the supply of U.S. dollars in the foreign exchange market. US dollars will then depreciate (i.e. price of U.S. dollars decreases).

In terms of U.S. dollar, U.S. goods become relatively cheaper than foreign goods. Exports rise and imports fall. Net exports increase, thereby raising the quantity of goods and services demanded in the U.S.
The AD curve shows the relationship between price level and quantity of output demanded, holding other factors unchanged. When price level changes, the output level changes due to the wealth effect, interest-rate effect and exchange-rate effect. Such changes are shown by movements along an AD curve.

However, when other factors (e.g. government policy) change, and the price level remains unchanged, the whole AD curve will shift to the right or left.
An increase in government expenditure raises the AD from $AD_1$ to $AD_2$. 

*Figure 3 Shift of the AD Curve*
1.4 Determinants of aggregate demand

I. Private consumption expenditure (C)

Increase in C $\Rightarrow$ increase in AD

(i) Disposable income (after-tax income):
   salaries tax $\downarrow \Rightarrow$ disposable income $\uparrow \Rightarrow$ C $\uparrow \Rightarrow$ AD curve shifts to the right

(ii) Desire to save:
   saving for retirement $\uparrow \Rightarrow$ current consumption $\downarrow \Rightarrow$ AD curve shifts to the left

(iii) Wealth (value of assets):
   stock market booms, people’s wealth $\uparrow \Rightarrow$ C $\uparrow \Rightarrow$ AD curve shifts to the right

(iv) Interest rate:
   interest rate $\downarrow \Rightarrow$ costs of borrowing lower $\downarrow \Rightarrow$ incentive to borrow for consumption $\uparrow \Rightarrow$ AD curve shifts to right
II. Investment expenditure (I)

Firms’ incentives to invest are determined primarily by:

(i) **Productivity of factor inputs**: If firms find new tools and machinery (e.g. a faster computer) that can increase output given the same amount of resources, firms are more willing to invest in the new tools and machinery.

(ii) **Business prospects**: Optimistic business prospects offer better returns on investment. Business firms have higher incentive to invest. On the contrary, pessimistic business conditions incentivize firms to cut back investment spending.
(iii) Government policy: E.g. tax exemption for investment will motivate firms to invest more.

(iv) Money supply and interest rate: An increase in the supply of money lowers the interest rate in the short run. This leads to more investment spending, which causes an increase in aggregate demand.

III. Government expenditure (G)

When government increases expenditure on infrastructure or other services such as education and medical services, this shifts the AD curve to the right and vice versa for a decrease in government expenditure.
IV. Net export (NX)

(i) Economic conditions of foreign countries: When the income levels of trading partners grow faster than that of domestic economy, they will buy more goods from the domestic economy and NX of domestic economy will rise. The AD curve will shift to the right.

(ii) Exchange rate: NX will fall when the value of domestic currency rises against foreign currency. To illustrate, if the exchange rate between euro and U.S.$ changes from €1 = U.S.$1.5 to €1 = U.S.$1.7, the value of euro increases and the prices of European products in the U.S. will rise, which makes European goods less competitive in the U.S. market. The NX of European countries will fall and the AD curve will shift to the left.
Demand curve in Micro vs AD curve in Macro

The demand curve of a good in Microeconomics slopes downward because when the price of the good decreases, the purchasing power of the consumer goes up and they are willing and able to buy more of that good. This is income effect. At the same time, the fall in price of the good makes it relatively cheaper given prices of other goods remain unchanged. The consumer will buy more of the cheaper good. This is substitution effect.

However, the AD curve in Macroeconomics depicts the relationship of general price level and aggregate output level (i.e. all goods and services produced). A rise in general price level means that the prices of all domestically produced goods and services rise. Consumers have no other goods and services which they can substitute for. There is no substitution effect for AD curve in Macroeconomics.
2. Aggregate Supply

2.1 What is aggregate supply?
Aggregate supply (AS) refers to the total amount of goods and services supplied by the firms in an economy.

2.2 What is an aggregate supply curve?
It shows the relationship between price level and the quantity of output that firms in an economy are willing and able to supply.

Since the effects of changes in price level on aggregate supply is very different in short run and long run, we will use two AS curves i.e. the short run aggregate supply (SRAS) curve and the long run aggregate supply (LRAS) curve, for analysis.
2.3 Why is the long run aggregate supply curve vertical?

The long run production capacity is constrained by the available resources and technology. Hence price will have no effects on output level in the long run because the change of price level will not change the amount of resources and technology available in the economy.

Figure 4 Long run aggregate supply curve
2.4 What are the factors shifting LRAS curve?

LRAS is situated at an output level referred to as potential output or full-employment output. This is the level of output that the economy produces when resources are fully utilised (i.e. firms produce at their full capacity) and the economy is at the full-employment level. This level of output is also called natural rate of output.
Determinants of long run aggregate supply

(i) **Labour**: Labour supply can be increased by growth in population and increases in immigrants.

(ii) **Capital**: Capital includes both physical and human capital. An increase in the economy’s physical capital stock (e.g. factories, machinery and tools) raises productivity and an increase in human capital (e.g. skills and knowledge of the workers).

(iii) **Natural Resources**: A discovery of new minerals and natural resources increases LRAS. On the contrary, a change in weather patterns e.g. more frequent drought or floods that makes farming more difficult and hence shifts LRAS curve to the left.

(iv) **Technological Knowledge**: Technological change refers to an advance in knowledge which can improve the production efficiency of goods and services. For example, the invention of computer will shift the LRAS curve to the right.
2.5 Why is the short run aggregate supply curve upward sloping?

2.5.1 Absence of capacity constraints

Suppose the economy is producing point A in the short run.

There is excess capacity (i.e. no capacity constraints) as there are unemployed factor inputs available in the economy.

When AD rises, firms can recruit the unemployed factor inputs whose prices do not increase much. Hence the proportion of increase in output is greater than that in price (from point A to point B).

The SRAS curve is relatively flatter in this portion.

Figure 5 Short run aggregate supply (SRAS) curve
However, when output continues to expand the economy would move closer to full capacity (point D). The number of unemployed factor inputs will be falling and their prices will begin to rise rapidly.

Therefore, the proportion of increase in output price will be larger than that in output quantity. The SRAS curve becomes much steeper (i.e. the portion between point C and point D).
2.5.2 Imperfect adjustment of input and output prices

However, excess production capacity itself cannot fully explain why SRAS is upward sloping. If factor prices rise at the same pace as output prices, firms have no incentive to produce more as they make no additional profit, the SRAS curve will become vertical, like the LRAS.

In reality, adjustments in input prices always lag behind changes in product prices. It is particularly true when wage contracts are signed the wage rates remain unchanged even when product prices change. The imperfect adjustment of input and output prices incentivizes the firms to increase output when output prices rise to capture additional profit.

Starting from 2016 HKDSE Examination, “imperfect adjustment of input and output prices” is the Only explanation required.
In a nutshell, **excess production capacity** constitutes a necessary condition and **imperfect adjustment of input and output prices** constitutes a sufficient condition for an upward sloping SRAS curve.

Put it in a straightforward way, excess production capacity allows firms to have the resources to produce more if they are willing to do so. Imperfect adjustment of input and output prices gives an incentive for firms to increase (decrease) output when output prices increase (decrease).
I. The Sticky-Wage Theory

Nominal wages do not immediately adjust to the price level due to the contract signed, an increase in price level makes employment and production more profitable, leading firms to increase the quantity of goods and services supplied.

For instance, suppose a firm has agreed in advance a certain amount of wage to be paid to workers but then the price level increases unexpectedly. This implies that the firm is now paying a real wage (wage/price level) that is lower than it intended and its profit drops. Thus, the firm hires more labor and produces a greater quantity of goods and services.
II. The Sticky-Price Theory

The prices of some goods and services are also sometimes slow to respond to changes in the economy because of the costs of adjusting prices which are named as *menu costs*.

If the price level rises unexpectedly, some firms immediately adjust their prices upward, but some firms do not change the price of their products quickly to *temporarily avoid the* menu costs. The price of their products will be relatively lower and this will lead to a profit in sales. Thus, when sales increase, firms will produce more quantity of goods and services.
III. The Misperceptions Theory

Changes in the price level can temporarily mislead suppliers about what is happening in the market in which they sell their output. As a result of these misperceptions, suppliers respond to changes in the level of price which causes the SRAS curve to be upward sloping.

Suppose that the general price level rises unexpectedly. Some firms mistakenly believe that the price of their products rises and they perceive it as an increase in the relative price of their products. This misperceptions about the relative prices makes firms believe that the reward of supplying their product has increased, and thus they increase the quantity that they supply.
2.6 What are the factors shifting the short run aggregate supply curve?

Factors that shift the LRAS curve will also shift the SRAS curve. However, people’s expectation of the price level will affect the position of the SRAS curve even though it has no effect on the LRAS curve.

A higher expected price level decreases the quantity of goods and services supplied and shifts the SRAS curve to the left. Suppose workers and firms expect the future price will increase, the workers will negotiate a rise in wage to maintain their purchasing power and firms facing higher factor prices will raise the output prices accordingly. If all firms and workers in the economy are affected by higher expected prices, the costs of production will increase and the SRAS curve will shift to the left.
**Sticky Price Theory vs Misperception Theory**

According to the Sticky-Price Theory, the SRAS curve is upward sloping because some suppliers are slow to respond to the change of general price level to avoid the menu cost temporarily.

However, the Misperceptions Theory explains that some suppliers over-respond to the change of general price level due to the lack of information.
3. Determination of the Equilibrium Levels of Output and Price in the AS-AD Model

3.1 Long run equilibrium

It is found where the aggregate demand curve intersects with the long run aggregate supply curve. Output is at its natural rate.

At this point, perceptions, factor prices, and prices have fully adjusted and resources are utilized at its full capacity. Therefore, the SRAS curve and AD curve intersect at the potential (i.e. full employment) output level.

Figure 6 Long run equilibrium
3.2 Changes in equilibrium levels of price and output

I. The effects of a change in aggregate demand

Suppose households and firms are pessimistic about the future economic conditions.

$C \& I \downarrow \rightarrow AD_1 \rightarrow AD_2$

In the short run, the equilibrium moves from A to B.

$Q$ and price levels fall from $P_1$ to $P_2$. This drop in output means that the economy is in a recession.

Figure 7 The effects of a shift in AD curve
Under high unemployment, workers are willing to accept lower wages and firms are willing to accept lower prices.

After all adjustments, the SRAS curve shifts to the right, from SRAS\(_1\) to SRAS\(_2\). Equilibrium moves from B to C, reaching the full-employment output level again at a lower price level \(P_3\). This process is called **automatic adjustment mechanism**.

In the long run, the decrease in AD causes a drop in the equilibrium price level but leave the output level unchanged. Thus, the long-run effect of a change in AD is a **nominal change (in the price level) but not a real change (output level remains constant)**.
II. The effects of a change in short run aggregate supply curve

Suppose firms face a sudden increase in their costs of production (e.g. oil price increases substantially).

SRAS curve shifts to the left (SRAS$_1$ to SRAS$_2$). Assume that it does not affect the LRAS.

In the short run, Q ↓, P ↑, this situation is called **stagflation** The equilibrium moves from A to B.
If the government does nothing, price and wage expectations will adjust. With increased unemployment, workers are willing to accept lower wages. When nominal wages fall, producing goods and services becomes more profitable and firms are willing to supply more, causing the SRAS curve to shift back to the right.

Recession gradually ends and employment rebounds. The equilibrium moves back from B to A (SRAS$_2$ to SRAS$_1$).
However, if the government is impatient to wait for the automatic adjustment mechanism, it can shift the AD curve by increasing government expenditure.

AD curve shifts from $AD_1$ to $AD_2$. The recession will end, but the price level will be permanently higher at $P_3$. The higher price level is pushed by the government’s expansionary fiscal policy. The equilibrium moves from A to B, and then finally to C.

*Figure 9: Government increases expenditure to reduce the impacts of stagflation*
1. Determine whether the **AD or SRAS curve would shift caused by the event**.

2. Determine whether the curve concerned shifts to the left or right.

3. Use an AD-AS diagram to see how the shift changes output and price levels in the short run.

4. Use an AD-AS diagram to see how economy moves from the new short run equilibrium to the new long run equilibrium.

4.1 Highlights of the Budget 2014-15

- Forecast GDP growth is 3–4%.
- Average rate of headline inflation for the year is estimated at 4.6%.
- Government expenditure is estimated to reach $411.2 billion; total government revenue is estimated to be $430.1 billion.
- Major policy areas include enhance competitiveness and manpower and increase land supply.

4.2 How does the Budget affect our macroeconomy?

The first category includes the expenditure items having *less prominent effects on both AS and AD as the amount of expenditure is relatively limited*. The expenditures on health care of this Budget fall on this category. They have relatively slight impact on AD.
The second category of expenditure items will have more significant effects on price and output in the short run, but less in the long run. The social welfare and relief measure belong to this category. These expenditure items are more substantial and consumptive in nature, which means that they increase the AD in the short run, but not much effect on the long run.

These policies shift the AD curve to the right, both price and output level will rise in the short run. Since the expenditures do not change the available factor inputs and the production capacity is not much affected, there will be limited effects on LRAS.
I. Case of education

Suppose the initial output level is at A which is below the full employment output level. An increase in education expenditure shifts $\text{AD}_1$ to $\text{AD}$. The new equilibrium is at B and the economy reaches its full employment output level.

*Figure 10 The effects of an increase in education expenditure*
However, if the original equilibrium has already been at the full employment level (Point B), the increase in education expenditure will shift AD to AD$_2$.

Output increases from $Y_f$ to $Y_2$. Prices go up to $P_2$ and workers will bargain for higher wage to maintain their purchasing power. SRAS curve will shift to the left and reach the equilibrium point D, resulting in an even higher price level, but restoring the output level back to $Y_f$. 

Figure 10 The effects of an increase in education expenditure
Education will increase human capital which increases production capacity of the economy. The LRAS curve will shift to the right. If long run output can be increased to \( Y_2 \), price level will fall back to \( P_2 \).

**Conclusion:** Any rightward shift in AD will push up prices in the short run, but the extent of price increase will be smaller if output level can be increased in the long run (i.e. a rightward shift of LRAS curve).
II. Case of land supply

Land supply increases expand the production capacity of the economy. LRAS curve shifts from $\text{LRAS}_{2014}$ to $\text{LRAS}_{2016}$.

Prices will fall substantially if AD remains unchanged at $\text{AD}_{2014}$. However, AD is not constant and it increases over time. Though price level goes up, the extent is smaller than that under fixed long run output level.

*Figure 11 The effects of an increase in land supply*
THANK YOU!