ANGLO-CHINESE JUNIOR COLLEGE
JC2 Economics 2024

H2

MACROECONOMIC POLICIES (1)
Demand-Side Policies

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Texts for References:

1. ***Principles of Economics**: Case, Fair & Oster, 10th edition, pages 638-644, 662-663*
2. ***Principles of Economics, Asian Edition**: Mankiw, Quah & Wilson, chapter 25*
3. ***Economics**: John Sloman & Alison Wilde, 7th edition, chapters 14.4, 14.5, 22 & 23*
4. ***Economics Today**:*
   - *Volume 21 Issue 1, Pages 10-15*
   - *Volume 24 Number 2, Pages 22-28*

WHAT IS THIS TOPIC ABOUT?

At any time, every country faces a set of macroeconomic problems, such as slow/negative GDP growth, high/negative inflation (deflation) and high unemployment.

These problems are caused by a confluence of internal and external factors and the causes of some of these problems are interrelated. For example, a fall in consumer confidence could lead to a country experiencing both negative GDP growth and high unemployment (i.e. causes of macroeconomic problems may be interrelated). Thus, the complexity of macroeconomic problems makes them difficult to solve and policy decisions will also involve hard choices and constraints.

When governments consider the various policy options, they have to take into account the constraints they face, the cost and benefits of the policies as well as the intended and unintended outcomes of their policy options. For example, to solve the problem of high inflation, policies used may pose the risks of slower growth and rising unemployment. The choice of policies adopted by governments will depend on their economic priorities and the economic characteristics of their countries.

LEARNING OUTCOMES

Enduring Understanding:

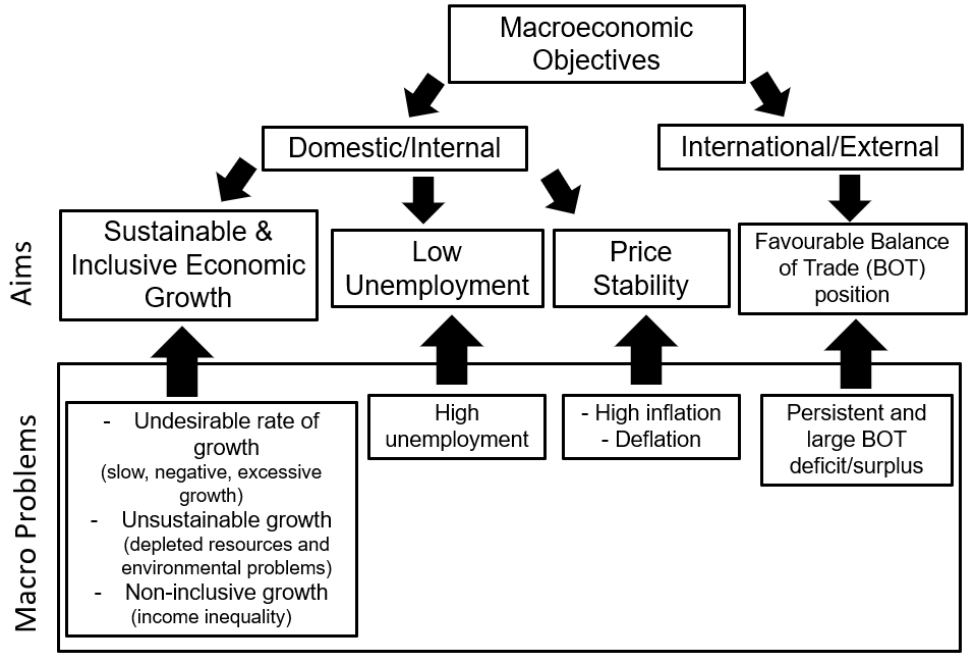
- Dealing with macroeconomic problems involves the use of a set of policy instruments which are broadly considered as fiscal policy, monetary policy, and supply-side policies.
- Policies chosen by governments are dependent on the causes of macroeconomic problems they are meant to address, the characteristics of the economy as well as the government constraints.
- Every policy chosen will have its set of intended consequences and trade-offs, which the government may need to weigh the benefits and costs.

Overarching Essential Questions:

- Which policy is the most appropriate to solve a country's macroeconomic problems?
- How effectively can government intervention be in solving a country's macroeconomic problems?

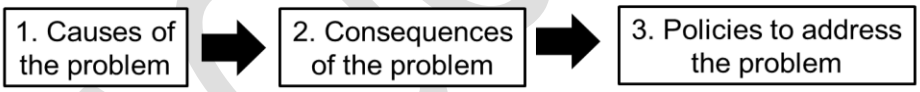
1. OVERVIEW:

Recall in the previous set of lecture notes, you learnt about government macroeconomic objectives and the macroeconomic problems.

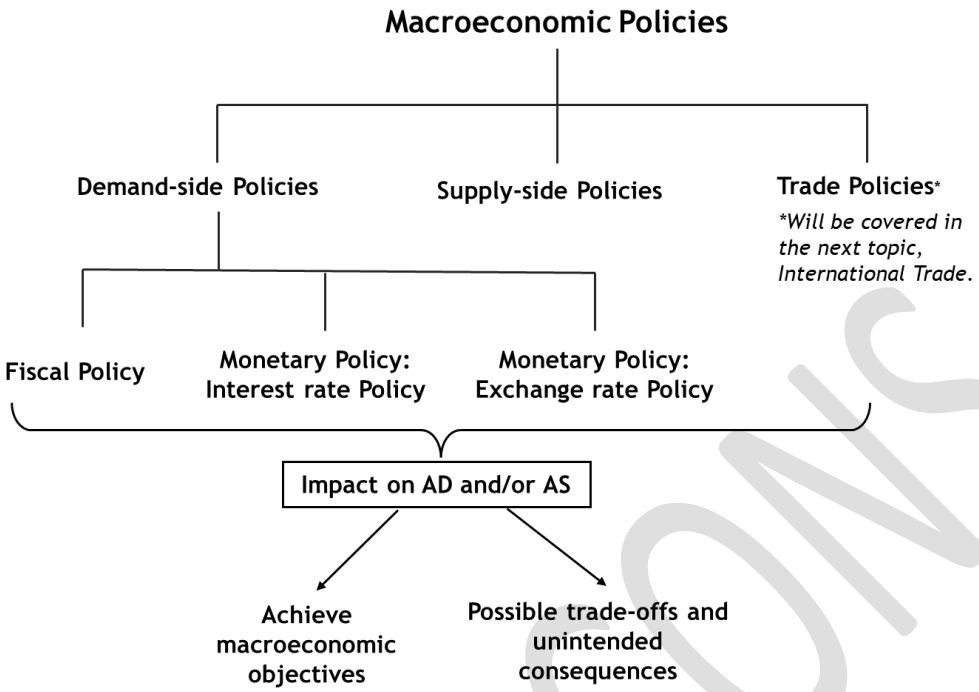


And in this set of notes, we will be studying the macroeconomic policies used by governments in addressing the various macroeconomic problems.

For each macroeconomic problem, it is important to understand its **causes** and **consequences** before understanding how governments make use of **policies to address the problem**.



Governments could adopt the following policies to address macroeconomic problems and achieve their macroeconomic goals.



The previous set of lecture notes on Domestic Macroeconomic Aims and Problems explains the causes and consequences of macroeconomic problems such as negative economic growth, high unemployment, high inflation, and balance of trade deficit.

Governments' macroeconomic intervention for dealing with macroeconomic problems involves the use of a set of policy instruments. These policy instruments can be classified as follows:

Fiscal Policy		Management of the budget balance (deficit or surplus budget) using tax and government expenditure to influence AD. Fiscal policy can also have an impact on AS.
Monetary Policy	Interest Rates	Monetary policy (MP) involves the management of interest rate and money supply to influence AD.
	Exchange Rates	Monetary policy (MP) involves the management of exchange rate to influence AD and AS.
Supply-side Policies		Supply-side policies, involving government intervention in markets. Note: supply-side policies may also be fiscal in nature as these may involve tax and spending policies.
Trade Policy		Trade policy involves the use of instruments such as tax, subsidies and regulations on imports and exports.

2. DEMAND SIDE POLICIES:

Demand side policies mainly influence the level of AD. These include:

a. Fiscal policy

b. Monetary policy centred on interest rates and

c. Monetary policy centred on exchange rates (for Singapore)

These policies can be expansionary or contractionary:

Expansionary Policies	• **Purpose**: to increase AD to promote economic growth, reduce unemployment, and achieve a healthy rate of inflation. • Impact on real national income and general price level is shown in Figure 1
Contractionary Policies	• **Purpose**: to decrease AD in order to reduce pressure on general price level any prevent demand-pull inflation, or to correct a persistent balance of trade deficit. • Impact on real national income and general price level is shown in Figure 2

Figure 1: Expansionary Demand-Side Policies

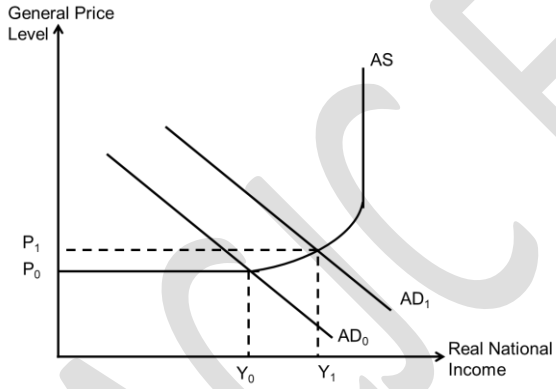
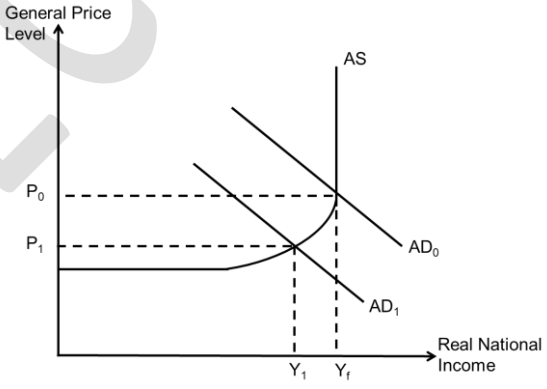


Figure 2: Contractionary Demand-Side Policies



2.1 Fiscal Policy

Discretionary fiscal policy refers to the deliberate changes to the level of government expenditure and/or the direct tax rates to influence the level of aggregate demand.

Discretionary fiscal policy is used to achieve various macroeconomic objectives such as sustained economic growth, low inflation, and low unemployment.

2.1.1 Expansionary Fiscal Policy

The expansionary fiscal policy increases AD via the increase in government expenditure and/or lowering of direct tax rates aim to:

- Promote real / actual economic growth by increasing real national output.

- Reduce demand-deficient unemployment.
- Fight deflation by increasing the general price level.

Primary effects:

Under expansionary fiscal policy, governments could increase government expenditure and/or decrease direct tax rates to increase AD to achieve the above-mentioned macroeconomic objectives.

Note that only government spending in form of development expenditure (where the government spends on infrastructures for the purpose of economic and social development) will increase the G component of AD. Transfer payments, for example subsidies to households and firms, can also increase the AD, but via the increase in C and I when households and firms increase their spending.

1. **Increasing government spending (G)**
   - Given that G is a component AD, ceteris paribus, this increases AD directly. Governments may spend on, for example, infrastructure such as roads and public transport systems.

2. **Reducing personal income and/or corporate income tax rates**
   - Reduction in personal income tax → increases households' ***disposable income*** → higher purchasing power → increasing household consumption expenditure → increase in AD.
   - Reduction in corporate income tax → increases firms' ***after-tax profits*** and encourages investment expenditure → increases AD.

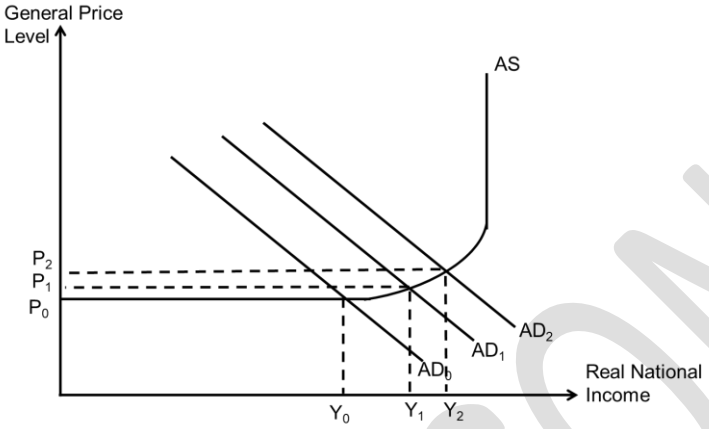
Governments typically implement expansionary fiscal policy during a recession / economic downturn. This helps to:

- **Achieve / increase actual economic growth.**
  - **Recall the *multiplier process*:** AD rise → this results in an unplanned fall in inventory spending, signalling to firms to increase output → allows firms to employ more factors of production to increase output → RNY increases.
  - the higher derived demand for factors of production also imply greater factor payments such as wages → higher household disposable income → induced consumption increases.
  - This increase in induced consumption → increase AD → increasing RNY again → this process repeats itself until RNY ultimately increases by a multiplied magnitude, equivalent the original increase in AD x 1 / (1 – MPC).

- **Reduce demand-deficient unemployment.**
  - Furthermore, since more factors of production are needed to increase output → the derived demand for factors of production increases → firms will therefore hire more workers and lay-off fewer workers → this decreases demand-deficient unemployment, unemployment rate falls.

- **Avoid deflationary pressure.**
  - Given more factors of production are required to increase output → the increasing scarcity of available factors of production results in a moderate increase in factor payments → increase cost of production for firms → passed on to consumers as a moderate increase in GPL → helps achieve a low and positive rate of inflation.

Figure 3: Use of expansionary fiscal policy to achieve the macroeconomic aims.

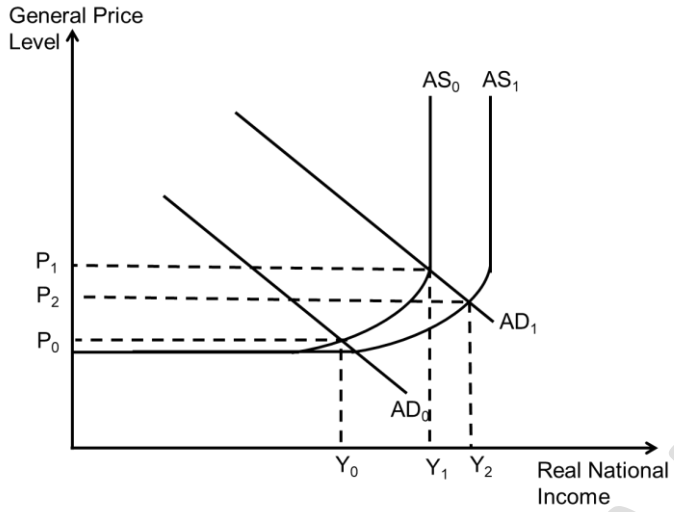


Secondary effects: Depending on what G is spent on, Fiscal Policy may have impact on secondary impact.

- **Potential Economic Growth**
  - If the government spends on **physical capital**, for example roads / transport networks to enhance geographical mobility → increases productivity as less time is taken to move goods and services and factors of production around.
  - If the government spending is on **human capital,** for example education, retraining and skills-upgrading (such as SkillsFuture) → workers pick up more relevant skills such as digital knowhow → the quality of the labour force improves → higher productivity → each worker is now able to produce more output for a given amount of time.
  - If the government spending is on **research and development**, for example the Productivity Solutions Grant or procuring intellectual property → develop and /or adopt more efficient methods of production → there could be an increase in the level of technology.
  - The increase in quantity of resources, improvement in quality of resources and the level of technology → increase in the country's productive capacity → Increase in LRAS → rightward shift in the LRAS curve, achieving potential economic growth.

- **Sustained Economic Growth**
  - As the increase in government expenditure under the expansionary fiscal policy can achieve both the primary effects on actual economic growth and the secondary effect on potential growth in the long term, the country is able to achieve sustained economic growth.

Figure 4: Using Fiscal Policy to achieve Sustained Economic Growth



- Figure 4 illustrates how the increase in government expenditure can increase both the AD and LRAS. This shows that the RNY increases not just from Y_0 to Y_1, but in fact a larger increase from Y_0 to Y_2. This is because there is now more productive capacity to cater to a rise in AD. At the same time, instead of a significant rise in price GPL from P_0 to P_1, the increase in LRAS ensures that GPL increases only by a smaller extent, as seen from P_0 to P_2.
- This slight increase in price is possible due to the increase in LRAS, which suggests the economy now has an even larger productive capacity → there is less competition for resources when firms increase production → this allows the prices of the factor payments such as wages to increase by a smaller extent → the increase in the unit of cost of production is therefore more moderate → firms pass on this slight increase in unit costs to their consumers in terms of higher GPL, the rate of increase in GPL will also be slower → lower inflation.
- The large increase in RNY and the slight increase in GPL when both AD and LRAS increase shows the economy achieving sustained economic growth, which is, non-inflationary rise in real GDP in the long run.

- **Sustainable Economic Growth**
  - If the government spending is on infrastructure for clean energy (e.g. installing solar panels or electric vehicle charging points) → allows the economy to produce energy with less pollution (and reduce negative externalities in production) → this allows the economy to increase its output without increasing pollution level (or even to reduce pollution level, if adopted on a significant scale) → improvement in the quality of the environment over time.
  - A cleaner environment may boost the health of the citizens, decreases risks of illnesses → increase life expectancy → non-material SOL improves and labour productivity improves.
  - If the government spending on solar panels → slowdown the depletion of resources such as fossil fuels → slows down or prevents the depletion of resources over time (referring to Figure 4 above, AS_1

will not fall to AS_0) → with enough productive capacity, economy is able to meet future rise in demand for goods and services when AD rises → economy can grow more in the long run to Y_2 → future SOL rises

Think about this:
How does achieving sustainable economic growth benefit residents' standard of living? Consider the benefits to both non-material and material SOL.

- **Inclusive Economic Growth**
  - The government may also use **transfer payments** as part of their fiscal policy tool to achieve certain macroeconomic and microeconomic objectives.
  - A transfer payment given to households (e.g. unemployment benefits or cash handouts like CDC vouchers) increases households' disposable income → increases their purchasing power (reduce out of pocket expenses) → increase consumer expenditure (C) → increase AD. The implications of an increase in AD are similar to the previous explanations of increase in G.
  - Transfer payments are also often given to lower-income households. By increasing the purchasing power of lower-income households → the income difference between higher- and lower-income households could fall, ceteris paribus → implies an improvement in income inequality → this can be reflected by a lower Gini Coefficient → reduce feelings of dissatisfaction within the population → increasing non-material standard of living.
  - Additionally, increasing the purchasing power of lower-income households may allow them to meet more of their nutritional, healthcare, and educational needs, for example the reduction in the out-of-pocket expenses can help the lower-income families go through more years of formal education (especially if the transfer payment provided is directly given for education).
  - If the government spends on educating and retraining low-skilled workers, it allows them to increase their skills sets → improve their occupational mobility so that they able to take on high-skilled jobs which command higher wages → increases the income of previously low-skilled workers → reduces the wage gap → reduces income inequality as measured by a lower Gini Coefficient.
  - Impact on SOL: In the short term, this can be reflected through a higher HDI (i.e. literacy rate, life expectancy rate). In the long term, transfer payments could even improve the overall quality of labour (since more of them are educated and healthier) → increase the country's productive capacity and increase LRAS → the economy enjoys higher sustained growth in future.

__Transfer payments__ refer to transfers given by the government to businesses and households. Refer to your lecture notes on "The Government Budget" to recap this concept.

Limitations of Expansionary Fiscal Policy

a) Budget constraints

- Increasing government spending and reducing taxes may not be feasible if the government already has an existing large national debt. For example, Italy, Spain, and France.
- Large national debt may prevent government from increasing G sufficiently → G may rise less than required to prevent a fall in AD or even if AD rises, it will only rise by a small extent → minimising the effectiveness of expansionary fiscal policy during periods of low/negative economic growth.
- Alternatively, a government could borrow to increase G. While this allows the government to increase AD, it would worsen the government debt. Large national debt will also have other negative implications such as increasing the debt payment for future generations.
- Since Singapore has accumulated past reserves, this may be less of a concern. However, the government is only able to accumulate reserves due to prudent use of its budget.

b) Crowding-out effect

- With a huge budget deficit, government may have to borrow (from households, financial institutions, or foreign countries) to finance their spending. This creates higher demand for loanable funds, which will increase the interest rate (i.e. the price of loanable funds). The higher interest rate may possibly crowd out private investment, due to the higher cost of borrowing which firms must incur. Hence, G rise but impact on AD is partially negated by fall in C and I → AD rise less.
- However, during recession, crowding-out effect is very small in view of weak private sector demand for investment funding.

c) Size of the multiplier

- The smaller the size of the multiplier, the less effective fiscal policy will be since the increase in AD will have a less significant impact on national income.
- Example: Singapore has a high marginal propensity to import due to the lack of natural resources and a high marginal propensity to save due to the compulsory state savings scheme (CPF) and Asian's culture of thrift. This results in Singapore having a smaller multiplier size compared to other countries. Thus, if the Singapore government adopts an expansionary fiscal policy, the final impact on the country's national income will be smaller compared to other countries with a larger multiplier size, for example the USA. Large withdrawals mean the rise in induced C as Y increases is much smaller → impact on real economic growth and demand-deficient unemployment is smaller.
- Additionally, during recessions, households tend to have higher precautionary savings ▫ MPS is larger ▫ more withdrawals ▫ multiplier size is smaller ▫ change in government expenditure results in a smaller change in real national income.

d) Nature of Economy

- Expansionary FP primarily aims to increase G, C and I and hence AD. How much AD rises depends on how much these components take up in an economy's GDP.
- In the case of USA, C for example takes up around 70% of its GDP. Hence, expansionary fiscal policy can potentially have a large impact on the US economy.
- In contrast, for economies with a small domestic market such as Singapore, X which takes up more than 150% of GDP is the much larger component. Hence, the impact of expansionary fiscal policy is much smaller.

e) Conflict of Macroeconomic Aims: Demand-Pull Inflation

- Expansionary fiscal policy increases the AD of an economy to increase its RNO. However, if the AD increases even when the economy is near employment level of output, expansionary fiscal policies may result in demand-pull inflation.
- Imperfect information might result in the government estimating the economy to be further from the full employment more than what it really is. This might cause the government to spend more, result in demand-pull inflation. Hence it is important that policymakers gather information accurately and in a timely manner so as to minimize potential conflicts between goals arising from their policy decisions.

f) Time lags in policy implementation

- There are mainly 3 types of time lag – recognition lag, implementation lag and impact lag.
- Recognition Lag: Time is needed for the collection of data for analysis. This is especially so when economic reports are released every quarter of the year.
- Implementation Lag: If the government wants to use expansionary fiscal policy to prevent further economic downturn, the government would need to debate and discuss the policies at the parliament before it can be implemented. The implementation lag may be longer with more complex political system.
- Impact Lag: Once the policies are implemented, it takes time for the effects to be felt in the economy. E.g. changes in tax may not affect tax payments *immediately*. Instead, it may affect tax payments only at the end of the financial year i.e. a full 12 month delay.
- If the time lag is long enough, fiscal policy could even destabilize the economy especially when the policy effects set in when the initial problem is no longer a problem at that time.
- For example, the expansionary policy may not come into effect until the economy has already recovered and is expecting a boom. Under this circumstances, expansionary policies when implemented would worsen the problems of overheating instead of solving the recession faced initially.

Good to know: Implications of government deficit and debt.

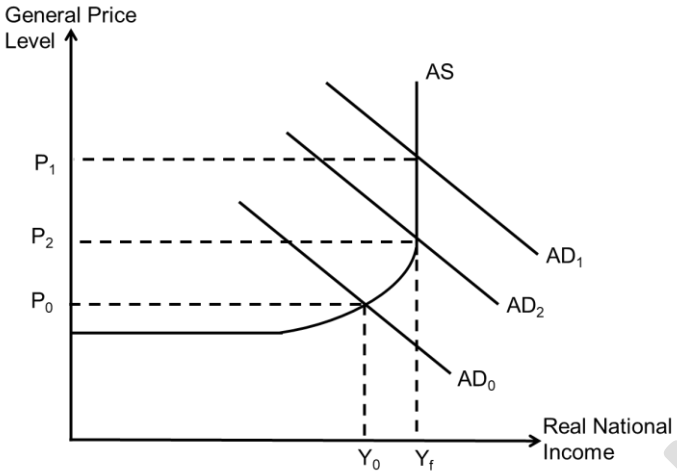
- Budget deficits can be financed through past accumulated fiscal reserves or through borrowing. One advantage that Singapore has is prudent spending by the government which has allowed it to accumulate significant budget surpluses (i.e. savings) → this allows the Singapore government the ability to spend extensively without incurring debt during periods of severe economic downturn. For example, the Resilience, Unity, Solidarity, Fortitude packages were launched to combat Covid, amounting to 20% of GDP.
- These reserves, however, must be spent wisely because once drawn down, the government will either have less reserves to spend or tax revenues will have to be diverted to pay for the resulting debt and the interest incurred. As there will be less resources available in the future for the government to spend on social and developmental needs, the main consequence of budget deficits is the intergenerational transfer of welfare from future generations to the current ones.
- Furthermore, excessive fiscal debt may result in capital flight (where investors leave / refrain from investing in a country due to poor business sentiment) and sovereign debt defaults (where the government fails to repay its debt obligations) which can create severe macroeconomic instability. To avoid such situations, a country may need to undertake painful austerity measures* to restore investor confidence. Hence governments should try to maintain fiscal sustainability to avoid running into such problems.

**Austerity measures refer to tax increases, spending cuts, or a combination of the two, used by governments to reduce budget deficits.*

2.1.2 Contractionary Fiscal Policy

Under contractionary fiscal policy (whereby government runs a budget surplus), governments could decrease government spending and/or increase taxes. Contractionary policies are usually used in the context where there is a large increase in AD, from AD_0 to AD_1 near or at the full employment level of output, resulting in high demand-pull inflation. This could happen due to an economic boom or strong economic recovery.

Figure 5: Contractionary Fiscal Policy



The government can adopt contractionary fiscal policy by:

a) Reducing government spending (G)

- Given that G is a component AD, ceteris paribus, this decreases AD directly from AD_1 to AD_2.

b) Increasing personal income and/or corporate income tax rates

- Increase in personal income → decrease disposable income → decrease purchasing power → decrease consumption expenditure → decrease in AD from AD_1 to AD_2.
- Increase corporate income tax rates → decrease firms' after-tax profits and discourage investment → decrease in AD from AD_1 to AD_2.

The fall in G, C and I as a result of contractionary fiscal policy can also be seen as reducing the original rise in AD from AD_0 to AD_2, instead of from AD_0 to AD_1.

The fall in AD from AD_1 to AD_2 results in an unplanned rise in inventory spending, signalling to firms to decrease output → firms require fewer factors of production → reduces the competition for factors of production (e.g. labour) → firms bid down factor payments (e.g. wages) → reduces the unit cost of production for firms → pass on to households as lower GPL from P_1 to P_2.

Hence relative to the original price P_0, price rises less and there is less demand-pull inflation in the economy.

Limitations of Contractionary Fiscal Policy

Just like the case of exp FP, effectiveness of con FP is also determined by the nature of the economy, the size of the multiplier, and time lags. Other limitations of contractionary fiscal policy include:

a) Inflexibility of government expenditure

- Some forms of government expenditure are inherently difficult to remove/ reduce. For example, reducing expenditure geared towards long-term developmental projects such as infrastructure/ schools/

road or port construction etc. may cause disruptions. If these projects are already in progress, abandoning them midway leads to wastage of resources. Moreover, it may adversely affect the country's potential and sustained economic growth.
- Reducing expenditure in defence may compromise national security.
- Reduction in health care and unemployment benefits are unpopular and often strongly resisted.

b) Conflict with other macroeconomic aims: Actual Growth and Unemployment

- When a government uses a policy to achieve certain macroeconomic goals, it may be at the expense of other macroeconomic goals.
- Example: A contractionary fiscal policy aimed at reducing demand-pull inflation may lead to falling national income and rising unemployment. Thus, there is a trade-off between macroeconomic goals (low and stable inflation vs slow economic growth).
- Whether contractionary fiscal policy will result in conflict between macroeconomic aims depends on state of economy. During an economic boom, economic outlook of households and firms is very positive. Hence, despite rising taxes, consumption and investment may still increase, albeit at a slower rate. This means that real GDP will still be rising, and the conflict with economic growth and unemployment is less significant.

Strengths of Fiscal Policy

The following point applies to both expansionary and contractionary fiscal policy:

a) Greater certainty compared to monetary policy.
- A trait that makes government spending especially effective is that increasing or decreasing government spending is decided purely by the government. This implies that even if business sentiment regarding the future outlook is pessimistic, the government can still decide to spend more to increase the AD. Likewise, even if business sentiments are very optimistic, the government can also decide to reduce spending to reduce the AD. This makes government spending a direct policy that can produce more certain outcomes.
- This contrasts with monetary policy (that will be explained in the next section), where even if the central changes interest rates, consumption and investment expenditure may not change significantly if the market sentiment remains very optimistic or pessimistic.

2.2 Interest Rate Centred Monetary Policy

Monetary policy refers to the actions by the **central bank** to influence the money supply, interest rates or exchange rate, to achieve the macroeconomic objectives.

A central bank is a government institution that manages the currency and monetary policy of an economy.

The central bank of a country may adopt either an interest rate-centred ***or*** exchange-rate centred monetary policy, depending on the economic characteristics of the country.

In large economies like the United States, where consumption and investment expenditure make up a large proportion of their aggregate demand, interest rate-centred monetary policy is chosen.

However, in the case of small and resource poor countries with small domestic markets like Singapore, where volume of trade is close to 4 times of the country's GDP, Singapore's Monetary Authority of Singapore (MAS) chooses exchange rate-centred monetary policy instead.

Interest Rate Centred Monetary Policy

Interest rate can be known as the price of money. From lenders' perspective, it represents their cost of borrowing. From savers' perspective, it is their returns on savings.

The Central Bank influences the interest rate, through increasing or decreasing the money supply. When the Central Bank increases money supply, interest rate falls. Conversely, when the Central Bank decreases or "tightens" money supply, interest rate rises.

Good to know: How interest rates are determined

If you are interested to find out more, you may read up more on the "Liquidity Preference Theory" in Annex A. This theory helps us understand how money supply and demand determine interest rates. You are not required to know this for the A levels examinations.

2.2.1 Expansionary Interest Rate Policy

When Central Banks implement expansionary monetary policies, they *decrease* interest rates by *increasing* money supply. This *increases* AD and hence helps to:

- Promote real economic growth
- Reduce demand-deficient unemployment
- Fight deflation

Primary effects on domestic demand:

a) Impact on **consumption expenditure** of households

Lower interest rates **lower the cost of borrowing** and encourage households to spend more, especially on big ticket luxury items such as properties and cars. Lower interest rates also indicate lower returns to savings. The opportunity cost of consumption is now lower since the returns on savings that households must forgo is lower. Thus, this gives households more incentive to consume instead of save.

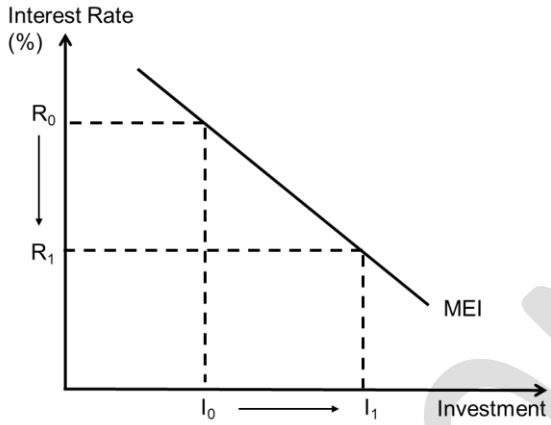
b) Impact on **investment expenditure** of firms

Profitability of any investment expenditure is dependent on the expected rate of returns as well as the cost of borrowing, which is the interest rate. It is calculated as:

Profitability = Expected Rate of Returns – Cost of borrowing

A lower interest rate is going to raise the profitability of investment projects, which encourages more firms to invest more. As such, there is an inverse relationship between the interest rate and investment. This can be illustrated using the Marginal Efficiency of Investment (MEI) diagram:

Figure 6: Marginal Efficiency of Investment Diagram



Thus, a fall in interest rates from R_0 to R_1 leads to more profitable investment projects. This encourages more firms to borrow, leading to an increase the level of investment expenditure from I_0 to I_1.

Impact of expansionary interest rate policy on the macroeconomic objectives:

a) Actual economic growth

The increase in AD due to a rise in consumption and investment leads to an increase in real national income via the multiplier process.

Refer to the previous section on Fiscal Policy (pages 6-7) for the full explanation on the impact on the rise in AD on actual economic growth.

Reminder: Students are expected to bring in the multiplier process when explaining how the increase in AD may lead to an increase in real national income and hence, actual economic growth.

Potential economic growth

Do note that the increase in investment expenditure may also lead to increase in potential economic growth in the long-term.

The investment in capital goods such as machinery and plants increases the country's capital stock / accumulation and this increases the country's productive capacity, shifting the LRAS or PPC outwards, leading to greater potential economic growth.

With more productive capacity, the economy is better about to increase production when AD rises, resulting in sustained economic growth: rise in real GDP while maintaining low and stable inflation.

Note: The primary impact of monetary policy is on AD. The impact on AS is secondary, and hence less important.

b) Unemployment

Since more factors of production are needed to produce more, firms' derived demand for factors of production such as labour increases, leading to a less demand-deficient unemployment.

c) Price stability / Deflation

An increase in aggregate demand can help to fight deflationary pressures. As firms increase production due to a fall in inventories, there will be greater competition for the available resources such as labour. This increases the prices of these resources such as wages. When the firms pass on the higher unit cost of production to the consumers, general price level increases. This helps Central Banks maintain low and stable inflation at around 2%.

Secondary effect on external trade, (X-M):

Note that this effect is not the intended effect of the policy. While it does benefit the economy, it is more of a side effect. In exams, it would be sufficient to focus on the primary effect.

Central Banks use monetary policy primarily to influence domestic demand. However, in economies open to capital flows, a change in interest rates will also have a secondary impact on exchange rate and hence X-M.

a) Impact on exchange rate

In an open economy where there is free flow of capital funds, a fall in interest rate may lead to an outflow of short-term capital. Short-term capital is otherwise known as '***hot money***', which are speculative money aiming to pursue the high interest rates offered.

A lower interest rate relative to other countries translate to lower returns for domestic and foreign investors, who would prefer to save their funds in a country with a higher interest rate.

The outflow of short-term capital would in turn increase the supply of domestic currency in the foreign exchange market (since foreign investors sell the assets in local currency in exchange for other currencies). There will be a surplus of domestic currency in foreign exchange market. The downward pressure on exchange rate will lead to a depreciation of the domestic currency.

Lower domestic interest rates also make the country less attractive to foreign investors. With less inflow of short-term capital, demand for the local currency falls. This again results in a surplus of domestic currency in the foreign exchange market, adding further downward pressure on the exchange rate.

b) Impact on (X-M)

As the currency depreciates, price of exports in foreign currency is now lower. This leads to an increase in quantity demanded for our exports and hence export revenue. At the same time, the price of imports in local currency is now higher. Households will switch from imports to domestic goods and services instead, increasing consumption expenditure.

The increase in export revenue and consumption expenditure thus increase AD and hence real national income via the multiplier process. This reinforces the rise in AD due to a rise in domestic demand explained in Section 2.1, and can further help to achieve the country's macroeconomic objectives of real economic growth and lowering unemployment rate.

Note:

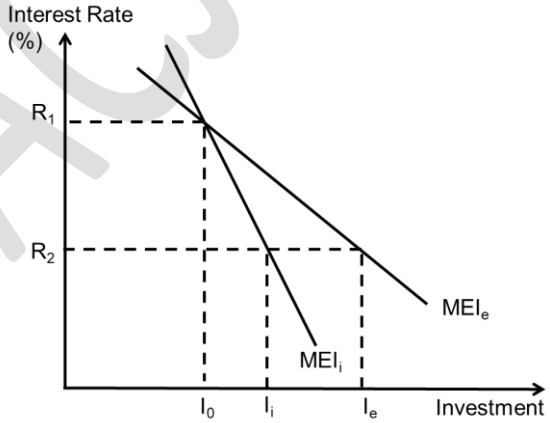
During exams, when you explain monetary policy, your focus should be the ***primary*** impact of interest rates on domestic demand of consumption and investment. The impact on exchange rate and X-M is ***secondary***, and hence less important.

Limitations of Expansionary Interest Rate Policy

a) Weak economic outlook

- During recessions, consumers experience greater uncertainty about job security and future incomes. They may choose to increase precautionary savings instead. Hence, due to this poor economic outlook, the extent to which consumption rises when interest rates are cut is limited.
- Furthermore, firms are likely to face falling demand for their goods and services. With falling profits and lower expected rates of returns, firms have less incentive and ability to spend on investment projects. This will limit the extent to which lower interest rates can stimulate investment, making expansionary monetary policy less effective.
- Due to firms' poor outlook and lack of business confidence, investment is less responsive to a fall in interest. This means that investment is ***interest-rate inelastic***, giving rise to a ***steep*** MEI curve.

Figure 7: Interest-inelastic investment



- The steeper MEIi represents investment that is interest rate-inelastic. When interest rate falls from R_1 to R_2, investment rises to a smaller extent to I_i. This is less significant compared to the interest-rate elastic case represented by the less steep MEI_e curve where investment increases more significantly to I_e for the same fall in interest rate.

b) Size of multiplier

- Similar to expansionary fiscal policy, expansionary interest rate policy aims to increase AD via the multiplier process. Hence, the size of multiplier determines its effectiveness.
- Refer to "Limitations of Expansionary Fiscal Policy" on page 10 for more details.

c) Nature of Economy

- Similar to expansionary fiscal policy, expansionary interest rate policy targets specific components of the AD.
- Expansionary MP primarily aims to stimulate C and I and hence AD. How much AD rises depends on how much these components take up in an economy's GDP.
- In the case of USA, C takes up around 70% of its GDP. Hence, lower interest rates can potentially have a large impact on the US economy.
- In contrast, for economies with a small domestic market such as Singapore, X which takes up more than 150% of GDP is the much larger component. Hence, the impact of expansionary monetary policy is much smaller.
- Furthermore, Foreign Direct Investment (FDI) makes up the bulk of Singapore's investment. Foreign firms tend to have their own source of funds, thus do not need to borrow money from the host country. Hence, lower interest rates are unlikely to increase investment much, limiting the effectiveness of expansionary interest rate policy in Singapore.

d) Zero Lower Bound

- Nominal interest rate cannot be negative. Hence, Central Banks are unable to cut interest rates much further when interest rates are near zero. This means that Central Banks could no longer rely on interest rates to stimulate AD, and monetary policy is no longer effective.

Good to know: Quantitative Easing and Liquidity Trap

1. The government may at times try for alternative monetary policy when the interest rates are already too low. This alternative monetary policy is called "**Quantitative Easing**". If you are interested to find out more, read up on **Annex B** to learn more about what Quantitative Easing means and how it works.

2. When households and firms continue to withhold spending on consumption and investment despite near-zero interest, we say that the economy is in a **liquidity trap**. If you would like to find out more, you may refer to **Annex C** to see how this is illustrated using a Money Supply and Demand diagram.

e) Conflict with Macroeconomic Aims: Demand-pull Inflation.

Similar to expansionary fiscal policy, the use of expansionary monetary policy to increase AD, if left unchecked, may result in demand-pull inflation. Refer to "Limitations of Expansionary Fiscal Policy" on page 11 for more details.

Good to know: Asset bubbles and Inequity

Lowering of long-term interest rates, while encouraging borrowing, it could unintentionally lead to assets (property and shares) bubbles. Lowering interest rate could encourage borrowing by households to buy more properties (i.e. transaction and speculative motive). The increase in the demand for housing against a low supply of housing can lead to a sharp increase in property prices.

If households expect this increase in property prices to continue into the future, it could further encourage more speculative buying, as buyers attempt to sell the properties at a higher price in the future. This further drove up the demand for properties, causing subsequent sharp increase in prices.

Rising property prices will have the following implications:

Bursting of property bubble: if rising property prices are left unchecked, it will lead to property bubble and when the bubble burst, it could lead to severe economic crisis. Rising property prices will not be sustainable because when prices of property increase to a certain level, beyond the reach of speculators and buyers, demand for property begin to fall and prices of property may collapse. The property bubble burst and buyers who previously took huge loans and mortgages to purchase the property may find themselves in debt or worse, holding on to properties with current value lower than what they paid for earlier.

Rising cost of production: increase in demand for property will also increase rental by firms and households. Higher rental will increase the operating cost of firms.

Inequity: lower income families may not be able to have access to affordable housing.

2.2.3 Contractionary Interest Rate Policy

Contractionary monetary policy aims to achieve price stability by moderating the extent of rise in AD. Central Bank can do so by reducing or "tightening" the money supply to raise interest rate.

Primary effects on domestic demand

a) Impact on consumption expenditure by households

Higher interest rates increase the cost of borrowing for households and discourages spending on goods and services especially on big ticket luxury items such as properties and cars.

At the same time, a higher interest rates also indicate a higher return on savings. The opportunity cost of consumption is now higher since households must forgo a higher return on savings if they choose to spend. Thus, this increases the motivation for households to save instead of consume, reducing consumption.

b) Impact on investment expenditure by firms

Recall the equation that links profitability of investment with cost of borrowing (interest rate) and the MEI diagram.

Higher interest rates also increase the cost of borrowing for firms. Investment projects which were previously profitable may now no longer be profitable. As such, an increase in interest rates discourages firms from borrowing, which reduces investment.

Impact of contractionary interest rate policy on macroeconomic objectives:

a) Price stability

During an economic boom, AD increases significantly. This results in demand-pull inflation as the GPL increases. To address this, central banks implement contractionary interest rate policy, reducing AD. Refer to the previous section on **Contractionary Fiscal Policy (page 13)** for the diagram and full explanation on the impact on the fall in AD on price stability.

Secondary impact on external trade (X-M):

Recall how the expansionary interest rate policy impact the exchange rate, in an open economy with free capital flows. This is the same for a contractionary interest rate policy, where there is a fall in export revenue due to currency appreciation.

a) Impact on exchange rate

A higher interest rate may lead to an inflow of short-term capital. This is because lower interest rate relative to other countries translate to higher returns for foreign investors, who would prefer to save their funds in a country with a higher interest rate.

The inflow of short-term capital would in turn increase the demand of domestic currency in the foreign exchange market (since foreign investors buy the assets in local currency.) This creates a shortage of the local currency in the foreign exchange market. This exerts an upward pressure on the value of the domestic currency, resulting in appreciation.

b) Impact on X-M

The price of exports in foreign currency is now higher, leading to a fall in quantity demanded of export and hence lower export revenue. At the same time, the price of imports in local currency is lower. Local households switch from domestic goods and services to cheaper imports instead, decreasing the consumption expenditure.

The decrease in export revenue and consumption expenditure thus decreases the country's AD. This addresses external sources of demand-pull inflation and allows policymakers achieve the macroeconomic objective of price stability.

As price of imported factors of production such as raw materials and energy fall, firms enjoy lower unit cost of production. When firms pass on lower costs to consumers as lower prices, general prices fall, alleviating imported cost-push inflation.

Note:

During exams, when you bring in contractionary monetary policy, your focus should be the ***primary*** impact of interest rates on domestic demand of consumption and investment, and hence domestic sources of inflation.

The impact on exchange rate, X-M and external sources of inflation is ***secondary***, and hence less important.

Limitations of Contractionary Interest Rate Policy

a) Positive economic outlook

During economic booms, households are very optimistic about their job security and future income. Hence, they will reduce their precautionary savings and spend instead. As such, the fall in consumption brought about by higher interest rates is limited.

Furthermore, firms are likely to enjoy rising demand for their goods and services. With rising profits and higher expected rates of returns, firms have more incentive and ability to spend on investment projects. Due to firms' positive outlook, investment is less responsive to interest rates. This means that investment is ***interest-rate inelastic***, giving rise to a ***steep*** MEI curve. (Refer to Pages 16 and 18 for the explanation on MEI). As such, the fall in investment brought about by higher interest rates is limited, making contractionary monetary policy less effective.

b) Root causes of inflation

Contractionary interest rate policy may not be so effective to address cost-push inflation due to domestic factors. For example, shrinking workforce and ageing population lead to a fall in supply of labour. Manpower shortages exert upward pressure on wages and unit cost of production. In this case, increasing interest rate which targets primarily on the reduction of AD, will not address the root cause of such cost-push inflation. Policymakers should consider policies that increase labour productivity such as retraining. Such

policies that aim to increase a country's productive capacity and lower unit cost of production are known as Supply-Side policies. You will learn more about them shortly.

c) Conflicts with other macroeconomic aims: Actual Growth and Unemployment

Similar to contractionary fiscal policy, when interest rates are raised too aggressively, AD may fall sharply, leading to a significant contraction of real national income and rising unemployment. Refer to **"Limitations of Contractionary Fiscal Policy" on page 14** for the full explanation.

2.3 Exchange Rate Centred Monetary Policy

Aside from interest rate policy, governments may also manipulate exchange rates as a form of monetary policy.

An expansionary exchange rate policy means that the central bank devalues (or weakens) the currency, whereas a contractionary monetary policy centred on exchange rate means that the central revalues (or strengthens) the currency.

Note: What is the difference between Depreciation/Appreciation and Devaluation/Revaluation?

- In previous topics, you were introduced to the terms depreciation and appreciation. There is a difference between depreciation / appreciation and devaluation / revaluation.
- Depreciation / appreciation is used when the currency value changes due to **market forces**, i.e. changes in demand and supply for the currency.
- Devaluation / revaluation is used when the government **deliberately manipulates** the value of the currency by buying and selling currencies in the foreign exchange market.

Singapore is an example of a country that chooses to use exchange rate centred monetary policy. The following sections will cover:

a. **Why** Singapore's Central Bank Monetary Authority of Singapore (MAS) chooses to use a monetary policy centred on exchange rate,

b. **How** we manage this exchange rate in different economic situations and

c. The **impact** of the exchange rate on our macroeconomic objectives.

2.3.1 Why the choice of exchange rate as the monetary policy tool in Singapore

Singapore manages her exchange rate for the following reasons:

a. Singapore has limited resources and is therefore import dependent.

Singapore's lack of natural resources means that the country must import even the most basic of our daily essentials such as food, energy, and water. In fact, import expenditure is more than 150% of Singapore's GDP.

This makes Singapore very vulnerable to external supply shocks such as natural disasters and wars (e.g. the Russian-Ukraine war). Foreign price increases such as higher energy and food prices will lead to significant increases in domestic prices and hence imported inflation.

Compared to the use of monetary policy centred on interest rates, the use of an exchange rate policy will allow Singapore to address imported inflation, hence maintain price stability with greater effectiveness.

b. Singapore has a small domestic market and is therefore export dependent.

With a small population of only 6 million, Singapore's domestic market is small. Hence Singapore relies heavily on exports for economic growth. The importance of external demand (export revenue takes up as much as 150% of GDP) to Singapore's economy means that traditional monetary policy instrument such as interest rates, which largely affect domestic demand of domestic consumption and investment, have a smaller influence on our economy.

In contrast, exchange rates directly affect the prices of exports and imports, and hence have a much larger impact on our trade-dependent economy than interest rates.

c. Openness to Capital Flows

Singapore's economy is relatively small compared to larger economies like the United States, the European Union, or China. In the global financial system, Singapore's influence on interest rates is limited compared to these larger economies.

As an international financial centre, the Singapore economy is very open to capital flows such as foreign investors' deposits known as **hot money**.

As a result, small changes in the difference between domestic and foreign interest rates can lead to large, sudden, and quick movements of capital flows in and out of Singapore. This makes it difficult for MAS to target money supply in Singapore. As such, manipulating interest rates via money supply will be challenging.

For example, if MAS raises interest rates to curb domestic inflationary pressures, higher interest rates will attract hot money inflows since foreign investors enjoy higher returns from financial institutions in Singapore. This will increase money supply, exerting downward pressure on interest rates. Consequently, the inflow of hot money will 'negate' the initial rise in interest rates.

On the other hand, if MAS lowers interest rates to stimulate domestic demand, the lower interest rates will lead to hot money outflows as foreign and domestic investors enjoy higher returns from financial institutions in other countries. Money supply in Singapore will decrease, exerting upward pressure on interest rates. Consequently, this outflow of hot money will 'negate' the initial cut in interest rates.

Thus, inflow and outflow of hot money makes it extremely hard for MAS to control the money supply and hence interest rates in Singapore.

As a result, interest rates in Singapore are not set independently by the MAS but are determined by interest rate decisions made by these major central banks such as Federal Reserves of the USA instead. Due to characteristics of Singapore's small economy open to capital flows, Singapore is an ***interest rate taker***.

2.3.2 How Singapore manages her exchange rate

Singapore manages her exchange rate via the managed float exchange rate system.

The managed float system lies between the fixed and floating exchange rate regimes. In a managed float regime, exchange rates are not fixed; they are allowed to float within an upper and a lower limit, or band. MAS intervenes from time to time to prevent excessive exchange rate fluctuations. It is thus a form of "managed flexibility" where the exchange rate is partly determined by market forces up till a certain range within the band, but monitored and intervened by the Singapore government where the need arises to ensure that **exchange rate remains within the band**.

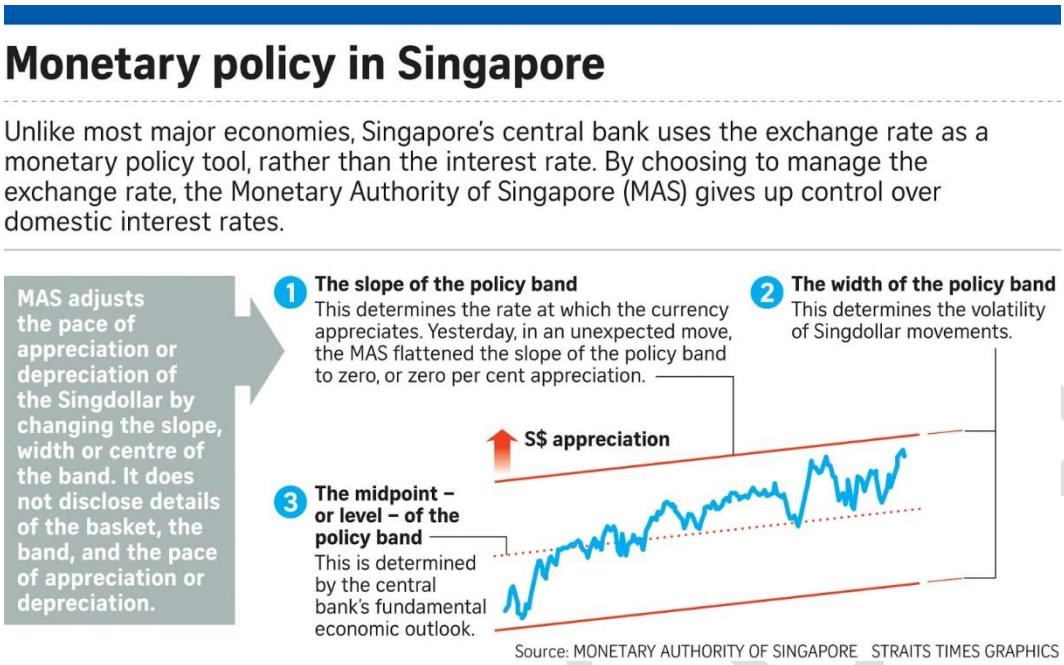
For example,

- When the Singapore dollar (SGD) appreciates above the upper limit, MAS may be concerned as this will make our exports less price competitive in foreign dollar → MAS will step in to weaken the currency by selling SGD in exchange for foreign currencies. This increases the supply of SGD in the foreign exchange market → creates a surplus → exerts downward pressure on the value of SGD → as a result, SGD depreciates and goes back into the band.
- When the SGD depreciates below the lower limit, MAS may be concerned as this will make imports more expensive, resulting in imported inflation → MAS will step in to strengthen the currency by buying SGD using our foreign currencies. This increases the demand of SGD in the foreign exchange market → creates a shortage → exerts upward pressure on the value of SGD → SGD appreciates and goes back into the band.

Good to know: Exchange Rate Regimes

Students who want to read up on other type of exchange rate regimes (i.e. the fixed and floating exchange rate regimes), you may refer to Annex D.

MAS implements this managed float exchange rate regime by targeting the Singapore dollar's nominal effective exchange rate (NEER) within an undisclosed policy band.



Referring to the graphic above, MAS can adjust the following few components to influence our Singapore's exchange rate:

1. Slope of the policy band – this determines the rate at which the currency appreciates. The steeper the slope, the faster the appreciation rate.

2. Width of the policy band – this determines the volatility of the currency movements. The wider the policy band, the more volatile the currency can fluctuate within the band.

3. Midpoint of the policy band – this determines how positive MAS perceived the future economic outlook to be.

When future global economic outlook is positive, AD is likely to rise sharply due to rising demand for Singapore's exports. Furthermore, price of imported factors of production such as oil is also like to increase with rising global demand. This will give rise to the higher the inflationary pressures. Hence MAS will adjust the midpoint band upwards, allowing the SGD is appreciate to achieve price stability.

When future global economic outlook is poor, AD is likely to fall, due to rising demand for Singapore's exports. This will result in negative economic growth and rise in unemployment. Hence, MAS will hence adjust the midpoint band downwards, allowing the SGD to weaken to boost AD and hence achieve economic growth and lower unemployment rate.

2.3.3 Contractionary Exchange Rate Policy

In general, countries use a **revaluation** of currency to address high inflation. In Singapore, the MAS adopts a **modest and gradual appreciation** of Singapore dollar to address inflationary pressures. This is because for an export dependent country like Singapore, a large appreciation of SGD would reduce export competitiveness and harm the economy too much.

MAS can achieve this modest and gradual appreciation by adjusting the slope and/or the midpoint level upwards to allow the SGD to strengthen due to upward pressure of market forces in the foreign exchange market. MAS can also buy SGD in the foreign market, increasing the demand for it and hence, creating an upward pressure on the value of SGD.

Modest and gradual appreciation of the SGD is to ensure price stability in the following ways:

a) Addressing imported cost-push inflation

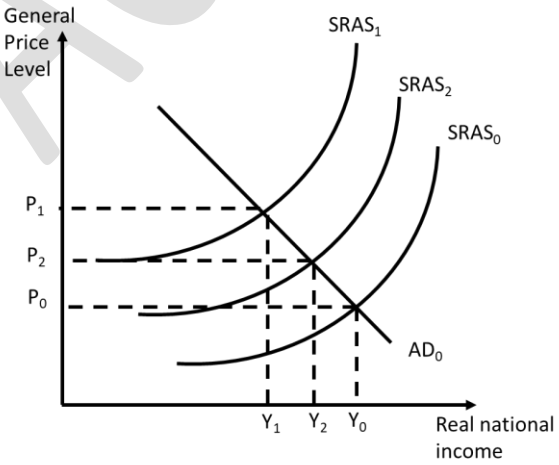
When there are external supply shocks, price of imports increases and SRAS decreases from $SRAS_0$ to $SRAS_1$. General price level increases from P_0 to P_1, leading to cost-push inflation.

The government allows the SGD to appreciate. Imported factors of production, such as raw materials, electronic components, and semi-finished goods, become cheaper in terms of domestic currency.

As domestic firms see a fall in unit cost of production, they will have more incentive to produce, shifting SRAS rightwards from $SRAS_1$ to $SRAS_2$. The lower unit cost of production may be passed on the households as lower prices.

At the same time, firms may be more willing and able to increase production of goods and services, leading to a surplus, hence reducing the prices of final goods and services. As a result, GPL falls from P_1 to P_2.

Figure 8: Reducing cost-push Inflation using exchange rate policy



Evaluation point: As a resource poor country, most of Singapore's imports are resources imported from overseas as there are few local substitutes.

This makes our demand for imports very price inelastic and Singapore is, hence, more vulnerable to external shocks. As such, given Singapore's nature of economy, currency appreciation of Singapore effectively helps us address imported inflation and achieve price stability.

b) Addressing high demand-pull inflation

During an economic boom, AD increases significantly. This results in demand-pull inflation as the GPL increases.

An appreciation of the SGD would mean that prices of exports in terms of foreign currencies increases. Exports will be less price competitive, and foreigners' demand for exports falls.

On the other hand, imports will be cheaper in domestic currency, resulting in households and firms to switch away from consuming local goods and services towards imports. Consumption expenditure would fall.

Overall, the fall in X and C reduces AD. Refer to the previous section on **Contractionary Fiscal Policy (page 13)** for the diagram and full explanation on the impact on the fall in AD on price stability.

Evaluation point: This is appropriate for trade-dependent Singapore since X takes up 150% of our GDP. Our source of demand-pull inflation is likely to be external given the nature of our economy.

Good to know: Impact of Appreciation on FDI

When SGD appreciates, there may be negative impact on Investment (FDI) too:

- Foreign firms may find investing in the domestic country more expensive, given that the domestic currency is stronger. The costs of investing include the cost of labour and raw materials.
- This may discourage foreign direct investment to flow into the country.

However, it is also possible that appreciation may in fact help Singapore attract more FDI. This is because a strong dollar helps achieve price stability and hence less uncertainty for foreign firms. In addition, a strong dollar may also be an indication that the Singapore economy is performing well, boosting investors' confidence.

Furthermore, FDI is also dependent on many other factors. For example, should there be very buoyant economic outlook, productive workforce, good infrastructure and low corporate taxes, FDIs may still flow in despite the stronger currency. Therefore the **impact of exchange rate on FDI is uncertain**.

Limitations of Contractionary Exchange Rate Policy

a) Might not address the root cause of inflation

Appreciation helps Singapore address external sources of inflation. However, if the rise in unit cost of production is due to domestic factors, such as rising labour and rental costs, appreciation may not effectively reduce the inflation in the country, as a stronger currency does not target the root cause of inflation.

A stronger SGD may only benefit firms that mostly import resources and factor inputs into Singapore. Not all firms require imported inputs.

For example, firms that are more service-based may not benefit from this, as compared to manufacture-based. Service-based industry requires fewer imported inputs, thus the impact of lower import prices on their cost of production becomes less significant. As such, an appreciation of S$ may not benefit these firms as much. If inflation is mainly in the service-based sectors, the stronger currency will not help to lower inflation much.

Good to know: Higher Order Evaluation

However, appreciation may help address domestic inflation ***indirectly***. In the case of Singapore, the bulk of our imports are mostly resources and factor inputs. Therefore, keeping our import prices low and stable will directly stabilise the prices of final goods and services, hence maintaining our purchasing power.

By maintaining our purchasing power, it also discourages workers from demanding for higher wages. This can help to reduce domestic inflation caused by wage-push inflation.

b) Conflicts with other macroeconomic aims: Actual Growth and Unemployment

Similar to contractionary fiscal and interest rate policy, if exchange rate appreciates too much, X and AD may fall sharply, leading to a significant contraction of real national income and rising unemployment. Refer to **"Limitations of Contractionary Fiscal Policy" on page 14** for the full explanation.

This unintended consequence can be significant for trade-dependent Singapore given that X takes up as much as 150% of our GDP.

Good to know: Higher Order Evaluation

However, strong currency keeps price of imports and hence the unit cost of production low. Hence, if firms pass on this lower unit cost of production to foreign households / trade partners, this will help mitigate the loss of export price competitiveness brought about by a stronger currency. As such, the negative impact on real growth and unemployment is less severe.

2.3.4 Expansionary Exchange Rate Policy

In general, countries use a **devaluation** of currency to address negative economic growth and high unemployment.

In Singapore, the MAS adopts a **zero appreciation of SGD**. When such a policy is adopted, MAS allows the SGD to depreciate. Do note that due to Singapore's reliance on imported factors of production, the MAS usually implements a modest and gradual appreciation. Zero appreciation is only used during severe global recessions, such as the COVID-19 pandemic in 2020 and the Subprime Crisis in 2008.

During a recession, zero appreciation of SGD aims to:

- Promote economic growth via higher (X-M)
- Reduce demand-deficient unemployment

This can be achieved through the impact of zero appreciation on aggregate demand:

- Export prices in foreign currencies fall → Prices of Singapore's exports will be cheaper to foreigners → Quantity demanded for exports will increase → export revenue increases, leading to increase in AD.
- Price of imports rise in domestic currency → consumers switch from imports to domestic goods → increase in consumption of domestic goods → AD rises further.
- The increase in AD will lead to actual economic growth. At the same time, the greater demand for goods and services will lead to higher derived demand for labour, reducing the demand-deficient unemployment.

The increase in AD due to a rise in consumption and investment leads to an increase in real national income via the multiplier process. Refer to the previous section on Fiscal Policy (pages 6-7) for the full explanation on the impact on the rise in AD on actual economic growth.

Evaluation point: Exports take up as much as 150% of Singapore's GDP. Given our reliance on external demand, a rise in X will lead to a significant rise in AD given the nature of our economy. This makes zero-appreciation effective.

Limitations of Expansionary Exchange Rate Policy

a) May lead to unintended consequences such as imported inflation

Zero appreciation will lead to conflicts with imported inflation.

When Singdollar depreciates, prices of imported resources increases in domestic currency. This increases the average unit cost of production, causing SRAS to decrease.

If firms pass on the rise in unit cost of production to the consumers by raising the prices of the goods and services, the general price level increases,

leading to imported inflation. This is especially so for Singapore as a resource poor country.

As a result of this significant unintended consequence, MAS will only allow our Singdollar to weaken during global recessions. The MAS may choose to prioritize growth and unemployment in the short run over inflationary concerns.

Good to know: Higher Order Evaluation

This limitation may not be significant in its impact in times of weak global economic growth. The risks of imported inflation are weaker in times where external economic environments are also weak. This is because global demand for goods and services, including resources, tends to be weak during global recession or slowdown, and this would likely depress global prices, hence dampening the effect of imported inflation. Hence, Singapore allowed the exchange rate to weaken during global recessions such as 2009 and 2020.

b) Outlook of the global economy

During a global recessions, other countries are concurrently facing recession or slow economic growth. This means that even if Singapore's exports are cheaper in foreign currencies, foreign households may not be willing and able to consume the exports, given their falling incomes and higher desire to increase their precautionary savings due to greater economic uncertainties. This will limit how much zero appreciation can help increase our export revenue.

Good to know: The Impossible Trinity

Now that you have learnt the various monetary policy tools such as interest rate and exchange rate, do you know that a government is not able to control interest rate, exchange rate and capital flows at the same time? For those interested, you may refer to Annex E to understand more about this impossible trinity.

Annex A: Determination of interest rate – Liquidity Preference Theory

Liquidity preference refers to the demand to hold 'liquid' also known as cash or money. This preference to hold cash can come from various motives:

a) Transaction Motive

The desire to hold cash to pay for current expenditures. This desire may vary depending on

- Movement in prices of goods and services in general. The higher the prices of goods and services, the greater the need to hold cash.
- The level and frequency of income received. The higher and more frequent the income is received, the lesser the need to hold cash.

b) Precautionary Motive

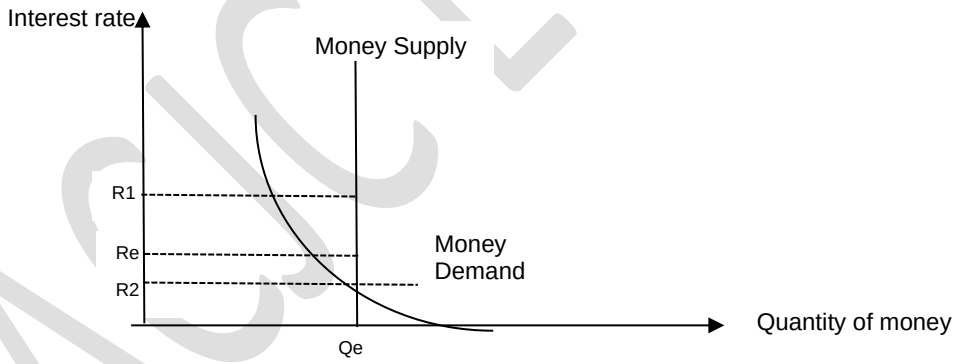
The desire to hold cash balances to meet expenditures that may arise due to unforeseen circumstances such as illness and accidents.

c) Speculative Motive

This refers to the cash balances that are held in excess of both Transaction and Precautionary motives, which are essentially known as idle balances. It can be used to purchase financial assets such as stocks, equities or bonds.

The supply of the liquidity or money is determined by the country's Central Bank and is independent of the interest rate. This is shown by a perfectly inelastic supply curve. How much money the Central Bank decides to hold depends on how much they would like to influence the interest rates to achieve its macroeconomic objectives.

Determination of Interest Rates



The equilibrium interest rate is determined by the intersection between the money demand and the money supply, at point E, giving the market interest rate of Re.

Suppose the market interest rate is at R1, where the money supply exceeds the money demand, this suggests an excess surplus of liquidity, which means that the interest rate has to drop in order to clear the surplus of liquidity. When interest rate falls, the quantity of money demanded will start to rise as shown by the movement along the money demand curve. The quantity of money demanded can rise when interest rate is lower due to the greater willingness to borrow to fulfil the various liquidity motives.

However, if the market interest rate is at R2, where the money demand exceeds the money supply, this suggests a shortage of liquidity, which means that the interest rate has to increase in order to clear the shortage of liquidity. When interest rate increases, the quantity demanded for money will drop since there is generally a lower willingness to borrow

money to fulfil the various motives. At the same time, the opportunity cost of consuming to households is now higher when interest rate is higher, as the returns on saving is higher.

Annex B: Unconventional Monetary Policy - Quantitative Easing

Traditionally, Central Banks (e.g. Bank of England, Bank of Canada and Bank of Japan) adjust the policy interest rate to influence economic growth and inflation. Changing the policy interest rate directly affects **very** short-term interest rates. Changes in the short-term interest rates will eventually have an impact on mortgages and long-term interest rates.

However, during crisis such as the financial crisis of 2008-09 and COVID-19 pandemic, the interest rate is already very low and Central Banks need to use other monetary policy tools to support the economy and reach the inflation goal.

One of these tools is quantitative easing (QE). QE is different from the normal interest rate policy actions because it allows Central Banks to have more **direct** influence on longer-term interest rates that consumers and businesses pay. But QE has the same objective as changing interest rate policy rate—to achieve economic growth and inflation target.

Glossary of Terms

- Short-term interest rates are the rates of short-term borrowings between financial institutions (e.g. commercial banks, investment banks and insurance companies).
- Long-term interest rates are one of the determinants of business investment. Low long-term interest rates encourage investment in capital goods and high interest rates discourage it. Rates are mainly determined by the price charged by the lender and the risk from the borrower. Long-term interest rates refer to government bonds maturing in ten years.
- Bond is like a 'IOU' issued by governments and companies that can be bought and sold in the financial markets. A government bond issued by a national government to finance its spending. Essentially, a government bond is a loan that a lender makes to a government, which the government has to repay when the bond matures. The lender will receive periodic interest payments and the return of the principal amount when the bond matures. Bonds are considered to be low-risk investments, as they are backed by the full faith and credit of the issuing government.

The workings of Quantitative Easing (QE):

QE affects the long-term interest rates and prices of other financial assets.

1. **Impact of QE on long-term interest rates**

   Under QE, a central bank buys government bonds. The money Central Banks used to buy bonds did not come from government taxation or borrowing. Instead, central banks create money digitally.

   Buying government bonds increase the demand for bonds and thus, raises the price of the bonds. However, this lowers the return of the bonds — the rate of interest bonds pays to bondholders. This rate of return will directly influence other borrowing rates. Overall, long-term interest rates will fall, making it cheaper for households and firms to borrow money. So, QE encourages households and businesses to borrow, spend and invest. Increase consumption and investment spending will increase AD.

QE also sends a signal that the Central Banks intend to keep their policy interest rate low for a long time— as long as inflation stays under control. By giving more certainty to the interest rate policy will remain low, QE can help reduce longer-term borrowing costs for businesses and households, further increase consumption and investment spending.

2. **Impact of QE on financial assets**

   QE increases the price of financial assets other than bonds, such as shares.

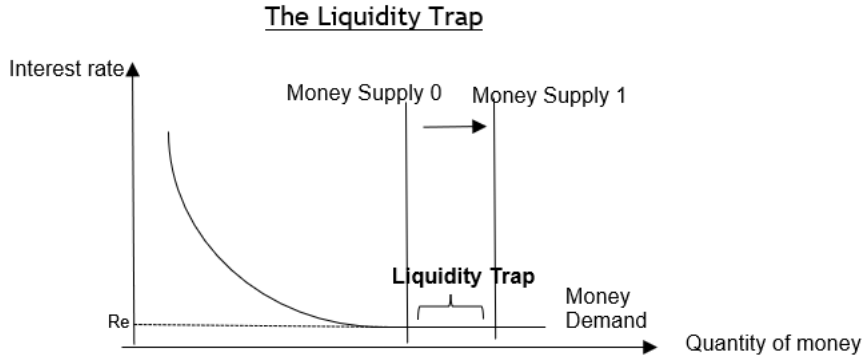
   When Central Banks buy government bonds from financial institutes (e.g. commercial banks and investment banks), the financial institutes will see themselves holding more funds. Rather than hold on to that cash, the financial institutes might use the additional funds to buy other financial assets, such as shares.

   Increase in demand for shares will push up on the value of shares. Households and businesses and other financial institutions that own those shares will see an increase in their wealth. That makes households and firms likely to spend more, increase consumption and financial spending. This will increase AD, boosting economic activity.

Limitations and danger of QE

The main limitation of QE is the weak outlook of the economy. Despite the injection of liquidity into the economy, if the households and businesses are pessimistic about the future expected income and profits, they are unlikely to borrow and thus, consume and invest respectively.

Annex C: The Liquidity Trap



When the Central Bank increases the money supply and the interest rate falls, the demand for money does not change when the interest rate is already near to zero.

This can be seen by the perfectly elastic money demand curve, where the money demand remains low despite the low interest rates.

Annex D: Different exchange rate regimes

Different countries may choose to adopt different exchange rate regimes. In the case of Singapore, we have chosen to influence our exchange rate via the managed float regime. The choice of exchange rate regime to adopt is usually decided by the government.

There are three types of exchange rate regime:
1. Floating exchange rate regime
2. Managed float regime – adopted by Singapore
3. Fixed exchange rate regime

In this Annex, you will learn more about the floating and fixed exchange rate regimes.

Floating Exchange Rate
Note that this is what you have learnt in the previous set of notes External Macroeconomic Issue – Section 2.1 Exchange Rate Determination.

The floating exchange rate is determined directly by market forces, demand and supply of currency. If either demand and/or supply of a currency changes, appreciation or depreciation of the currency may occur.

Fixed Exchange Rate
A fixed exchange rate, sometimes called a pegged exchange rate, is a type of exchange rate regime where the domestic currency's value (e.g. Yuan) is fixed to a value of a single foreign currency (e.g. US$). At times, the government may choose to fix it to a basket of other currencies (e.g. US$, Euro and Japanese Yen).

A fixed exchange rate is usually used to stabilize the value of the domestic currency against the foreign currency it is fixed at. This makes trade and investments between these two countries easier and more predictable. It could be especially useful for economies where external trade forms a large part of their GDP.

This is a system whereby exchange rates are fixed for a period of time and the government will have to either buy or sell foreign currencies to keep the value fixed.

Annex E: The Trilemma / Impossible Trinity

We have learnt and understood why Singapore does not make use of interest rates, but rather exchange rates, to achieve our macroeconomic objectives. We have also learnt that changes in interest rates affects short-term capital flows such as 'hot money' which then in turn affects the country's exchange rates.

However, do you know that it is impossible for a country to control all three of the following simultaneously?

1. Exchange rate
2. Capital mobility
3. Interest rates

For any country that pursues free capital mobility (i.e. allowing capital flows to come in and out of the country freely), the country will have to make a choice between choosing a monetary policy centering around exchange rates OR interest rates.

- If a country chooses to prioritize a monetary policy centered on interest rate (i.e. government manipulates interest rates) and free capital mobility, this means the government gives up the control of exchange rate, hence it may result in a fluctuating exchange rate, where the exchange rate is determined based on market demand and supply forces.
- If a country chooses to prioritize a monetary policy centred on exchange rate (i.e. government manipulates exchange rate) and free capital mobility, this will result in the country losing the ability to adjust her interest rates, to be an interest rate taker (i.e. follows the interest rates set by major economies).
- For any country which would like to control both the interest and exchange rates, the country will then have to give up on free capital mobility. Thus, the country must

manage how much capital inflow and outflow it can allow, so as to set the interest rate and exchange rate at an expected level.

Therefore, a government and hence the central bank will have to choose which tools they would like to control, because it is not possible to target all three concurrently. The tools they eventually chosen should help the country to achieve its macroeconomic objectives most effectively.