RAFFLES INSTITUTION

MACROECONOMIC POLICIES
MONETARY POLICY & EXCHANGE RATE POLICY

Outline of Contents

References
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Lispey, et al., *Economics,* 9th Edition, Harper Collins
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Sloman, J., *Economics*, 8th Edition, Hertfordshire: Prentice Hall
Singapore Department of Statistics www.singstat.gov.sg
Monetary Authority of Singapore www.mas.gov.sg
The Federal Reserve http://www.federalreserve.gov/
The Bank of England http://www.bankofengland.co.uk/monetarypolicy/

Lecture Objectives:

- Explain how the AD/AS approach may be used to analyse the way monetary policies (interest rate and exchange rate) can affect the levels of employment, rate of inflation, economic growth and the balance of payments position.
- Evaluate the effectiveness of these policies to address the economic aims in a country.
- Have a good knowledge of recent economic trends and developments, with a focus on the Singapore economy.

1 Introduction - Monetary Policy around the world

The financial news is always full of reports about interest rates. Below are some examples of such reports.

"Bank of England maintains Bank Rate at 0.5% and the size of the Asset Purchase Programme at £375 billion. The MPC voted unanimously to maintain Bank Rate at 0.5%. The Committee also voted unanimously to maintain the stock of purchased assets financed by the issuance of central bank reserves at £375 billion……."

(Bank of England 04 February 2016)

"Japan's investment industry is seeking protection from negative interest rates as the central bank's policy comes into effect this week and threatens a $100bn slab of savings."

(http://www.ft.com/cms/s/0/38c1d806-d2d6-11e5-8887-98e7feb46f27.html#ixzz4091mlk1g)

The Federal Reserve decided to hold steady and not raise US interest rates for at least another two months at its latest meeting, arguing that near-term risks to the US economy have diminished. This is the fifth time that the Fed has decided against raising interest rates since December, when it raised interest rates for the first time in almost a decade. Federal interest rates remain unchanged at 0.25% to 0.5%.

From the above examples, it is evident that interest rate is an important variable in the economy as it has implications on the macroeconomic goals of the government. As such, interest rate has been employed by governments all over the world to influence the performance of their economies.

Note:
There are 2 possible tools of Monetary Policy:
1. Interest-rate
2. Exchange rate

2 Definition of Monetary Policy

Monetary policy (MP) refers to a Central Bank's actions to influence the availability and cost of money and credit, so as to achieve macroeconomic goals of sustained rate of economic growth, low inflation, full employment and favourable balance of payments. The Central Bank can do this either through influencing the interest rate or the money supply in the economy.

In large economies like the United States, where consumption and investment expenditure make up a large part of aggregate demand, interest rate or money supply is used as a tool of monetary policy. This is conventional MP.

However, in small and open economies like Singapore, where the value of its total trade is close to 4 times its GDP value, the Central Bank may choose to anchor its monetary policy to the exchange rate. This is also known as Exchange Rate Policy. The Monetary Authority of Singapore manages the value of the Singapore dollar within a desired range in relation to a basket of foreign currencies[1]. *This will be explained in Section 4 under The Exchange Rate Policy.*

The **Central Bank** is the principal monetary authority of a nation, which performs several key functions, including issuing currency and regulating the supply of credit in the economy. Refer to Appendix 1 for the functions of the central bank.

Central Banks around the world: US - Federal Reserve Bank (Fed), UK - Bank of England, Japan - Bank of Japan, Singapore – Monetary Authority of Singapore

[1] Adopting the managed float system, the Singapore dollar is allowed to fluctuate within an undisclosed band against a trade-weighted basket of currencies of Singapore's major trading partners.

2.1 Types of Monetary Policy

Depending on the circumstances facing each economy, the Central Bank can choose to adopt either:

- **An Expansionary Monetary Policy (Cheap or Loose Monetary Policy)**
  The Central Bank increases money supply or lowers interest rate to make credit more easily available and borrowing cheaper.

> **Note:** Interest rate determination is NOT in the syllabus. This section will focus on the effects of interest rate changes.

- **A Contractionary Monetary Policy (Restrictive or Tight Monetary Policy)**
  The central bank reduces money supply or increases interest rate to limit the availability of credit and make borrowing more costly.

> **Key effect of MP:**
> Changes in interest rate will affect C, I, and net X, and thus AD. This will impact growth, employment, inflation and BOP.

3 Monetary Policy and its Effectiveness

Recall that in a 4-sector economy, AD = C + I + G + (X-M). Interest rate changes will affect consumption spending by households and firms' investment on capital goods and inventories, as well as net exports by the foreign sector. These components of AD will then have an impact on the level of national output, employment, general price levels and the balance of payments.

3.1 Using Expansionary Monetary Policy in a Recession and to reduce Cyclical Unemployment

Expansionary monetary policy seeks to boost the rate of economic growth and reduce cyclical unemployment.

> **Recall:** Interest rate is a determinant of the level of consumption and investment.

i. How It Works

Internal Effects:
A lower interest rate makes it cheaper to borrow. Households are more likely to borrow to purchase big-ticket items or consumer durables such as cars, furniture and household appliances. Consumption spending rises as a result. For firms, there will be more projects which will now be profitable due to the lower cost of borrowed funds used to finance these projects. As long as the expected profits from the project are greater than the lowered interest rate, firms will increase investment in plants and machines as well as inventories.

External Effects:
The fall in domestic interest rates may make it lower than that of other countries. People are likely to place their funds in other countries with higher rates to enjoy the higher interest returns. This induces a rapid outflow of 'hot money' from the country.

As the domestic currency is given up in exchange for foreign currency, its supply rises in the foreign exchange market. Ceteris paribus, the result is a fall in its exchange rate i.e. depreciation of the currency against other currencies. With the depreciating exchange rate, the country's exports are now cheaper in foreign currency. The quantity demanded for exports rises. On the other hand, imports are now more expensive in domestic currency. The quantity demanded for imports falls. Assuming the demand for exports and imports is price elastic, the value of net exports increases.

ii. Impact on Internal Stability: National Income, Employment and Inflation

The resultant increase in consumption and investment and value of net exports (X-M) causes aggregate demand for goods and services to rise and a more than proportionate increase in

the equilibrium level of real national income, ceteris paribus.

The increase in AD causes current spending to exceed current production levels at the initial general price level. Hence, firms will run down on inventories to meet the excess demand/shortage. The fall in inventories will stimulate firms to hire more workers and increase production in the next time period. Workers use part of this additional income to buy domestically produced goods and services. The increase in induced consumption spending creates income for yet another round of firms and their workers. This process is repeated over many rounds to create more income and jobs.

However, the presence of withdrawals/leakages (due to savings, taxes and spending on imports) at each round cause each subsequent round of spending to be smaller than the previous round. Eventually when the increase in total withdrawals equals the initial increase in AD, the spending process will stop with a new and higher equilibrium level of national income attained. The increase in equilibrium real national income is more than proportionate to the initial increase in AD. This is known as the multiplier process. Actual growth is achieved.

As seen in Figure 1, the economy is initially operating at less than full employment at 0Y1. The increase in AD due to the rise in C, I and (X-M) causes multiple rightward shifts of the AD curve from AD1 to final position AD2. Equilibrium level of real national income rises by more than proportionate from Y1 to Y2. As the increase in output to $0Y_2$ requires the employment of more factors of production, including labour, the level of cyclical unemployment is reduced.

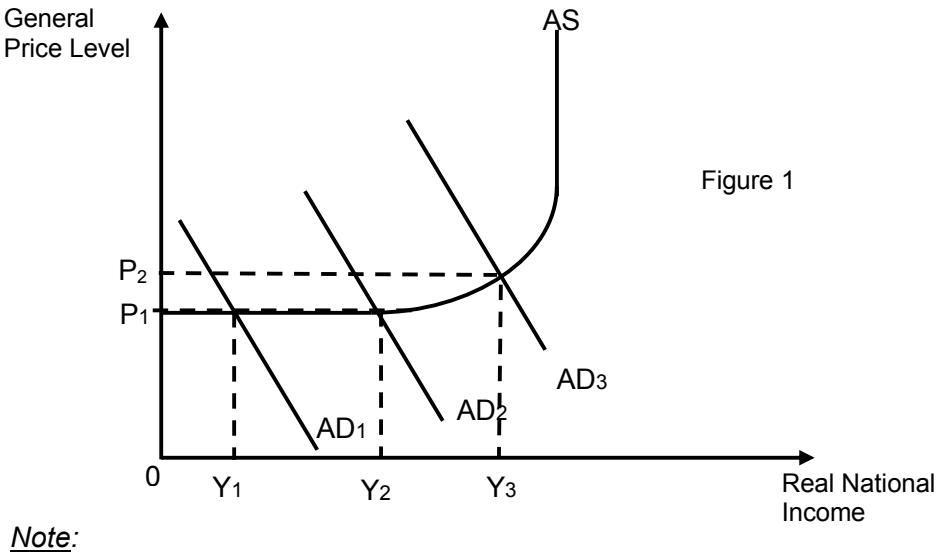


Figure 1

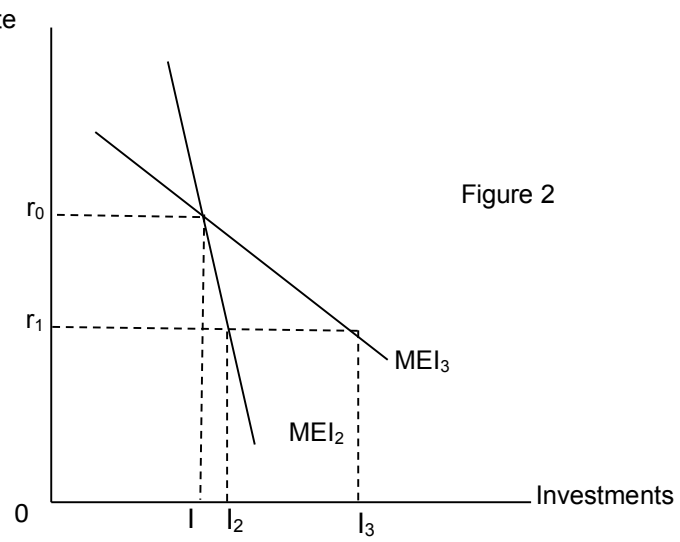
Note:
However, if the economy is already near or at full employment of resources, the rise in AD causing the AD curve to shift from AD2 to AD3 will result in a smaller increase in real national income from Y2 to Y3 and an increase in the general price level from 0P1 to 0P2. Why?

This is because as production increases, resources become scarcer and each additional unit of output becomes more costly to produce. A higher price is required to ensure that production remains profitable so that producers have the incentive to increase production. Thus the rise in aggregate demand has led to a rise in the general price level, also known as demand-pull inflation.

iii. Effectiveness of Expansionary Monetary Policy

1. Responsiveness of investment to interest rate change

The response of investment decisions to changes in interest rate will determine its effectiveness. Keynesian economics argues that the demand for investment is interest insensitive (or interest inelastic) i.e. any changes in interest rate will be met with a less than proportionate change in investment.



Thus, as seen in Fig 2 above, with an interest insensitive MEI_2 ,(shown by a steeper curve), a decrease in interest rate from $0r_0$ to $0r_1$ will not have a significant impact on investment as investment rises only to 0I2. The argument is that the level of investment depends on other more important factors such as confidence of future profits. In a recession, business confidence is likely to be low and firms' expected stream of profits from the additional investment project may be lower than the lower cost of borrowing (i.e. lower interest rate).

Households may be similarly pessimistic about the future state of the economy and may not be induced to borrow more despite the lower interest rate. This can also have an impact on firms as they are less likely to increase their investment in anticipation of lower consumer demand. In sum, the effect on AD due to the lower interest rate may not allow the real national income to reach its desired level.

2. Size of multiplier

The larger the multiplier size, the more effective will be the expansionary monetary policy in stimulating growth and reducing cyclical unemployment. The higher the marginal propensity to consume (i.e. the more households spend out of every increase in income), the larger will be the multiplier size since a greater fraction of each additional rise in income will be spent instead of being withdrawn in the form of savings, taxes and imports.

3. Problem of Time Lag (*Refer to Fiscal Policy for details)*

Just like fiscal policy, there are three phases, namely recognition lag, administrative lag and operational lag for a given policy to finally yield its effect on the level of real national income. The Central Bank is fairly autonomous in its decisions on interest rate changes, so administrative lag is shorter than that for fiscal policy. Nonetheless, it still takes a fairly long time for monetary policy to work through the economy. For example, the many rounds of spending can take anywhere from three months to two years to be completed. As a result, the economy may have recovered on its own, causing AD to rise. The expansionary impact of the monetary policy causes further increases in AD, thereby contributing to a possible reverse problem of demand-pull inflation.

4. Availability of Alternative Sources Of Funds

A fall in interest rate will not increase the level of long term investment extensively if there is a large proportion of foreign direct investment (FDI). Often, these firms have their own sources of funds and may not borrow from the local banks. Any fall in the interest rate may have little bearing on the foreign firms' decisions to invest. In this instance, the impact of the interest rate may be limited.

5. Not appropriate for Reducing Structural Unemployment

Monetary policy is a demand-management policy appropriate for stimulating economic growth and as a result, reducing demand-deficient or cyclical unemployment. Structural unemployment often arises when an economy restructures (e.g. shifting from reliance on labour-intensive industries to capital-intensive industries). Workers are likely to lack skills for the new industries. In this instance, the use of supply-side policies that focuses on re-training rather than monetary policy will be more appropriate in solving the employment problem.

6. Limited Role of Interest Rate Policy in Singapore

In the context of Singapore, in a recession, the government usually uses expansionary fiscal policy as interest rates have a limited role. Its smallness and importance as a financial centre means that a large percentage of its funds are from overseas. Any influx of 'hot money' will increase the money supply and thus reduce interest rates, vice versa. In fact, interest rates in Singapore are largely determined by international rates. For example, if US interest rates were to fall, 'hot' money may flow into the Asian region including Singapore where the rates may be higher. As a result, the money supply in Singapore rises, causing a fall in interest rates.

Since interest rates are beyond the control of the Singapore government, it is limited in its role as a demand-management tool.

3.2 Using Contractionary Monetary Policy to reduce Demand-Pull Inflation

Contractionary monetary policy refers to the raising of interest rates by the Central Bank. It seeks to reduce the level of inflation caused by high aggregate demand when the economy is already near or at full employment.

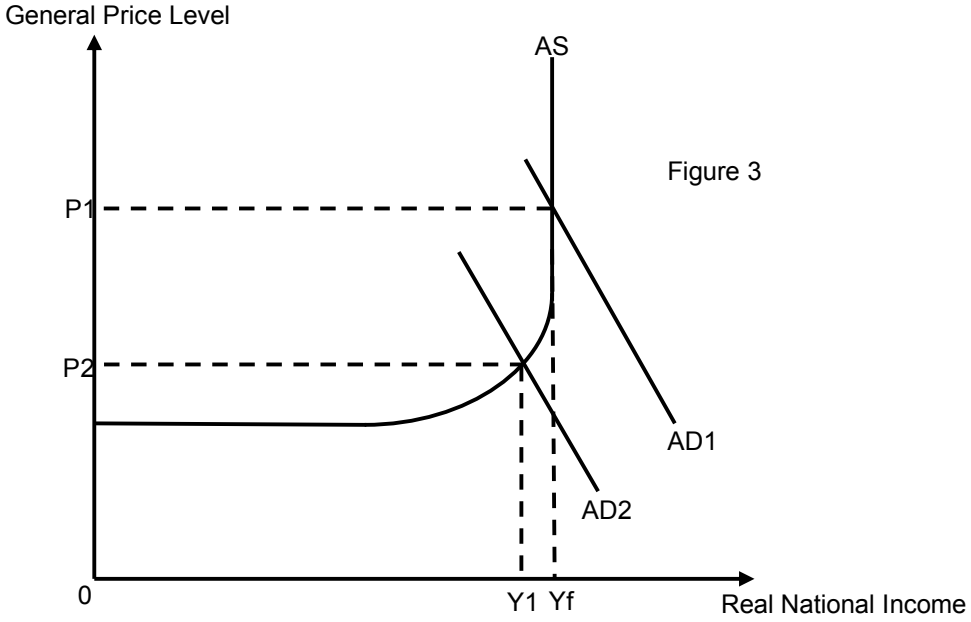
i. How It Works:

Internal effects:
With the higher interest rates, households now find it more costly to obtain loans from the banks to finance the purchase of big-ticket items and consumer durables. At the same time, firms are left with fewer investment projects with expected profits high enough to cover the higher cost of borrowing. Thus raising interest rates leads to a reduction in both consumption and investment spending.

External Effects:
When Country A's interest rate increases relative to that of other countries, ceteris paribus, 'hot money' will flow into the country to take advantage of the higher interest returns, given free capital flows. This increases the demand for Country A's currency, thus causing an appreciation of its exchange rate, ceteris paribus. As more foreign currency is needed to exchange for one unit of Country A's currency, the appreciation increases foreign price of Country A's exports, making it more expensive to the foreigners. The quantity demanded for Country A's exports falls as a result. Concurrently, imports are now cheaper in Country A's currency. The quantity demanded for imports rises. Assuming the demand for exports and imports is price-elastic, the value of net exports falls.

ii. Impact on Demand-pull Inflation

As autonomous C, I and X-M fall, the decrease in AD will shift the AD curve from AD_1 to AD_2, as shown in Figure 3 below. The general price level is now at $0P_2$. Thus, inflationary pressures have been dampened.



iii. Effectiveness/Limitations of Contractionary Monetary Policy

1. Responsiveness of investment to interest rate changes

As mentioned in *Section 3.1*, the effect on AD depends on the interest sensitivity of investment. Inflation caused by rising AD is due to a booming economy. This fuels optimism, and encourages spending as firms are confident of continued future profits and households feel assured of pay rises and bigger bonuses. This is likely to make the demand for investment interest-insensitive (inelastic). For a given increase in interest rates, there will only be a less than proportionate fall in investment. In such a case, the fall in AD may not be sufficient to reduce the demand-pull inflation or over-heating in the economy.

2. Alternative sources of funds to finance projects

A rise in the interest rate may not deter firms from investing if business expansion is financed through retained profits which is all the more possible in a booming economy. Furthermore, in a country where FDIs make up the bulk of the investment, these corporations are less likely to be borrowing from the local banks to finance their expansion plans. In all, the reduced dependence on bank loans as a source of financing can weaken the effectiveness of a contractionary monetary policy.

3. Conflicts with other macroeconomic goals

Conflicts between macroeconomic goals often occur. When interest rates are raised to reduce demand-pull inflation, the fall in AD can cause the level of national income to fall to 0Y1, as shown in Figure 3. Consequently, the unemployment rate rises since fewer workers are needed with the fall in output. This is known as the inflation-unemployment trade-off.

4. Problem of Time Lag

The above problem of fall in growth and increased unemployment may be worsened due to time lags. The economy could have already landed in a recession as AD has fallen due to other factors (e.g. a fall in exports). Then the contractionary policy starts to take effect, causing a further fall in AD. This can impinge adversely on the level of national income and worsen the unemployment problem.

5. Limited Role of Interest Rate Policy in Singapore

As discussed in Section 3.1, there is limited role for interest rates in Singapore since its rates

are determined by international rates. Thus, where demand-pull inflation is concerned, the government often chooses to be more prudent in its spending so that such public sector (i.e. government) spending does not add to the over-heating. One of the key factors affecting inflation in Singapore is the rise in the price of imported raw materials. Given our reliance on such imports due to our lack of natural resources, we are often very susceptible to imported cost-push inflation. In this respect, an appreciation of the exchange rate directly reduces the price of imports, and may thus be a more appropriate measure to address the root cause.

4 Exchange Rate Policy

4.1 Definition of Exchange Rate

Exchange rate is the price of one country's currency in terms of another country's currency.

4.2 Determination of Exchange Rate

The market exchange rate, where there is no intervention by the Central Bank, is determined by the interaction of demand for and supply of a country's currency. This is known as the freely floating or perfectly flexible exchange rate system.

However, sometimes the Central Bank may intervene in the exchange rate market to prevent excessive fluctuations in the exchange rate.

- In a fixed exchange rate system, the Central Bank intervenes by fixing (pegging) the value of the country's currency at a specific rate of exchange to another country's currency eg. US$.
- In a managed float exchange rate system, the currency is allowed to float within a targeted band/range. The Central Bank intervenes only when the currency floats out of the band/range.

4.3 Determination of Exchange Rate in a Freely Floating Exchange Rate

Note:
ER determination may be tested under the applications of demand and supply.

Demand for currency

1) Changes in the demand of Singapore goods and services by foreigners
2) Changes in relative interest rates between countries
3) Changes in the expectations of currency traders about the likely future value of the Singapore dollar against foreign currencies

Supply of currency

1) Changes in demand for foreign produced goods and services by Singaporeans
2) Changes in relative interest rates between countries
3) Changes in the expectations of currency traders about the likely future value of foreign currencies

Equilibrium in a Freely Floating Foreign Exchange Market

As shown in Figure 4, the equilibrium exchange rate is initially at E_0 where quantity demanded for the currency matches quantity supplied. There is no shortage or surplus of domestic currency.

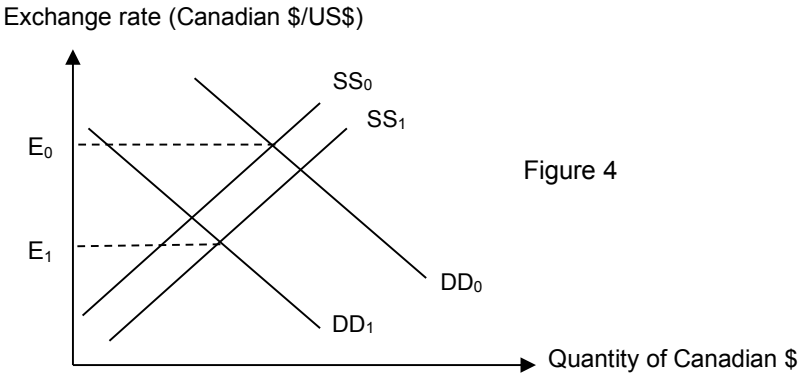


Figure 4

Factors affecting Demand for currency

- **Changes in income levels of trading partners** will influence demand for Singapore products. An economic expansion in our trading partners will increase demand for Singapore's goods/services and thus increase demand for S$. Likewise, during a recession, demand for S$ will fall.

- **Changes in relative interest rates between countries.** If interest rates in Singapore rise and are higher than that of the UK, the desirability of investing in Singapore's financial assets will increase. The demand curve for S$ shifts right, causing an appreciation of the Singapore dollar.

Factors affecting Supply of currency

- **Changes in demand for foreign produced goods and services by Singaporeans.**
  If there is a switch in taste and preference by Singaporeans towards imported (British) goods as compared to locally produced goods, this will increase the demand for imports. The rise in import spending will increase the supply of S$ in the foreign exchange market as Singaporeans give up S$ in exchange for UK pound.

- **Changes in relative interest rates between countries**
  As explained earlier, changes in relative interest rates will also affect the exchange rate of a currency. For example, if interest rates in Singapore fall relative to interest rates in the UK, this will lead to short-term capital outflow from Singapore to the UK. Thus, the supply of S$ in the foreign exchange market will increase.

- **Relative price levels of similar goods and services between countries:**
  The relative price level of goods and services is one of the most important determinants of exchange rates. Take for example two countries – Canada and the United States. If prices rise faster in Canada than in United States, this will cause Canada's exports to be relatively more expensive compared to the US. Thus the demand for Canadian goods & services will fall. When total spending on Canadian goods falls, the demand for Canadian dollars decreases. This causes the demand curve for Canadian dollars to shift to the left, causing it to depreciate against the US$.
  On the other hand, imports from US are now relatively cheaper in Canada. Hence, the demand for US goods and services rises. As the total spending on US goods rises, the demand for US$ will increase. More Canadian dollars are supplied in exchange for US dollars. This will cause an increase in the supply of Canadian dollars in the foreign exchange market and the supply curve of Canadian dollars will shift to the right.

  As seen in Fig 4 above, the fall in demand for Canadian dollars to DD_1 and the increase in its supply to SS_1 will cause the Canadian dollars to depreciate against the US dollar, ceteris paribus.

1.4 Foreign Exchange Market Intervention by the Central Bank

The **details** of the different exchange rate systems are not required in the H1 syllabus.

Not all countries allow their exchange rate to be determined by demand and supply forces. Some countries choose to adopt what is known as the fixed exchange rate system or the managed float exchange rate system.

i. Fixed exchange rate (pegged exchange rate system)

To minimise uncertainty and to prevent excessive fluctuations in its country's exchange rate, the Central Bank may intervene in the foreign exchange market to prevent the external value of its domestic currency from changing.

For instance, the Chinese Yuan and the Malaysian Ringgit (RM) were both fixed to the US$ until 21st July 2005. The Thai Baht was also fixed to the US$ prior to 2nd July 1997.

To influence the price at which one currency trades for another, the Central Bank has to

influence the demand for or supply of its domestic currency. The Central Bank has to buy and sell its own domestic currency in the foreign exchange market in return for the foreign currency to which it is pegged. For instance, to increase the value of its domestic currency, it must buy (increase the demand for) the domestic currency and sell foreign currency. To decrease the value of its domestic currency, it must sell (increase the supply of) its domestic currency and buy foreign currency.

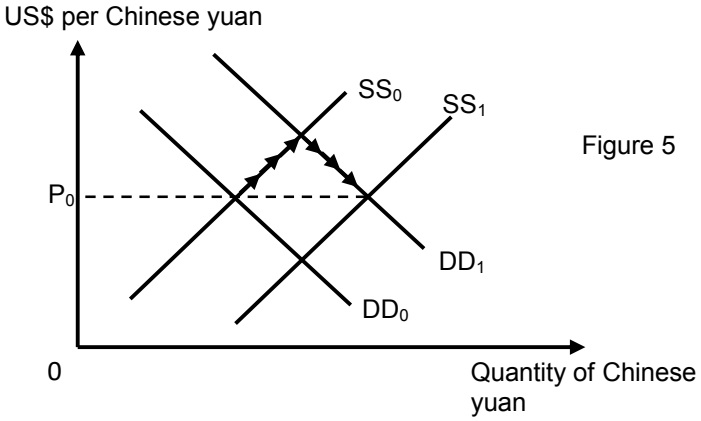


Figure 5

Figure 5 shows how the government can peg the price of Chinese yuan to the US$. Suppose the China central bank targets its exchange rate at P_0. Assume that there is an increase in demand of yuan due to an increase in preference for Chinese goods by the US consumers. This means that US consumers will demand more yuan. The demand for yuan will shift to DD_1. If left to free market forces, the yuan will appreciate. As the Chinese government is committed to keep the value at P_0, they will sell yuan into the foreign exchange market. The supply curve of HK$ will shift to SS_1. The resultant effect is that there will be more yuan transacted in the foreign exchange market and the Chinese government now has more foreign reserves (other countries' currencies). This allows the yuan to remain at P_0.

Note: This is Singapore's ER regime.

ii. Managed float (dirty float) exchange rate

The fully fixed and free float exchange rate regimes are the two theoretical extremes. Today, almost all economies have some sort of compromise between these extremes - an exchange rate system that is free to fluctuate with the central bank intervening to prevent wild and excessive fluctuations. There is thus an acceptable band whereby the exchange rate is allowed to fluctuate in the foreign exchange market before intervention begins. Some countries disclose how much fluctuations are allowed (disclosed band) but others do not disclose their official target band.

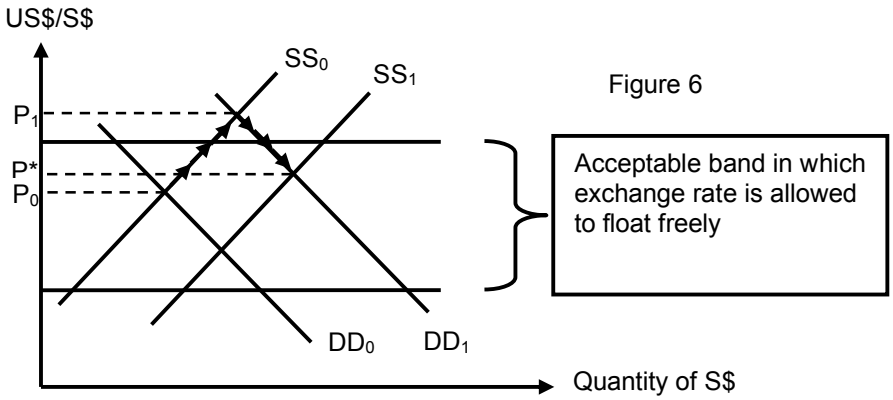


Figure 6

Figure 6 shows how the Monetary Authority in Singapore (MAS) can manage the price of Singapore Dollar. Suppose MAS allows its exchange rate to float freely within the target band above. Assume that there is an increase in demand of S$ due to an increase in preference for Singaporean goods by the US consumers. This means that US consumers will demand more S$. The demand for S$ will shift to right (DD_1). There will be an upward pressure on the value of the S$. If left to free market forces, value of S$ will go beyond the upper limit of the band at

P_1. However, the Singapore government is committed to keep the value within the band, hence they will release more S$ into the foreign exchange market, shifting supply of S$ to SS_1. The resultant effect is that there will be more S$ transacted in the foreign exchange market as well as a slight appreciation of the Singapore dollar from P_0 to P^* and the value of S$ in terms of US$ remains within the band.

5 Exchange Rate Policy and its Effectiveness

Changes in exchange rates can affect the price of exports in terms of foreign currencies, as well the price of imports in terms of domestic currency. In other words, the management of exchange rates can affect a country's export competitiveness and in turn its balance of trade and balance of payments position. Hence the exchange rate can be used to achieve certain macroeconomic aims like boosting economic growth, correcting balance of payments deficit.

5.1 Devaluation/Depreciation of currency

When a government devalues its exchange rate or allows the currency to depreciate, it will cause the price of the country's exports in terms of foreign currency to fall and the price of imports in terms of domestic currency to rise. This causes a rise in the quantity of exports and a fall in the quantity of imports respectively.

The effect on balance of trade depends on the price elasticities of demand for exports and imports. As long as the demand for X and M is price elastic, the balance of trade will improve, thus reducing a BOP deficit.

The increase in X-M will also lead to a more than proportionate increase in AD and generate economic growth and reduce unemployment.

However, prices of <u>imported</u> raw materials used in the production of goods and services will increase as a result of the depreciation of the currency. This causes the costs of production to increase, resulting in a vertical upward shift of the AS curve with resultant imported cost-push inflation.

[Note: Compared to a larger and less import-reliant economy, the impact of currency depreciation on import prices is more significant in a small, open economy such as Singapore where most factor inputs are imported from abroad.]

Difference between Devaluation and Depreciation (Revaluation/Appreciation)

Devaluation and depreciation are often used interchangeably in newspaper articles but there is a difference and it is good practice to know what the difference between them is. Devaluation happens only in a country with a fixed or semi-fixed exchange rate, whereby the government makes a conscious decision to lower its exchange rate.

Depreciation occurs in a floating exchange rate, where the fall in value of the currency is due to the changes in the free forces of demand and supply factors, rather than a government's decision.

Limitations:
However, devaluing the exchange rate may not be the best policy if it does not address the root cause of the balance of payments deficit. For instance, if the deficit on the current account is incurred due to a loss in cost competitiveness, then devaluation is only a temporary solution. The long term solution is the use of supply-side policies which include measures to boost productivity or even restructure the economy.

<u>J-curve Effect</u>
However, **<u>in the very short run</u>**, the demand for both exports and imports may be very price inelastic, thus worsening the balance of trade.

Consumers need time to change their consumption patterns and preferences. They may not increase their consumption of goods from the country that devalued its currency. Similarly, as imports become more expensive, domestic consumers need time to find substitutes. In addition, producers often have to fulfil existing contractual obligations with respect to the volume and price of imports/exports. As a result, the demand for exports and imports may be very price inelastic in the short run. As a result, the balance of trade may worsen initially.

Given a longer period of time, changes in consumption pattern will take place and substitutes can be found. When the Marshall-Lerner condition is fulfilled, the balance of trade will improve.

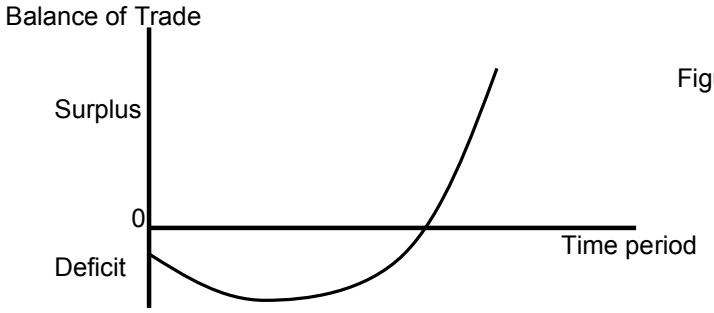


Figure7

The effect of currency devaluation on the balance of trade, and therefore balance of payments, is shown by the J-curve in Figure 9. The J-curve shows the initial deterioration in the current account as a result of the devaluation of a currency. This is followed by an improvement over time.

5.2 Revaluation/Appreciation of currency

Revaluing the domestic currency or allowing the exchange rate to appreciate will cause exports to be more expensive in terms of foreign currencies and imports to be cheaper in terms of domestic currency. Assuming demand for exports and imports is price-elastic, the balance of trade will worsen, hence reducing the balance of payments surplus. A decrease in net exports will contribute to a fall in AD causing a leftward shift of the AD curve, ceteris paribus. This can be useful if the economy is booming and facing demand-pull inflation.

In addition, prices of imported raw materials (in S$) used by Singapore firms in the production of goods and services will decrease as a result of the appreciation of the S$. This causes the costs of production to fall, resulting in a vertical downward shift of the AS curve. This reduces the prospect of imported cost-push inflation.

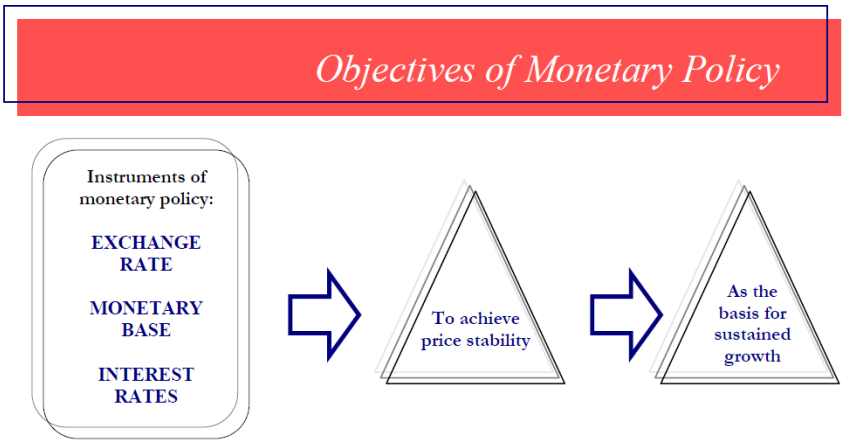
In all, an appreciation of the currency can lead to a lower rate of inflation. However, national income will fall. As labour is a derived demand from the production of goods and services, unemployment will also increase due to the fall in national income.

Lecture Exercise:

Illustrate the impact of a (i) appreciation and (ii) depreciation of the currency on the macroeconomy using AD/AS framework:

6 Monetary Policy in Singapore

The Monetary Authority of Singapore (MAS) is the Central Bank of Singapore. Like other central banks in the world, one of its primary responsibilities is the conduct of monetary policy. The primary objective of the exchange rate-centred monetary policy in Singapore is to promote price stability (control of inflation) as a sound basis for sustained economic growth **in the long run**.



Source: *http://www.mas.gov.sg/~/media/manual%20migration/Economics%20Explorer%20Series/explorer2.pdf*

The long term policy stance of the MAS is a gradual and modest appreciation of the Singapore dollar.
The main objective is to reduce Singapore's vulnerability to imported cost-push inflation which can affect its long-term export competitiveness.

But in times of a world-wide recession, the MAS may allow a temporary depreciation of the S$ such as in 2001 or a 0% appreciation in 2009. A depreciation allows for export prices to be more competitive as they become cheaper in foreign $.

6.1 Reasons for Choice of Exchange Rate instead of Interest Rate

Why the exchange rate is the most effective instrument in Singapore stems largely from the fact that the Singapore economy is very small in size and has a high degree of openness to trade and capital flows.

1. Small Size & Limited Resources
Given the small size of its economy, Singapore is a price taker in the world market for goods and services. This means that she is too small to influence world prices. In addition, due to the lack of natural resources, Singapore is highly dependent on imported raw materials and imported goods and services. The high import content of Singapore's output and consumption means that changes in the exchange rate will have a significant and direct influence on imported inflation and in turn, cost push inflation and cost of living in Singapore. By allowing the Singapore dollar to appreciate against foreign currencies, this will help to reduce imported inflation in Singapore. In addition, this also helps to manage wage expectations (pre-empt wage-push inflation) and in turn, dampen overall inflation rate in Singapore.

2. Openness to Trade
Secondly, due to its small domestic economy, Singapore is highly dependent on the external market as an engine of growth. Exports as a percentage of GDP constitute about 200%. Singapore's exchange rate policy has a significant impact in affecting her export competitiveness. The relative importance of external demand in Singapore means that traditional monetary policy tools like money supply and interest rates, which largely affect domestic demand (i.e. C and I) have a smaller influence on the overall level of economic activity, and therefore inflation in Singapore. By allowing the Singapore dollar to appreciate against foreign currencies, demand-pull and cost push inflation will be reduced. This ensures

lower relative inflation compared to our trading partners and thus boosts competitiveness in the long run.

However, in the short run, export competitiveness will be hurt. Hence, there are times when MAS may need to allow the Singapore dollar to depreciate against foreign currencies to boost export competitiveness (especially during a global recession).

3. Openness to Capital Flows

Thirdly, given our small size, Singapore is also a price taker for interest rates. Due to Singapore's role as an international financial centre, the economy is very open to capital flows. As a result, small changes in relative rates of interest between Singapore and the rest of the world can result in large and quick movements of capital flows in and out of the economy (otherwise known as "hot" money flows). This makes it difficult to target money supply to influence domestic interest rates in Singapore. Any attempt by MAS to raise or lower domestic interest rates over a long period of time will be thwarted by large shifts of funds into and out of Singapore. In order to minimise large swings in the USD-SGD exchange rate so as to maintain exchange rate stability. Singapore's benchmark interest rate, the SIBOR (Singapore Interbank Offered Rate) is tied to the US Fed Funds Rate.

6.2 Conduct of Monetary Policy in Singapore

The MAS manages the Singapore dollar (S$) exchange rate against a trade-weighted basket of currencies of Singapore's major trading partners. The rate at which the Singapore dollar exchanges for this basket of currencies is called the trade-weighted exchange rate or the effective exchange rate.

Exchange rates influence inflation outcomes in the economy in two main ways.

Channel 1: Through Import Prices

The exchange rate directly influences prices of imports in Singapore. As an illustration – Singapore imports rice from Thailand. Thai rice is quoted in Thai baht, and the price we pay for in Singapore dollars is determined by the exchange rate between Singapore dollars and baht. What happens if due to a shortage, the price of Thai rice in Thai baht rises. Singapore will have to buy more expensive Thai rice.

The effects have already been explained under Section 5. This section is specific to the Singapore Economy.

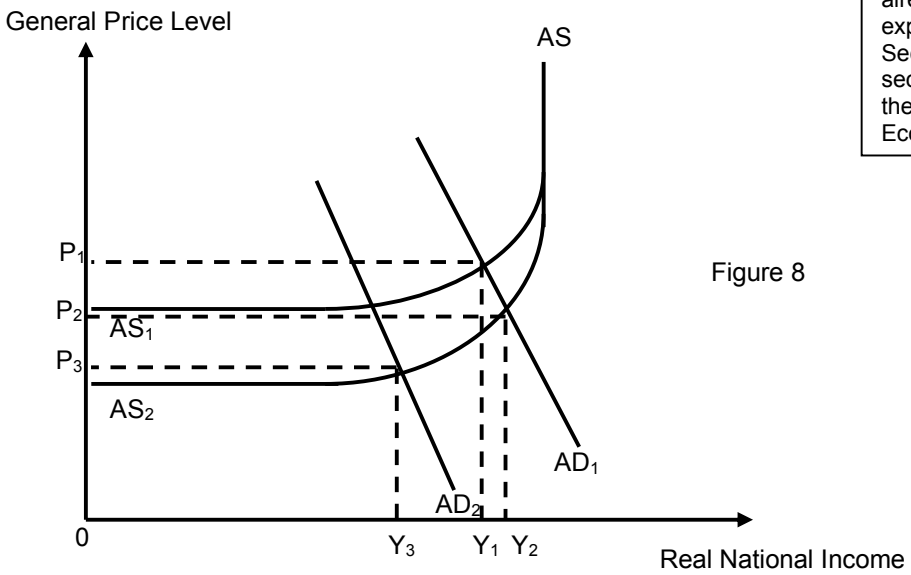


Figure 8

But suppose the MAS allows S$ to appreciate against the baht. The price of Thai rice in S$ will be relatively lower. This is especially useful in cushioning the impact of a rise in import prices.

Because of the appreciation, imported raw materials and components are relatively cheaper in S$. This reduces the cost of production and increases AS, shifting the AS curve from AS1

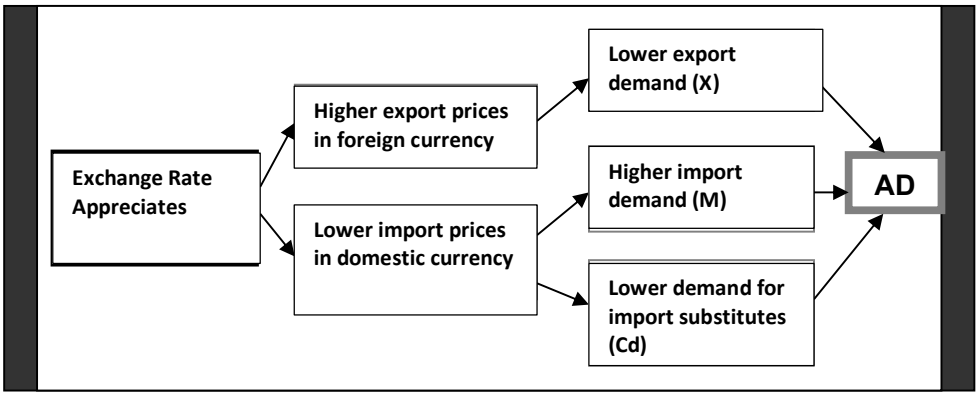
to AS2, as shown in Figure 8. The general price level is thus lower at P2. The appreciation has therefore worked to reduce imported cost-push inflation.

Channel 2: Impact on Aggregate Demand

On the other hand, the appreciation of Singapore dollar raises the price of Singapore exports in terms of foreign currencies and reduces the price of imports in domestic currency. The quantity of exports falls and quantity of imports rises respectively. Given price-elastic demand, the appreciation of S$ will cause the value of net exports to fall (balance of trade worsens).

In addition, when the price of imported goods and services fall in terms of Singapore dollars, consumers in Singapore will switch away from the relatively more expensive domestically produced import substitutes. Therefore, consumption on domestically produced goods (C_d) falls.

With a fall in the value of net exports (X-M) and a fall in the consumption on domestically produced goods (C_d), the AD falls and the AD curve shifts from AD_1 to AD_2. This can help to relieve demand-pull inflation which arises as the economy approaches full employment. The general price level is now at P_3, instead of P_2. Hence, inflation is further dampened.



Allowing the Singapore dollar to appreciate is most desirable during a period of economic boom where the AD can be dampened to prevent excessive demand-pull inflation.

However **in the short run**, there is a trade-off between macroeconomic goals. For instance, by allowing the Singapore dollar to appreciate against foreign currencies, export competitiveness will be hurt.. This in turn leads to a worsening of the balance of payments, ceteris paribus. The fall in the value of net exports will also cause aggregate demand curve to shift multiple times to the left and cause a more than proportionate fall in the equilibrium level of real national income via the multiplier process.

Note that for an appreciation, the fall in the equilibrium level of real NY due to fall in AD will more than offset the increase in equilibrium level of real NY due to the rise in AS. This is because while the price of exports will rise by the full extent of the appreciation, the fall in cost of production will be less than the extent of the appreciation. When the price of imports falls by 100%, the cost of production will not fall by 100% because domestically produced goods and services are not 100% import-content.

As labour is a derived demand, the fall in output may in turn cause an increase in cyclical unemployment as less factors of production are required. Thus policymakers, in deciding the timing and extent of inflation reduction, have to weigh the benefits of lower inflation against the costs of output loss.

Yet by targeting low and stable inflation using the exchange rate policy, Singapore can gain export competitiveness over its competitors **in the long run** by minimising the dangers of

wage-price spiral. Wage-price spiral refers to the vicious cycle where inflation escalates due the workers demanding higher nominal wages in anticipation of higher inflation in the future. Keeping inflation low relative to other countries' inflation will help ensure Singapore's export competitiveness, which will in turn help Singapore to achieve stable and sustained economic growth.

For example, Singapore and Country X start off having identical GPL. Through good management of its inflation rate using the exchange rate policy, Singapore is able to maintain annual inflation rate of 3% inflation over 10 years while Country X experiences annual inflation rate of 7% over 10 years. In keeping inflation rate lower relative to its competitors, Singapore's exports, relative to Country X's, will be significantly cheaper at the end of the 10 year period. This is in line with MAS' monetary policy objective of promoting price stability (control of inflation) as a sound basis for sustainable economic growth in the long run.

ii. Time Lag

It will take some time before any macro problem is fully recognised (recognition lag) and for the central bank to implement the appropriate exchange rate policy (implementation lag). In addition, it can take a fairly long time for the policy action to affect the economy and inflation (impact lag).

The long lags associated with exchange rate policy actions can give rise to complications. Suppose the Central Bank sees an increase in demand-pull inflation and intervenes in the foreign exchange market to bring about a currency appreciation. By the time the monetary tightening takes effect, the economy might have already suffered from a fall in X. To have the economy contracting at this point would only raise unemployment further.

Because of the lags in exchange rate policy, MAS formulates and conducts the exchange rate policy in a ***forward looking manner***. This is accomplished by evaluating the impact of the policy over the medium term based on reasonable assumptions of economic outlook and possible negative shocks.

iii. Availability of reserves

Intervention in the foreign exchange market to keep the country's exchange rate strong is possible only if the country has sufficient reserves to manage the exchange rate. A country with insufficient reserves loses its ability to support its exchange rate. Speculators, expecting an eventual depreciation, will begin a sell-off. This exerts a downward pressure on the exchange rate, making it difficult for the Central Bank to maintain its targeted exchange rate.

[Note: This limitation of reserves availability pertains only to the Central Bank attempting to keep the currency over-valued. The pursuit of an under-valued currency results in the accumulation of foreign reserves. Hence, the constraint of reserves availability is not applicable in the latter case.]

iv. Imperfect Information

Despite the best effort of the national account statisticians, the Central Bank does not have up-to-the-minute information about the state of the economy. Economic data is limited because of lags in their publication as it takes time to capture the myriad transactions in the economy.

Second, the Central Bank does not have perfect knowledge of how the economy works: its multitude of linkages, causes and effects.

Lastly, constant changes in the conditions of domestic and international economies compound to the problem of imperfect information.

6.4 Monetary Policy does not work alone

It is important to appreciate that monetary policy does not work alone in Singapore. While an exchange rate policy can ensure price stability, it per se cannot affect the long term growth capacity of the economy. In the long run, the growth of an economy is determined by supply-side factors such as technological progress, capital accumulation and the size and quality of the labour force. Some government policies may be able to influence these supply-side factors, but monetary policy generally cannot do so directly. By providing a sound stable and low inflationary macroeconomic environment, however, exchange rate policy can ensure a smooth and efficient functioning of the economy, thereby creating the necessary condition for sustained economic growth.

In addition to having the appropriate monetary policy, there must be efficient co-ordination with fiscal and supply-side policies to bring about sustained economic growth over the medium term. This idea is consistent with the *Tinbergen-Theil* theory of economic policy which states that *one policy instrument should be optimally used to achieve one macroeconomic target at one time*. Hence, if an economy wishes to achieve multiple macroeconomic targets simultaneously, it should possess as many policy tools.

Section Summary:

- There are 2 tools of monetary policy: interest rate and exchange rate.
- Expansionary MP is used in times of recession and high unemployment, whereas contractionary MP is used in times of inflationary pressures.
- Singapore uses exchange rate policy to achieve price stability and sustained economic growth. In times of recession, MAS may allow the S$ to depreciate, and in times of EG, MAS will allow for gradual appreciation of the S$.

Appendix 1: Why is Singapore Different, i.e. neither Float nor Fixed?

(source: Singapore Exchange Rate Policy, MAS)

Since the Asian crisis, there has been a growing consensus that the only sustainable exchange rate regime for emerging markets is either a currency board or a floating exchange rate regime. Singapore stands in contrast to this conventional wisdom. Why does MAS choose a managed float? The short answer is that this provides MAS with flexibility to deal with shocks while at the same time maintaining the purchasing power of the Singapore dollar (SGD).

A basic philosophy underlying Singapore's exchange rate policy is to preserve the purchasing power of the SGD, in order to maintain confidence in the currency and preserve the value of workers' savings, especially their CPF balances. Over the years, the managed float has served Singapore well in this respect. Inflation and interest rates have been low, and expectations are for the SGD to appreciate over time.

When economic conditions change, and it is necessary to reduce the real exchange rate, the government prefers to do this by direct measures. This includes reducing wages through the variable bonuses, and in extremis by reducing employer contributions to the Central Provident Fund. This has happened twice: in the mid-1980s recessions, and again in the Asian financial crisis. The government believes that it is better to confront the issue squarely and persuade workers to accept a direct wage cut. If it glossed over the problem through a steeper SGD depreciation, workers would find out later that inflation had eroded the purchasing power of their wages. In fact their loss would be greater because most workers have accumulated substantial CPF savings denominated in SGD, whose real value would also shrink.

Workers would seek higher wage settlements to compensate, and the wage price spiral would soon erode away the temporary cost advantage. Worse, Singaporeans would lose confidence in the currency and the government.

❖ **Why not float?**

A floating exchange rate regime would prevent the government from meeting this fundamental objective. It would also not be appropriate for a small and open economy like Singapore for two other reasons.

First, MAS has found the exchange rate to be the most effective instrument to keep inflation low. Other possible intermediate targets, in particular interest rates are less effective in influencing real economic activity and domestic inflation outcomes. The main advantage of a floating regime – the ability to pursue an independent monetary policy – is less relevant to Singapore that to other larger, less open economies with domestic policy imperatives.

Second, a freely floating SGD may become too volatile in the short-run. Worse, the currency could become misaligned over a sustained period of time, leading to resource misallocation.

❖ **Why not fixed?**

First, the Singapore economy has highly diversified trading links, substantial fiscal surpluses, and a long track record of low inflation. Both inflation and interest rates have been lower in Singapore than in the US. There is thus little need for a nominal anchor for the SGD to manage inflationary expectations, or for the discipline imposed by the monetary policy of a foreign country – most likely the US – to which the SGD is pegged.

Second, there would be a cost resulting from the adoption of the anchor country's monetary policy because of the divergence in business cycles. This is shown by Hong Kong's example. While Hong Kong's business and economic cycle has become increasingly aligned with that of China, its peg to the USD ties its monetary policy closely to that of the US. During the early 1990s, the Hong Kong economy was growing rapidly and warranted tighter monetary conditions, but interest rates fell in line with those in the US, which was experiencing economic slowdown. This contributed to an asset price bubble. Then during the Asian crisis, when the regional currencies depreciated sharply, the Hong Kong dollar experienced a sharp involuntary appreciation in trade-weighted terms. The adjustment was severe, especially in asset price deflation.

Third, a fixed exchange rate would make it more difficult for Singapore to absorb shocks from abroad, and adjust the value of the SGD exchange rate in line with changes in the country's underlying macroeconomic fundamentals. This would be so even if the SGD were pegged to a trade weighted basket rather than a single anchor currency. For example, during the Asian crisis from late 97 to early 98, when the regional economies depreciated sharply against the USD, the SGD too depreciated against the USD, but by much less. In trade-weighted terms the SGD actually appreciated moderately, because MAS exercised flexibility to allow the exchange rate to rise above the policy band. If the SGD had been required to remain strictly within the policy band, or had been pegged to the NEER, the MAS would have had to force the SGD to depreciate much more against the USD, at a time when market sentiment was weak. This could have resulted in a loss of confidence in the SGD. Instead, MAS only brought down the NEER to within the policy band months later, when financial markets had stabilized and conditions had become more conducive.