# Notes 2012 Topic 2C: Inflation

## List of Definitions

### Inflation

* + - When inflation occurs, it implies that the price level has increased over the previous year and this is measured by the **consumer price index.**
    - Price increases at increasing or decreasing rate, inflation rate is positive

### Degree of Inflation

* + - Mild: Single digit and non-distortionary to relative price. (below 2%)
    - Galloping: Price increasing beyond 2 digits annually
    - Hyperinflation: Extremely high (more than 100%) inflation.

### Stagflation (Cost-Push Inflation)

* + - Stagflation is an economic situation in which inflation and economic stagnation occur simultaneously and is sustained over a period of time. (Loss of output ↑ and ↑ in unemployment/rise in price level)
    - Inflationary condition occurs from sector to sector and it is the result of high wages as seen in Japan

As seen from the diagram, the fall in aggregate supply from ASo to AS1 is greater than the fall in aggregate demand from ADo to AD1, which contributes to the rise in price from Po to P1 and a fall in real GDP from Yo to Y1. This implies that the economy experiences stagflation.

the causes of stagflation – market pessimism – contribute to lower export demand and FDI – decrease in AD and together with the rise in price of oil which will lead to cost-push inflation

### Deflation

* + - This occurs when in real inflation rate is negative, a period of falling price.

Solution to solve this – inflate the economy (increase in AD) - like Japan

### Consumer Price Index (CPI)

* + - CPI measures relative changes in value of money as a percentage variation in the general price level over a period of time. Price changes are expressed as an index number to show how it differs from a reference/base year.
    - Steps in the calculation of CPI
* Choose a basket of goods that is representative of the consumers’ consumption.
* Derive the base year and current year price level (should be a year without recession and boom)
* Provide weightage according to the consumer consumption composition
* Formula:

CPI for good A, B and C = (

PA1

PA0

PC1

PC0

PB1

PB0

x WtA) + (

x WtB) + (

x WtC)

(Rental – 800 / Food 300 / Transport 400)

0.3 0.3 0.4

Weightage of the items will distort the change in inflation rate – increase in the price of big ticketing item (car) will raise the inflation rate extensively

Comparison  
-YOY – 2%

-based on a base year (2000)

-102% (2003)

(Y₁ - Y₀)🡪102% - 100%

[101% (Y₀)]

-convert base year compared to p.a

### Cost of Living Index

* + - A theoretical price index that measures the difference in the price level of the amount of good and service one needs to spend in order to maintain the livelihood in an economy.

### Cost of Production Index

* + - It measures the percentage change in unit cost of production of any particular industry.

### Internal Value of Money –determined by the price level/inflation

* The purchasing power of a unit of local currency on local goods and services which is inversely determined by the price level.
* Decrease in price level will raise the value of money which will lower purchasing power
* Increase in price level will lower the value of money which will raise purchasing power

**1.9A Explain the relationship between Internal and External value of Money**

### External Value of Money – determined by the exchange rate

* + - The purchasing power of local currency in foreign denomination on foreign goods and services

### Demand-Pull Inflation (Singapore 🡪 ↑AD is due to ↑Xd/↑FDI)

* + - It occurs when there is an increase in the aggregate demand which will contribute to excess demand condition which will lead to the rise in price level under rising cost and full employment condition

### Cost-Push Inflation

* + - It occurs when there is a rise in cost of production which will lead a fall in the aggregate supply that will lead to an excess demand condition, contributing to increase in price level. When the cycle becomes cyclical, it will develop as wage-price spiral or price-wage spiral.

### Structural Rigidities

* + - It refers to the condition of immobility of economic resources due to the inflexibility structural establishments that will lead to rising cost condition as here is a rise in unit cost of resources.

### Asset-Based Inflation (Speculation and Profiteering)

* + - It occurs when there is rising prices of assets which will lead to rising cost of condition in term of mortgage loan that will rise of the cost of rental and thus, contributing to cost push inflation
    - Inflow of hot money due to Quantitative Easing  
       by US government will induce an inflow of hot money that will raise the local money supply, contributing to fall in interest rate. This will lead to rise in demand for property and asset-based inflation will occur.

### Imported Inflation

* + - The rise in global price of certain essential goods or global boom will cause the price of imports to rise which will lead to a rise in cost of living and cost of production, contributing to cost-push inflation. For example, rise in the price of oil.

🞹**For the various types of inflation like imported inflation, structural rigidities, asset-based inflation, tax-based inflation, the diagram to be used is the same as cost-push inflation.**

### Function of Money

* + - Money functions as:
* A medium of exchange to facilitate trading of goods and services
* Unit of account
* Store of value
* Standard of deferred payment

## Causes of Inflation

### Demand-Pull Inflation

* + - This occurred as a result of the rise in aggregate demand, leading to **an excess demand condition** and a rise in price level, only when the economy is **experiencing rising cost condition or full employment condition.**

Y2=Y3=YF

Real GDP

GPL

AS0

AD3

AD2

AD1

AD0

Y1

Y0

P2

P3

P1=P0

* + - As seen from the diagram, the rise in AD from AD₀ to AD₃ will lead to inflation (rise in price level) when the economy is experiencing rising cost condition from Y₁ to Y₂ or it is at full employment at Y₂=Yf
    - Rise in AD is mainly contributed by excessive ↑ in Xd/FDI or rise in local consumption and government expenditure

### Cost-Push Inflation

* + - Caused by a rise in cost of production, which can be due to an increase in unit labour cost or an increase in cost of raw materials. The increase in cost of production will lead to a reduction aggregate supply, contributing to a shortage or excess demand condition leading to increase in price level.
    - There are two ways which cost-push inflation can develop, namely the wage-price spiral and price-wage spiral
    - **Wage-price spiral** happens when powerful union demands for higher wages but is not matched by a corresponding higher increase in productivity. It leads to higher prices and inflationary pressures. Higher prices then lead the unions to again demand higher wages, and the spiral continues.
    - **Price-wage spiral** happens when big business corporations increase price to increase their profit margin. Cost of living rises and unions may ask for higher wages to make up for loss of living standards. Cost of production and prices eventually will rise.
  1. **Diagram to describe cost-push inflation**

AS₀

GPL

Real GDP

P₁

P₀

Y₁

Y0=YF

AD₀

AS₀

AS1

🞹 As seen from the diagram, the rise in cost of production will lead to a fall in aggregate supply from AS0 to AS1 which will create an excess demand condition at P0 which will prompt the rise in price from P0 to P1

This diagram is used to explain how cost-push inflation can be affected by structural rigidities, asset-based inflation, imported inflation and tax-based inflation

* + - The rise in cost of production due to rise in wages or cost of resources (all other reasons that affect COP will lead to rise in COP like imported inflation) will cause a leftward shift of the AS from AS₀ to AS₁, which means that there is an excess demand condition at P₀ and thus inducing rise in price level from P₀ to P₁. While the real GDP falls from Y₀ to Y₁ (no change in potential capacity – YF remains the same)

### Structural Rigidities

* + - Rigid structures restrain the mobility of resources causing shortage and rising cost condition.
    - The increase in cost may be passed onto the consumers as increase in price level.
    - Structural rigidities is the result of the change in the nature of the economy when its experiences a change in the production method or focus of the industries.

### Asset Based Inflation

* + - The rise in the price of assets and luxury goods will cause the individuals to raise the price of their factor services as they peg their factor cost to the price of the luxury goods. Therefore, the rise in the price of assets will raise the value of mortgage and cost of payment, inducing a rise in rental cost. Consequently, there will be a round of rise in prices.
    - Why price of assets will rise?

🡪inflow of hot money

### Imported inflation

* + - The rise in global price of foreign goods (Global market demand/supply – difficult to regulate as Singapore is a price-taker) and resources will raise the cost of imports and lead to a higher level of cost of production which will induce a cost-push inflationary condition.

2.6 Tax-based inflation

* Increase in indirect tax like GST will encourage producers to raise their price of goods and services. This will trigger the cost of production at respective production and distribution especially in industries where value of tax is not separated from the price of goods (Listed price: $2.00, GST: $0.14)

**Qn: What are the internal and external factors of inflation?**

**Qn: Distinguish between cost-push inflation and demand-pull inflation**

**2.7 Is inflation in Singapore contributed by external factors rather than internal factors?**

a) Why external factors are more influential?

b) Why internal factors are less influential?

## Internal Effects of Inflation

### Impact on Investment, Production and Employment (Beneficial effects of mild inflation)

* + - Inflation stimulates investment, raising production and national income when inflation rate is low as it induces growth of profitability
    - As production cost lags behind product prices, producers can pass on the rising cost condition to the consumers, enabling to gain greater revenue and profitability
    - Higher price level will raise revenue under price-inelastic demand condition and when increase in total revenue is higher than the increase in cost of production, profitability will rise and entrepreneurs are more willing to invest because of their expectations of higher profit margins.
    - However, uncertainty may lead to a fall in investment as hyperinflation will disrupt the derivation of cost of production, making it difficult to set price which discourage trading activities and determine cost of investment which undermines investment. (hyper-inflation sets in)

### Unequal Re-distribution of Income

* + - With inflation, the real value of wealth and purchasing power will be distorted, creating unequal distribution of income and wealth
    - When there is inflation, fixed income earners can only purchase fewer goods and services than before, real income falls.
    - Businessmen or entrepreneurs stands to gain from inflation because production costs usually lag behind product prices; reason being that wage and raw materials are usually fixed by agreement which take time to revise.
    - Debtors gain as inflation leads to a fall in the value of money, and therefore the real value of their debts fall. Creditors receive less in real terms of what they would otherwise receive the settlement of the debt if there is no inflation.
    - Appreciation of assets will raise the wealth of higher Y group while the rise in price of resources will lower the real income of the poor
    - Inflation will also discourage willingness to save as future value of money is lower and undermine the ability to save as purchasing power has decreased

### Reduction in Level of Saving (ability and willingness to save)

* + - People will be discouraged from saving, as wealth in other less liquid forms (e.g. real asset, stocks) would be preferred.
    - Individuals are unwilling to save as the future value of money is lower and therefore they rather increase the consumption now and save less. Their ability to save will be compromised too when inflation occurs since their purchasing power is lowered and to maintain the current level of standard of living, individuals will increase their expenditure on consumption and save less. The reduction in saving will lead to the reduction in the source of fund for investment.

### Increase Cost of Living and Lower Standard of Living

* + - Persistent increase in prices will lead to **an increase in the cost of living**. If the income of a family is unchanged, then its living standard will be lowered. (real per capita income decreases)

### Undermine the Main Function of Money

* + - **Erode the main functions of money** due to inflation as their confidence in the currency is eroded. Money cannot serve as a medium of exchange, an unit of account, standard of deferred payment as people feel the value of money cannot be sustained, undermining the purchasing of the consumer

### Misallocation of Resources

* + - Inflation distort the production and corruption activities leading to inefficient allocation of resources due to speculative activities
    - As the industries will plough in areas of production which experiences inflation, allowing the firms to reap higher revenue. Consequently, there will be excess increases in production in these industries.
    - This will lead to excess supply production condition, the occurrence of misallocation of resources when the demand falls.

### Increase in Cost of Adjustment to Adapt to Inflation

* + - Increase in the cost of resource allocation as cost of adjustment to inflation, as there is a need to adjust production and competitive activities. In a period of inflation where prices are continually rising, sellers of goods and services have to constantly review, change and update price catalogues.
    - The opportunity cost of resources used to protect against inflation and the distortions will rise as firms attempt to plan for the long run. Misallocation of resources will occur as speculative activities discourage investors to plough investment in non-production based industries.

## External Effects of Inflation

### Loss of International Competitiveness

* + - Loss in the **international competitive edge** as inflation will raise the cost of production and an increase in the price of the goods. This will cause an increase in the price of exports and a relative fall in the price imports. The rising export price will decrease demand for exports, undermining the country’s competitive edge.

🡪inflation🡪↓Xd/↓FDI (↑Px and cost of FDI↑)

* This will affect Singapore extensively as Singapore relies extensively on external demand for growth of the economy

### Balance of Trade and Payment of Deficit

* + - Exports demand decreases and import demand increases due to more expensive domestic substitutes, may **lead to a BOT deficit,** without government intervention, will **lead to fall in foreign exchange rate, or the external value of money.**

Px↑,Pm↓ relatively

🡪↓Xd

🡪BOT deficit (since inflow < outflow) 🡪 exchange rate depreciation - affects investors’ confidence in saving and investing in Singapore

### Depreciation of Exchange Rate

* + - Decrease in demand for currency due to lower export demand and increase in supply of local currency due to greater import demand will contribute to a fall in the exchange rate. Falling exchange rate will cause capital outflow undermining the financial stability of the economy.

Is the external effect of inflation a more serious concern than the internal effect of inflation? (aims of government/concern of government)

* + - * Basis of evaluation

-Can policy dampen effect?

-Severity of the effects

* + - * Why internal effect is not that serious?

-Lower level of saving for Singapore is not a serious concern

🡪CPF compulsory saving

* Why external effect is more serious?

-Competitiveness is a main concern

-high dependency on export demand/ FDI for production and employment

## Solutions to Inflation

In the process to solve inflation, it is imperative for the government to understand the nature of economy and the causes of the inflation so as to curb inflationary condition effectively.

### **Contractionary Monetary and Fiscal Policy**

With contractionary MP, central bank of the country will reduce money supply by selling treasury bonds and raising interest rates of borrowing. Higher interest rates will push consumers to save and consume less since the opportunity cost of consumption has increased and the cost of credit consumption is higher. As for investment, it will fall as there is increase in cost of borrowing, leading to reduction in profitability. Consequently, AD will decrease and through reverse multiplying process, price will decrease and inflation is curbed, since the excess demand condition is eradicated.

Fiscal policy in the contractionary mode decreases government expenditure (G) and raises tax to curb inflation. Reducing G would mean that the government stops spending on public facilities and welfare so that total money supply in the economy is reduced. Increase in taxes will lower the disposable income of the consumers, and reduce profitability after tax and thus decreases government expenditure, consumption and investment

Draw AS-AD diagram to show how contractionary demand management policy can be used to curb demand-pull inflation

GPL

AS

P1

P0

P2

AD­0

AD­1

AD2

Y0 = Y1

= YF

Y2

Real GDP

As seen from the diagram, the contractionary demand management policy will reduce aggregate demand from AD0 to AD1 which will clear the excess demand condition and then, curb inflationary condition from P0 to P1. However, a further reduction in price level from P1 to P2 will be achieved at the trade-off of a lower level of real GDP from Y0 to Y2 when the aggregate demand falls from AD0 to AD2

**Evaluation (MP)**

* + - Central Bank cannot control the money supply due to the presence of foreign banks / liberalisation of the banking system
    - MEI is interest inelastic – increase in cost of borrowing will decrease investment less than proportionally – interest rate is not reflected on Investment) – Singapore is FDI dominated / if the business confidence is high, the rise in interest rate will not decrease the level of profitability as the level of revenue is still high and thus, the interest is still profitable.
    - Although price level stabilizes, there is no growth in the economy. In more extreme cases, the economy will shrink.
    - Increases in interest rates will attract hot money inflow from other countries and this will raise the local money supply which will lower the interest rate, making it difficult for the government to condutct contractionary monetary policy.

**Evaluation (FP)**

* + - Raising tax is a bad political move. May cause social unrest.
    - Time lag for policy implementation (delayed in the implementation)
    - Reduction in essential infrastructure development for the public is not beneficial (↓SOL, lower productivity for the private and public sector)

🞹Cannot control imported and cost-push inflation (for MP and FP, they control only demand-pull inflation)

### **Direct Regulation**

* + - Price control – Price ceiling for certain goods below equilibrium
    - Income Policy – capping wage at a certain level/Flexible wage structure🡪↓Variable wage during inflation

🡪eradicate cost-push inflation

* Wage and price control seeks to curb wage-price inflationary spiral

Evaluation

-Due to extensive government regulation in building facilities, the government is able to control the cost of living to prevent the inflationary spiral (the involvement of HDB in public housing)

-Price policy is against the principle of market forces which wage controls depends on the corporation of the free trade union (very difficult to introduce wage control)

### **Supply-side policies**

* + - The government can adopt supply-side policies to expand the resource capacity so as to dampen the cost condition. As a result, there will be an outward shift of the AS, raising the full employment capacity. This will enable the economy to attain a higher of production capacity without having to experience inflation.
  1. How supply-side policy expand production capacity
     + Supply-side policies can also focus on the efficiency of production which will enable the industries to lower the cost condition, so as to dampen cost-push inflation.
     + Supply-side policies can also improve the mobility of resources so as to solve the structural rigidities which will lower cost of production.

Explain how the supply-side policies are used to curb inflation through the AS-AD diagram

AD0

Real GDP

AD­1

Y1 =YF0

AS1

AS0

Y0

Y2

YF1

GPL

P1

P2 = P0

Draw diagram to show how the economy can curb rising cost condition to attain sustainable economic growth

* + - As seen from the diagram, the supply-side policies will expand the resource capacity and cause an outward shift of the AS from AS₀ to AS₁ which will enable a reduction in cost and thus, the price level will reduce from P₁ to P₂. It will lower cost condition which will induce increase in quantity of aggregate demand and thus, leads to rise in real GDP from Y₁ to Y₂, while price level remains at P2

Y1

P0

Y0

P1

Real GDP

ASF

GPL

AD­

As seen from the diagram, the government can introduce manpower development policy to raise the efficiency of the workers to decrease cost condition, allowing an increase in aggregate supply from AS0 to AS1, which will eradicate the excess demand condition and thus, lower price from P0 to P1

### **Exchange Rate Management Policy**

* + - The Central Bank will intervene into foreign exchange rate market to raise the exchange rate by direct intervention where the central bank increases the demand for local dollars through buying of local dollars and selling forex
    - Alternatively, some economies may conduct exchange rate monetary policy by raising interest rate to attract more capital inflow to induce an increase in demand for local dollar which will also appreciate the exchange rate. This will help to curb imported inflation.
    - ↓Price of resources in local $ 🡪 ↓cost of imports 🡪↓cost of production and cost of living
    - ↓COL – slow down wage increment 🡪 sustain value of wage for foreign workers – prevent price-wage spiral

**Evaluation**

Advantages

* Strong ER – makes import cheaper, reduce cost of raw material.

Limitations of the exchange rate management system

* Exports would be more expensive in terms of foreign currency 🡪 fall in X, assuming Marshall-Lerner condition 🡪 unemployment in export industries (↓production)
  + - Government needs to set aside funds for intervention in FOREX market – raise the opportunity cost of resource🡪less economic development
    - Exchange rate management by raising interest rate is short-lived, since the speculator will sell local $ when it appreciates, therefore increasing the supply of local $ which will lower exchange rate

### **International Trading Network**

FTA, trade network with facilities, supported by PSA, SIA, CAAS, NOL, maritime and aviation industries – manpower development

🡪expand the source of supply of resources

* + - Trading network increases the source of supply from various countries, lowering the cost of inputs.
    - FTA will facilitate trade and lower domestic price for goods and services.

**Evaluation** – Government have to weigh the cost of FTA to the benefit for the country

* + - Increased vulnerability to trade cycle, infant local industry will be compromise.
    - FTA restricts trade to some countries which may be the cheapest source – trade creation may not occur

## Reasons for government to keep inflation rate low / Why is low inflation more important than other aims?

## Internal aspect

* + - Low inflation helps to **prevent** unequal distribution of income

(Price of goods for resources is not lowered which will sustain the purchasing power of the lower income group while the price of assets will not rise excessively to raise the wealth of the rich – income and wealth disparity will not widen – social dissatisfaction will be minimised – social stability is promoted)

* + - It also prevents rise in cost of living and cost of production.
    - It also maintains purchasing power and ability to save.
    - It will induce investment, production and employment.
    - prevent misallocation of resources

## External aspect

* + - It helps to maintain international competitiveness due to cost competitiveness
    - It helps to prevent the occurrence of balance of trade deficit.
    - It helps to prevent fluctuation of exchange rate (depreciation).

## Why is there low rate inflation for Singapore?

Inflation is quite stable and low in Singapore as the government has introduced effective policies to dampen the effects of inflation. However, the nature of the economy has made it difficult for the government to control inflation, creating a unique inflationary condition.

Firstly, it is a small and open economy, implying that its economy is greatly influenced by world development. Increasing world prices in term of rising raw material cost such as a rise in price of oil will create rising cost condition that will lead to cost-push inflation. **The current rise in world price in most of the raw material will contribute to extensive rise in the imported cost of raw materials and goods and services. This will raise both the cost of living and production.**

Secondly, the economy is subjected to limited production as it is a small country with very little resource and a small population. Furthermore, the economy constantly experience structural rigidities as the constraint of resources tend to undermine the production capacity of resources for production such the rise in cost condition in the construction industry as result of the ban of sand by the Indonesian Government. Under such circumstances, the economy is likely to experience rising cost condition which will lead to cost-push inflation.

Thirdly, the economy has experienced asset-based inflation which occurs as a result of property appreciation. **This will induce factor owners** to **raise their cost of factor services** which will contribute to a rise in cost of production, leading to cost-push inflation. **This occurrence in 2007 and 1995 has brought inflationary pressure is the result of property appreciation.**

Fourthly, excessive increase in aggregate expenditure due to an increase in export demand and foreign direct investment will lead to a demand for greater production and thus inducing the demand for resources. Subsequently, the economy will experience inflation if it is under rising cost or full employment condition.

The low inflationary condition is the result of effective exchange rate management and resource management. High and stable exchange rate has been used to curb imported inflation. **During the high rising oil prices period in 2005, the government has allowed the exchange rate to appreciate extensively to curb the rising cost of oil and thus cub imported inflation.**

Besides, resource management is achieved by diversifying the source of supply of resources through trade negotiation and diplomatic negotiation. Free trade agreement will enable the government to derive cheaper sources of supply. Furthermore, the government has also developed an international transport sea and air network to make the transport of raw materials from various countries easier and less expensive. This helps to dampen the cost of resources and at the same time, overcomes the possible structural rigidities.

Cost of rental are kept low by government providing adequate supply of land for building of factories and office space and statutory board’s supply of office space through the HDB and JTC to influence the rental cost. As for wages, it is also kept low or within productivity changes to ensure that there is wage-price spiral through negotiation of the MWC, trade union and employers.

Excessive increase in aggregate expenditure will not lead to rising cost condition if the production capacity can be expanded through effective resource management and improvement in productivity to dampen cost of production. Thus, a corresponding increase in aggregate supply to match increase in aggregate demand helps to prevent inflationary condition or at least, keep inflation low.

It is also part of the government policy is to enhance the wealth of the people through the preservation of value of their assets to allow them raise their purchasing power when they retire, enabling them to overcome the effects of rising prices.

The government has also provided more subsidies to the lower income group to help them increase their disposable income to offset the rising price which has undermined the purchasing power of the lower income group.

It can be concluded that the government has done a good job in keep inflation low as it is critical in keeping the production sustainable to achieve economic growth.

Due to extensive rise in global resource in recent year starting from 2010, the government has been relying on two main areas in trying to tackle the imported inflation. In the short run, the government **raises the exchange rate to lower down price of imported goods in local value and at the same time, provides subsidies to the general population to sustain purchasing power especially to the lower income group.** In the long run, the government is focusing on **raising the income level of the workers through improvement in productivity to help to raise the wage rate without sustaining rising cost condition.** This focus on productivity will also help workers to sustain employment to ensure that they have a job to create income and together with subsidy from the government, imported inflation can be managed.