Macroeconomic Equilibrium Analysis [Unit 6]

Special Illustration on:

- (Ye) Vs. (Yf)
- Expenditure & Output Gaps

Recap:

Conceptual Difference between [Ye] Vs. [Yf]

- There is a conceptual difference between full employment level of output (Yf) and equilibrium level of national income (Ye).

- Full-employment level of national income (AKA: potential output) and equilibrium level of national income (national output) need not always be the same value or level of output, i.e. the economy can be in equilibrium with **either inflation (Ye > Yf) or unemployment (Ye < Yf) or neither (Ye = Yf).**

  (Ye) = Equilibrium real output or income
  (Yf) = Full-employment level of Income

Illustration: (Yf) Vs (Ye)

Assume in a given economy during the present period of time the (Yf) is estimated at 5000 Bn, discuss the balance between (Yf) and (Ye) in the following alternative situations:

(Yf)	(E or AD)	(Y)*	(Ye: Y=E)	Outcome
5000Bn	**4000Bn**	**4000Bn**	**4000Bn**	**Unemployment**
5000Bn	**6000Bn**	**6000Bn**	**6000Bn**	**Inflation**
5000Bn	**5000Bn**	**5000Bn**	**5000Bn**	**Neither (Yf = Ye)**

Macroeconomic Equilibrium/Disequilibrium Analysis

*The Law $Y = f(E)$

Full Employment Level of National Income or Output (Yf)
[AKA: Potential Output (Yp) or Productive Capacity]

Full employment level of output, is the output level an economy is able to produce when **all** its presently available **resources** are **fully employed**, at their **normal rate of usage** or **productivity**, at a given point of time (i.e. when the economy's available resource endowment is used at **productive efficiency**, at present).

Alternatively potential output or (Yf) is the **maximum sustainable output** that can be produced **without triggering rising inflation** or an **inflationary pressures**. It is not necessarily the absolute maximum output that an economy can produce.

[Y_f] Vs. [Y_e]
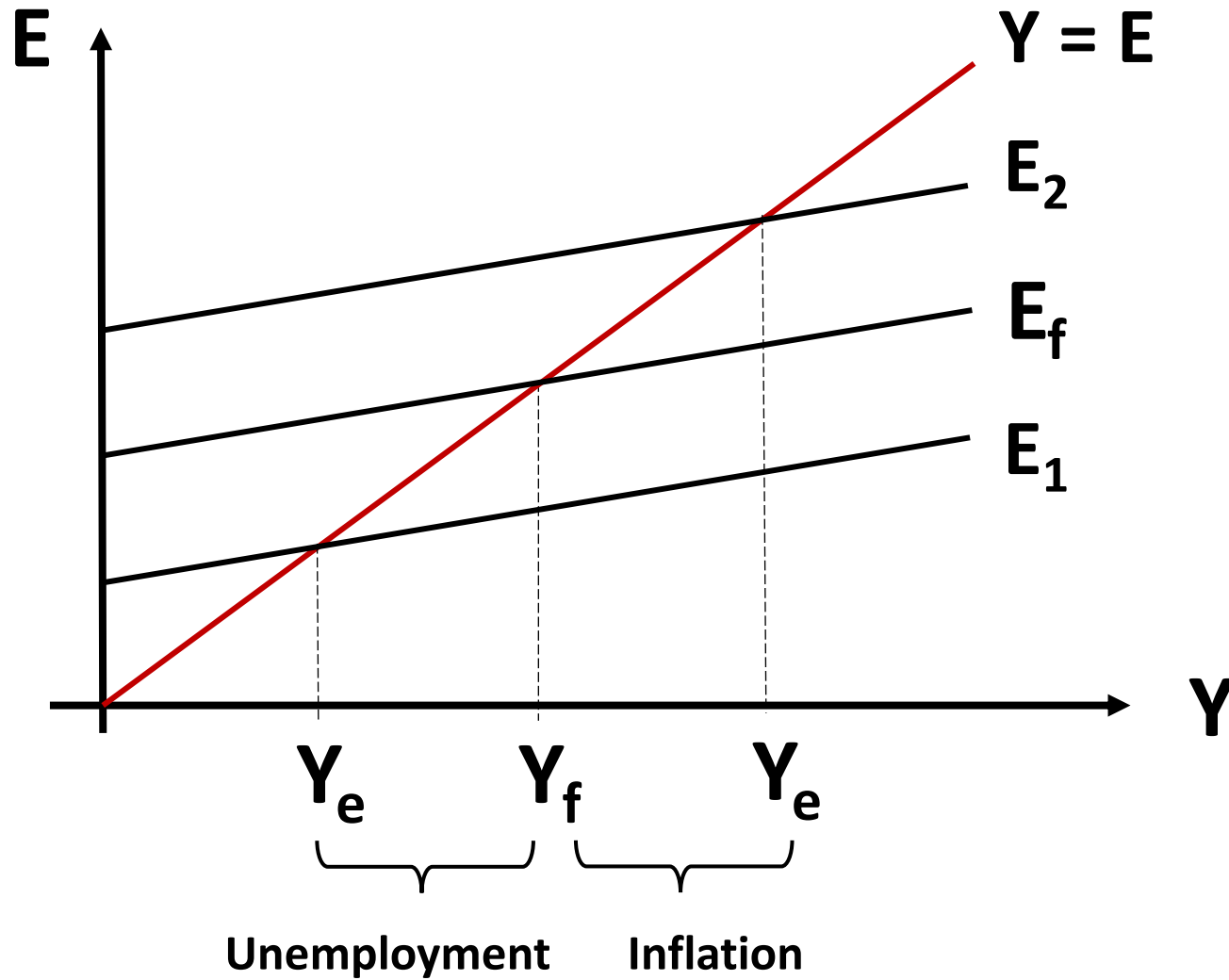
Basic Keynesian Approach[Model/Theory]

- The Keynesian model essentially there is an equilibrium income (Ye) when the aggregate expenditure (E), equals aggregate output /income (Y), i.e. when (Y = E).

- This equilibrium income (Ye) is assumed to be generally achieved not at the full employment level or potential level of output (Ye ≠ Yf), but at an underemployment or with economic inefficiency (Ye < Yf).

- Accordingly Keynesian theory or model suggests the increase in one or any combination of autonomous expenditure, components (Ea or A_0), can help the economy to reach the full employment level.

P. Perera, 2020 (P 509)

Possibility to produce beyond (Yf)

The economy can operate with actual output levels above potential output for a short time. As an example: Factories and workers can work overtime for a while, but production above potential is not indefinitely sustainable.

Maximum Output: the **absolute maximum** output that an economy can or is able to produce. Production **above potential** is **not indefinitely sustainable,** while attempting to produce at maximum, **triggers rising inflationary pressures** (i.e. leading to inflationary output gap).

Full Employment Level of (Real) Output or Income [Y_f], also [Y_M]
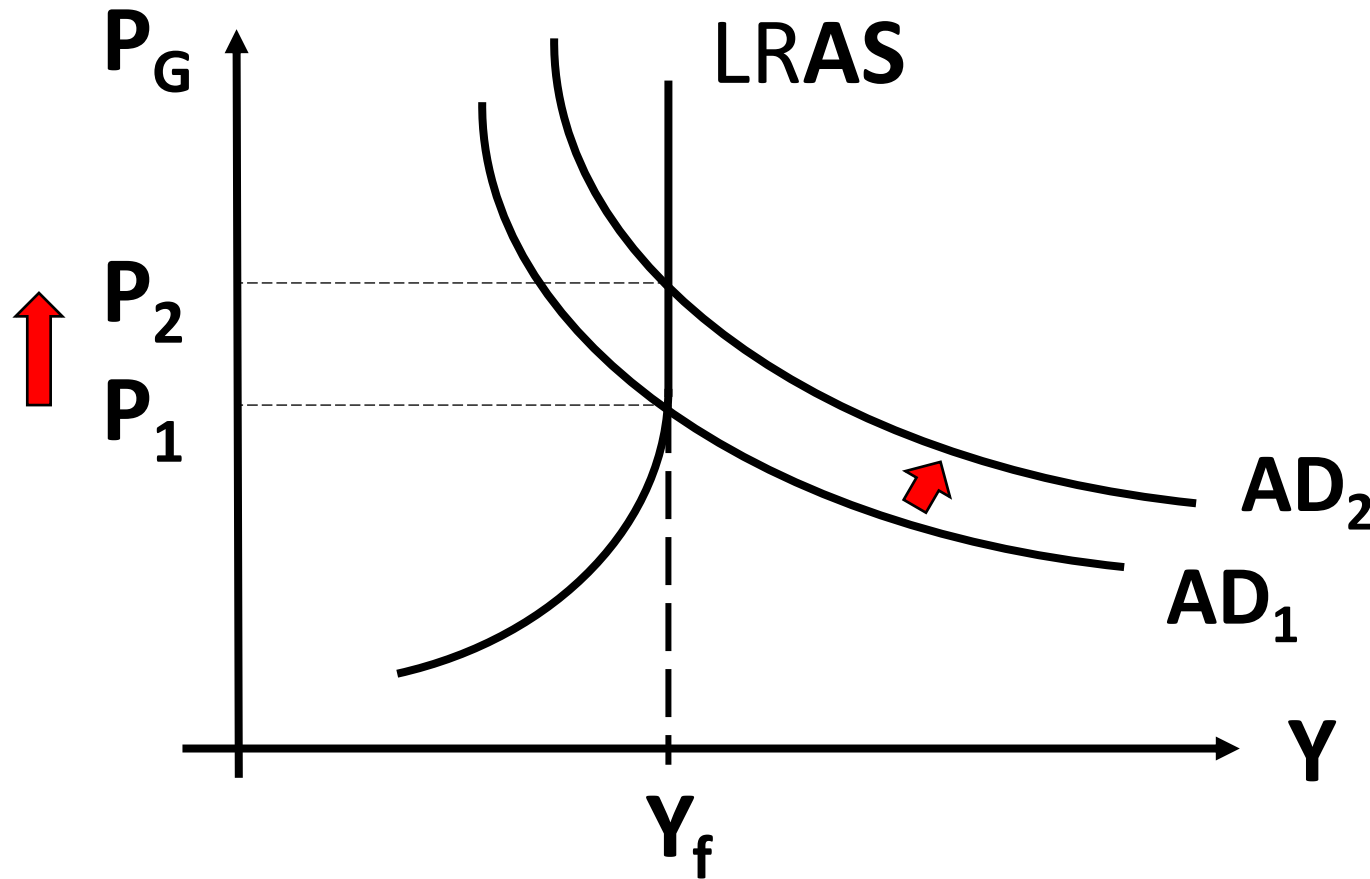
[Y_M]: Maximum Output

Rapid Inflation Pressure
[Demand-pull Inflation]

Expenditure Gaps

<u>Inflationary Expenditure Gap</u> (→ <u>Expansionary</u>)

Represents the level by which the actual aggregate expenditure prevailing or existing in the economy; has exceeded or surpassed the aggregate expenditure level required by the economy to achieve and maintain its full employment level of output [**E** (AD) > **E$_f$** (AD$_f$)].

It describes the difference between current level of real GDP (i.e. actual output level) and the anticipated GDP, experienced at an economy's full employment level, i.e. potential output.

P. Perera, 2020 (P 522)

# Deflationary Expenditure Gap (→ Recessionary)

Represents the level by which the actual aggregate expenditure prevailing in the economy; is in deficit or shortfall than the aggregate expenditure level required by the economy to achieve and maintain its full employment level of output [E (AD) < E_f (AD_f)].

Under the deflationary gap, all the resources of the economy are not fully utilized in production and some resources are idle, i.e. inefficiently used in production.

P. Perera, 2020 (P 523)

It is highly noteworthy, such expenditure gaps (inflationary and deflationary) are represented graphically exclusively using the (Y=E) Keynesian cross approach diagram or model (45 degree line based method).

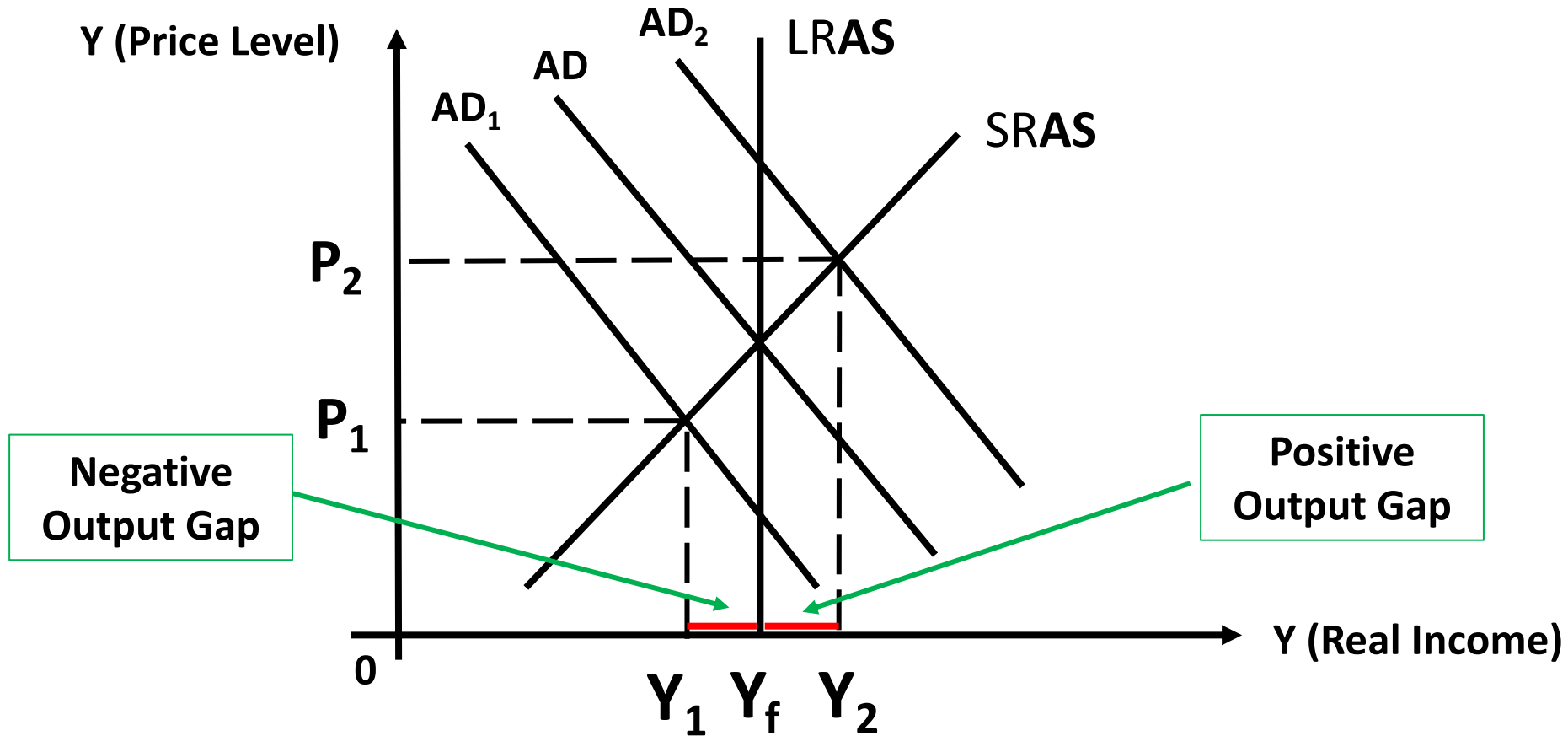# Inflationary and Deflationary Expenditure Gap
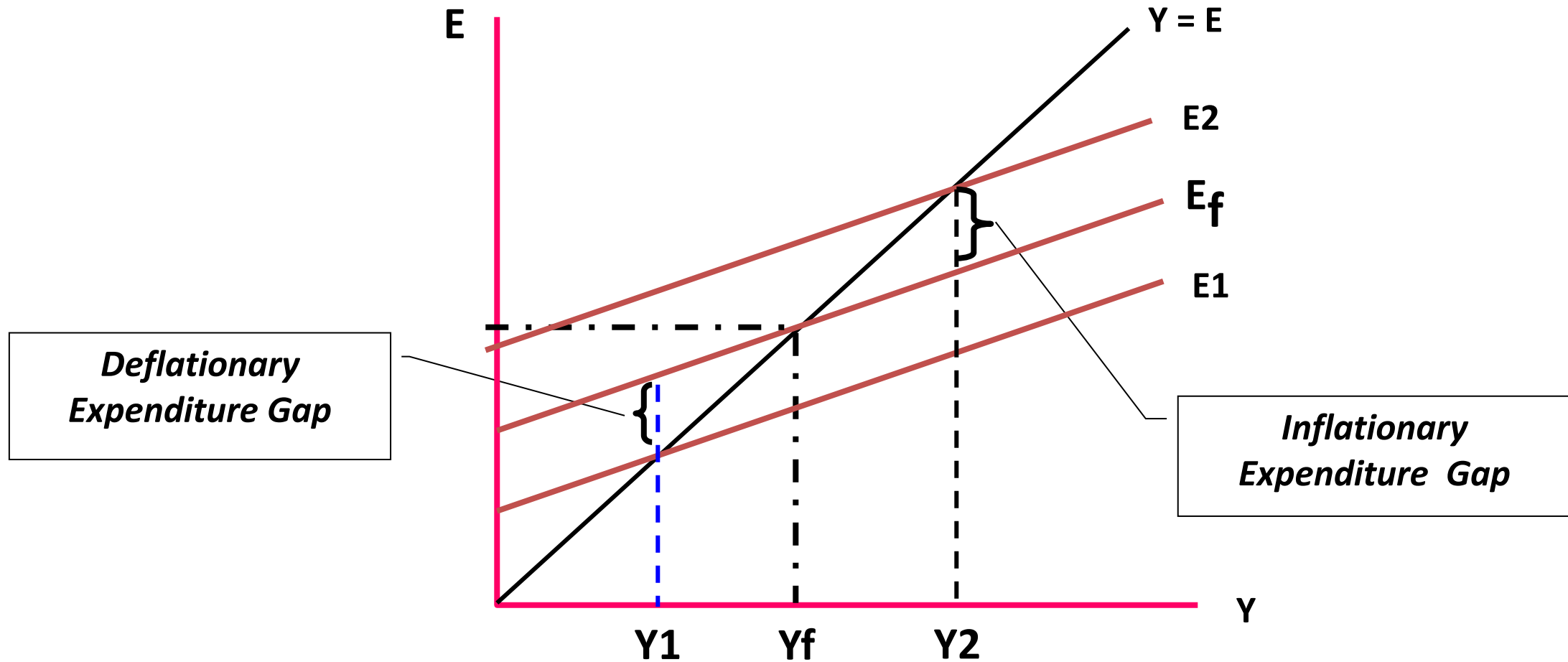
Output Gaps

Positive Output Gap:

✓ The actual output level of the economy is higher than the potential output level which represents the full employment level of output [**Actual > Potential**].

✓ When an economy attempts a sustain an output level above the potential level, there is an **excessive rate of resource utilization** than the average rate of resource utilization and the outcome of this is high wages, high profits and **'high inflation (demand pull inflation)'**

✓ AKA: **Inflationary or Expansionary Output Gap**

Negative Output Gap:

✓ The actual output level of the economy is lower than the potential output level which represents the full employment level of output [Actual < Potential].

✓ At a phase of recession in a business cycle, an economy's resources cannot be fully utilized and become unemployed. Economy reports a negative output gap and it is termed as a recessionary gap.

✓ AKA: **Deflationary, Recessionary or Unemployment Output Gap**

Output Gaps: Classical Approach

Output gaps (positive and negative) are represented graphically using the (AD = AS) diagram, in addition to the business (trade) cycle and a PPF.

Expenditure Gaps Vs. Output Gaps
[Cause and Effect]

- Deflationary gap and recessionary gap are conceptually different.

- Deflationary gap represents or indicates the reasons for the inefficiency in the economy or the limitation or deficiency in aggregate demand or expenditure.

- Recessionary gap indicates or represents the effect caused by the deficiency in aggregate demand or expenditure, i.e. deflationary gap

D. Atapattu, 2017 (P 631)

Essentially…..

Inflationary **Expenditure** Gap

       Expansionary (Inflationary) **Output** Gap

       [Positive **Output** Gap]

Deflationary **Expenditure** Gap

       Recessionary (unemployment) **Output** Gap

       [Negative **Output** Gap]

Further Learnig Inputs:

Multiplier [Concept, Estimation and Application]

Tax Function

Keynesian Model and Change in autonomous expenditure

Investment & Government Purchases Functions

Imports and Net Exports Function

The Concept:

$$K = \frac{\Delta Y}{\Delta E} \quad OR \quad K = \frac{\Delta Y}{\Delta A_0}$$

$$\Delta E \,(\triangle A_0) = \Delta a + \mathbf{\Delta I} + \mathbf{\Delta G} + \Delta NX$$

The Estimation:

$$K = \frac{1}{\mathbf{1 - MPC}} \quad OR \quad K = \frac{1}{\mathbf{MPS}}$$

$$MPW = MPS + MPT + MPM$$

The Application:

$$K = \frac{\Delta Y}{\Delta E}$$

Therefore:

$$\Delta Y = \Delta E \times K$$

Autonomous Expenditure Multiplier (K) Concepts

Concept:

Autonomous Investment (Income) Multiplier (K_I)

$$K_I = \frac{\Delta Y}{\Delta I}$$

Estimation:

$$K = \frac{1}{\textbf{MPW}}$$

Autonomous Government Expenditure Multiplier (K_G)

$$K_G = \frac{\Delta Y}{\Delta G}$$

Essentially

Autonomous Consumption Expenditure Multiplier (K_a)

$$K_a = \frac{\Delta Y}{\Delta a}$$

$$K = \frac{1}{\textbf{1 - MPC}}$$

TRM: Page 16

Autonomous (Lamp-sum) Tax Multiplier (K_T)

The Concept:

$$K_T = \frac{\Delta Y}{\Delta T_0} \quad \text{OR} \quad K_{Ta} = \frac{\Delta Y}{\Delta Ta}$$

The Estimation:

$$K_T = \frac{-b}{1-b} \quad \text{OR} \quad K_T = \frac{-MPC}{1-MPC}$$

The Application:

$$K_T = \frac{\Delta Y}{\Delta Ta}$$

Therefore:
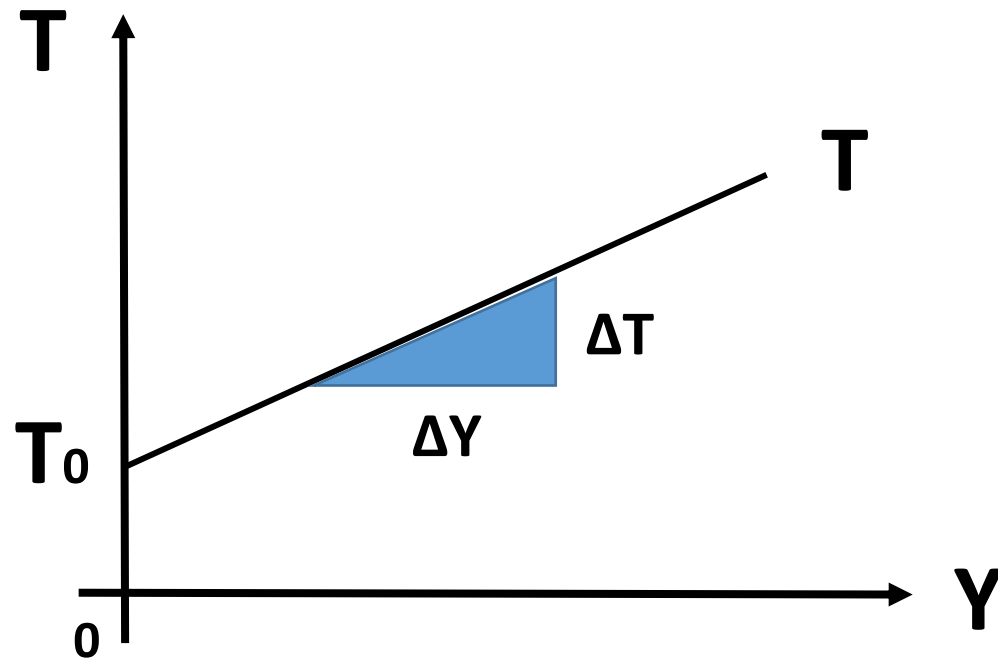
$$\Delta Y = \Delta Ta \ \times -K_T$$

TRM: Page 16

Transfer Multiplier (K_{Tr})
The <u>Concept</u>:

$$K_{Tr} = \frac{\Delta Y}{\Delta T_0} \quad OR \quad K_R = \frac{\Delta Y}{\Delta T_a}$$

The <u>Estimation</u>:

$$K = \frac{b}{1-b} \quad OR \quad K = \frac{MPC}{1-MPC}$$

The <u>Application</u>:

$$K_{Tr} = \frac{\Delta Y}{\Delta Tr}$$

Therefore:

$$\Delta Y = \Delta Tr \times K_{Tr}$$

TRM: Page 16

Transition to: Closed and Open Economic Models

Tax Function (T):

$T = f(Y)$ Taxation mainly depends on income (Y)

$$T = T_0 + T_1 Y$$

Alternative: $T = T_a + TY$

T – Taxation
T0 – Autonomous (lamp-sum) tax
          Vertical intercept of (T) curve

T1 – Induced tax or MPT [= $\Delta T \div \Delta Y$]
Slope of the (T) curve

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Theory Essentials:

In the basic Keynesian model, there is an equilibrium income when aggregate expenditure equals aggregate output (income). This equilibrium income is achieved not at the full employment level but at an underemployment level, according to Keynesians. Thus, the increase in one or any combination of standard autonomous expenditure can help the economy to reach the full employment level. These policies include:

- ✓ Increase in **investment** ($\Delta I \uparrow$)
- ✓ Increase in **government expenditure** ($\Delta G \uparrow$)
- ✓ Increase in **exports** ($\Delta X \uparrow$) and decrease in **imports** ($\Delta M \downarrow$)
- ✓ Increase in transfers ($\Delta Tr \uparrow$)
- ✓ Tax cuts ($\Delta T \downarrow$)
- ✓ Increase in autonomous consumption expenses (basic standard of living expense) ($\Delta a \uparrow$)

Gross Capital Formulation or Gross Investment (I)
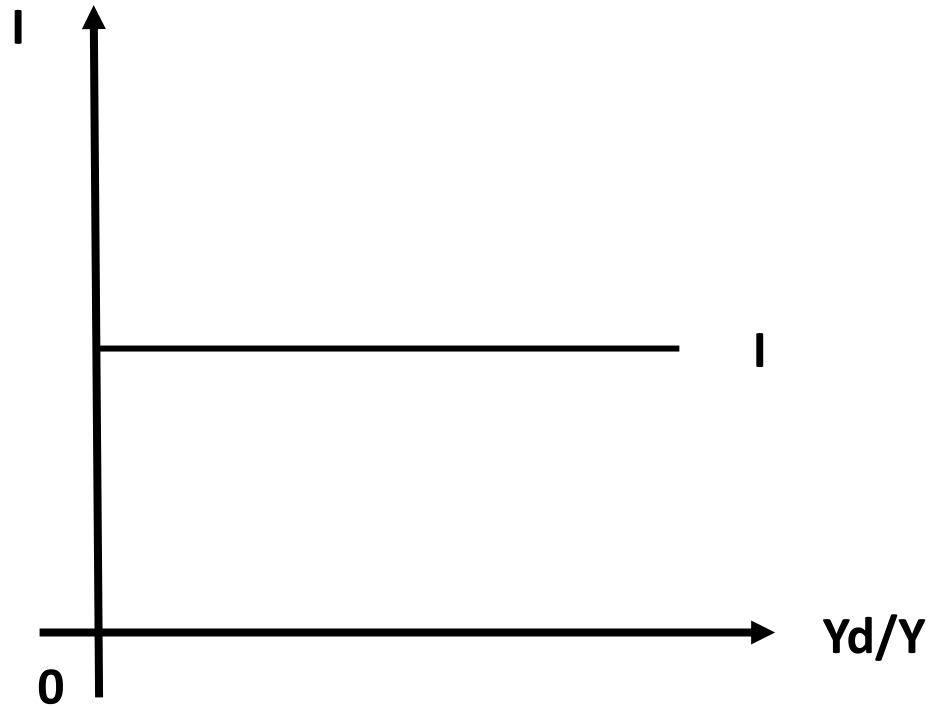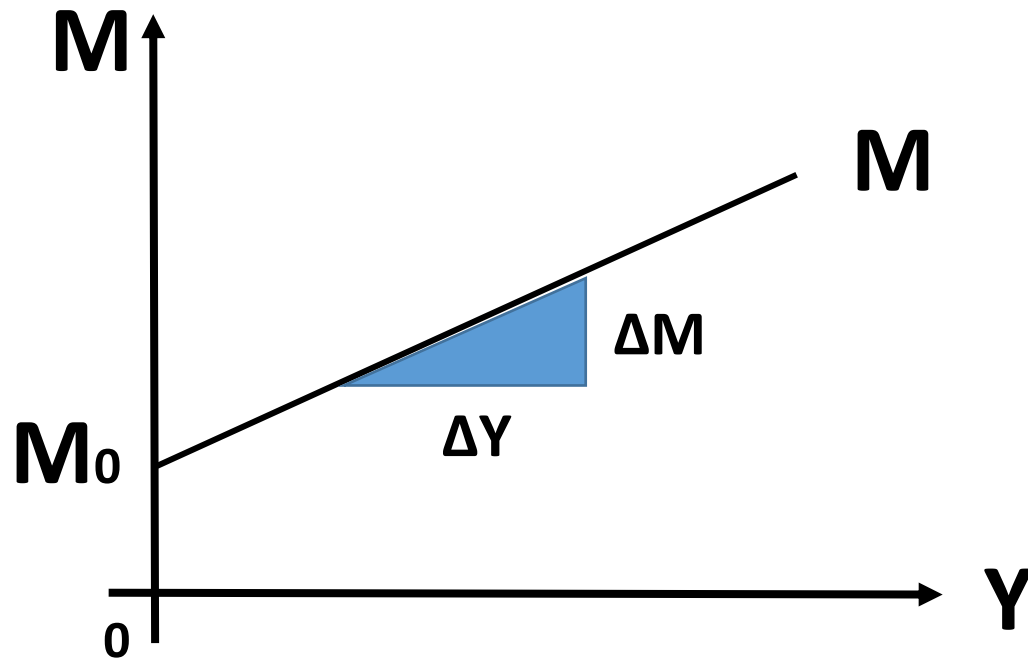
Public Consumption Expenditure (G)
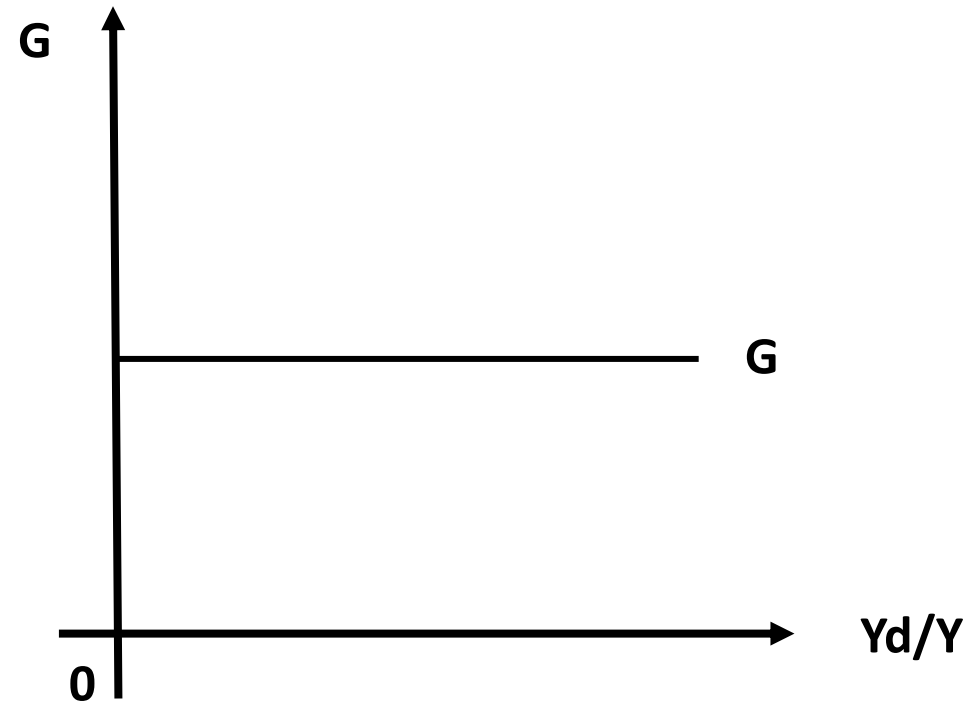
In the basic Keynesian model, gross short term investment expenditure (I) and planned government expenditure (G) is assumed to be an **independent variable** and an **autonomous expenditure**.

Transition to: Open Economic Models

Import Function (M):

$M = f(Y)$ Imports mainly depends on domestic income (Y)
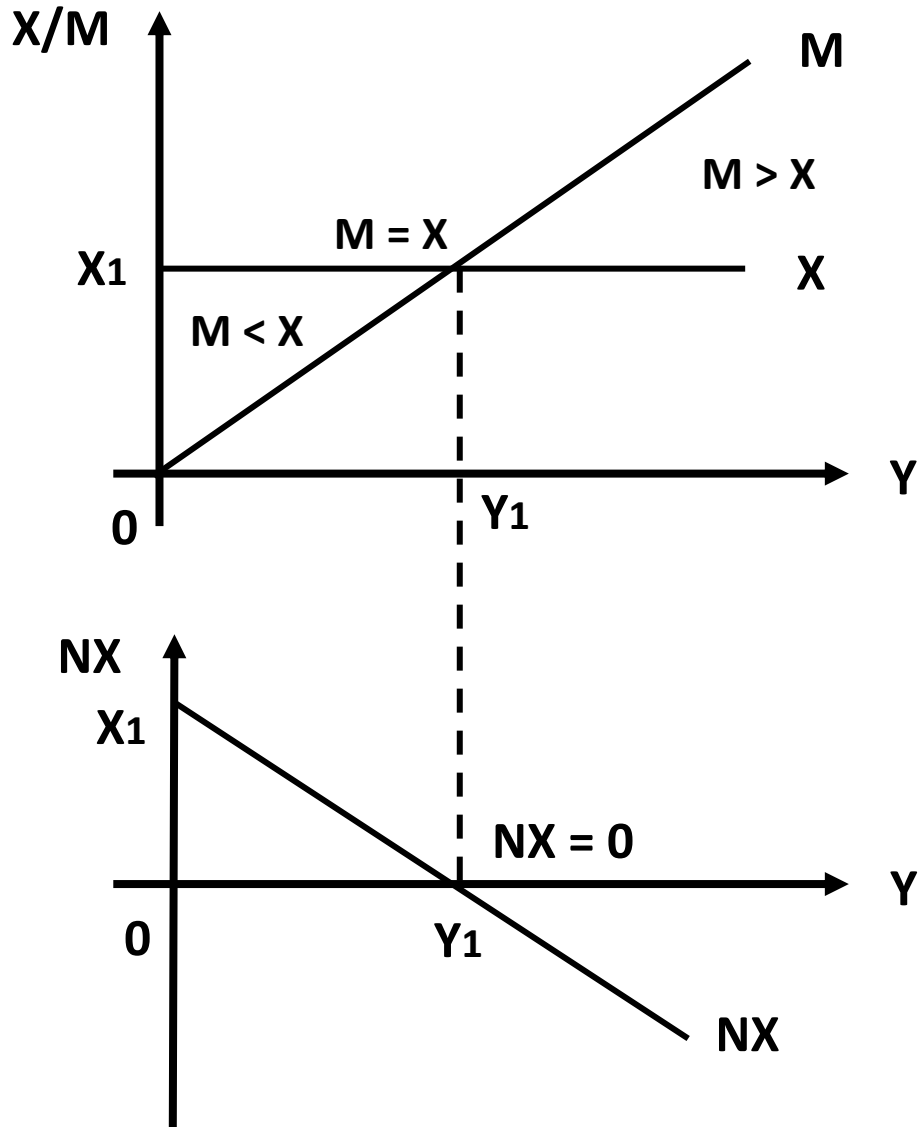

$$M = M_0 + M_1 Y$$

Alternative: $M = M_a + MY$

M – Imports
M0 – Autonomous imports
              Vertical intercept of (M) curve

M1 – Induced Imports or MPM [$= \Delta M \div \Delta Y$]
Slope of the (M) curve

TRM: Page 14-15

Net Exports (NX)

- **In the Keynesian model exports (X) are assumed to be an autonomous expenditure.**

- **(X) is not dependent on any variable, not even income of the rest of the world, price of exports and exchange rates. The (X) function tends to be a horizontal line parallel to the aggregate income (Y) axis.**

- **The (M) function tends to be upwards sloping and is dependent on the home country's national income.**

- **Net exports (NX = X - M) function is downwards sloping, since as income (Y) rises, imports increase, and exports remain at the same level (i.e., exports is autonomous)**