Evolution of the Economic Systems

- There are mainly three types of economic systems, namely;
    a. Simple Economy (Two Sector Economy)
    b. Closed Economy (Three Sector Economy)
    c. Open Economy (Four Sector Economy)

Simple Economy

- Simple economy or the two sector economy is the simplest economic model.
- In this economic model there are only two economic agents.
    a. Households
    b. Business Firms

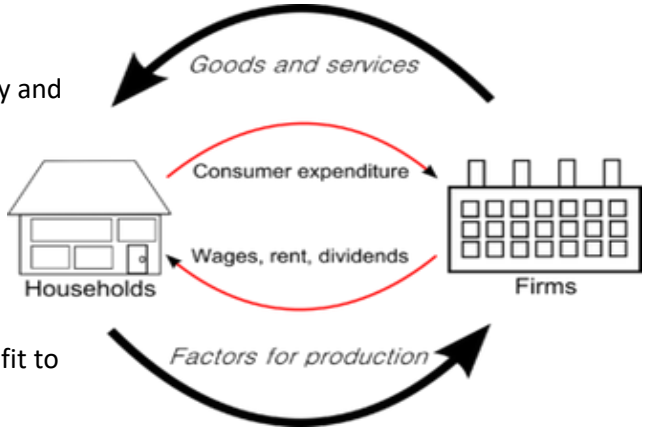
Closed Economy

- Closed economy or the three sector economy is the simple economic model with the addition of government sector.
- In this economic model there are three economic agents.
    a. Households
    b. Business Firms
    c. Government sector

Open Economy

- Open economy or the four sector economy is the economic model that opens out to foreign sector.
- In this economic model there are four economic agents.
    a. Households
    b. Business firms
    c. Government sector
    d. Foreign sector

Main Circular flow of income



- Households are the factor owners of the economy and they provide factor of production to business firms to produce an output.
- Business firms produce an output using the factors of production provided by the households and pay wages, rent, interest and profit to households as factor payments.
- These factor payments create an income to factor owners and that factor income is used to purchase the output that has produced by the business firms.
- Thus, output produced by the business firms flow in to households for the final consumption and households make expenditure to purchase the output.
- This process is called as **main circular flow of income.**
- The circular flow of income shows **how income 'circulates' in an economy**.
- Theoretically, the **circular flow of income could go on at the same value indefinitely** because nothing is being added or taken away from the system.
- **Thus, if no income or output added or taken away from the main circular flow this process operates at an equilibrium level.**
- **In such a situation total factor income equals to the expenditure generated on total output produced using the same factors of production. (Y=E)**
- **This situation is known as a macroeconomic equilibrium.**
- **However if there are leakages and injections to the main circular flow this equilibrium gets distorted.**

Leakages and Injections

01. Injections

- Injection to the main circular flow of income is any expenditure generated on goods and services other than consumer expenditure (household expenditure).
- In other wards if goods and services produced by business firms are purchased by any other economic agent other than consumers/households can be considered as an injection.

1. Injections in simple economy
    a. Capital goods purchased by business firms (investment)

2. Injections in closed economy
    a. Capital goods purchased by business firms (investment)
    b. Goods and services purchased by government (Government Expenditure)
3. Injections in open economy
    a. Capital goods purchased by business firms (investment)
    b. Goods and services purchased by government (Government Expenditure)
    c. Goods and non-factor services exports (Exports)

02. Leakages

- Leakage from main circular flow is any factor income generated by providing factors of production to produce national output **which is not passed on within the system**.
- In other wards if any factor income has not been converted to household consumption expenditure can be considered as a leakage.

1. Leakages in simple economy
    a. Total savings (Savings)
2. Injections in closed economy
    a. Total savings (Savings)
    b. Total taxes paid to government (Taxes)
3. Injections in open economy
    a. Total savings (Savings)
    b. Total taxes paid to government (Taxes)
    c. Goods and non-factor services imports (Imports)

Special note; - In a situation where there are leakages and injections present in an economy, macro-economic equilibrium to happen amount of leakages should equal to the amount of injections.

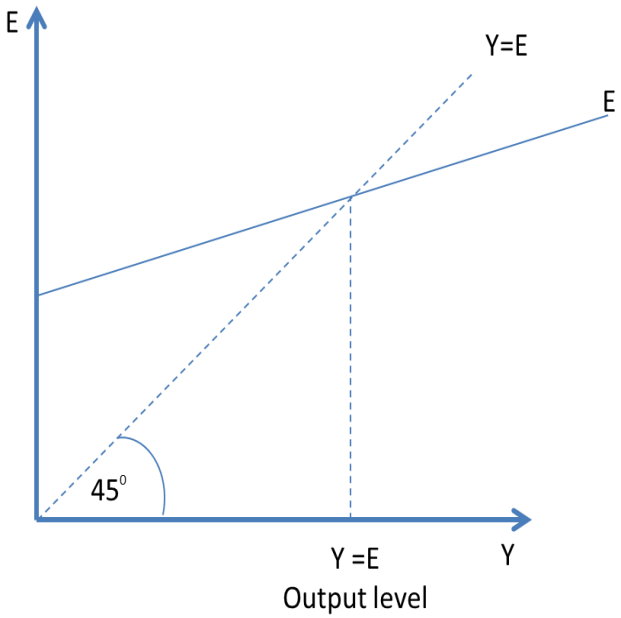
Macro-Economic Equilibrium Conditions

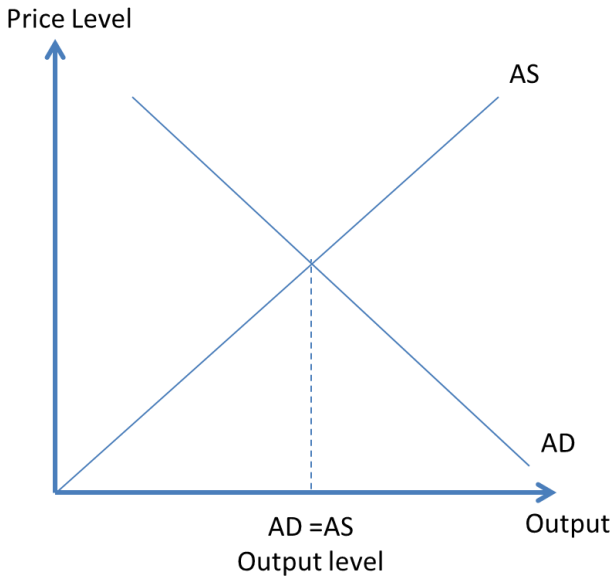
- There are two main conditions of macro-economic equilibrium.
    1. Y=E (Aggregate Output =Aggregate Expenditure)
    2. W=J (Withdrawals = Injections)

01. Y=E Approach

- Aggregate output (Y) is the total output produced by an economy within a particular period of time. This is equals to **gross domestic production at market price**.

- Aggregate Expenditure (E) is the total expenditure made by an economy within a particular period of time. This is equals to **gross domestic expenditure at market price**.
- If Y=E, it shows that arrearage demand (aggregate expenditure) equals to aggregate supply (aggregate output). Thus, economy settles at macro-economic equilibrium.
- Graphically this can be depicted in two ways;





Constructing Y=E in different economic models

a. Simple Economy

- In simple economy aggregate expenditure is constructed by main two variables;
  a. Expenditure on consumer goods (c)
  b. Expenditure on capital goods including depreciation (I)

$$E = C + I$$

b. Closed Economy

- In closed economy aggregate expenditure is constructed by main three variables;
  a. Expenditure on consumer goods (c)
  b. Expenditure on capital goods including depreciation (I)
  c. Goods and services purchases of the government (G)

$$E = C + I + G$$

c. Open Economy

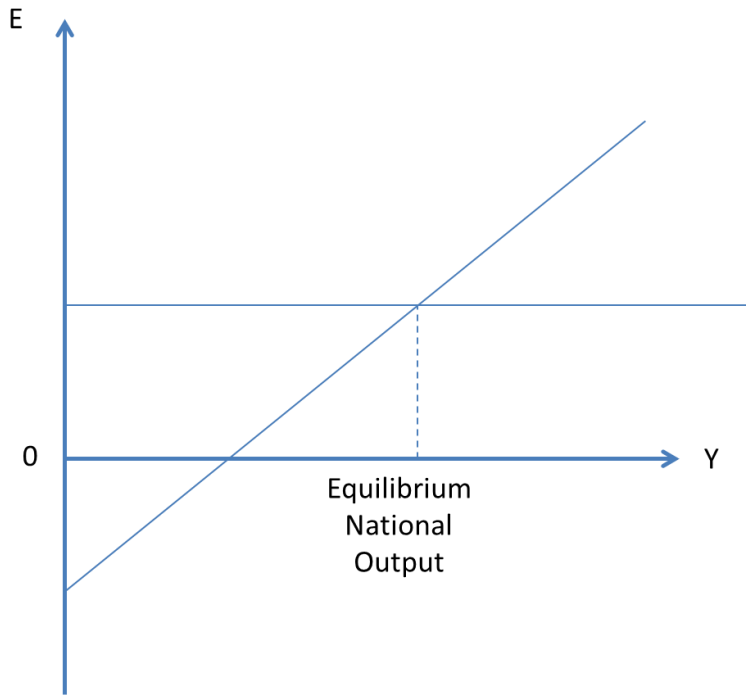
- In open economy aggregate expenditure is constructed by main three variables. However since there are exports and imports are also involved in this economy an adjustment should be made in order to convert gross domestic expenditure in to gross domestic production. Thus, **aggregate expenditure that equals to aggregate output is constructed by main four components**:
    a. Expenditure on consumer goods (c)
    b. Expenditure on capital goods including depreciation (I)
    c. Goods and services purchases of the government (G)
    d. Goods and non-factor services net exports (NX)

$$E = C + I + G + NX$$

02. W=J Approach

- If total withdrawals equal to total injections then, main circular flow again settles at equilibrium.
- However, if withdrawals (w) exceed injections (j) main circular flow gets contracted whereas, if injections (j) exceed withdrawals (w) main circular flow gets expanded.

Constructing W=J in different economic models

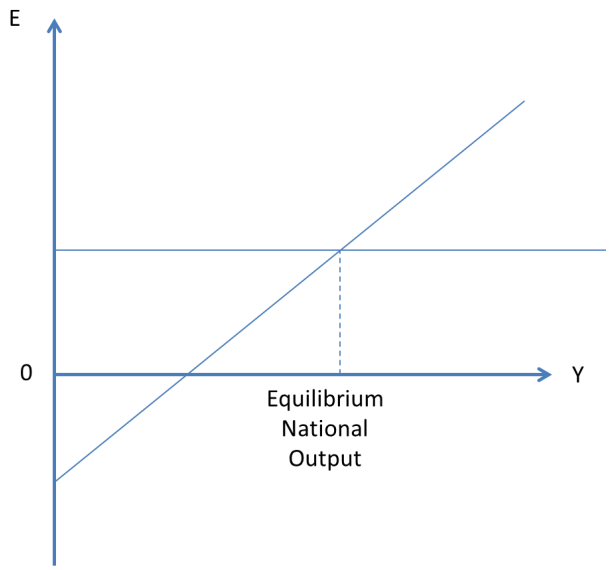


Constructing W=J in different economic models

a. Simple Economy

- In simple economy, there is only one withdrawal
    a. Total savings (S)
- Further it has only one injection as well.
    a. Expenditure on capital goods including depreciation (I)

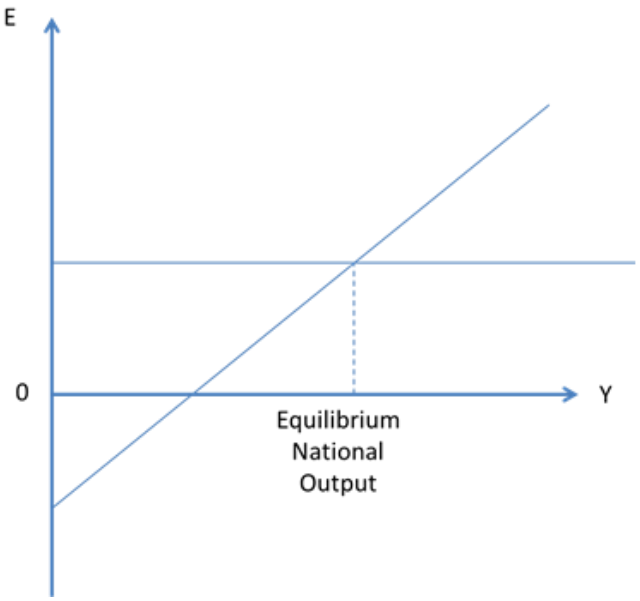
$$S = I$$



b. Closed Economy

- In closed economy, there are two withdrawals
    a. Total savings (S)
    b. Total Taxes (T)
- Further it has two injections as well.
    a. Expenditure on capital goods including depreciation (I)
    b. Goods and services purchases of the government (G)

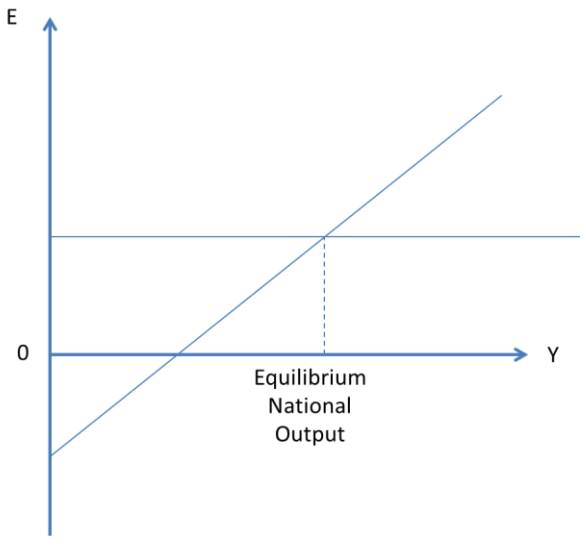
$$S + T = I + G$$



c. Open Economy

- In open economy, there are three withdrawals
    a. Total savings (S)
    b. Total Taxes (T)
    c. Goods and non-factor services imports (M)
- Further it has two injections as well.
    a. Expenditure on capital goods including depreciation (I)
    b. Goods and services purchases of the government (G)
    c. Goods and non-factor services exports (X)

$$S + T + M = I + G + X$$



Understanding different functions related to macroeconomic equilibrium

01. Consumption Function

- Consumption function is constituted by main two components:
  a. Autonomous consumption (consumption that is independent from factor income) – (a_0)
  b. Consumption that varies with disposable household income – **(b X Yd)**

$$C = a_0 + bYd$$

a. Autonomous Consumption (a_0)

- Autonomous consumption is amount of expenditure spend on goods and services even at the zero level of factor income. Therefore **autonomous consumption is independent from factor income (Y).**
- This autonomous consumption is the **mandatory expenditure** that has to be spent by household sector for their bare minimum survival even if they do not receive any factor income. Therefore it is considered that **autonomous consumption is spent out of savings of the economy**.

b. Consumption Varies with Disposable Income (bYd)

- "b" refers to the additional amount that is spent on consumption (Δc) out of one unit of additional disposable income (ΔYd) received by household sector.

$$b = \Delta C/\Delta Yd$$

- Disposable income is the total income that can be spent by household either on consumption or savings as per their choice.
- In **simple economy** disposable income equals to factor income received by household since there is no government sector. **(Y =Yd)**
- However **in closed economy and in open economy** when government imposes taxes and government grant subsidies to the households disposable income does not equal to factor income. (Y≠Yd)

$$Yd = Y - Tx + R_0$$

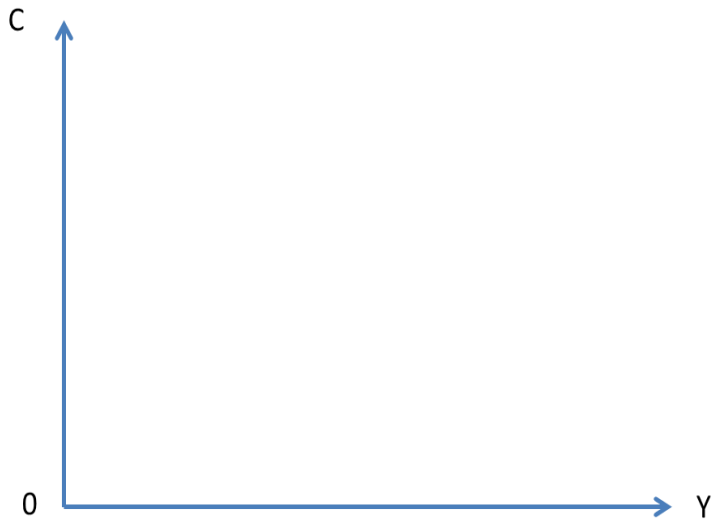
- **"R_0"** refers to the transfers granted by the government. This expenditure is independent from the factor income received by household sector. Therefore, this is an **autonomous expenditure** component.
- **It is important to note that R_0 is not a part of Government purchases (G)**
- **"Tx"** refers to the total tax function. It is made out of main two types of taxes.
    a. Indirect Taxes/ Lump-sum taxes (Taxes independent from factor income) – **T_0**
    b. Direct taxes/Income taxes – **tY**

$$Tx = T_0 + tY$$

- "t" refers to **percentage of income tax paid from factor income received by households**. Therefore "t" is known as **income tax percentage**.

Special note ;-

Constructing consumption function in a diagram



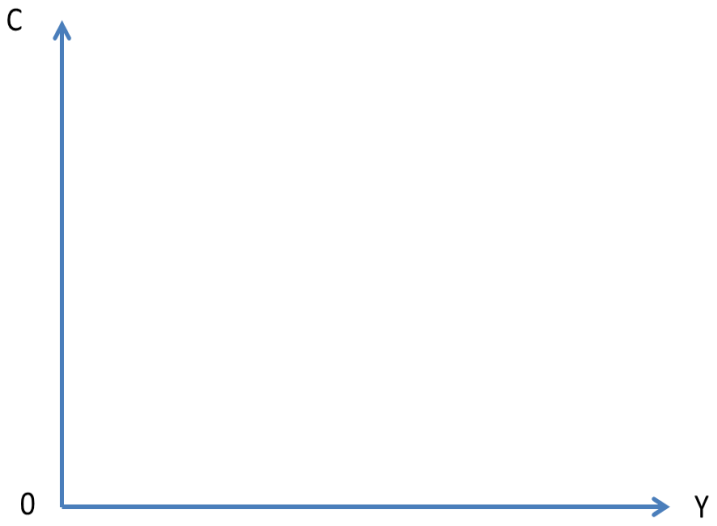
Y	C
0	500
500	750
1000	1000
1500	1250
2000	1500
2500	1750

Understanding concepts relating to consumption diagram

a. Average Propensity to Consume (APC)

- Average propensity to consume is proportion that is allocated on consumption by households from their factor income.

APC= C/Y



Y	C	APC
0	500	N/A
500	750	1.5
1000	1000	1.0
1500	1250	0.8
2000	1500	0.8
2500	1750	0.7

b. Marginal Propensity to Consume (MPC)

- Marginal propensity to consume is the additional consumption expenditure made by households from additional factor income that they received.

$$MPC = \Delta C / \Delta Y$$

Y	C	MPC
0	500	
500	750	
1000	1000	
1500	1250	
2000	1500	
2500	1750	

02. Savings Function

- Savings function is constituted by main two components:
  a. Autonomous savings (Savings that is independent from factor income) – ($-a_0$)
  b. Consumption that varies with disposable household income **–[(1-b) X Yd]**

$$S = -a_0 + (1-b)Yd$$

a. Autonomous Saving ($-a_0$)

- Autonomous savings is amount of savings at the zero level of factor income. Therefore **autonomous consumption is independent from factor income (Y).**
- This autonomous savings is **always negative**. The reason is at the zero factor income level there is an autonomous consumption and that consumption takes place by utilizing the current savings. Hence **at the zero income level savings will be negative by the amount of autonomous consumption expenditure.**

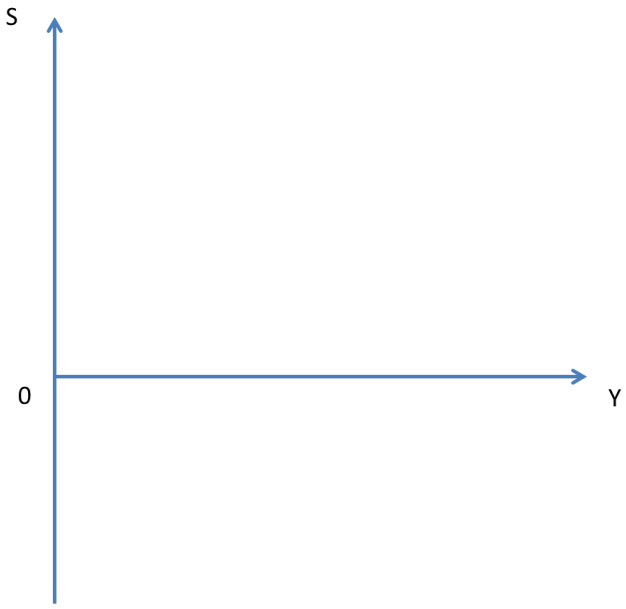
b. Savings that varies with disposable Income (bYd)

- "1-b" refers to the additional amount that is allocated on savings (Δs) out of one unit of additional disposable income (ΔYd) received by household sector.

$$1-b = \Delta S / \Delta Yd$$

Connection between consumption & savings function

Constructing savings function in a diagram



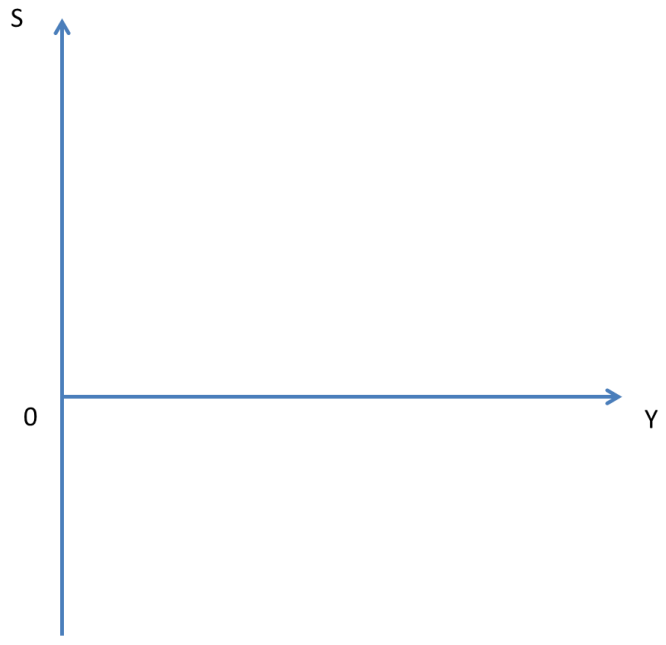
Y	S
0	-500
500	-250
1000	0
1500	250
2000	500
2500	750

Understanding concepts relating to consumption diagram

a. Average Propensity to Save (APS)

- Average propensity to save is the proportion that is allocated on savings by households from their factor income.

APC= S/Y



Y	S	APC
0	-500	N/A
500	-250	-0.5
1000	0	0
1500	250	0.17
2000	500	0.25
2500	750	0.3

b. Marginal Propensity to Save (MPS)

- Marginal propensity to save is the additional savings allocation made by households from additional factor income that they received.

$$MPC = \Delta S / \Delta Y$$

Y	S	MPC
0	-500	
500	-250	
1000	0	
1500	250	
2000	500	
2500	750	

03. Autonomous Expenditure Functions

- Autonomous expenditure is any expenditure which is independent from factor income received.
- Following expenditure functions are autonomous expenditure function:
  a. Investment function ($I = I_0$)
  b. Government Expenditure function ($G = G_0$)
  c. Export Function ($X = X_0$)

04. Import Functions

- Import function is constituted by main two components:
  a. Autonomous imports (Imports that is independent from factor income) – **(M_0)**
  b. Imports that varies with disposable household income **–[(m X Yd]**

$$M = M_0 + mYd$$

a. Autonomous Imports (M_0)

- An autonomous import is amount of imports at the zero level of factor income. Therefore **autonomous import is independent from factor income (Y).**
- This autonomous import is the mandatory imports an economy requires. Thus, even at no income level autonomous imports are available.

b. Imports that varies with disposable Income (mYd)

- "m" refers to the additional amount that is spent on import expenditure (ΔM) out of one unit of additional disposable income (ΔYd) received by household sector

$$m = \Delta M / \Delta Yd$$

Constructing imports function in a diagram

Y	M
0	200
500	250
1000	300
1500	350
2000	400
2500	450

Understanding concepts relating to consumption diagram

a. Average Propensity to imports (APM)

- Average propensity to import is the proportion that is allocated on imports by households from their factor income.

$$APM = M/Y$$

b. Marginal Propensity to Import (MPM)

- Marginal propensity to import is the additional import expenditure allocation made by households from additional factor income that they received.

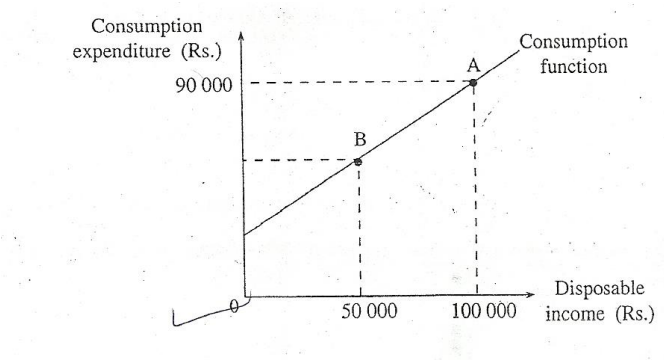
$$MPM = \Delta M / \Delta Y$$

Y	M	MPM
0	200	
500	250	
1000	300	
1500	350	
2000	400	
2500	450	

Questions

1. For a closed economy with no government, suppose the consumption function is given by C = 100 + 0.8Y , While investment is given by I = 50
   a. What is the equilibrium level of income of this economy?
   b. What is the level of savings in equilibrium?
   c. If, for some reason, income is at the level of 800, what will the level of involuntary inventory accumulation be?
   d. If investment (I) rises to 100, what will the effect be on the equilibrium income?
   e. Draw a diagram indicating the equilibria in both (a) and (d)
2. Explain graphically the determination of the equilibrium GDP through both the aggregate expenditure approach and the leakages- injections approach. For an economy comprising of government sector and foreign trade sector.
3. Suppose the aggregate consumption function for a simple economy is a follows.
   C = 200 + 2/3 Y
   a. What would the equation be for the aggregate savings function?
   b. At which level of income would savings be zero?

4. The diagram below displays a linear aggregate consumption function with a marginal propensity to consume (MPC) of 0.82.



What is the amount of consumption expenditure corresponding to point B?

(i) 82000 (ii) 50000 (iii) 49000 (iv) 41000 (v) 33000

5. Using an appropriate diagram explain what is meant by the equilibrium level of national income.

6. If equilibrium national income is (Y)= 5,200, disposable income is (Yd)=4,400, consumption is (C) = 4,100, net exports is (NX)= - 110, and the budget deficit is (BD) = 150, what is the level of investment (I) at equilibrium?

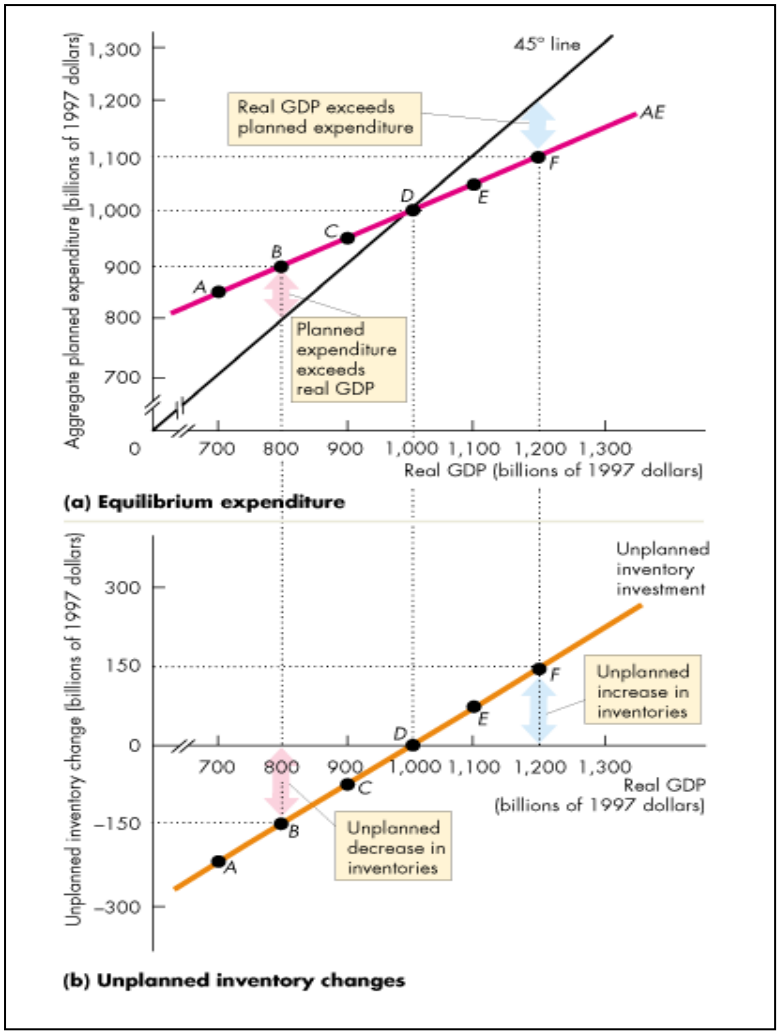
7. (a) Consider an economy with no government, imports, or exports and with fixed prices and interest rates The aggregate consumption function of the economy is X = 150 + 0.60 YR

(b) Suppose a government sector is now added to the original economy described in part (a) the government spends 100 on goods and services and receives taxes s of 100

i What is the equilibrium level of aggregate output now?

ii Full employment output, but taxes are not changed. What level of government spending will result in an equilibrium output of 800?

Unplanned change in inventory



Connection between MPC, MPS, MPT and MPM

RECAP

MPC Refers to,

MPS Refers to,

_____

_____

_____

_____

_____

_____

MPT Refers to,

_____

_____

_____

_____

_____

_____

MPM Refers to,

_____

_____

_____

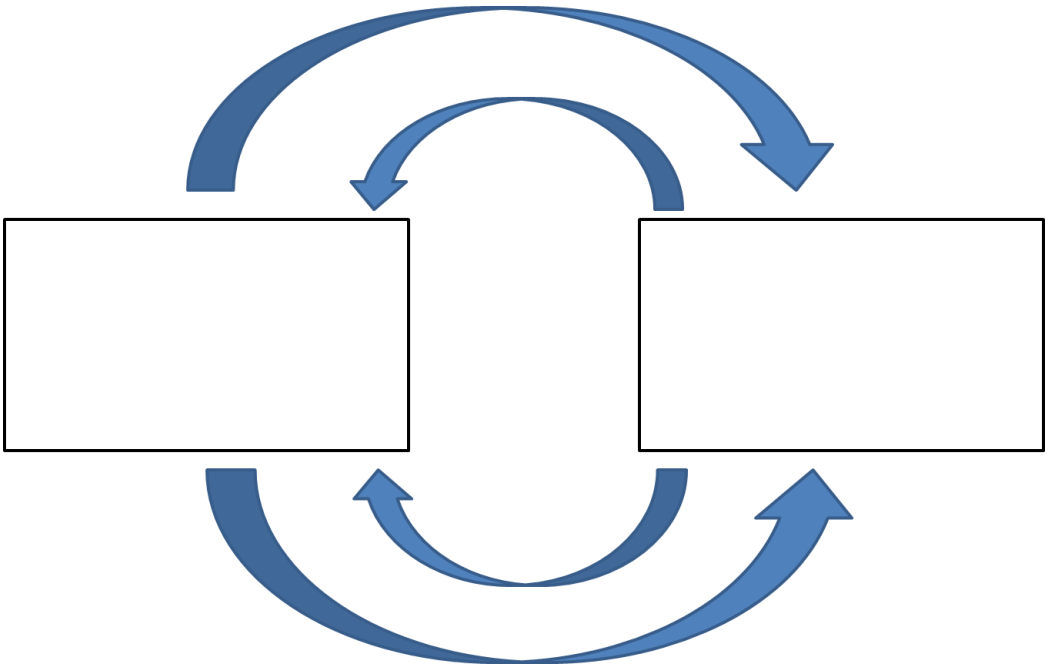
_____

_____

_____

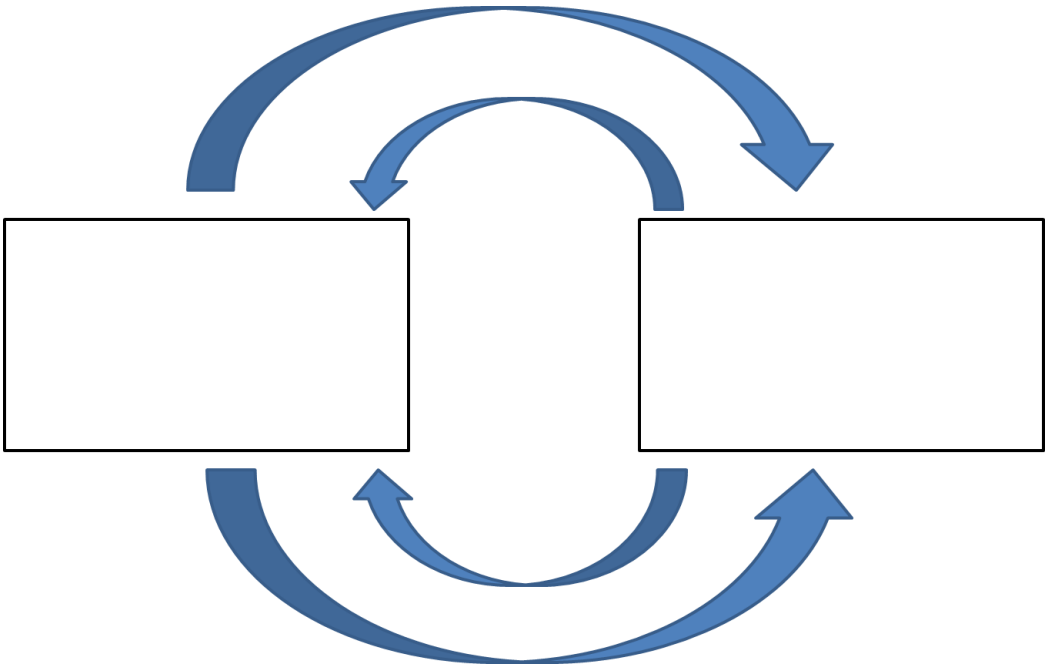
In Simple Economy

MPC + MPS =1



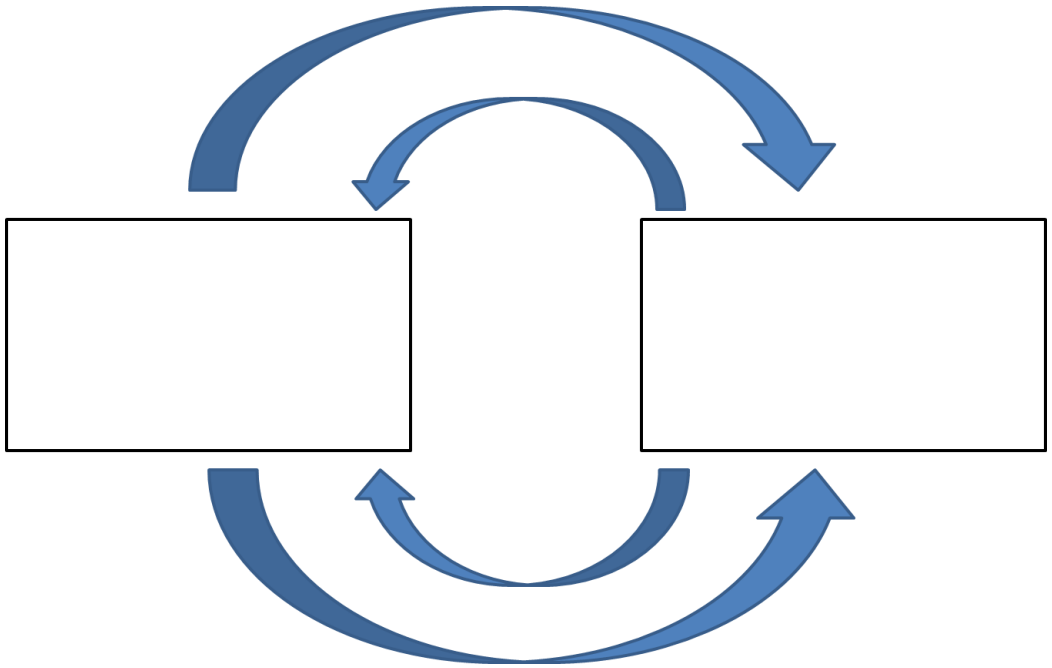
In Closed Economy (Simple economy with government)

MPC + MPS +MPT =1



In Open Economy (Economy with government & foreign sector)

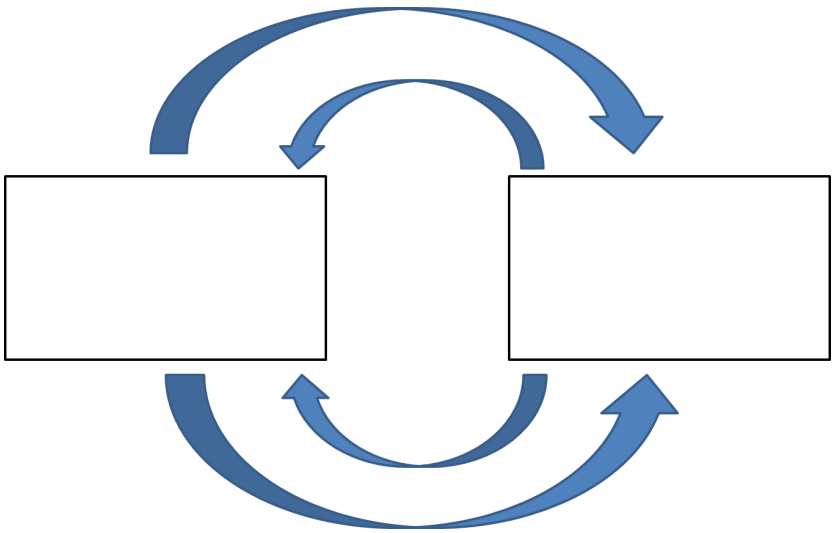
MPC + MPS +MPT +MPM =1



Multiplier effect

- An initial change in aggregate demand can have a much greater final impact on the level of equilibrium national income.
- This is commonly known as the **multiplier effect** and it comes about because **injections of demand** into the **circular flow of income** stimulate further rounds of spending – in other words "one person's spending is another's income" – and this can lead to a much bigger effect on equilibrium output and employment.
- It is the cornerstone of Keynesian economics.
- **Multiplier is the factor that describes number of times in which equilibrium income changes when an additional unit of autonomous expenditure changes.**

Example :- Imagine a hypothetical economy where there are four economic sectors (Households, Business firms, Government and Foreign sector). In this economy MPC = 0.6, MPS= 0.2, MPT =0.1 and MPM =0.1. If this economy receives Rs.1000/- worth of an injection show how multiplier effect works.



1st round of multiplier effect - _____

2nd round of multiplier effect - _____

3rd round of multiplier effect - _____

4th round of multiplier effect - _____

Total multiplier effect - _____

Multiplier effect in any economy

- Equilibrium national income of any economy is comprised of two main components.

    1. Total autonomous income of the economy – (A_0)
    2. Expenditure multiplier of the economy – (K)

$$Y = A_0 \times K$$

- In any economy expenditure multiplier can be obtained by 3 methods.

Method I

$$K = \frac{1}{\text{Total withdrawals out of an additional unit of factor income}}$$

Method II

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

Method III

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

Multiplier effect in simple economy

- In simple economy total withdrawals is only comprised by savings.
- Therefore multiplier in simple economy can be calculated as follows.

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

Multiplier effect in closed economy

- In closed economy total withdrawals are comprised by savings and taxes.
- Therefore multiplier in closed economy can be calculated as follows.

$$K = \frac{1}{MPS + MPT}$$ OR $$K = \frac{1}{1-MPC}$$

Multiplier effect in open economy

- In open economy total withdrawals are comprised by savings, taxes and imports.
- Therefore multiplier in open economy can be calculated as follows.

$$K = \frac{1}{MPS + MPT + MPM}$$ OR $$K = \frac{1}{1-MPC}$$

Total Autonomous Expenditure

- Autonomous expenditure are the expenditure items those are independent from factor income received by households.
- In simple economy total autonomous expenditure can be found as follows.

$$A_0 = a_0 + I_0$$

- In closed economy total autonomous expenditure can be found as follows.

$$A_0 = a_0 - bT_0 + bR_0 + I_0 + G_0$$

- With regard to closed economy following key points need to be considered.
    a. When lump sum taxes (indirect taxes) are imposed total autonomous expenditure of the economy falls. Thus, equilibrium national income also falls.
    b. However when a lump sum taxes are imposed total autonomous expenditure of the economy does not fall by the same amount of lump sum taxes but by a lesser amount (since final impact is "b X T_0 ")
    c. When transfers are granted total autonomous expenditure of the economy rises. However the rise of autonomous expenditure is lesser than the amount at which transfers are granted. (since final impact is "b X R_0 ")
    d. If autonomous consumption, Investment or government purchases are increased autonomous expenditure of the economy rises by the same amount at which relevant expenditure item is increased.

Tax Multiplier

- Tax Multiplier is the factor that describes number of times in which equilibrium income changes when an additional unit of autonomous taxes (lump sum taxes) changes.
- Lump sum tax and equilibrium national income has an inverse relationship.
- Therefore tax multiplier is always provides a negative figure.

$$K = \frac{-b}{MPS + MPT}$$

OR

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

Transfer Multiplier

- Transfer multiplier is the factor that describes number of times in which equilibrium income changes when an additional unit of autonomous transfers changes.
- Transfers and equilibrium national income has a direct relationship.
- Therefore transfer multiplier is always provides a positive figure.

$$K = \frac{+b}{MPS + MPT}$$

OR

$$K = \frac{+b}{1-MPC}$$

Past Paper Questions

A/L 2012

(i) Explain what is meant by equilibrium level of national income. What are the conditions required for the equilibrium in national income level?

(ii) Why is saving called a 'leakage'?

(iii) Assume that, without taxes the consumption schedule of an economy is as shown below: (Figures are in Rs. billion)

GDP (Y)	Consumption (C)	GDP (Y)	Consumption (C)
100	120	400	360
200	200	500	440
300	280	600	520

Graph this consumption schedule and derive the equation representing the consumption function

(iv) Assume now that a lump-sum tax system is imposed, such that the government collects Rs. 20 billion in taxes at all levels of GDP. Graph the resulting consumption schedule and derive the equation representing the new consumption schedule.

A/L 2013

(i) Briefly explain the meaning of the meaning of the "Investment multiplier".

(ii) Distinguish between "inflationary gap" and "recessionary gap"

(iii) "The simple income-expenditure model of income determination shows that that the economy can be in equilibrium with **either** inflation or unemployment **or** neither" Explain using appropriate diagrams.

(iv) Suppose that for a particular closed economy, for some given time period, investment was equal to 100, government purchases were equal to 75, net taxes were fixed at 100, and consumption (C) given by the consumption function.

$$C = 25 + 0.8\ Y_d$$

Where Y_d is disposable income.

(a) What are the values of the government expenditure multiplier and the tax multiplier?

(b) Suppose that the full-employment level of income for this economy is 1000. What would be the increase in government spending required to reach full-employment income level? Alternatively, what reduction in tax collection would be sufficient to reach full-employment income level?

MOCK QUESTIONS

1. Following data has been extracted from a simple economy.

   Autonomous consumption = 100
   Investment = 1500
   MPS = 0.4

   a. Calculate national income using Y=E method
   b. Calculate national income using W=J method
   c. Calculate expenditure multiplier

2. Following data has been extracted from a simple economy.

   Autonomous consumption = 500
   Investment = 2500
   MPC= 0.5

   a. Show equilibrium national income using a diagram (Y=E method)
   b. Show equilibrium national income using a diagram (W=J method)
   c. Calculate national income using multiplier.

3. Following data has been extracted from a closed economy.

   C = 200 + 0.6 Y
   I = 3160
   G = 4340

   a. Calculate national income using Y=E method
   b. Calculate expenditure multiplier
   c. If new investment of 500 is injected to the economy calculate the new national income
   d. Show first 3 rounds of multiplier effect of the new investment

4. Following data has been extracted from a closed economy.

   C = 400 + 0.5 Yd
   Tx = 1000 + 0.25 Y
   I = 2100
   G = 4250

   a. Calculate national income using Y=E method
   b. Calculate following at the equilibrium :
      - Consumption
      - Savings

- Budget deficit/surplus
- Disposable national income
- MPC
- MPS
- Expenditure multiplier

c. Calculate extra investment requirement for this economy to achieve full employment level of 20,000

5. Following data has been extracted from a closed economy.

C = 500 + 0.5 Yd
Tx = 500 + 0.5 Y
I = 10250
G = 12500

a. Calculate national income using W=J method
b. Calculate following at the equilibrium :
   - MPC
   - MPS
   - Expenditure multiplier
   - Tax multiplier
c. Calculate unemployment gap if full employment level is at 30,000.
d. In order to increase national income which of the following is the most appropriate method
   - Increase investment by 400 or
   - Reduce indirect tax by 400

6. Following data has been extracted from a closed economy.

S = - 400 + 0.75 Yd
Tx = 1000 + 0.2 Y
I = 4300
G = 1000

a. Calculate national income using Y=E method
b. Calculate following at the equilibrium :
   - Expenditure multiplier
   - Tax multiplier
d. Show equilibrium national income using a diagram (Y=E method)
e. Show equilibrium national income using a diagram (W=J method)

7. Following data has been extracted from a closed economy.

Disposable National income (YD) = 8,000
Budget deficit (BD) = 600
Government Expenditure (G) = 2100
Indirect tax (T_0)= ?
Income tax percentage= 10%
Investment = 2000
MPC = 0.5

a. Calculate followings:

- Total tax amount at equilibrium
- Indirect tax amount at equilibrium
- Tax function
- Consumption function
- MPS
- Total autonomous expenditure
- Expenditure multiplier

8. Following data has been extracted from a closed economy.

   C = 2000 + 0.5 YD
   Tx = 500 + 0.2 Y
   I = 3250
   G = 2300
   NX = - 300

   a. Show equilibrium national income using a diagram (Y=E method)
   b. If this economy wants 50% growth, how much of investment should be increased.
   c. If indirect tax is reduced by 400, how much of national income be increased.

9. In a hypothetical economy following information is provided.

C = 2000 + 0.75 YD
Tx = 1000 + 0.2 Y
I = 2750
G= 4000

1. Calculate equilibrium national Income using Y=E method
2. Calculate equilibrium national Income using W=J method
3. Calculate followings at equilibrium national Income:
   a. Consumption
   b. Savings
   c. Budget surplus /deficit
   d. Method of financing budget surplus /deficit
4. Calculate followings with regard to this economy
   a. Total autonomous expenditure
   b. MPC
   c. MPS
   d. Expenditure multiplier
   e. Tax multiplier
5. Show national income in a graph (Y=E method)
6. Show national income in a graph (W=J method)
7. Suppose this economy opens up. Following additional information is provided with regard to this new development.
   X = 1000
   M = 200

a. Calculate equilibrium national Income
b. Show first 3 rounds of multiplier in this economy with the addition of Net exports (NX)

8. After the addition of foreign sector, it has been assessed that the full employment level of this economy is 30,000.
    a. What is the unemployment gap in this economy
    b. If this economy decides to increase level of investment to reach full employment level what should be the additional investment injection required by this economy.
    c. Is it possible to achieve full employment level of investment by reducing indirect taxes without increasing investment? Explain your answer.
9. Explain economic consequences of following events.
    a. Government increase government spending by 50%
    b. Government revise its income tax percentage to 50% but no change in indirect taxes

10. Explain if government wants to expand he economy what is the most appropriate strategy
    a. Government increase its government purchases by 1000
    b. Government decrease its government indirect taxes by 1000