

# “AGGREGATE DEMAND AND INCOME MULTIPLIER”

## BRAINSTORMING

### 1a. Warm up questions

1. How may we define the economists before Keynes? Are they generally referred to as the “*classical economists*”?
1. Did they believe that “Say’s law” of markets caused market equilibrium?
1. Is the “*quantity theory of money*” one essential principle of the *classical approach*?
1. Why is “Say’s law” usually stated as “*supply creates its own demand*”?
1. Is it the same to say “*whatever the value of output, demand will adapt*”?
1. Are prices and wages flexible according to the “*classical*” point of view?
1. Since savings and investment are always brought into balance by changes of the interest rate, can we say that all savings are therefore reinvested?
1. If we accept all these principles, are over-production of goods and unemployment possible in the mid- or long run?
1. Will the economy therefore naturally tend towards equilibrium?
1. Is this equilibrium a “*full employment equilibrium*”?
1. Did the “*classical economists*” consider any government intervention useful to reach equilibrium?
1. Why did the “*classical economists*” feel that any unemployment, whenever occurring, was *voluntary*?

### 1b. Key words and formula

- ***Marginal propensity to consume*** – variations in consumption in response to an incremental change in disposable income (***income induced consumption***). It is found by dividing the *change* in consumption by the *change* in disposable income that produced the consumption change:  
$$MPC = \text{change in consumption} / \text{change in income}$$
- ***Autonomous Spending*** - spending that is determined outside the model (independent of level of income and other variables).
- ***Invisible hand*** – According to Adam Smith’s theory, an invisible hand process is one in which the outcome to be explained is produced in a decentralised way, with no explicit agreements between the acting agents. The second essential component is that the process is not intentional. The agents' aims are neither coordinated nor identical with the actual outcome, which is a by-product of those aims. The process should work even without the agents having any knowledge of it. This is why the process is called invisible. The system in which the invisible hand is most often assumed to work is the free market.
- ***Aggregate expenditures*** - Total spending on goods and services in the economy as the sum of four components: consumption, investment, government spending, and net exports:

$$AE = C + I + G + NX$$

where,

AE = aggregate expenditures

C = consumption

I = investment

G = Government spending

NX = net exports (exports - imports)

- **The consumption function** represents the "planned" or "desired" level of consumption for a given level of income:

$$C = C_0 + c \cdot Y$$

where,

C = desired level of consumption spending

$C_0$  = fixed (autonomous) level of consumption,  $C_0 > 0$

c = constant,  $0 < c < 1$ , also called the "marginal propensity to consume" (MPC)

Y = total income

- **Autonomous consumption** - the minimum level of consumption necessary to survive (often called the "subsistence" level). Even if you are unemployed, you still have to eat and hopefully sleep under a roof. You still consume food and housing.

## 2a. Lesson One

Smith and the classical economists that followed believed that governments could be their own worst enemies when it came to the economy. With *laissez-faire* (hands-off) government policies, the economy would better achieve the goals of price stability, full employment, and economic growth.

The classical economists believed that prices, wages and interest rates would adjust "as if led by an invisible hand" to return the economy to full employment and economic growth.

### **Classical macro theory:**

- Prices will fall thereby stimulating demand.
- Interest rates will fall thereby stimulating investment.

On the other hand, the foundation of Keynesian macroeconomic theory is that prices, wages, and interest rates are fixed. Prices and wages are directly related because firms could not lower product prices if wages were not lowered. Classical economic theory suggested that high unemployment rates would lead to lower wage rates, which would lead to lower prices, which would lead to higher demand because of the increased purchasing power of existing wealth. But Keynes observed that wages were not falling (actually there was a decline in the average price level during the early 1930s but evidently not enough to matter). Keynes could not apply an economic theory to explain why those people out of work were unwilling to accept a lower wage in order to get a job. He simply accepted it as an unexplained socioeconomic fact of life and built a theory around the assumption that prices and wages were rigid.

### Keynesian macro theory:

- Prices, wages and interest rate are fixed.
- Government fiscal policy stimulus needed.

Interest rates are a different story. Classical theory suggests that during a recession or depression interest rates should fall, which would stimulate consumption and investment spending. Keynes observed that if interest rates were already near zero, they could hardly go any lower. Moreover, even if interest rates could decline further, why would that lead to an increase in investment? With factories running well below capacity because of the Depression, there would be no point in building new production plants.

## Graphing the Consumption Function

The consumption function is a simple linear equation that is graphed as a straight line in Figure 5-2 with the intercept on the vertical (expenditure) axis equal to the autonomous component,  $C_0$ , and the slope equal to the marginal propensity to consume,  $c$ . When income is zero, total consumption is equal to the autonomous level of consumption. If the marginal propensity to consume is 0.9 then the slope of the consumption function equals 0.9. For every \$1 increase in income there is a \$0.90 increase in consumption.

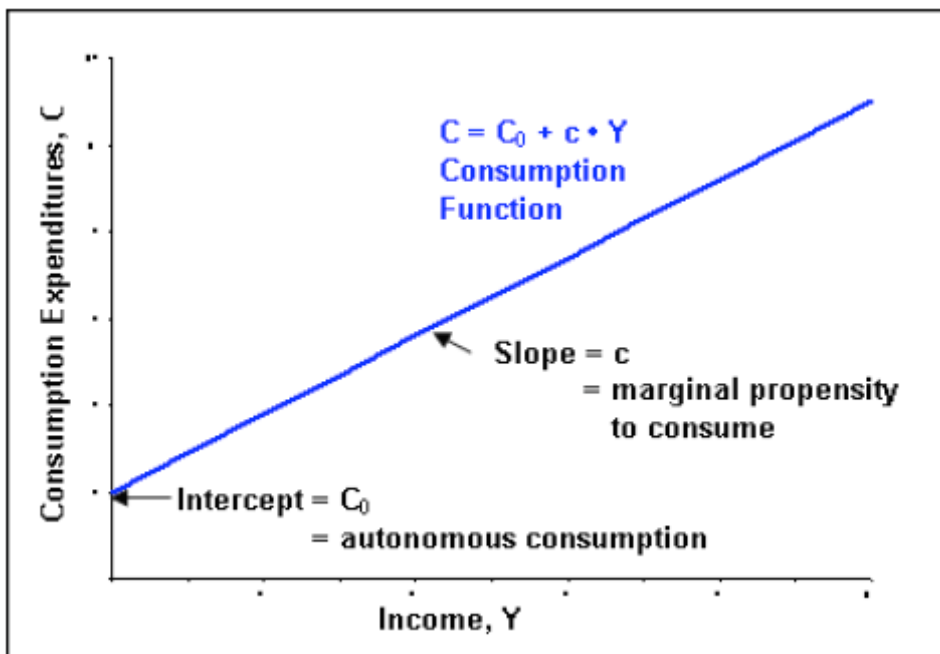


Figure 1. The Consumption Function

**The Consumption Function:  $C = C_0 + c \cdot Y$**

where,

$C$  = desired level of consumption spending

$C_0$  = fixed (autonomous) level of consumption,  $C_0 > 0$

$c$  = constant,  $0 < c < 1$ , also called the "marginal propensity to consume" (MPC)

$Y$  = total income

## 2b. Lesson Two

### Graphing the Aggregate Demand Function

The aggregate expenditures function in Figure 2. looks identical to the consumption function in Figure 1. except that it has shifted up by  $I_0 + G_0$  as **autonomous spending**.

**Autonomous spending** - Autonomous (*adj.*) - self-governing  
Spending that is independent of any other variable (e.g., income, prices, interest rate)

$C_0$  = Autonomous Consumption

$I_0$  = Autonomous Private Investment

$G_0$  = Autonomous Government Spending

$NX_0$  = Autonomous Net Exports

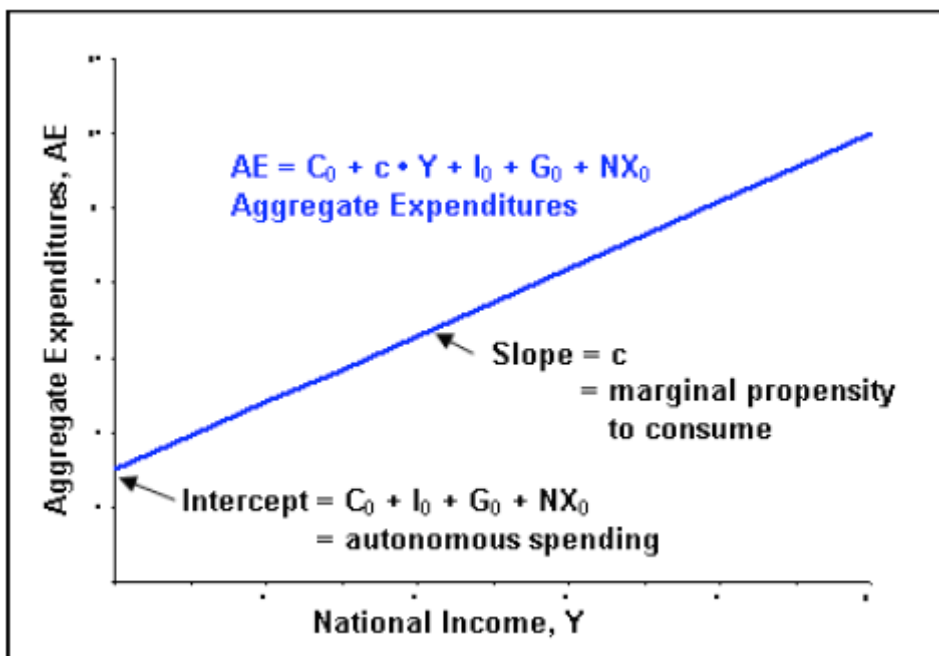


Figure 2. Aggregate Expenditures

## Graphing the Equilibrium Condition

The equilibrium condition is drawn in Figure 2. as the dashed line starting at the origin. This equilibrium line (often called the "45 degree line") identifies all possible points of equilibrium where aggregate expenditures equal total income.

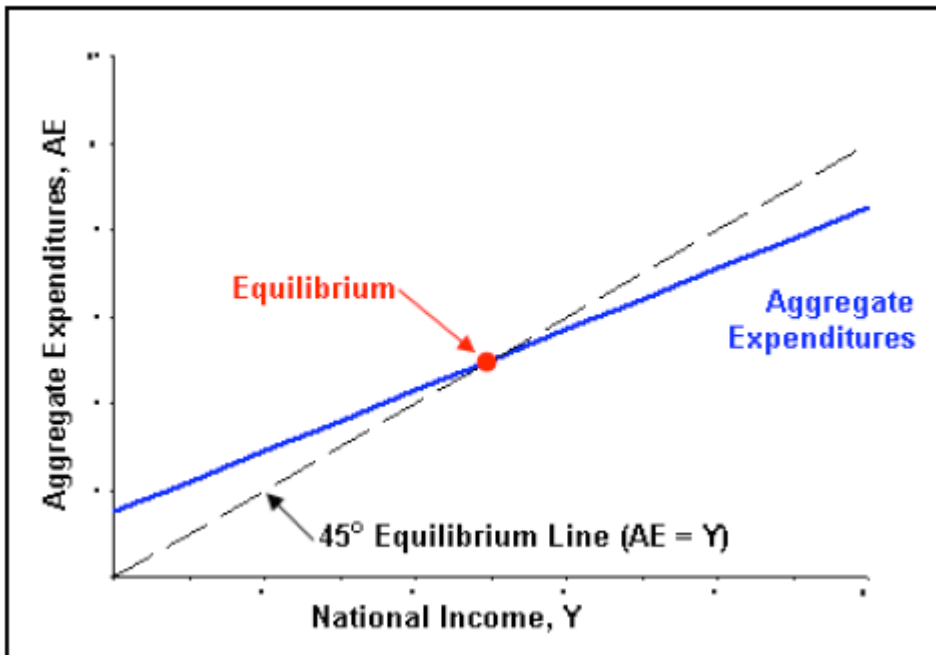


Figure 3. Equilibrium Between Expenditures and Income

## 2c. Lesson Three

### Autonomous Spending Multiplier

The components of the Keynesian model (the equilibrium condition and the aggregate expenditures equation) have been established. Note that we have really only defined spending. This characterizes the Keynesian model as strictly a model of demand. The supply side is essentially ignored. Firms simply increase or reduce output to meet the level of demand at the fixed price level. The aggregate supply curve is flat at the fixed price level and only shifts in spending result in changes in aggregate economic output.

This leads us to two basic questions on spending and the economy:

- What happens to total output and national income if there is a change in autonomous spending (e.g., government spending)?
- If the economy is in a recession, how much of an increase in autonomous spending is needed to increase total output and income to the level of full-employment output?

The autonomous spending multiplier tells us how much total output or income increases when there is a one Euro increase in autonomous expenditures. For example, if the marginal propensity to consume,  $c$ , equals 0.8, the autonomous spending multiplier equals 5.0. If autonomous government spending,  $G_0$ , increases by \$1, national income,  $Y$ , increases by \$5.

$$\text{Autonomous spending multiplier} = 1/1-c = 1/1-\text{MPC}$$

**Autonomous Spending Multiplier** - the amount by which output and national income change when autonomous aggregate expenditures change by one unit.

## An example

Let's say the government increases spending by € 10. That spending is income to someone. If the marginal propensity to consume is 0.8, whoever gets the € 10 turns around and spends € 8 of that income ( $0.8 \times € 10 = € 8$ ). That € 8 spending is income to someone else. That person then spends € 6.4 of that € 8 income ( $0.8 \times € 8 = € 6.4$ ). That € 6.4 is income to someone, and so on. National income has increased by the original € 10 plus the subsequent spending of € 8 and then € 6.4 and then... The cumulative increase in national income according to the multiplier is € 50.

Time period		Y =	C +	S
	1	10	8	2
	2	8	6.4	1.6
	3	6.4	5.12	1.28
	4	5.12	4.09	1.03
Initial New Investment of \$10		new y	new c	new s
After 4 time periods		29.52	23.61	5.91
After Infinite Time periods		50	40	10

Table 1.

## An Overview

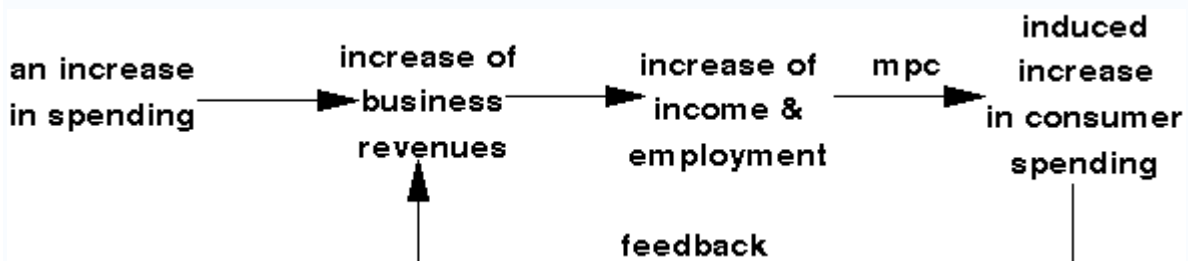
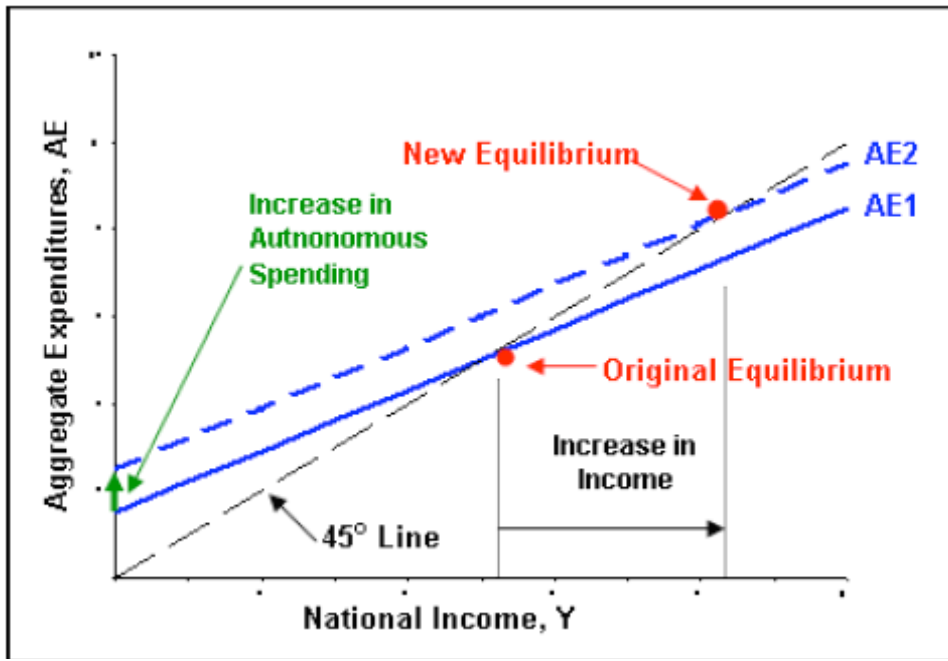


fig. 4. - The Simple Multiplier Process. (mpc=marginal propensity to consume)

## Graphing the Multiplier Effect

The larger the marginal propensity to consume,  $c$ , the larger the multiplier, as we can see in the table above. In the next figure 4., a larger marginal propensity to consume means a steeper aggregate expenditure curve. A given increase in autonomous spending leads to a larger increase in national income if the MPC is larger and the aggregate expenditure curve is steeper.



**Figure 5. Change in Autonomous Spending and Income**

The basic assumption of the multiplier effect is that the economy starts off with unused resources, for example, that many workers are cyclically unemployed and much of industrial capacity is sitting idle or incompletely utilized. By increasing demand in the economy it is then possible to boost production. If the economy was already at full employment, with only structural, frictional, or other supply-side types of unemployment, any attempt to boost demand would only lead to inflation. For various laissez-faire schools of economics which embrace Say's Law and deny the possibility of Keynesian inefficiency and under-employment of resources, therefore, the multiplier concept is irrelevant or wrong-headed.

The multiplier effect arises because of the *induced* increases in consumer spending which occur due to the increased incomes -- and because of the *feedback* into increasing business revenues, jobs, and income again.

### 3. GLOSSARY

#### **AGGREGATE DEMAND**

The total amount of expenditure on domestic goods and services. Aggregate demand is made up of CONSUMPTION expenditure (C), INVESTMENT expenditure (I), GOVERNMENT expenditure (G) and net EXPORTS (exports minus imports) (E).

#### **AGGREGATE SUPPLY**

The total amount of domestic goods and services supplied by businesses and government, including both consumer products and capital goods.

Aggregate supply interacts with aggregate demand to determine the equilibrium level of national income.

#### **MARGINAL PROPENSITY**

The marginal PROPENSITY to consume (or to save) measures by how much a household's CONSUMPTION (SAVINGS) would increase if its INCOME rose by, say, \$1. The marginal tax rate measures how much extra tax you would have to pay if you earned an extra dollar.

#### **MULTIPLIER**

Shorthand for the way in which a change in spending produces an even larger change in INCOME. For instance, suppose a GOVERNMENT loosens FISCAL POLICY, increasing net PUBLIC SPENDING by pumping an extra \$10 billion into education. This has an immediate effect by increasing the income of teachers and of people who sell educational supplies or build or maintain schools. These people will in turn spend some of their extra money, putting more cash into the pockets of others, who spend some of it, and so on.

In theory, this process could continue indefinitely, in which case the multiplier would have an infinite value. In practice, most people save some of their extra income rather than spend it. How much they spend will depend on their MARGINAL PROPENSITY to consume. The value of the multiplier can be calculated by this formula:

multiplier =  $1 / (1 - \text{marginal propensity to consume})$

If the marginal propensity to consume is 0.5 (50 cents of an extra dollar), the multiplier is 2. In practice, it is often hard to measure the multiplier effect, or to predict how it will respond to, say, changes in MONETARY POLICY or fiscal policy.

#### **OUTPUT**

The fruit of economic activity: whatever is produced by using the FACTORS OF PRODUCTION.

#### **OUTPUT GAP**

How far an economy's current OUTPUT is below what it would be at full CAPACITY. On average, INFLATION rises when output is above potential and falls when output is below potential. However, in the short run, the relationship between inflation and the output gap can deviate from the longer-term pattern and can thus be misleading. Alas for policymakers – because nobody really knows what an economy's potential output is, the size and even the direction of the output gap can easily be misdiagnosed, which can contribute to serious errors in MACROECONOMIC POLICY.

**PROPENSITY**

ECONOMICS abounds with propensities to do various things: consume, save, invest, import, and so on. In each case, it is important to distinguish between the AVERAGE propensity and the MARGINAL one. The average propensity to consume is simply total CONSUMPTION divided by total INCOME. The marginal propensity to consume measures how much of each extra dollar of income is consumed: the percentage change in consumption divided by the percentage change in income. The value of the marginal propensity to consume, which determines the MULTIPLIER, is harder to predict than the value of the average propensity to consume.

**SAY'S LAW**

SUPPLY creates its own DEMAND. So argued a French economist, Jean-Baptiste Say (1767–1832), and many classical and neo-classical economists since. KEYNES argued against Say, making the case for the use of FISCAL POLICY to boost demand if there is not enough of it to produce FULL EMPLOYMENT.

## 4. Verifica

Cognome e Nome	Classe
Udine,	Verifica di Economia Politica

1. The relationship between consumption and income is described by the “*consumption function*”:

$$C = C_0 + c \cdot Y$$

where

C = .....

C<sub>0</sub> = .....

c = .....

Y = .....

2. What is the “*marginal propensity to consume*”?

.....  
 .....  
 .....  
 .....

3. Total spending on goods and services in the economy is the sum of four components:

- a. ....
- b. ....
- c. ....
- d. ....

4. When firms are selling as much as they produce and households are buying the amount they want to purchase, the economy is said to be .....

5. What happens when the economy is operating below its potential of full employment?

a. In the classical model

.....  
 .....  
 .....

b. In the Keynesian model

.....  
 .....  
 .....

6. The Keynesian model is strictly a model of demand because:
- The supply side is essentially ignored;
  - The aggregate supply curve is flat;
  - The price level is fixed;
  - All of the above.
7. Which of the following will result in a shift up of the aggregate demand curve?
- There is an increase in government spending, *ceteris paribus*;
  - There is an increase in the rate of interests, *ceteris paribus*;
  - There is an increase in taxes, *ceteris paribus*;
  - All of the above.
8. Suppose there are no government taxes. The first column of Table 1 shows possible levels of output, the second column, the amount that individuals consume at different levels of output; the third, the value of investment spending; the fourth, the government spending; and the fifth, the sum of aggregate spending at each level of output.
- Fill in the gaps in Table 1: choose the different levels of Investment and Government spending. Find the different amounts of the Aggregate Expenditures, especially the one that could be the *equilibrium* level of output.

**TABLE 1**

Aggregate output (Y)	Consumption (C)	Investment (I)	Gov. Spending (G)	Aggregate spending ( )
150	130			
160	135			
170	140			
180	145			
190	150			
200	155			

- Which is the *marginal propensity to consume* at each different level of income?
    - .....
    - .....
    - .....
    - .....
    - .....
9. The *multiplier* measures the rate of change in:
- Output resulting from a change in spending;
  - Consumption resulting from a change in output;
  - Output resulting from a change in consumption;
  - Investment resulting from a change in output.
10. When the marginal propensity to save is 0.20 the value of the multiplier is:
- 2;
  - 4;
  - 5;
  - 8;
  - there is no multiplier effect.