John Maynard Keynes and the National Income Multiplier

\[ C = 200 + \frac{2}{3} Y \]
John Maynard Keynes is unquestionably the major figure in twentieth-century economic theory. His criticism of the peace treaty of Versailles (1919) with Germany in *The Economic Consequences of the Peace* (1919)\(^1\) made him famous overnight and during the economic crises of the 1920s, he came increasingly to identify conservative ‘free market’ policies as the cause of Britain’s economic problems.

As World War II was drawing to a close, Keynes arrived in the U.S. State of New Hampshire as the most important member of the British delegation to the famous Bretton Woods conference, a conference that established an international monetary system; a system that provided the world economy with much-needed stability for a whole generation. According to the agreement reached, countries would retain fixed exchange rates against the dollar, while

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\(^1\) Keynes’s concern over the vindictive terms imposed on the defeated Germans in the World War I Treaty of Versailles was vindicated by the rise of Adolf Hitler; and the memory of his warnings helped convince the victorious Allies of WW II to aid, not punish, their enemies.
the dollar itself would be matched to gold. Two institutions, the International Monetary Fund (IMF) and the World Bank (IBRD), were created to oversee the new international monetary system.

In 1936, Keynes had published *The General Theory of Employment, Interest and Money*, a book that revolutionised economic theory in the same way that Charles Darwin’s *The Origin of Species* revolutionised biology. This so-called Keynesian revolution was grounded in a new theory of income determination; a theory based on the concept of:

- the 'consumption function',
- the 'liquidity preference theory of interest', and
- the ‘inflexibility of money wages’.

The consumption function referred to a relationship between total consumer spending and national income, such that consumer spending always rises less than proportionately with income, leaving a savings gap that only private or public investment can fill. The liquidity preference theory of interest emphasised the role of interest rates as the reward for doing without the advantages of money as the only perfectly liquid asset. The inflexibility of money wages, the most controversial of Keynes’ leading principles, was grounded on a realistic appreciation of labour markets in a modern industrial economy.

With the *General Theory*, as it became known, Keynes sought to develop a theory that could explain the determination of aggregate output - and as a consequence, employment. Among the revolutionary concepts initiated by Keynes was the concept of a demand-determined equilibrium wherein unemployment is possible, the ineffectiveness of price flexibility to cure unemployment, a unique theory of money based on "liquidity preference", the introduction of radical uncertainty and expectations, the marginal efficiency of investment schedule breaking Say's Law (and thus reversing the savings-investment causation), the possibility of using government fiscal and monetary policy to help eliminate recessions and control economic booms. Indeed, with this book, he almost single-handedly constructed the fundamental relationships and ideas behind what became known as "macroeconomics".

Before the *General Theory*, economists could not explain how economic depressions happen, or what to do about them. After 1936, they could. Full employment, Keynes concluded, could be maintained in a capitalist economy but only if governments are willing to incur counter-cyclical budgetary deficits to offset the inbuilt tendency towards private over-saving. For a stretch of about 25 years, many economists turned their backs on Keynes. They claimed, with some justice, that he made assumptions that could not be rigorously justified. Moreover, the problems facing the world in the 70s and 80s were non-Keynesian in nature; inflation rather than deflation, inadequate saving rather than deficient demand. For a while various anti-Keynesian ideas - ranging from mathematically impeccable academic demonstrations that recessions cannot happen, to popular doctrines like supply-side economics - seemed to have crowded Keynes off the stage.

Yet, just take a look at the current world situation (2000 – 2004), particularly at Japan - an economy that has clearly been suffering from a lack of demand, not supply, where the clear and present danger is deflation, not inflation. In the face of this reality, how can anyone say that Keynesian ideas are no longer relevant? The essential truth of Keynes’s big idea - that even the most productive economy can fail if consumers and investors spend too little, that the pursuit of sound money and balanced budgets is sometimes (but not always!) foolish rather than wise - is as evident in today’s world as it was in the 1930s. In addition, in these dangerous days, we ignore or reject that idea at the world economy’s peril.
The Keynesian Model: Introduction

Perhaps, the easiest way to look at Keynesian theory is to see the arguments he gave for Classical theory being wrong. In essence, Keynes argued that markets would not automatically lead to *full-employment equilibrium*. Indeed, the economy could settle in equilibrium at any level of unemployment. This means that Classical policies of non-intervention would not work. The economy would need prodding if it was to head in the right direction, and this meant active intervention by the government to manage the level of demand.

Keynesian theory can be illustrated in terms of the *circular flow of income*; a model showing the flows of money around the economy. The economy is conventionally split into firms and households and the circular flow shows the movement of money between these groups. From households to firms there is a flow of consumption expenditure which results in a flow of income from firms to households. This income may be in the form of rent, wages, interest or profit.
If leakages and injections were in disequilibrium, then classical economists believed that prices would adjust to restore the equilibrium. Keynes, however, believed that it is the level of output (in other words, National Income) that would readjust the economy back into equilibrium, not prices.

For example, if for some reason there is an increase in injections (perhaps through an increase in investment, government expenditure or exports), an imbalance between leakages and injections would occur. As a result of this extra aggregate demand, firms would employ more people. This would mean more income in the economy, some of which would be spent and some saved, or paid in tax, or spent on imports. The extra spending would prompt firms in the economy to produce even more, leading to even more employment and therefore even more income. This process would go on, and on, and on, until it stopped! It would eventually have to stop because each time income increased, the level of leakages (savings, tax and imports) also increased. Once leakages and injections were equal again, equilibrium would be restored. This process, called the Multiplier effect, has very important implications for economic planning and macroeconomic policy.

![Diagram: The circular flow of income](image)

**WHY DIVIDE EXPENDITURES INTO FOUR COMPONENTS?**

<table>
<thead>
<tr>
<th>Component</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumption</strong></td>
<td>Stable, not constant but predictable on the basis of income.</td>
</tr>
<tr>
<td><strong>Investment</strong></td>
<td>Unstable, affected by unpredictable shifts in investment demand.</td>
</tr>
<tr>
<td><strong>Government</strong></td>
<td>Stabilizing, deliberately altered with an eye to shifting demand.</td>
</tr>
<tr>
<td><strong>Net Exports</strong></td>
<td>Unstable, affected by unpredictable shifts in foreign demand.</td>
</tr>
</tbody>
</table>

\[ C + I + G + (X - M) \] is stabilisable—potentially stable with wise and well-timed fiscal and/or monetary policies.
Figure 1: Equilibrium National income showing the Expenditure and Withdrawal approach.

Note that income (Ye) is not fixed; it fluctuates in relation to the cumulative cycles of declining or increasing production.

For Keynes there was a difference between equilibrium income (the level toward which the economy gravitates in the short run) and potential income (the level of income that the economy is technically capable of producing, without generating accelerating inflation).

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**The Essence of Keynesian Economics**

- Keynes said: “In the long run we are all dead.” By this he meant that decisions are taken in the short run not in the long run.

- Keynes created the macroeconomic framework that focuses on stabilisation policy.

- Keynes thought that the economy could get stuck in a rut as wages and price level adjusted downward to sudden changes in expenditures.

- Keynes argued that, in times of recession, spending is a public good that benefits everyone.

- Hence the importance of: Aggregate demand management – the government’s attempt to control the aggregate level of spending in the economy.
The determinants of Aggregate Demand and Aggregate Supply

Aggregate Demand:
- Consumption
- Investment
- Government Expenditure
- Net Exports
- Money

Aggregate Supply:
- Profit Margins
- Production Costs
  - Labor Costs
  - Capital Costs
  - Material Costs
  - Productivity
  - Capacity
  - Expectations
**Keynes’s arguments against the effectiveness of the market system**

Keynes argued that relying on markets to get to full employment was not a good idea. He believed that the economy could settle at any equilibrium and that there would not be automatic changes in markets to correct this situation.

The main Keynesian theories used to justify this view were:

- An imperfect labour market
- The existence of a ‘money market’ and not merely a ‘loanable funds market’
- The Multiplier coefficient
- Keynesian inflation theory

**The labour market**

Keynes did not have the same confidence in the labour market as Classical economists. He argued that wages would be 'sticky downwards'. In other words workers would not be happy about taking wage cuts and would resist this. This would mean that wages would not necessarily fall enough to clear the market and unemployment would linger. This can be seen in the diagram below:

![Diagram of labour market](image)

**Figure 2: How a freely competitive labour market would reduce unemployment**

According to Classical theory, when the demand for labour falls from D1 to D2 (perhaps due to the onset of a recession), the wage rate should fall in order for the market to clear. However, Keynes argued that because wages were sticky downwards, this would not happen and an unemployment level of ab would persist. This unemployment he termed demand deficient unemployment.
The money market

Classical economists were of the view that savings would need to be increased in order for more funds to be available for investment. This would occur when interest rates fall.

Keynes disputed this assumption - once again because he had less faith in markets as the economic miracle cure. He argued that any increase in savings would mean that people spend less; and as interest rates declined, excess funds would be held for speculative purposes. Lower interest rates mean higher bond prices. Hence, more idle money balances or liquidity would induce speculators to ‘wait’ for higher interest rates and lower bond prices. This is known as a ‘bear’ market, while a market where bond prices are expected to increase is known as a ‘bull’ market.

The point is that, as aggregate demand declines, firms would not be inclined to invest because they would find the demand for their products decreasing. This occurs in spite of low interest rates. Keynes believed that while the demand for liquidity is interest elastic, investment depended much more on business expectations, than on interest rates.

The Multiplier

Any increase in aggregate demand in the economy would result, according to Keynes, in an even bigger increase in National Income. This process comes about because any increase in demand would lead to more people being employed. If more people were employed, then they would spend the extra earnings. This in turn leads to even more spending, which leads to even more employment, which leads to even more income and which would then lead to even more spending, which then leads to ................. The length of time this process went on for would depend on how much of the extra income was spent each time. If the initial recipients of the extra income saved it all, then the process would stop very quickly as no-one else would get their hands on the extra income. However, if they spent it all, the knock-on effects of the extra spending would carry on for some time.

Therefore the higher the level of leakages, the lower the multiplier would be. The precise formula for calculating the multiplier in a two sector closed economy is:

$$\text{Multiplier} = \frac{1}{1 - \text{Marginal propensity to consume}}$$

Keynesian view of inflation

The key to the Classical view of inflation was the Quantity Theory of Money. This theory revolved around the Fisher Equation of Exchange:

$$MV = PT$$

where:
- $M$ is the amount of money in circulation
- $V$ is the velocity of circulation of that money
- $P$ is the average price level and
- $T$ is the number of transactions taking place
Keynes once again rejected this classical theory. He argued that increases in the money supply would not inevitably lead to increases in inflation. Increasing $M$ may instead lead to a decrease in $V$. In other words the average speed of circulation of money would fall because there was more of it about.

Alternatively, the increase in $M$ may lead to an increase in $T$, rather than to an increase in $P$. Once again, Keynes disputed the assumption that the economy will find its own equilibrium through changes in the price level. Hence, if the economy is in a position where there is insufficient demand, increasing the money supply may fund extra demand and move the economy closer to full employment.

A MACROECONOMIC IDENTITY

\[ Y = C + S + T \]

INCOME IS THE SUM OF:

- THE PART YOU SPEND,
- THE PART YOU DON'T SPEND,
- THE PART YOU NEVER SEE!
The Simple Keynesian Model

Suppose a factory with a wages payroll of €50,000 locates in Bubaqra, Malta, a small, isolated, suburban community. Suppose further that the €50,000 is the only money that the factory spends in the community, that all employees live in Bubaqra, and that each person who lives there spends exactly one half of his income locally. By how much will the income of Bubaqra rise as a result of the new factory?

The €50,000 will be an addition to Bubaqra income. But the story does not end here because, by assumption, the people who earn the payroll will spend one half of it, or €25,000, in the community. This €25,000 will become income for the shopkeepers, plumbers, lawyers, teachers, etc. Thus Bubaqra income will rise by at least €75,000. But the story does not end here either. The shopkeepers, plumbers, etc. who received the €25,000 will in turn spend one half of their new income locally, and this €12,500 will become income for other people in the community. Total Bubaqra income is now €87,500. The process will, by geometric progression, continue on and on, and on, and as it does, total income will approach €100,000.

Note that the initial €50,000 in income expands to €100,000 once it is injected into the system. There is a multiplier effect; the size of which depends on the percentage of income people spend within the community. The smaller the percentage, the more quickly the extra income leaks out of the economy and the smaller the multiplier.

Central in the income-expenditure model is an assumption about how people spend; the consumption function. The consumption function positively relates the amount people spend with their income. As income increases, so does consumption.

The table below illustrates a consumption function. It says that if people expect incomes of €10,000, they will spend €12,500. This amount of spending is possible if people plan to dissave, which means that they use past savings or sell other assets. The table says that when expected income is €30,000, people will spend €27,500 which means that they plan to save €2,500.

<table>
<thead>
<tr>
<th>Expected Income</th>
<th>Consumption</th>
<th>Expected Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>€10,000</td>
<td>€12,500</td>
<td>-€2,500</td>
</tr>
<tr>
<td>€12,000</td>
<td>€14,000</td>
<td>-€2,000</td>
</tr>
<tr>
<td>€20,000</td>
<td>€20,000</td>
<td>0</td>
</tr>
<tr>
<td>€30,000</td>
<td>€27,500</td>
<td>€2,500</td>
</tr>
</tbody>
</table>

The table shows that if expected income rises by €2,000, from €10,000 to €12,000, people will increase their spending by €1,500, or that they will only spend three-fourths of additional income that they expect to receive. This fraction of additional income that people spend has a special name; the marginal propensity to consume (or mpc for short). In the table above the mpc is always three-fourths or 0.75. Thus if income
increases by €8000, from €12,000 to €20,000, people increase spending by €6,000, from €14,000 to €20,000.

The marginal propensity to consume can be computed with the formula:

\[
\text{MPC} = \frac{\text{(change in consumption)}}{\text{(change in income)}}
\]

In addition, economists often talk of the marginal propensity to save, which is the fraction of additional income that people save. Since people either save or consume additional income, the sum of the marginal propensity to save and the marginal propensity to consume should equal one.

The value of the marginal propensity to consume should be greater than zero and less than one. A value of zero would indicate that none of additional income would be spent; all would be saved. A value greater than one would mean that if income increased by €1.00, consumption would go up by more than a euro, which would be unusual behaviour.

The consumption function can also be illustrated with an equation or a graph. The equation that gives the consumption function in the table above is:

\[
\text{Consumption} = 5,000 + \frac{3}{4} \times (\text{expected Income})
\]

Where €5000 is autonomous consumption and \(\frac{3}{4}\) * (expected Income) is induced consumption.

\[
\begin{align*}
S &= Y - C, \text{ where } C = a + bY \\
S &= Y - (a + bY) \\
S &= Y - a - bY \\
S &= -a + Y - bY \\
S &= -a + (1 - b) Y \\
S &= -a + s Y \\
\text{where: } b &= \text{MPC and } s = \text{MPS}
\end{align*}
\]

Proof:

\[
\begin{align*}
C &= a + bY \\
S &= -a + (1 - b) Y \\
C + S &= 0 + bY + (1 - b) Y \\
C + S &= (b + 1 - b) Y \\
C + S &= Y \text{ and}
\end{align*}
\]

\[
\begin{align*}
b + s &= 1
\end{align*}
\]

Thus, if people expect an income of €10,000, this equation says that consumption will be:

\[
\text{Consumption} = 5,000 + \frac{3}{4} \times (10,000) = 5,000 + 7,500 = 12,500 \text{ and}
\]

\[
\text{Savings (Dissaving)} = - 5,000 + \frac{1}{4} \times (10,000) = - 5,000 + 2,500 = -2,500
\]
Graphing the consumption function presented above yields a straight line with a slope of 3/4 shown below. If the slope of the consumption function, which is the mpc, never changes, the consumption function is **linear**. If the mpc changes as income changes, then the consumption function will be a curved line, or a **nonlinear** consumption function. The €5,000 autonomous consumption is shown on the graph as the **intercept**, which indicates the amount of consumption if expected income is zero. The logical equilibrium condition in this model is that expected income should equal actual income.

In the table we see that €20,000 will be the equilibrium income. When people expect income to be €20,000, they behave in a way that makes their expectations come true. We can show the solution on a graph by adding a line that shows all the points for which actual income equals expected income. These points will form a straight line that will bisect the graph, shown below, as a 45° line. Equilibrium income occurs in the model when the spending line intersects the 45° line.

![Figure 3: The Consumption function at equilibrium, denominated in thousands of euros](image)

**Is this the way economists think?**
Investment and Government

Consumption is not the only type of spending; business spends in the form of investment (I), the government spends (G), and the economy has transactions with other nations (X & M). The government also taxes (T), both directly and indirectly. Making these adjustments to the model increases its complexity, but does not change its logic.

What assumptions should be made about how business makes investment decisions?

- One could assume that, like consumption spending, business investment decisions depend on expected income. The logic of the accelerator principle suggests this assumption. (For a more detailed explanation of the ‘accelerator’ see notes by Mr. Paul Libreri)

- It could also be assumed that interest rates, which measures the opportunity cost of tying up assets in the form of capital, should matter.

- The standard assumption in textbook treatments of the Keynesian model is that investment is determined outside the model, or in economic jargon, it is considered as being exogenous.

In the table below investment spending has been added to the model. At an expected or planned income of €20,000, consumers will spend €20,000 and expect to save nothing. Business will invest €2,500. Thus actual income will be €22,500 (and due to a reduction in stocks, realised or actual investment will be 0, matching savings). Since actual income will not equal expected income, expected income should change, causing behaviour to change too. Not until the economy expands and planned income equals €30,000 will expected income equal actual income and only then will behaviour stop changing.

<table>
<thead>
<tr>
<th>Table 2: The Simple Income-Expenditure Model with Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected Income</strong></td>
</tr>
<tr>
<td>€10,000</td>
</tr>
<tr>
<td>€12,000</td>
</tr>
<tr>
<td>€20,000</td>
</tr>
<tr>
<td>€30,000</td>
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</tbody>
</table>

Note that the addition of €2,500 in investment increased the equilibrium from €20,000 to €30,000. There is a multiplier effect here, and the multiplier is four. The reason for the multiplier effect can be seen intuitively. As the result of the addition of the $2,500 in investment, actual income rises by €2,500. Expected income will also rise. But at the new expected income of €22,500, people will want to spend more than €20,000 for consumption, so there will be an additional induced increase in spending. But the story does not end here. The additional consumption increases actual income, and thus expected income too. This changes behaviour still further. The chain reaction that the addition of investment sets into motion diminishes at each step, as the total approaches €30,000. This model is illustrated graphically below.
Figure 4: An investment injection of €2,500, induces the economy to expand

The only alteration is that the total spending line now includes investment as well as consumption. As before, the equilibrium exists when expected income equals actual income.

A wholly private economy is in macroeconomic equilibrium when:

\[ Y = C + I \]

Consumers’ spending is given by:

\[ C = a + bY \]

With \( I = 2,500 \) and \( C = 5,000 + \frac{3}{4} Y \), we can write

\[ Y = 5,000 + \frac{3}{4} Y + 2,500 \]
\[ Y - \frac{3}{4} Y = 7,500 \]
\[ \frac{1}{4} Y = 7,500 \]
\[ Y = 30,000 \]

Proof:

\[ C = 5,000 + \frac{3}{4} Y = 5,000 + \frac{3}{4} (30,000) \]
\[ C = 5,000 + 22,500 = 27,500 \]
\[ C + I = 27,500 + 2,500 = 30,000 = Y \]

To complete the standard textbook model, we need to add the third variable: government. Government affects the flow of spending in two ways:

- it adds spending in the form of government purchases of goods and services and
- it takes money from the flow of spending through taxes.
Government purchases include payments for infrastructure, civil servants’ salaries, and the provision of public goods and services. Not included in government spending are expenditures such as pensions, social security payments, student allowances, grants and other transfer payments. Transfers can be treated as subsidies or negative taxes.

Government spending affects the model in exactly the same way as investment spending does, but the addition of taxes forces some changes in the model. Because government spending enters the model in exactly the same way as investment spending, changes in it have the same multiplier effects as do changes in investment spending. Adapting the graph to the addition of government spending is equally easy. The line in the graph above which is called "C+I" will now be called "C+I+G". Equilibrium will occur where this line crosses the 45° line.

Figure 5: A similar economic expansion is induced by government expenditure plus investment

Figure 6: The same result is observed if savings and taxation (W) are correlated with injections (J)
The significance of taxes in the Keynesian model

Introducing taxes into an income-expenditure model means that people base consumption decisions not on total income, but on *disposable income*. Furthermore, total income never gets to households because it stays in the business sector as depreciation or as retained earnings, and there are a number of adjustments involving both taxes and transfer payments such as subsidies and social benefits.

But for the sake of simplicity, the only adjustment to be made in this model is direct taxation. Disposable income will be *total income less taxes*. Note that increases or decreases in taxes will change the relationship between expected income and consumption. This is illustrated in the table below.

From expected income in column one, taxes are subtracted to give an expected disposable income. The consumption decisions in column four are based on this expected disposable income. The next two columns showing investment and government spending are similar to the fourth column in Table Two.

Actual income at each level of expected income is attained by adding together consumption, investment, and government spending. Since spending by some is income for others, this summation gives us total income, which is shown in the last column. Equilibrium in this table should exist when expected income equals actual income, which happens when actual income is €22,500.

<table>
<thead>
<tr>
<th>Expected Income</th>
<th>Taxes</th>
<th>Expected Disposable Income</th>
<th>Consumption</th>
<th>Investment</th>
<th>Government Spending</th>
<th>Actual Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>€12,500</td>
<td>€2,500</td>
<td>€10,000</td>
<td>€12,500</td>
<td>€500</td>
<td>€2,000</td>
<td>€15,000</td>
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<tr>
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<td>€12,000</td>
<td>€14,000</td>
<td>€500</td>
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<td>€16,000</td>
</tr>
<tr>
<td>€22,500</td>
<td>€2,500</td>
<td>€20,000</td>
<td>€20,000</td>
<td>€500</td>
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<td>€22,500</td>
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<tr>
<td>€32,500</td>
<td>€2,500</td>
<td>€30,000</td>
<td>€27,500</td>
<td>€500</td>
<td>€2,000</td>
<td>€30,000</td>
</tr>
</tbody>
</table>

The addition of government spending and taxes gives government a role in determining the level of national income. In this model, when government increases spending by €1.00, income rises by more than a euro because of the multiplier effect. When government increases taxes, expected disposable income decreases and people reduce consumption. Through the multiplier process, national income falls by a multiple of the change in taxes. The use of *discretionary* or *automatic* changes in government spending or taxation, with the goal of changing national income, is called *fiscal policy*.

The *multipliers* for government spending and for taxes are not the same and the table above can help illustrate why they are not. As it stands, the equilibrium level of income is €22,500, which results when expected disposable income is €20,000. Suppose taxes are reduced to zero. What will happen to equilibrium income? The tax column becomes zero and expected disposable income would then equal expected income.

The first two columns of the table can then be ignored, and the third column can be re-labelled as *expected income*. Clearly the new equilibrium income will be €30,000. Thus a
reduction of taxes of €2,500 increases income by €7,500 (from €22,500 to €30,000), or each euro of tax reduction increases actual income by €3.

Suppose that government spending increases by €2,500. Then the sixth column would have the value of €4,500, and actual income would be larger in each row. In particular, in the fourth row, actual income would increase to €32,500. However, expected income in the fourth row is €32,500, so this row contains the new equilibrium values. Hence an increase in government spending of €2,500 increases actual income by €10,000 (from €22,500 to €32,500), or each euro of increased government spending increases actual income by a multiple of 4.

Changes in government spending and taxes both have the same effects on consumption in this table. A one euro increase in government spending increases consumption spending by three, as does a one euro decrease in taxes. The reason that they have different multiplier effects is that the change in government spending not only induces a change in consumption but also gets counted in spending, whereas the change in taxes does not get counted.
The Balanced Budget Multiplier

What would happen if the government balances out a change in fiscal expenditure with an equal amount of taxation, for example increasing or decreasing both G and T by one million euros? Would not such a balanced budget policy produce a neutral effect on the fiscal budget and on the economy? The answer is no.

This is because taxation does no have a direct impact on spending, while government spending does. For example, a tax cut would increase disposable income, which is then likely to lead to added consumption spending. Income will then increase by a multiple of the decrease in taxes. However, due to the fact that the tax multiplier for a change in taxes is smaller than the multiplier for a change in government spending, the GDP equilibrium will change in relation to government expenditure by a multiplier coefficient of one.

The balanced-budget multiplier is the ratio of change in the equilibrium level of output to a change in government spending, where the change in government spending is balanced by a change in taxes so as not to create any deficit.

The logic behind the balanced budget multiplier being always equal to a coefficient of 1 is explained below.

The Government tax multiplier is the ratio of the change in the equilibrium level of output to a change in income tax:

\[ \Delta Y = (-\Delta T \times MPC) \times \left( -\frac{1}{MPS} \right) = -\Delta T \times \left( \frac{MPC}{MPS} \right) \]

\[ Tax\ multiplier \equiv -\left( \frac{MPC}{MPS} \right) \]

If one combines the effects of the government spending multiplier with the tax multiplier:

\[ \Delta Y = \frac{1}{MPS} \]  \[ \Delta Y = -\frac{MPC}{MPS} \]

Then a multiplier coefficient of 1 is obtained:

\[ \frac{1}{MPS} + \frac{-MPC}{MPS} = \frac{MPS}{MPS} = 1 \]

Prepared by Vince Sammut
Alternatively, if $T$ is a direct tax on income, with $To$ being a lump sum and $t$ the tax rate; then the consumption function would be:

$$C = a + b(Y - [To + tY]) = a + bY - bTo - btY$$

From this equation, one may see that consumption is less by $(-bTo - btY)$ than what it would have been without taxation. Graphically, the imposition of taxes would shift the consumption function downwards. So if the government expenditure multiplier $= 1/(1-b)$ and, the government taxation multiplier $= -b(1-b)$; then a balanced budget would stimulate the economy by a combined multiplier coefficient of 1.

$$\frac{1}{1-b} + [-b(1-b)] = (1 - b)/(1 - b) = 1$$

In other words, a simultaneous increase in government spending by €1m and direct taxes by €1m will increase equilibrium income by €1m. The reason for this is that the government would be collecting in taxation some income that would otherwise have leaked out of the circular flow of income, but it would be spending all of this income.
The size of the Multiplier

A number of factors that may induce the size of the multiplier to decrease:

- **A high propensity of withdrawals:** The greater the level of leakages from the circular flow of income the lower the multiplier coefficient. This is typically the case for small island economies such as Malta, due to their high dependence on imports.

- **Automatic stabilizers:** When the economy expands and income increases, the amount of taxes collected increases, offsetting some of the expansion.

- **The interest rate:** All else remaining the same, an increase in government spending causes the interest rate to increase, crowding out consumption and investment expenditures.

- **The response of the price level:** Expansionary policy leads to an increase in the price level, which reduces the multiplier, particularly when the economy is on the steep part of the AS curve.

- **There are excess capital and excess labour:** Output can increase by putting excess labour and capital back to work. Hence less investment is required.

- **There are stocks or inventories:** To the extent that firms draw down their inventories in the short run in response to an increase in demand, output does not respond as quickly to demand changes.

- **The life-cycle hypothesis and household expectations:** The multiplier effects for policy changes, such as tax-rate changes, that are perceived by households to be temporary are smaller than long term ones.

![Figure 7: The ‘Life-cycle’ (Franco Modigliani) and ‘Permanent Income’ (Milton Friedman) theories of consumption are an extension of Keynes’s theory. They state that households make lifetime consumption decisions based on their expectations of lifetime income.](image)

- Finally, **the response of the economy to a change in monetary or fiscal policy** is not likely to be large and quick, and in the final analysis, the effects are much smaller than the simple multiplier would lead one to believe.
The Feedback Loop

The diagram below illustrates the cause and effect relationship between variables, sometimes referred to by economists as the feedback loop. This is central in the income-expenditure model. Consumption, investment, and government spending determine actual income. Actual income and taxes determine expected disposable income, and finally expected disposable income determines what consumption will be.

The feedback loop is the reason why investment and government spending have multiplier effects. A drop in investment, for example, begins by reducing actual income by the amount of the drop. Then the lower level of actual income changes expected income, and consumption also declines. Hence a €1.00 decline in investment will, according to the logic of this model, cause a decline in income of more than €1.00.

It has been stated that the equilibrium condition for this model is that expected income must equal actual income. There is another way of looking at this equilibrium condition. Expected income can be divided into three parts. First some is removed as taxes, and then what is left is divided between consumption and expected savings, or:

$$Y_{\text{exp}} = T + C + S_{\text{exp}}$$

It has also been argued that actual income is made up of three types of spending: consumption, investment, and government spending, or:

$$Y_{\text{act}} = C + I + G$$

In equilibrium these two equations are equal, or:

$$T + C + S_{\text{exp}} = C + I + G$$

The concept of feedback provides a way to view the functions of price in allocating scarce resources. A system of feedback exists when two variables are interrelated, so that a change in variable A affects variable B, but, in turn, a change in variable B affects variable A.

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2 The concept of feedback provides a way to view the functions of price in allocating scarce resources. A system of feedback exists when two variables are interrelated, so that a change in variable A affects variable B, but, in turn, a change in variable B affects variable A.
Subtracting C from both sides gives us the equilibrium condition in this form:

\[ S_{\text{exp}} + T = I + G \]

In other words, this equation says that equilibrium exists at that level of income for which the amount people intend to withdraw from the flow of spending either as taxes or savings just equals the amount they intend to add to the flow of spending as investment or government spending.

**There are holes in the bucket....**

National income equilibrium can be illustrated with an analogy to a leaky bucket. In the leaky bucket higher levels of water create more pressure and thus faster leakage. An equilibrium level of water occurs when the leakage just equals the inflow of water, and the water line remains stable.

In the income-expenditure model, investment and government spending are inflows and taxes and expected savings are leakages. As income increases, so does leakage in the form of expected savings. Just as there will be only one level of water in the bucket for which leakages will equal inflows, so there will be only one level of income in the model for which leakages will equal inflows.

In the top part of the illustration below, the difference between the C and the C+I+G lines is investment plus government spending, which the bottom part graphs separately as the I+G line. Because the distance between the C line and the C+I+G line is constant in the top part, the I+G line is flat in the bottom part. In other words, investment and government expenditure are considered as *autonomous* variables. The difference between the 45° line and the C line is the difference between expected income and consumption.
or taxes plus planned savings, which is graphed as the S+T line in the bottom part. Because the C line begins above the 45° line (autonomous consumption), the S+T line in the bottom part begins with a negative value (dissavings). It rises to zero when the C line crosses the 45° line, and then continues to rise as the gap between the 45° line and the C line widens.

Figure 8: National Equilibrium in a closed three sector economy

Equilibrium exists when the C+I+G line crosses the 45° line. At this level of expected income, the distance between the C and the C+I+G lines (which is investment plus government spending) just equals the distance between the C line and the 45° line (which is savings plus taxes). Thus equilibrium exists when investment plus government spending equals expected savings plus taxes.
Implications if the model

The Paradox of Thrift

Suppose people decide to become thriftier, that is, they decide to save more at each level of income. One might expect that this would increase the total amount of savings, but the simple income-expenditure model predicts a paradox of thrift, that total savings will remain the same and income will decline. If people become thriftier, they consume less at each level of expected income. On a graph, this increased thriftiness can be illustrated as a shift downward of the consumption function or a shift upward of the savings function. If one draws in these shifted lines, one would see a fall in the income equilibrium.

The diagram below shows the economy at a stable equilibrium, where I is in actual fact not purely autonomous but also induced; that is, it is also positively related with consumption. I is at a level that maximises output on the production possibility boundary. Hence, no deflationary or inflationary pressures exist. Furthermore, factor markets such as labour and loanable funds are ‘cleared’ at market rates. Hence, no resource shortages or surpluses exist either.

Note what happens when households become ‘thrifty’ and increase their savings:

- The “a” in \( C = a + bY \) decreases, which means that the demand function shifts downwards.
- Output, investment and income also decline, and as a result,
- Savings fall — undoing the initial increase in saving.
- Hence the paradox.

This sequence of events is illustrated in the following diagram.
The logic behind the ‘Paradox of Thrift’ lies in the fact that in equilibrium, savings plus taxes must equal investment plus government spending; and because, by assumption, investment, taxes, and government spending are fixed, savings would not change in equilibrium. Given that investment is not purely autonomous but may actually increase with income when the accelerator principle is in operation, the investment line would slope upwards, albeit slightly. Thus, at the new equilibrium caused by increased thriftiness, savings would actually be less!

In other words, if a large number of people in the economy suddenly decided to save more and consume less, total spending would fall and unemployment would rise.

Consider what would happen if the savings hole in the leaky bucket analogy is made a little larger, which corresponds to people becoming thriftier. Initially there will be a larger outflow of water. But this cannot continue indefinitely. Equilibrium exists when the inflow equals the outflow, and the inflow has not changed. This means that the water level must drop so that the pressure forcing water out of the bottom will be reduced. Less pressure means less outflow, and at some lower level of water, equilibrium will be re-established.
With the paradox of thrift, the income-expenditure model makes an important prediction of an unintended consequence. Prior to Keynes, most economists had argued that savings were helpful to the economy because saving spurred investment, and larger amounts of capital increased the productive capacity of the economy. Hence, a slower rate of savings would reduce the growth rate of the economy. In contrast, the paradox of thrift implied that more savings could harm the economy.

Many early followers of Keynes, and probably Keynes himself, believed that a lack of spending was likely to be a chronic problem in an industrialised economy, and therefore they thought that measures should be taken to reduce savings. Since the rich did most of the saving, an obvious solution was to tax the rich to reduce their incomes and thus their savings. Those who had wanted to tax the rich with the goal of equalising incomes had, prior to Keynes, been confronted with the argument that such a move would have harmful effects on growth. It is not surprising that they were often eager to embrace a theory that implied that equalising incomes had only good side effects. This partially explains the popularity of Keynesian economics with socialist or *centre-left* politicians.

Another important implication of the income-expenditure model is that governments must take an active role in an economy, hence the importance of fiscal policy.

**Fiscal Policy**

The use of government spending and taxes to influence GDP, employment, and the price level.

\[ AD = C + I + G + (X-M) \]

Keynes rejected the view of Adam Smith that left alone, a market system generally functions well, or that the "invisible hand" works. The simple income-expenditure model suggests that what happens in the market for goods and services is the key to understanding macroeconomic problems; but in analysing this market, it completely ignores prices. Price level is not determined within the Keynesian model, and generally it was assumed to be constant. Assuming fixed prices ignores the primary way that adjustment to equilibrium happens in microeconomics. Assuming prices constant or fixed, puts the Keynesian model on a conflicting path with microeconomic theory.

If there is unemployment, **microeconomic theory** suggests that wages will fall, and this will change the amount of unemployment. If it is assumed that prices are in fact not very
flexible, it is necessary to justify this assumption in some way in order to make it compatible with microeconomic theory. However, for many years this assumption was not properly justified, and as a result, microeconomics and macroeconomics were largely independent fields of study.

- **According to micro-economists**, equilibrium (in the market for a particular good) is a balance between quantity supplied and quantity demanded and is achieved by the appropriate change in the good's price.

- **According to macro-economists**, equilibrium (for the economy as a whole) is a balance between income and expenditures and is achieved by a change in the level of employment.

- Income-Expenditure analysis, as introduced by John Maynard Keynes in 1936, hinges not on how people earn their incomes but rather on how they spend them. If all the income gets spent, then the economy is in “equilibrium,” but it is not necessarily performing at its full-employment potential.

Putting the simple income-expenditure model into an aggregate-supply, aggregate-demand framework, one may see the problem that fixed prices create. In the income-expenditure model price level is fixed but output is flexible, so that the aggregate-supply curve is *perfectly price elastic*, a horizontal line. Aggregate demand is determined and measured in terms of real output, so that the C+I+G value represents aggregate demand. Hence aggregate demand is perfectly *price inelastic*, a vertical line. Clearly, the price level has to be determined outside the model, and any change in aggregate demand changes output.

If the aggregate-supply curve is horizontal, the model can say nothing about price change, which is a severe limitation because inflation is one of the variables macroeconomics
attempts to explain. This assumption of fixed prices was modified in the 1960s, but any aggregate-supply curve other than a vertical one implies that there is no tendency for an economy to have an equilibrium at full employment. Rather, the model says that an economy can have an equilibrium level of output with large amounts of unemployment if it is left to itself. But the economy does not have to be left to itself; the government can take an active role in managing the macroeconomic behaviour of the economy using its tools of fiscal policy to guide the workings of the economy.

Effectiveness of Fiscal Policy

- Problems of forecasting the magnitude of the effects
  - effects of changes in government expenditure
  - crowding out
  - effects of changes in taxes
  - size of the multiplier and accelerator effects
  - random shocks

- Problems of timing and time lags
  - various time lags
  - policy may be destabilising

- Side-effects of discretionary policy
  - cost inflation
  - welfare and distributive justice
  - incentives

- A rules-based approach to fiscal policy
  - A ‘steady-as-you-go’ policy
  - The EU Stability and Growth Pact
References


