

9.11: The Expenditure Multiplier Effect

LEARNING OBJECTIVES

- Explain the expenditure multiplier effect
- Compute the size of the expenditure multiplier

The Expenditure Multiplier Effect

Keynesian economics has another important finding. You've learned that Keynesians believe that the level of economic activity is driven, in the short term, by changes in aggregate expenditure (or aggregate demand). Suppose that the macro equilibrium in an economy occurs at the potential GDP, so the economy is operating at full employment. Keynes pointed out that even though the economy *starts* at potential GDP, because aggregate demand tends to bounce around, it is unlikely that the economy will stay at potential. In 2007, U.S. investment expenditure collapsed with the fall of the housing market. As a result, the U.S. economy went into the Great Recession. But how much did GDP fall? Suppose investment fell by \$100 billion. You might expect the result would be that GDP would fall by \$100 billion too. If so, you would be wrong. It turns out that changes in any category of expenditure (Consumption + Investment + Government Expenditures + Exports-Imports) have a more than proportional impact on GDP. Or to say it differently, the change in GDP is a multiple of (say 3 times) the change in expenditure. This is the idea behind the multiplier.

The reason is that a change in aggregate expenditures circles through the economy: households buy from firms, firms pay workers and suppliers, workers and suppliers buy goods from other firms, those firms pay their workers and suppliers, and so on. In this way, the original change in aggregate expenditures is actually spent more than once. This is called the **expenditure multiplier** effect: an initial increase in spending, cycles repeatedly through the economy and has a larger impact than the initial dollar amount spent.

Watch It

Watch this video for a quick overview of the expenditure multiplier.

An interactive or media element has been excluded from this version of the text. You can view it online here: <http://pb.libretexts.org/mlum/?p=393>

How Does the Expenditure Multiplier Work?

It's easiest to see how the multiplier works with an increase in expenditure. Suppose government spontaneously purchase \$100 billion worth of goods and services, perhaps because they feel optimistic about the future. The producers of those goods and services see an increase in income by that amount. They use that income to pay their bills, paying wages and salaries to their workers, rent to their landlords, payments for the raw materials they use. Any income left over is profit, which becomes income to their stockholders. Each of these economic agents takes their new income and spend some of it. Those purchases then become new income to the sellers, who then turn around and spend a portion of it. That spending becomes someone else's income. The process continues, though because economic agents spend only part of their income, the numbers get smaller in each round. When the dust settles the amount of new income generated is multiple times the initial increase in spending—hence, the name the **spending multiplier**. The table below gives an example of how this could work with an increase in government spending. Note that the multiplier works the same way in reverse with a decrease in spending.

Table 1. Calculating the Multiplier Effect

Original increase in aggregate expenditure from government spending	100
Save 10% of income. Spend 90% of income. Second-round increase of...	$100 - 10 = 90$
\$90 of income to people through the economy: Save 10% of income. Spend 90% of income. Third-round increase of...	$90 - 9 = 81$
\$81 of income to people through the economy: Save 10% of income. Spend 90% of income. Fourth-round increase of...	$81 - 8.1 = 72.10$

Table 1 works through the process of the multiplier. Over the first four rounds of aggregate expenditures, the impact of the original increase in government spending of \$100 creates a rise in aggregate expenditures of $\$100 + \$90 + \$81 + \$72.10 = \$343.10$, which is larger than the initial increase in spending. And the process isn't finished yet.

CALCULATING THE MULTIPLIER

Fortunately for everyone who is not carrying around a computer with a spreadsheet program to project the impact of an original increase in expenditures over 20, 50, or 100 rounds of spending, there is a formula for calculating the multiplier. The formula varies depending on how complex the version of the income-expenditure model is that you're using.

Let's look at the simplest case. The **marginal propensity to consume (MPC)** is the fraction of any change in income that is consumed and the **marginal propensity to save (MPS)** is the fraction of any change in income that is saved. We'll assume for simplicity that there are no income taxes, and that imports are a set amount. In this case, the formula is:

$$\text{Spending Multiplier} = \frac{1}{1 - \text{MPC}}$$

Since a consumer's only two options (in this example) are to spend income or to save it, $\text{MPC} + \text{MPS} = 1$, $1 - \text{MPC} = \text{MPS}$. Thus, an equivalent form for the multiplier is:

$$\text{Spending Multiplier} = \frac{1}{\text{MPS}}$$

Suppose the $\text{MPC} = 90\%$; then the $\text{MPS} = 10\%$

Therefore, the spending multiplier is:

$$\text{Spending Multiplier} = \frac{1}{1 - 0.9}$$

$$\text{Spending Multiplier} = \frac{1}{0.1} = \frac{1}{\frac{1}{10}} = 10$$

In this simple case, a change in spending of \$100 multiplied by the spending multiplier of 10 is equal to a change in GDP of \$1,000.

Watch the selected clip from this video (stopping at 3:14) for more practice in solving for the spending multiplier.

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In the real world, the multiplier formula is more complex since economic agents have more options than just spending or saving. They have to pay taxes, and they can buy imports, both of which reduce the amount of money being multiplied. Thus, the spending multiplier is somewhat smaller than the one we've calculated here.

These other factors are known as "leakages," because they determine how much demand "leaks out" in each round of the multiplier effect. If the leakages are relatively small, then each successive round of the multiplier effect will have larger amounts of demand, and the multiplier will be high. Conversely, if the leakages are relatively large, then any initial change in demand will diminish more quickly in the second, third, and later rounds, and the multiplier will be small. Changes in the size of the leakages—a change in the marginal propensity to save, the tax rate, or the **marginal propensity to import**—will change the size of the multiplier. Thus, the spending multiplier in the real world is less than the multiplier derived in our simple example above.

The multiplier applies to any type of expenditure (e.g. $C + I + G + X - M$), and it applies when expenditure decreases as well as when it increases. Say that business confidence declines and investment falls off, or that the economy of a leading trading partner slows down so that export sales decline. These changes will reduce aggregate expenditures, and then will have an even larger effect on real GDP because of the multiplier effect.

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Try It

This question allow you to get as much practice as you need, as you can click the link at the top of the question ("Try another version of this question") to get a new version of the question. Practice until you feel comfortable doing the question.

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Glossary

[glossary-page][glossary-term]Expenditure (or Spending) Multiplier:[/glossary-term][glossary-definition]the ratio of the change in GDP to the change in aggregate expenditure which caused the change in GDP; the multiplier has a value greater than one[/glossary-definition][glossary-term]Marginal Propensity to Consume:[/glossary-term][glossary-definition]percentage of an increase (or decrease) in income which one spends (or reduces spending); also known as the MPC[/glossary-definition][glossary-term]Marginal Propensity to Import:[/glossary-term]

[glossary-definition]percentage of an increase (or decrease) in income which one spends (or reduces spending) on imported goods and services; also known as the MPI[/glossary-definition][glossary-term]Marginal Propensity to Save:[/glossary-term][glossary-definition]percentage of an increase (or decrease) in income which one saves (or reduces saving); also known as the MPS[/glossary-definition]

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