Aggregate Expenditure or Keynesian Model

ECO 120: Global Macroeconomics

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Goals Reading and Exercises

Goals of this chapter

Unit Goals

- Describe how spending plans are determined when the price is fixed in the short run.
- ② Explain the intuition behind the expenditure multiplier.
- Use the expenditure multiplier to compute predicted changes for real GDP as a result of changes in expenditure plans.
- Use the expenditure multiplier to explain how recessions and expansions begin.
- It able how to pronounce Keynes. It's like candy canes.

Learning Objectives

LO5: Use the model of aggregate demand and supply to evaluate the short-run and long-run impacts of fiscal and monetary policy on production, employment, and the price level. 1/ 21

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Module 27 and 28

- Canvas Quiz due Wednesday 11:59 PM. Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
- Homework/In-class Exercise due Friday 11:59 PM. We will work together in class on Thursday.

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Model Background Consumption Demand Investment Demand Export and Import Demand

Keynesian Model Background

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- All prices and wages are assumed to be fixed \rightarrow *very* short run.
- \bullet Quantities firms sell only depend on aggregate demand \rightarrow only aggregate demand matters for determining real GDP
- Aggregate expenditure: expenditure *plans* for consumer spending + government spending + spending on investment + net exports
- **Real GDP**: equal to aggregate expenditure *in equilibrium*.
 - An increase in aggregate expenditure leads to an increase in real GDP.
 - An increase in real GDP is an increase in income, leading to an increase consumption and imports
 - This increase in aggregate expenditure leads to an increase in real GDP...

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Marginal Propensity to Consume

Marginal propensity to consume (MPC)

The fraction of an increase in income that is consumed.

 $\mathsf{MPC} = \frac{\Delta C}{\Delta Y}$

Marginal propensity to save (MPS)

The fraction of an increase in income that is saved.

 $\mathsf{MPS} = 1 - \mathsf{MPC}$

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U.S. Consumption as a Fraction of Real GDP





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Factors Affecting Consumption

Interest rate

- Suppose there is an increase in interest rates
- Higher incentive to save
- More expensive to borrow
- Demand for consumer spending decreases

Wealth

- Suppose an increase in stock market values lead to higher wealth for consumers
- Consumers can afford to withdraw savings, or save less
- Demand for consumer spending increases

- Suppose consumers expect higher incomes in the future
- Consumers expect to afford to withdraw savings, or save less, or borrow more
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Expected Future Income

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Factors Affecting Investment Demand

Interest rate

- Suppose there is an increase in interest rates
- More expensive to borrow to finance capital purchases
- Higher opportunity cost of using savings to finance capital purchases
- Demand for investment decreases

Business Economic Outlook

- Suppose businesses expect a decrease in profitability in the future
- Demand for investment spending decreases

Technology / Capital Productivity

- Suppose improvements in technology lead to higher productivity
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Factors Affecting Export Demand

Exchange Rates

- Suppose the domestic currency appreciates relative to major trading partners
- Country's currency is more expensive for people in foreign countries
- Demand for exported goods and services decreases
- Leads to a *decrease* in aggregate expenditures

Foreign Income or Wealth

- Suppose income or wealth in foreign countries that are trading partners increases
- People in foreign countries have higher demand for goods and services produced in this country
- Demand for exported goods and services increases
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Import Demand

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- **①** Consumers import products: \uparrow real GDP $ightarrow \uparrow$ imports
- Producers import intermediate goods: ↑ real GDP → ↑ production → ↑ imports of intermediate goods
- Imports increase as real GDP increases.

Marginal propensity to import (MPM)

- MPM: The fraction of an increase in real GDP that is spent on imports.
- MPM increases as the global economy becomes more integrated.

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Model Background Consumption Demand Investment Demand Export and Import Demand

Import Demand

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- Producers import intermediate goods: ↑ real GDP → ↑ production → ↑ imports of intermediate goods
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U.S. Imports as a Fraction of Real GDP



Model Background Consumption Demand Investment Demand Export and Import Demand

Factors Affecting Import Demand

Wealth and Expected Future Income

- Impact on demand for imports is the same as demand for consumption
- Suppose wealth or expected future income increases
- Consumers expect to afford to withdraw savings, or save less, or borrow more
- Demand for imported goods and services increases

Exchange Rates

- Suppose the domestic currency appreciates relative to major trading partners
- Foreign currencies become less expensive, so foreign-produced goods and services are less expensive
- Demand for imported goods and services increases
- Leads to a *decrease* in aggregate expenditures

(a)

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Mathematical Multiplier Example Intuition

12/21

Mathematical Example: Government Spending

- Suppose there is an increase in government spending.
- Y = C + I + G + X M
- An increase in G will increase Y
- An increase in Y will increase C (consumption plans) and M (import plans)
- The \uparrow real GDP equals $\uparrow G + \uparrow C \uparrow M$.

 $\Delta Y = \Delta C + \Delta G - \Delta M$ $\Delta C = MPC \Delta Y$ $\Delta M = MPM \Delta Y$ $\Delta Y = MPC \Delta Y + \Delta G - MPM \Delta Y$

• Solve for the change in real GDP (ΔY) :

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Mathematical Multiplier Example Intuition

Expenditure Multiplier

13/ 21

General Expenditure Multiplier

 $m = \frac{1}{MPS + MPM}$ $\Delta Y = m \Delta AE$

 $=\left(rac{1}{MPS+MPM}
ight)\Delta AB$

Where ΔAE = any of these: ΔC , ΔI , ΔG , ΔX , or - ΔM

Example

Let MPS = 0.15, MPM = 0.25, and suppose an increase of consumer spending plans equal to \$75 billion

$$m = \frac{1}{MPS + MPM}$$

$$m = \frac{1}{0.15 + 0.25} = \frac{1}{0.4} = 2.5$$

$$\Delta Y = m \Delta AE$$

 $= 2.5 \times (\$75 bn)$

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Mathematical Multiplier Example Intuition

Multiplier Intuition

• An exogenous increase in AE leads to an increase in real GDP *greater than* the initial increase in AE.

• Two ways to think about it:

 $\bigcirc \uparrow \mathsf{AE} \to \uparrow \mathsf{real} \mathsf{GDP} \to \uparrow \mathsf{C} \to \uparrow \mathsf{AE} \to \uparrow \mathsf{real} \mathsf{GDP} \dots$

Suppose government buys more bombs. → Defense contractors sales go up. → Salaries and profits for defense contractor workers increases. → They spend higher salaries and profits on consumption. → The consumption lead to higher sales for other businesses. → Workers at those businesses in turn consume more

Mathematical Multiplier Example Intuition

Multiplier Intuition

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Expenditure Implications

- The expenditure multiplier is given by, $m = 1/({\sf MPS} + {\sf MPM})$
- MPS + MPM = fraction of income *not spent* in the United States (saved or spent abroad).
- If economy does not trade, or if *change in* imports do not depend on change in income, then *MPM* = 0.
- Can think of 1 (MPS + MPM) as fraction of an increase in income that is spent domestically.
- The larger the fraction of an additional dollar of income is spent domestically, the larger will be the multiplier.
- Local or regional multipliers (eg: Big event like concert, professional sporting event, Oktoberfest, Wisconsin state high school track meet)

 $m_{
m local} = 1 - (
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Full Employment GDP Recession Process Government Policy Example Economic Stability

Full employment GDP

- Full employment GDP or Potential GDP: Level of GDP when all factors of production are used efficiently.
 - Implies cyclical unemployment is equal to zero. Frictional and structural unemployment will still be positive.
- Recession: when real GDP is below potential GDP.
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Full Employment GDP Recession Process Government Policy Example Economic Stability

Full employment GDP

- Full employment GDP or Potential GDP: Level of GDP when all factors of production are used efficiently.
 - Implies cyclical unemployment is equal to zero. Frictional and structural unemployment will still be positive.
- Recession: when real GDP is below potential GDP.
- **Recessionary gap**: amount by which expenditures fall short those required to achieve full employment GDP.
- Expansion: when real GDP is above potential GDP.
- **Inflationary gap**: amount by which expenditures exceed those required to achieve full employment GDP.

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Full Employment GDP Recession Process Government Policy Example Economic Stability

- Recessions and expansions occur because of the expenditure multiplier.
- Small negative shocks to autonomous expenditure cause larger decreases to real GDP.
- Recession process:
 - Negative shock to AE.
 - Real GDP exceeds planned expenditure.
 - Business inventories increase due to lower sales volume.
 - Businesses cut production (lay off workers) to reduce inventories.
 - Real GDP decreases.
 - O Decrease in real GDP reduces consumption...
Full Employment GDP Recession Process Government Policy Example Economic Stability

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- Suppose businesses have a pessimistic outlook for future profitability.
- As a result, investment decreases by \$100 billion
- Suppose past evidence revealed that when consumers received a \$600 tax rebate, on average they increased their spending by \$500 and increased import spending by \$50.

Computing Change in Real GDP

$$MPC = \frac{\$500}{\$600} = 0.8333$$

$$MPS = 1 - 0.8333 = 0.1667$$

$$MPM = \frac{\$50}{\$600} = 0.0833$$

$$m = \frac{1}{0.1667 + 0.0833} = 4.0$$

$$\Delta Y = m \times (\Delta I) = 4.0 \times (-\$100 \ bn)$$

= -\$400 billion

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- The government wants to stimulate the economy with an increase in spending to increase real GDP up to \$10 trillion
- We know the desired change in real GDP: $\Delta Y =$ \$1 trillion = \$1000 billion
- We need to solve for ΔG
- Suppose past evidence revealed that when consumers received a \$800 tax rebate, on average they increased their spending by \$600 and increased import spending by \$100.

Compute Change in G

$$MPC = \frac{\$600}{\$800} = 0.75$$

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$$m = \frac{1}{0.25 + 0.125} = 2.667$$

$$\Delta Y = m \times (\Delta G)$$

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Economic Stability

• Any change in any component of aggregate expenditure has amplified effects:

$$\Delta Y = \left(\frac{1}{MPS + MPM}\right) \Delta AE$$

• Decrease in marginal propensity to save:

- Denominator gets smaller ightarrow multiplier gets larger
- Larger changes in real GDP (positive or negative) \rightarrow less stable economy
- Larger multiplier \rightarrow larger is the amplification and effectiveness of government policy
- Decrease in marginal propensity to import:
 - Denominator gets smaller → multiplier gets larger
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 - Larger changes in real GDP (positive or negative) \rightarrow less stable economy
 - Larger multiplier → larger is the amplification and effectiveness of government policy

Full Employment GDP Recession Process Government Policy Example Economic Stability

Economic Stability

• Any change in any component of aggregate expenditure has amplified effects:

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20/21

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Reading and Exercises

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- Module 27 and 28
- Canvas Quiz due Wednesday 11:59 PM. Multiple-choice, 10 questions, unlimited attempts allowed, only best score counts
- Homework/In-class Exercise due Friday 11:59 PM. We will work together in class on Thursday.

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