Aggregate Supply and Aggregate Demand

Econ 120: Global Macroeconomics

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1.1 Goals

Goals

- Specific Goals

    - Define the expenditure multiplier and how to compute it.
    - Explain how recessions and expansions can occur using the expenditure multiplier.
    - Explain how real GDP and the price level are related in the short run.
    - Learn 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.
    - GELO1: Students will be able to use mathematical and logical methods to solve problems.
    - GELO2: Students will be able to construct and use models to analyze, explain, or predict phenomena.

Reading

- Expenditure multiplier: Module 16, ignore pages 161-164.

- Aggregate demand: Module 17

- Aggregate supply: Module 18

- Equilibrium and policy: Modules 19 and 20.

2 Keyensian Expenditure Multiplier

2.1 Background

Keynesian model background

- *Very* short-run model of expenditure *plans*.

- *Very short-run*: short enough so that prices stay fixed.

- Only expenditure plans (demand) determines real GDP - supply decisions is a longer-run consideration.

- **Aggregate expenditure (AE)**: C+I+G+X-M

- **Real GDP** is equal to aggregate expenditure *in equilibrium*.

    1. An increase in aggregate expenditure leads to an increase in real GDP.
    2. An increase real GDP is income for people: consumption and import plans increase.
    3. Go to step 1.

Marginal propensity to consume

- **Marginal propensity to consume (MPC)**: fraction of an increase in disposable income that is consumed.

- Assume for simplicity that a change in disposable income is approximately equal to a change in real GDP.

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

- **Marginal propensity to save (MPS)**: fraction of an increase in disposable income that is saved.

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

2.2 Multiplier Effect

Expenditure multiplier

- 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:

    1. $\uparrow$ AE $\rightarrow$ $\uparrow$ real GDP $\rightarrow$ $\uparrow$ C $\rightarrow$ $\uparrow$ AE $\rightarrow$ $\uparrow$ real GDP ...

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

2.3 Deriving the multiplier

Expenditure Multiplier

- Suppose there is an increase in government spending.

- GDP will increase by the $\uparrow G$ plus the $\uparrow C$ minus the $\uparrow M$.

$$\Delta Y = \Delta C + \Delta G - \Delta M \quad \Delta C = \text{MPC } \Delta Y \quad \Delta M = \text{MPM } \Delta Y$$
$$\Delta Y = \text{MPC } \Delta Y + \Delta G - \text{MPM } \Delta Y$$

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

$$(\text{1-MPC+MPM})\Delta Y = \Delta G \quad \Delta Y = \frac{\Delta G}{\text{1-MPC+MPM}} \quad \Delta Y = \frac{\Delta G}{\text{MPS+MPM}}$$

Expenditure Multiplier

- The expenditure multiplier is given by,

$$m_e = \frac{1}{\text{MPS+MPM}}$$

- MPS + MPM = fraction of income *not spent* in the United States (saved or spent abroad).

- If economy is closed, or imports do not depend on income, then $MPM = 0$.

- Let ΔAE denote any single change in aggregate expenditure

- The impact on real GDP is,

$$\Delta Y = m_e \Delta AE$$

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3.1 Next: Short-run Model of Supply and Demand

Next: Short-run Model of Supply and Demand

- Slightly longer, but still *short-run* model.

- Long enough so that the aggregate price level has time to adjust to changes in supply or demand.

- *Not long enough for wages* to adjust to new equilibrium levels in response to changes in labor demand or labor supply.

- Long enough to include supply decisions in the model.

4 Aggregate demand

Aggregate Demand

- **Aggregate demand**: schedule or curve that illustrates C+I+G+X-M expenditure plans, taking into account aggregate price level.

- Aggregate demand is downward sloping - *but not for the same reason the demand curve for a single product is downward sloping.*

- Recall demand curves for single goods slope downward because of the substitution effect and the income effect.

4.1 Downward sloping

Aggregate Demand
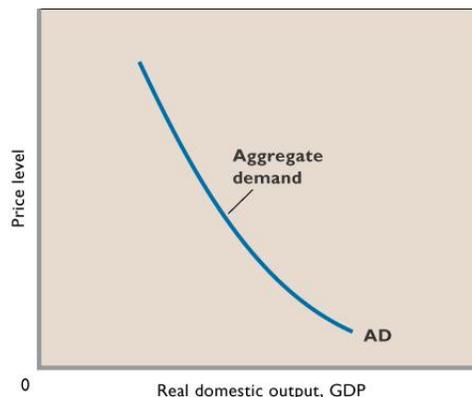
Downward sloping AD

- **Real balances effect**: when the price level increases, the purchasing power of the consumers' accumulated savings balances decreases.

  - With a lower real savings balance, consumers decrease consumption.

- **Foreign purchases effect**: When the price level rises relative to the price level in foreign countries, the foreign demand for U.S. products decreases. Similarly, the demand for imports increases.

    – This causes exports to fall and imports to rise.

4.2 Determinants of AD

Determinants of AD

- When something *besides the price level* affects the AD, this causes the AD curve to shift.

- The following affect *consumption* and therefore shift AD.

    – Consumer wealth: financial assets such as savings accounts, stocks, and bonds, and physical assets that consumers can borrow against like houses and land.

        * When consumer wealth increases, aggregate demand increases, causing it to shift to the *right*.

    – Household indebtedness: if household debt increases, AD shifts to the left.

    – Taxes: Increase in taxes decreases consumption, AD shifts to the left.

    – Consumer expectations: expectations about future income or future taxes can shift AD.

    – Interest rate: an increase in the interest rate decreases consumption which shifts AD to the left.

Determinants of AD

- The following affect investment and therefore shift AD.

    – Interest rate: increases the cost of borrowing to finance investment, therefore shifts AD to the left.

    – Expectations: expectations about the return on an investment shift investment demand and therefore shift AD.

- Change in government purchases.

- The following affect exports or imports and therefore shift AD.

    – Foreign incomes: higher foreign incomes increase exports, shifts AD to the right.

    – Exchange rates: when the value of U.S. currency depreciates, this causes imports to _____ and exports to _____.

5   Aggregate supply

5.1   Short run AS

Short run aggregate supply

- In the short run, factor markets are slow to adjust. Wages are slow to adjust and there may unemployment or even excess employment.

- Therefore in the short run, the aggregate supply curve is upward sloping.

    - Increases in the price level without increasing wages create larger profits for firms, creates incentive to produce more.

Short run aggregate supply
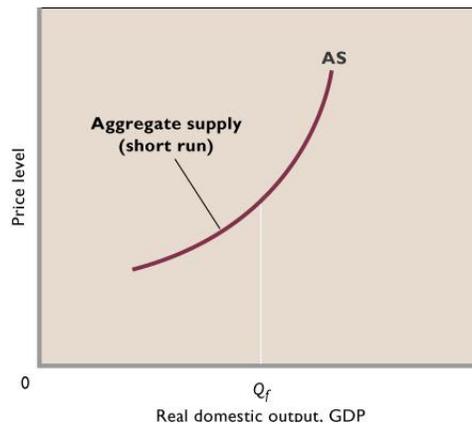

5.2   Determinants of AS

Determinants of AS

- When something *besides the price level* affects AS, this shifts AS.

- Prices of factors of production: when the price of labor, capital, or land increase, this shifts AS to the left.

- Exchange rate: if the value of the U.S. currency decreases, this increases the cost of importing foreign factors of production.

- Technology: an increase in technology shifts AS to the right.

- Business taxes can affect output decisions of firms and shift AS.

- Other government regulation.

5.3 Long run AS
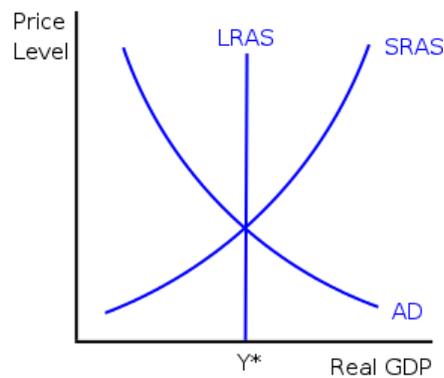
Long run aggregate supply

- **Long run aggregate supply**:
- In the long run, wages adjust so that the economy uses labor efficiently
- Long run aggregate supply is a vertical line at **potential GDP**
- Determined by production possibilities.
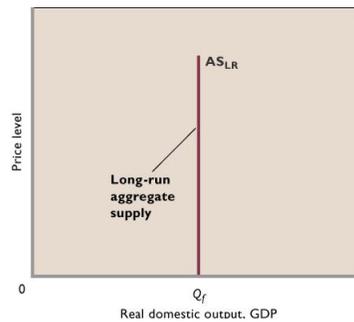
6 Equilibrium

Equilibrium

In equilibrium, real GDP and the price level are determined by the intersection of AS and AD
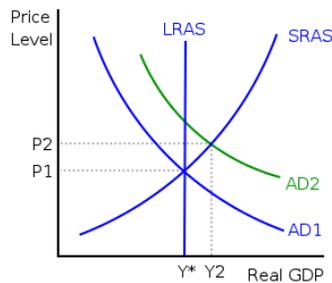

6.1 Inflation

Inflation

- Inflation can come from two sources, excess demand or increases in production costs.

- **Demand pull inflation**: when increases in demand cause inflation.

- **Cost push inflation**: when increases in production cost cause inflation.

Demand pull inflation

- Demand pull inflation begins when AD increases.

- Causes real GDP to increase and the price level to rise.

- Recall: **inflationary gap**: when aggregate expenditures is equal to real GDP above potential GDP.

Cost push inflation

- Cost-push inflation begins when an increase in production cost shifts SRAS to the left.

- Causes real GDP to fall and price level to rise.

- **Stagflation**: when there is unemployment and high inflation at the same time.
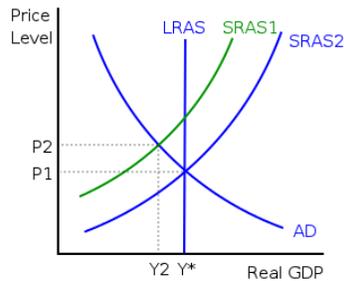
6.2   Long-run equilibrium

Long-run equilibrium

- Recall why the short run aggregate supply curve is upward sloping.

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- Suppose AD shifts to the right.

- Firms will be able to sell more goods. Firms hire more labor and produce more goods.

- Firm's per-unit labor costs do not increase because wages are fixed in the short run.

- In the long run, there is an excess demand for labor, wages will increase.

- This shifts the SRAS curve to the left.

Long-run equilibrium