
**Agenda**

- Price Adjustment and the Attainment of General Equilibrium

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**General equilibrium in the *AD-AS* model**

- If the economy is NOT in general equilibrium, economic forces will work to restore general equilibrium in both the *IS-LM* and *AD-AS* models.

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**Disequilibrium in the *AD-AS* model**
Price Adjustment and General Equilibrium

- Price adjustment in the IS-LM and AD-AS models:
  - An increase in government purchases,
  - An increase in the real money supply,
  - A short-run adverse supply shock, and
  - A long-run adverse supply shock.

Price Adjustment and General Equilibrium

- An increase in government purchases:
  - In Year 0, the economy is in general equilibrium.
    - Denote the general equilibrium level of output by $Y^*$. 

An increase in government purchases

- In Year 1, government purchases increase.
  - Assume Ricardian equivalence does NOT hold.
  - An increase in government purchases shifts both the IS and AD curves to the right.
Price Adjustment and General Equilibrium

• An increase in government purchases:

  ➢ In Year 1, the increase in government purchases increases output but leaves the price level unchanged.
    • Short-run equilibrium is at:
      – The intersection of the IS and LM curves, and
      – The intersection of the AD and SRAS curves.
    • The labor market is temporarily out of equilibrium.
      – Employment has increased.
      – The unemployment rate has declined.

  ➢ In Year 2, the price level begins to rise.
    • In Year 2, the SRAS curve shifts up because of excess aggregate demand in Year 1, i.e., Y₁ > Y*.
      – How far the SRAS curve shifts up depends on the explicit price adjustment process for the economy.
      – Generally it is a multiyear process dependent on the amount of excess aggregate demand.

  • A higher price level reduces the real money supply, M/P.
    – Alternatively, the purchasing power of the nominal money supply, M*, has been reduced.
  • A lower real money supply shifts the LM curve to the left, raising the real interest rate.
    • A higher real interest rate will:
      – Reduce interest-sensitive spending,
      – Reduce output and employment, and
      – Raise the unemployment rate.
Price Adjustment and General Equilibrium

• An increase in government purchases:
  ➢ In Year 3, the price level continues to adjust up.
    • In Year 3, the SRAS curve shifts up because of any excess aggregate demand in Year 2, i.e., Y₂ > Y*.
      – Because excess aggregate demand in Year 2 is less than in Year 1, the upward shift of the SRAS in Year 3 will be smaller than in Year 2.

Price Adjustment and General Equilibrium

• An increase in government purchases:
  ➢ In Year 4 and beyond, this process continues until general equilibrium is re-established in both the IS-LM and AD-AS models.
    • Output will be at its full-employment level.
      – Employment will be at its full-employment level.
      – The unemployment rate will be at its natural level.
    • The price level will be permanently higher.

Price Adjustment and General Equilibrium

• An increase in government purchases:
  ➢ Once general equilibrium has been re-established:
    • Output is back at its full-employment level.
    • The real money supply is lower.
      – Because of the increase in the price level.
    • The real interest rate is higher.
    • The composition of output has changed.

Price Adjustment and General Equilibrium

• An increase in the real money supply:
  ➢ In Year 0, the economy is in general equilibrium.
Price Adjustment and General Equilibrium

- An increase in the real money supply:
  - In Year 1, the nominal money supply increases.
    - An increase in the nominal money supply shifts both the $LM$ and $AD$ curves to the right.
    - The increase in the real money supply increases output but leaves the price level unchanged.

- In Year 2, the price level will begin to rise.
  - In Year 2, the $SRAS$ curve shifts up because of excess aggregate demand in Year 1, i.e., $Y_1 > Y^*$.
    - How far the $SRAS$ curve shifts up depends on the explicit price adjustment process for the economy.
    - Generally it is a multiyear process dependent on the amount of excess aggregate demand.

Price Adjustment and General Equilibrium

- An increase in the real money supply:
  - In Year 2, the price level will begin to rise.
    - A higher price level reduces the real money supply, $M/P$.
      - Alternatively, the purchasing power of the nominal money supply, $M^*$, is reduced.
    - A lower real money supply shifts the $LM$ curve to the left, raising the real interest rate.
Price Adjustment and General Equilibrium

- An increase in the real money supply:
  - In Year 2, the price level will begin to rise.
    - A higher real interest rate will:
      - Reduce interest-sensitive spending,
      - Reducing output and employment, and
      - Raise the unemployment rate.

- In Year 3, the price level continues to adjust.
  - In Year 3, the SRAS curve shifts up because of any excess aggregate demand in Year 2, i.e., \( Y_2 > Y^* \).
    - Because excess aggregate demand in Year 2 is less than in Year 1, the upward shift of the SRAS curve in Year 3 will be smaller than it was in Year 2.

- An increase in the real money supply:
  - In Year 4 and beyond, this process continues until general equilibrium is re-established in both the IS-LM and AD-AS models.
    - Output will be back at its full-employment level.
      - Employment will be back at its full-employment level.
      - The unemployment rate will be back at its natural rate.
    - The price level will be permanently higher.

- Once general equilibrium has been re-established:
  - Output is back at its full-employment level.
  - The real money supply is back at its original level.
    - The price level has increased proportionately with the increase in the nominal money supply.
  - The real interest rate is back at its original level.
  - The composition of output has NOT changed.
Price Adjustment and General Equilibrium

- An increase in the real money supply:
  - Once general equilibrium has been re-established:
    - All real variables are unchanged.
    - All nominal variables have increased proportionately with the increase in the money supply.
  - The result is known as the Classical Dichotomy.
    - Or the Long-run Neutrality of Money.

Price Adjustment and General Equilibrium

- An increase in the real money supply:
  - Trend money growth and inflation:
    - This analysis can also handle the case in which the money supply is growing continuously.
      - If both the money supply and price level grow at the same rate, then there is no change in the real money supply, and the $LM$ curve does not shift.
      - If the money supply grows faster than the price level, then the $LM$ curve would shift to the right.
Price Adjustment and General Equilibrium

• The self-correcting economy:
  - The economy is brought back into general equilibrium by adjustment of the price level.
  - How rapidly does the economy reach general equilibrium?
    - Classical and Keynesian economists differ significantly in their answer to this question.

Price Adjustment and General Equilibrium

• The self-correcting economy:
  - Classical economists believe that price adjustment is rapid.
    - Firms change prices instead of output in response to changes in demand.
    - The adjustment process is almost immediate.
      - The economy quickly returns to full employment after a shock.
    - There is NO appropriate role for monetary and/or fiscal policy in stabilizing the economy.

Price Adjustment and General Equilibrium

• The self-correcting economy:
  - Keynesians believe that price adjustment is slow.
    - It takes years before prices and wages fully adjust to changes in demand.
    - When not in general equilibrium, output is determined by aggregate demand and the labor market is not in equilibrium.
    - There is an appropriate role for monetary or fiscal policy in stabilizing the economy.

Aggregate Demand and Aggregate Supply

• A short-run adverse supply shock:
  - In Year 0, the economy is in general equilibrium.
A short-run adverse supply shock:

- In Year 1, imported goods prices increase.
  - An increase in imported goods prices immediately increases the price level and shifts the SRAS curve up.
  - A higher price level reduces the real money supply, $M/P$.
  - A lower real money supply shifts the LM curve to the left, raising the real interest rate.

- In Year 2, the price level will begin to fall.
  - In Year 2, the SRAS curve shifts down because of the insufficient aggregate demand in Year 1, i.e., $Y_1 < Y^*$. As the SRAS curve shifts down, the price level falls.
  - A lower price level increases the real money supply.
  - A higher real money supply shifts the LM curve to the right, reducing the real interest rate.
Aggregate Demand and Aggregate Supply

• A short-run adverse supply shock:
  ➢ In Year 2, the price level will begin to fall.
    • A lower real interest rate stimulates:
      – Increases interest-sensitive spending,
      – Increases output and employment, and
      – Decreases the unemployment rate.

• A short-run adverse supply shock:
  ➢ In Year 3 and beyond, the price level continues to fall until general equilibrium is re-established in both the IS-LM and AD-AS models.
    • Output will be back at its full-employment level.
      – Employment will be back at its full-employment level.
      – The unemployment rate will be back at its natural rate.
    • The price level will be back at its original level.

Aggregate Demand and Aggregate Supply

• A long-run adverse supply shock:
  ➢ In Year 0, the economy is in general equilibrium.

A long-run adverse supply shock
Aggregate Demand and Aggregate Supply

• A long-run adverse supply shock:
  ➢ In Year 1, there is a decrease in productivity.
    • A decrease in productivity shifts BOTH the SRAS curve up and the LRAS curve (and the FE line) to the left.
      – The short-run effects could be:
        » Greater than,
        » Equal to, or
        » Less than the long-run effects.

Aggregate Demand and Aggregate Supply

• A long-run adverse supply shock:
  ➢ In Year 1, the upward shift of the SRAS curve:
    • Increases the price level,
    • Reduces the real money supply,
    • Shifts the LM curve to the left,
    • Raises the real interest rate,
    • Reduces interest-sensitive spending, and
    • Reduces output and employment.

Aggregate Demand and Aggregate Supply

• A long-run adverse supply shock:
  ➢ In Year 1, the leftward shift of the LRAS curve reduces the economy’s full-employment level of output.
    • Which reduces general equilibrium output.

Aggregate Demand and Aggregate Supply

• A long-run adverse supply shock:
  ➢ In Year 2, if the short-run effects are less than the long-run effects, then:
    • Output in Year 1 is greater than the new, lower full-employment level of output, i.e., \( Y_1 > Y^*_{1} \).
    • So there is excess aggregate demand and the SRAS curve will shift up and the price level will rise.
    • This process continues until general equilibrium is re-established.
A long-run adverse supply shock

Aggregate Demand and Aggregate Supply

- A long-run adverse supply shock:

  - In Year 2, if the short-run effects are greater than the long-run effects, then:
    - Output in Year 1 is less than the new, lower full-employment level of output, i.e., \( Y_1 < Y^* \).
    - So there is insufficient aggregate demand and the SRAS curve will shift down and the price level will fall.

  - This process continues until general equilibrium is re-established.

- A long-run adverse supply shock:

  - Once general equilibrium has been re-established:
    - Output is at its new, lower full-employment level.
    - The price level will be permanently higher.
    - The real money supply will be lower.
    - The real interest rate will be higher.
    - The composition of output has changed.