Chapter 10 ECON4 William A. McEacherr

Aggregate Supply

Aggregate Supply in Short Run

- Aggregate supply, AS
  - Relationship between the price level
  - And output firms are willing and able to supply
  - Other things constant
    - Resource prices
    - Technology
    - Set of formal and informal institutions

Labor and Aggregate Supply

- Labor
  - 70% of production costs
- Supply of labor
  - Size/abilities of adult population
  - Preferences for work vs. leisure
- Higher wage
  - More labor supplied

Labor and Aggregate Supply

- Higher price level
  - The less the money wage purchase
  - The less attractive the wage
- Nominal wage
  - In dollars of the current year
- Real wage
  - In dollars of constant purchasing power
- Wage negotiation - expected price level

Potential Output

- Potential output
  - Amount produced
    - No surprises about price level
  - Maximum sustainable output, given
    - Supply of resources
    - Technology
    - Rules of the game
  - Natural rate of output
  - Full-employment rate of output

Natural Rate of Unemployment

- Natural rate of unemployment
  - Unemployment rate when
    - The economy produces its potential output
  - No cyclical unemployment
  - Some frictional, structural and seasonal unemployment
  - 4 to 6%

Price Level - Higher than Expected

- Price level > expected
  - Higher profit per unit
  - Increase production
  - Economy's output > potential
  - Unemployment < natural rate
- Increased per-unit production cost
  - Marginal cost increases
  - The price level rises faster

Price Level - Lower than Expected

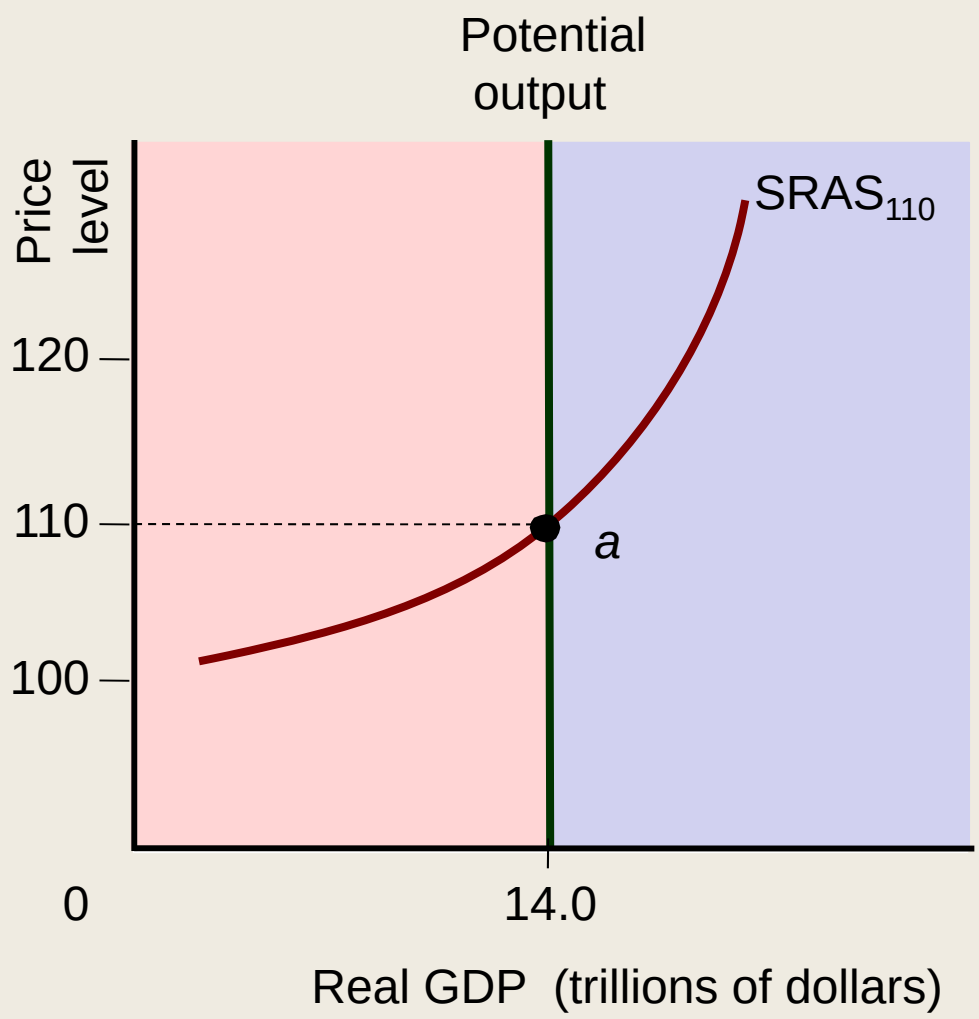
- Price level < expected
  - Production less profitable
  - Decrease production
  - Economy's output < potential
  - Unemployment > natural rate
- Decreased per-unit production cost

Short-Run Aggregate Supply

- Short-run aggregate supply curve, SRAS
  - Actual price level
  - Real GDP supplied
- Price level = as expected
  - AD curve intersects SRAS
    - Potential output
    - Natural rate of unemployment
- Slope of SRAS curve
  - Increase in marginal cost

Exhibit 1

Short-Run Aggregate Supply Curve



The short-run aggregate supply curve is based on a given expected price level, in this case, 110. Point *a* shows that if the actual price level equals the expected price level of 110, firms supply potential output. If the actual price level exceeds 110, firms supply more than potential. If the actual price level is below 110, firms supply less than potential. Output levels that fall short of the economy's potential are shaded red; output levels that exceed the economy's potential are shaded blue.

From Short Run to Long Run

- Short-run equilibrium
  - Price level and real GDP
  - Aggregate demand curve intersects the short-run aggregate supply curve
- Long run
  - Wage contracts and resource price agreements can be renegotiated
  - No surprises about the economy's actual price level

From Short Run to Long Run

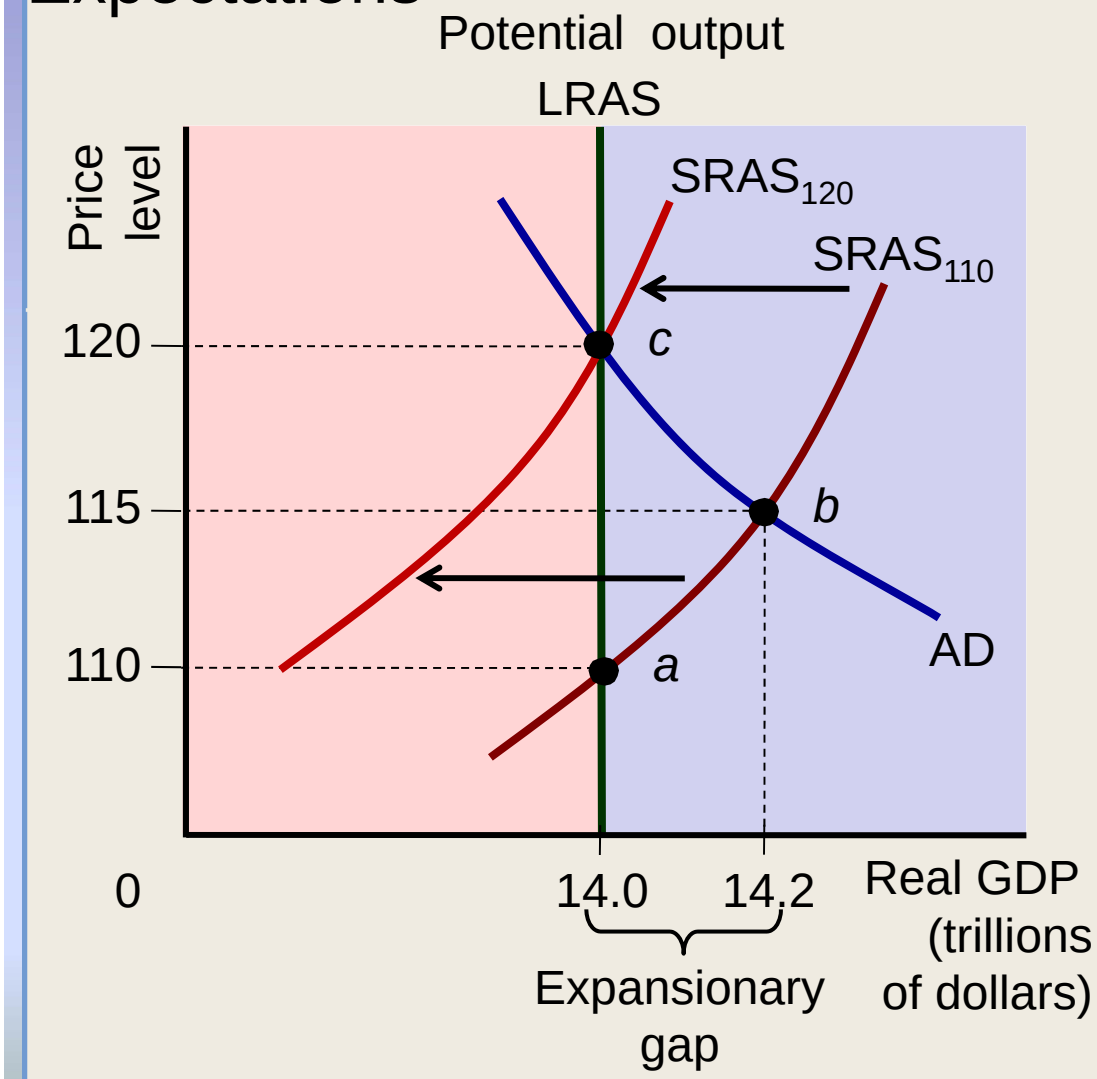
- Expansionary gap
  - Amount by which actual output in the short run
  - Exceeds the economy's potential output
- Recessionary gap
  - Amount by which actual output in the short run
  - Falls short of the economy's potential output

Closing an Expansionary Gap

- AD greater than expected, short run:
  - Price level > expected
  - Output > potential
  - Unemployment < natural rate
  - Expansionary gap
  - Inflationary pressure

Exhibit 2

Long-Run Adjustment When the Price Level Exceeds Expectations



If the expected price level is 110, the short-run aggregate supply curve is $SRAS_{110}$. If the actual price level turns out as expected, the quantity supplied is the potential output of $14.0 trillion. But here the price level ends up higher than expected, and output exceeds potential, as shown by the short-run equilibrium at point b. The amount by which actual output exceeds the economy's potential output is called the expansionary gap. In the long run, price-level expectations and nominal wages will be revised upward. Costs will rise and the short-run aggregate supply curve will shift leftward to $SRAS_{120}$. Eventually, the economy will move to long-run equilibrium at point c, thus closing the expansionary gap.

Closing an Expansionary Gap

- Long run
  - Higher nominal payments
  - Higher production costs
  - SRAS shifts left
  - Cost-push inflation
  - Lower output
  - Long run equilibrium

Closing an Expansionary Gap

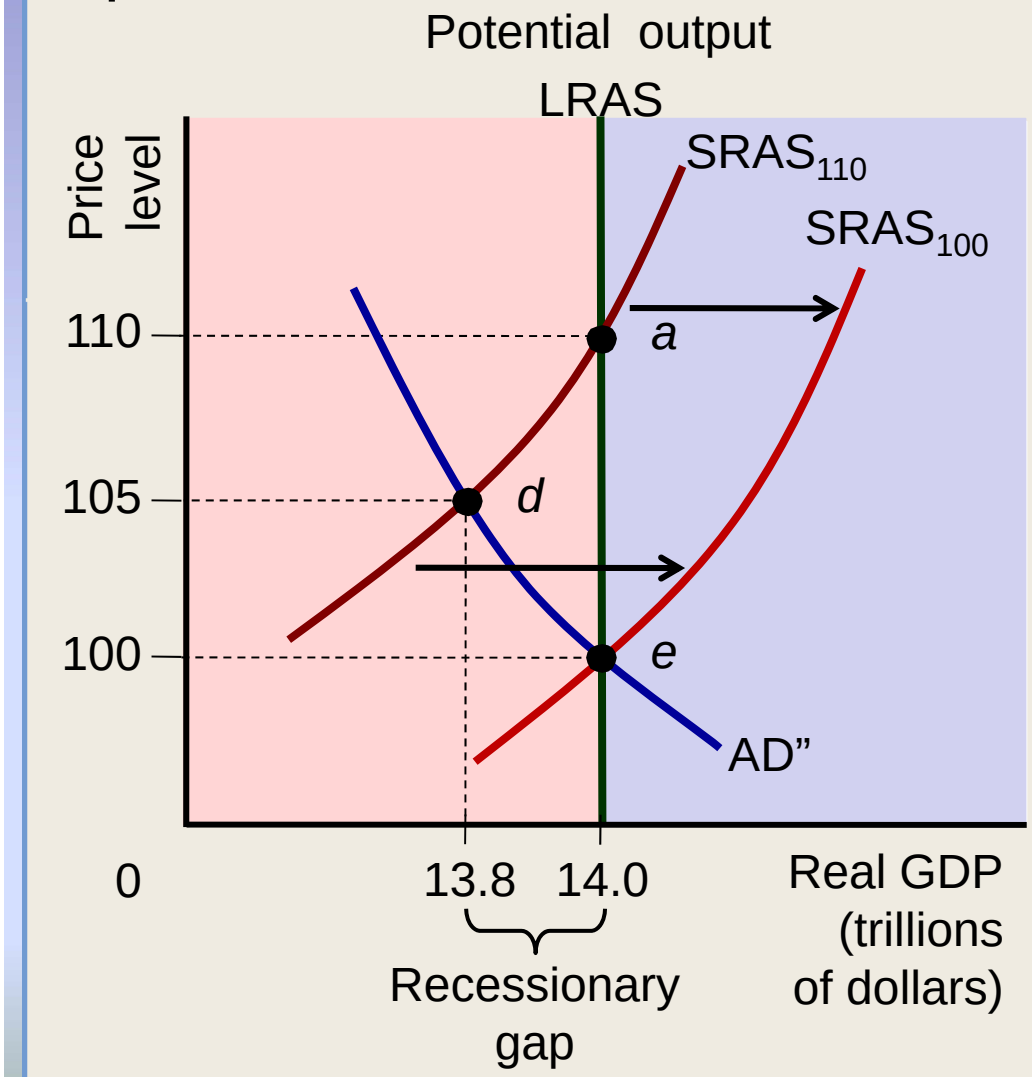
- Long run equilibrium
  - Expected price level = actual price level
  - Quantity supplied in SR = potential output = Quantity supplied in LR
  - Quantity supplied = quantity demanded

Closing a Recessionary Gap

- AD lower than expected, short run
  - Price level < expected
  - Output < potential
  - Unemployment > natural rate
  - Recessionary gap
  - Deflationary pressure

Exhibit 3

Long-Run Adjustment When the Price Level Is Below Expectations



When the actual price level is below expectations, as indicated by the intersection of the aggregate demand curve AD" with the short-run aggregate supply curve $SRAS_{110}$, short-run equilibrium occurs at point d. Production below the economy's potential opens a recessionary gap. If prices and wages are flexible enough in the long run, nominal wages will be renegotiated lower. As resource costs fall, the short-run aggregate supply curve eventually shifts rightward to $SRAS_{100}$ and the economy moves to long-run equilibrium at point e, with output increasing to the potential level of $14.0 trillion.

Closing a Recessionary Gap

- Long run
  - Lower nominal wages
  - Lower cost of production
  - SRAS shifts right
  - Deflation
  - Grater output
  - Long run equilibrium

Tracing Potential Output

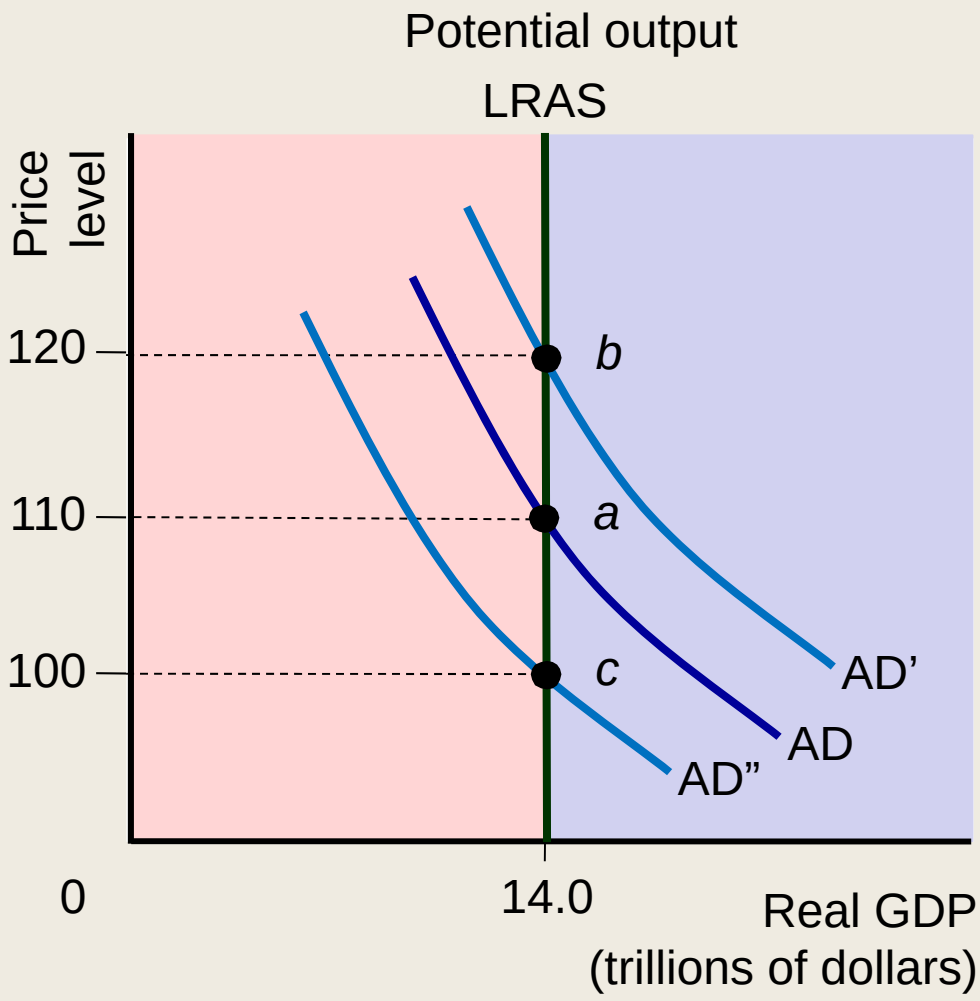
- Potential output in the long run
  - If wages and prices are flexible enough
- Long-run aggregate supply curve, LRAS
  - Vertical line at the economy's potential output
  - Aggregate supply when
    - There are no surprises about the price level
    - All resource contracts can be renegotiated

Tracing Potential Output

- Long-run aggregate supply curve, LRAS, depends on
  - Supply of resources in economy
  - Level of technology
  - Production incentives
- Long-run equilibrium
  - Output = LRAS = potential output
  - Price level: depends on AD curve

Exhibit 4

Long-Run Aggregate Supply Curve

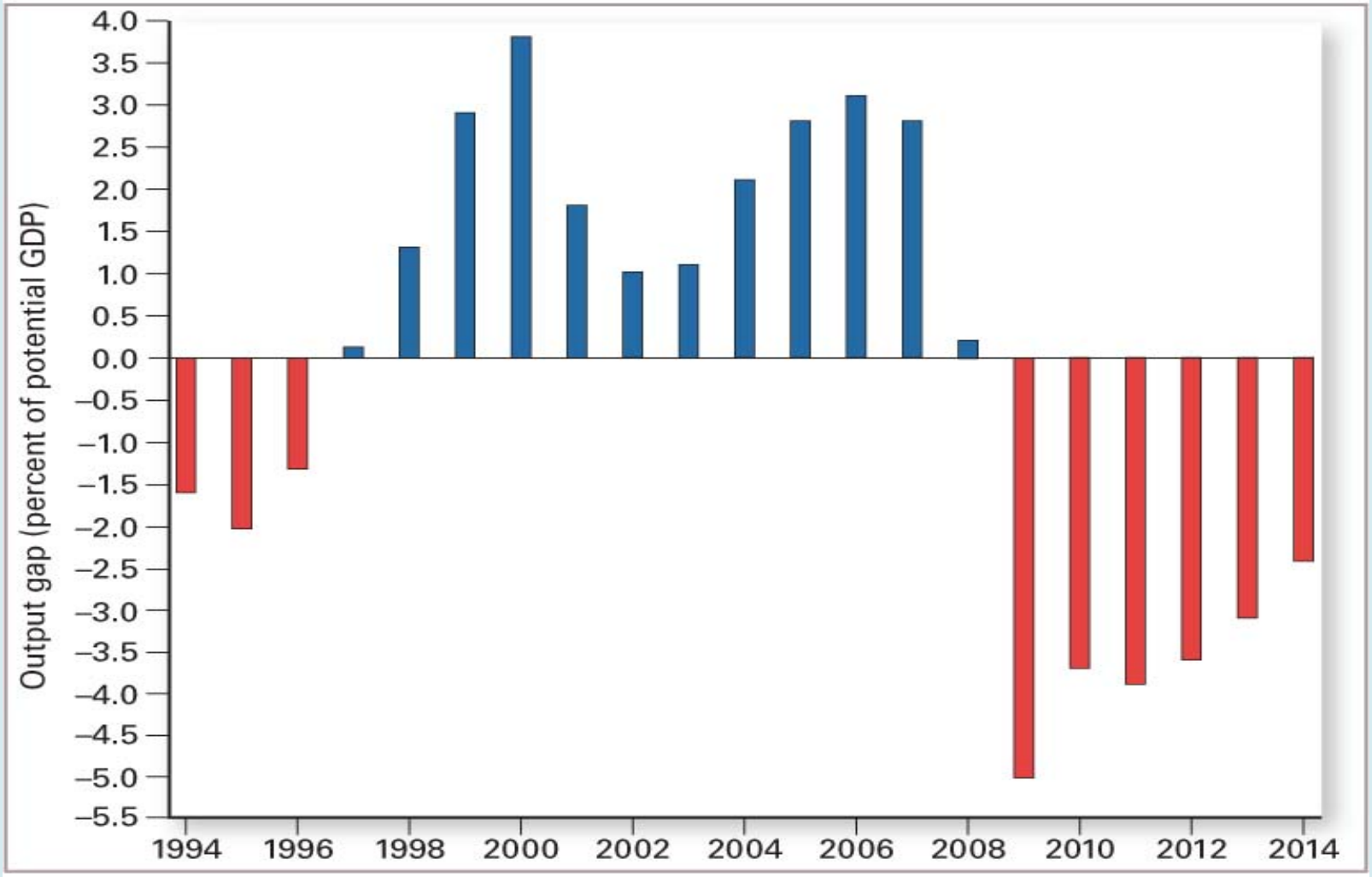


In the long run, when the actual price level equals the expected price level, the economy produces its potential. In the long run, $14.0 trillion in real GDP is supplied regardless of the actual price level. As long as wages and prices are flexible, the economy's potential GDP is consistent with any price level. Thus, shifts of the aggregate demand curve, in the long run, do not affect potential output. The long-run aggregate supply curve, LRAS, is a vertical line at potential GDP.

Exhibit 5: *Output Gap*

Exhibit 5

The U.S. Output Gap Measures Actual Output Minus Potential Output as a Percentage of Potential Output



SOURCE: Developed from estimates by the *OECD Economic Outlook*, 93 (June 2013), Annex Table 10. Figures for 2013 and 2014 are OECD projections. OECD data can be found at http://www.oecd.org/home/.

Wage Flexibility and Employment

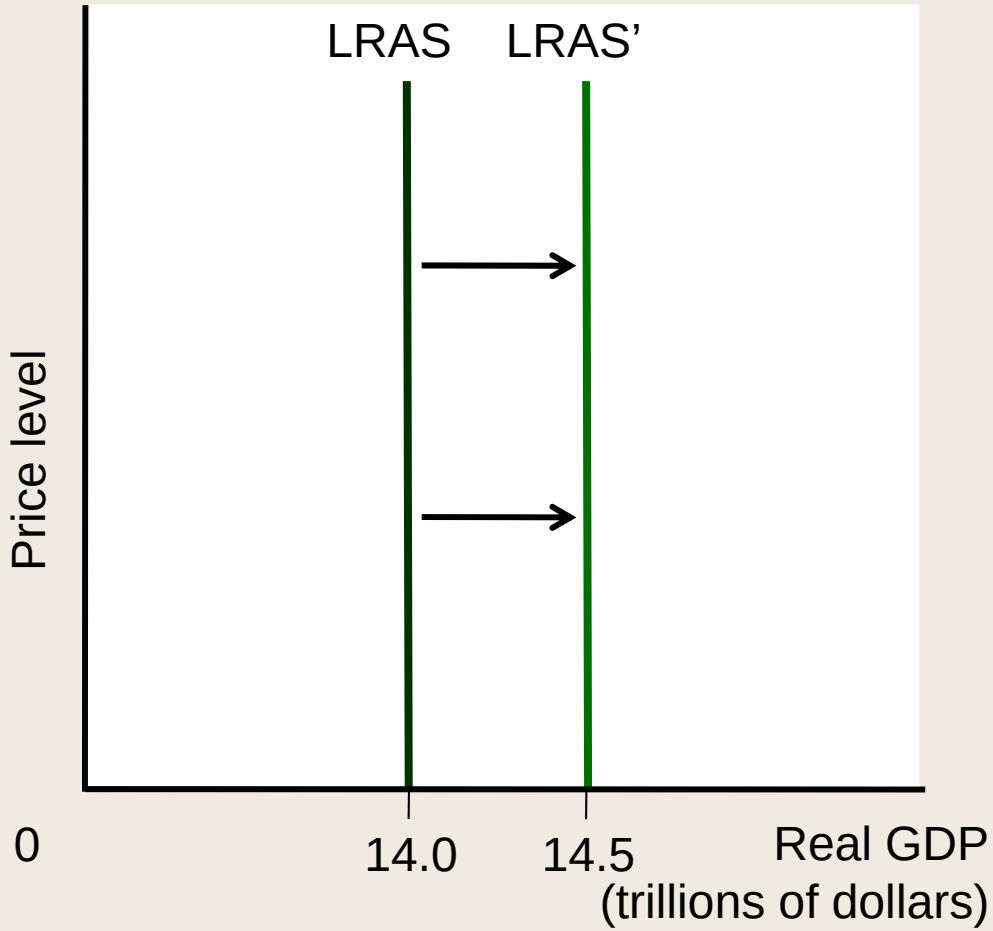
- Expansionary gap
  - Labor shortage
  - Higher nominal wage
  - Higher price level
- Recessionary gap
  - Nominal wages = “sticky” downward
  - Slow to close

Shifts of the LRAS Curve

- Aggregate supply increases, LRAS
  - Increased quantity and quality of labor and other resources
  - Institutional changes
  - Gradually

Exhibit 6

Effect of a Gradual Increase in Resources on Aggregate Supply



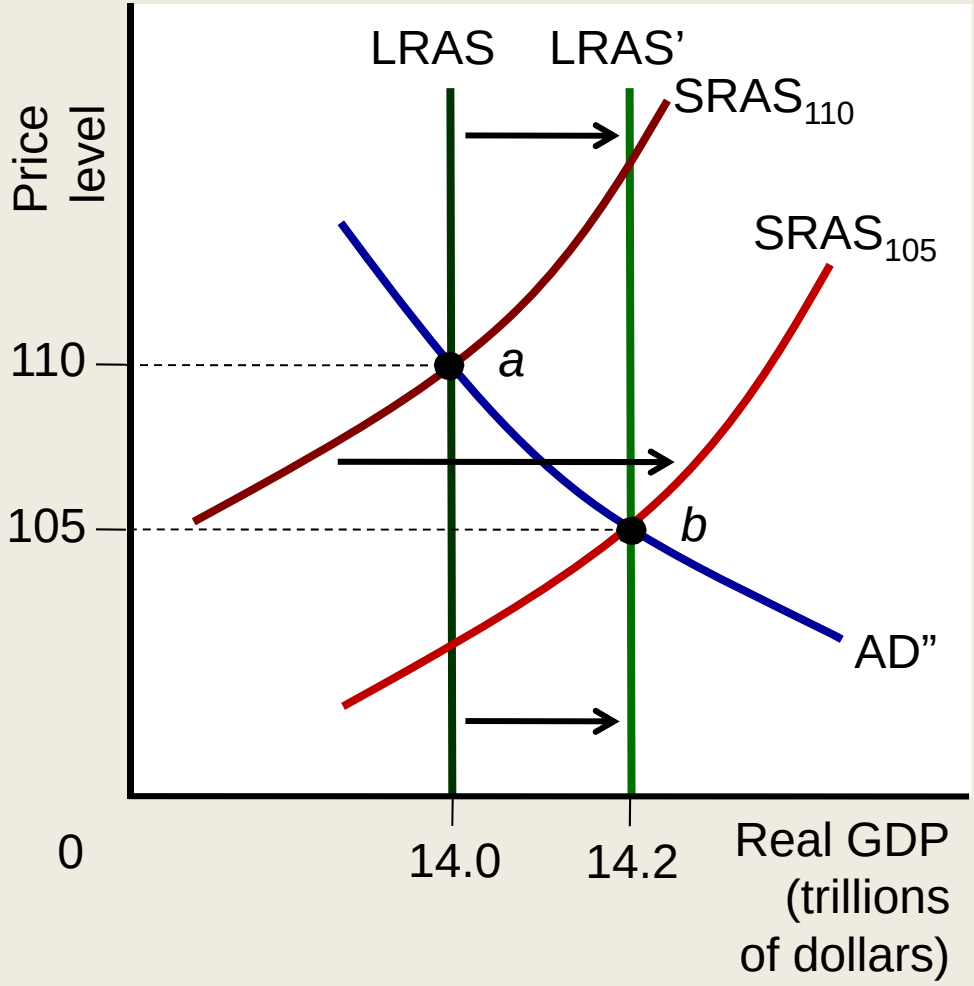
A gradual increase in the supply of resources increases the potential GDP – in this case, from $14.0 trillion to $14.5 trillion. The long-run aggregate supply curve shifts to the right.

Shifts of the LRAS Curve

- Supply shocks
  - Unexpected events
- Beneficial supply shocks
  - Increase aggregate supply (SRAS, LRAS)
    - Abundant harvests
    - Discoveries of natural resources
    - Technological breakthroughs
    - Sudden changes in economic system; tax cuts
  - Higher output; lower price level

Exhibit 7

Effects of a Beneficial Supply Shock on Aggregate Supply



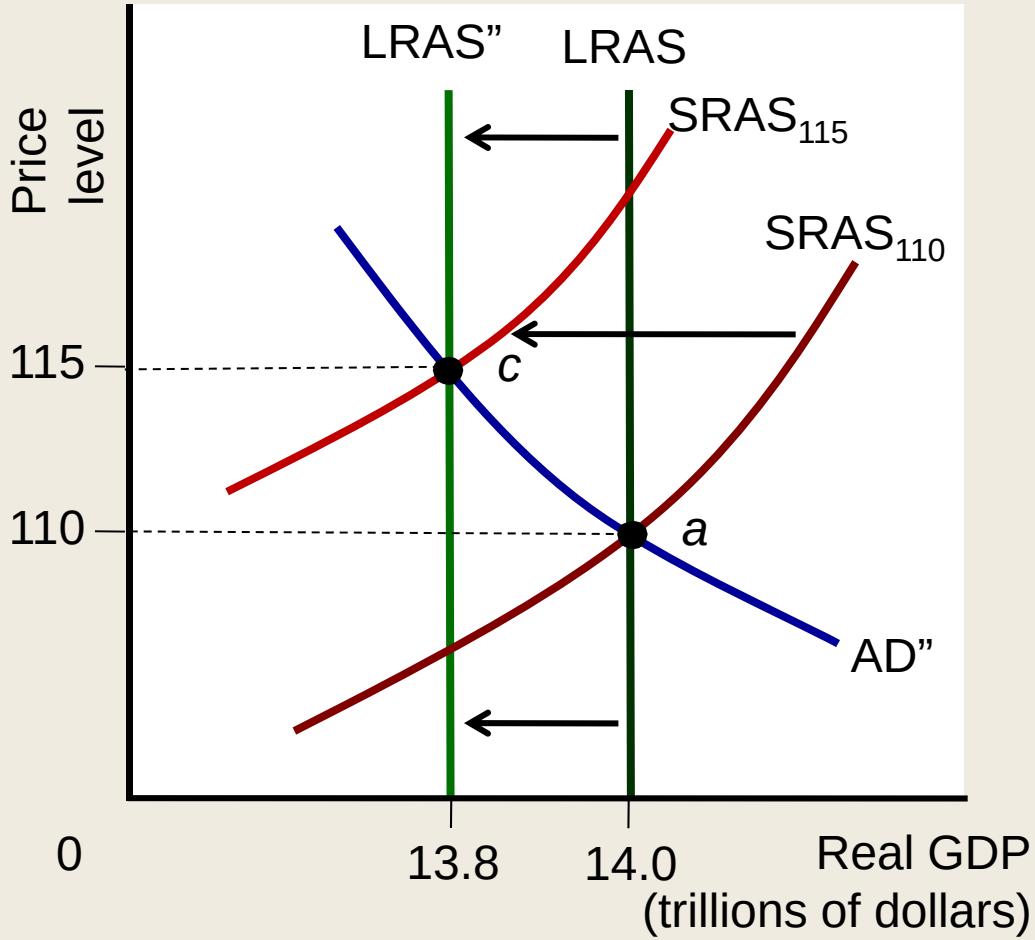
A beneficial supply shock that has a lasting effect, such as a breakthrough in technology, permanently shifts both the short-run and the long-run aggregate supply curves to the right. A beneficial supply shock lowers the price level and increases output, as reflected by the change in equilibrium from point a to point b. A temporary beneficial supply shock shifts the aggregate supply curves only temporarily.

Shifts of the LRAS Curve

- Adverse supply shocks
  - Decrease aggregate supply (SRAS, LRAS)
    - A drought
    - Overthrow of government
    - Terrorist attacks
  - Stagflation
    - Lower output
    - Higher price level

Exhibit 8

Effects of an Adverse Supply Shock on Aggregate Supply



Given the aggregate demand curve, an adverse supply shock, such as a drought, shifts the short-run and long-run aggregate supply curves to the left, increasing the price level and reducing real GDP, a movement called stagflation. This change is shown by the move in equilibrium from point a to point c. If the shock is just temporary, the shift of the aggregate supply curves will be temporary.