Inflation and the Phillips curve

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The first few months or years of inflation, like the first few drinks, seem just fine. Everyone has more money to spend and prices aren't rising quite as fast as the money that's available. The hangover comes when prices start to catch up.

— *Milton Friedman*

Chapter Goals

- State some of the distributional effects of inflation
- Explain how inflation expectations are formed
- Outline the quantity theory of money and its theory of inflation
- Outline the institutionalist theory of inflation
- Differentiate between long-run and short-run Phillips curves
- Explain the different views on the relationship between inflation and growth

Some Basics about Inflation

- **Inflation** is a continuous rise in the price level and is measured with price indexes
- Expectations of inflation can become built into individuals' behavior and economic institutions and cause a small inflation to accelerate
- Inflation creates feelings of injustice and destroys the informational value of prices and the market

The Distributional Effects of Inflation

- Unexpected inflation may redistribute income from lenders to borrowers
  - If lenders charge a nominal rate of 5% and expect inflation to be 2%, the expected real rate is 3%
  - If inflation is actually 4%, the real rate is only 1%
- People who do not expect inflation and who are tied to fixed nominal contracts will likely lose in an inflationary period

Expectations of Inflation

- Expectations play a key role in the inflationary process
  - **Rational expectations** are the expectations that the economists' models predict
  - **Adaptive expectations** are expectations based in some way on the past
  - **Extrapolative expectations** are expectations that a trend will continue

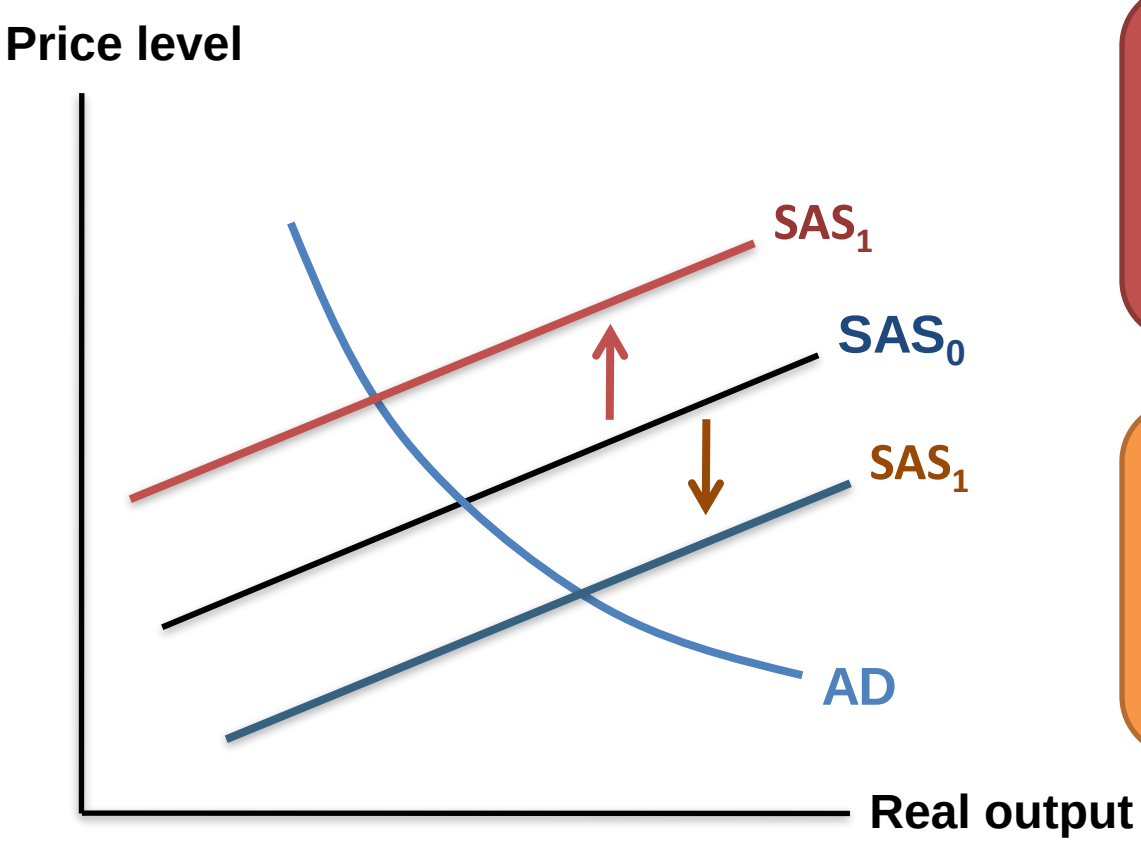
Productivity, Inflation, and Wages

- Changes in productivity and changes in wages determine whether inflation may be coming

- There will be no inflationary pressures if wages and productivity increase at the same rate

Inflation = Nominal wage increases - Productivity growth

Nominal Wages, Productivity, and Inflation



When nominal wages increase by more than the growth of productivity, the *SAS curve shifts* up, resulting in inflation

When nominal wages increase by less than the growth of productivity, the *SAS curve shifts* down, resulting in deflation

Theories of Inflation

- The two theories of inflation are the quantity theory and the institutional theory
  - The **quantity theory** emphasizes the connection between money and inflation; if the money supply rises, the price level rises
  - The **institutional theory** emphasizes the relationship between market structure and price-setting institutions and inflation
- The two theories overlap significantly, but because they come to different policy conclusions

The Quantity Theory of Money and Inflation

Inflation is always and everywhere a monetary phenomenon

- The equation of exchange is: **MV = PQ**

  M = Quantity of money Q = Real output

  V = Velocity of money P = Price level

- **Velocity of money** is the number of times per year, on average, a dollar goes around to generate a dollar's worth of income

$$\text{Velocity} = \frac{\text{Nominal GDP}}{\text{Money Supply}}$$

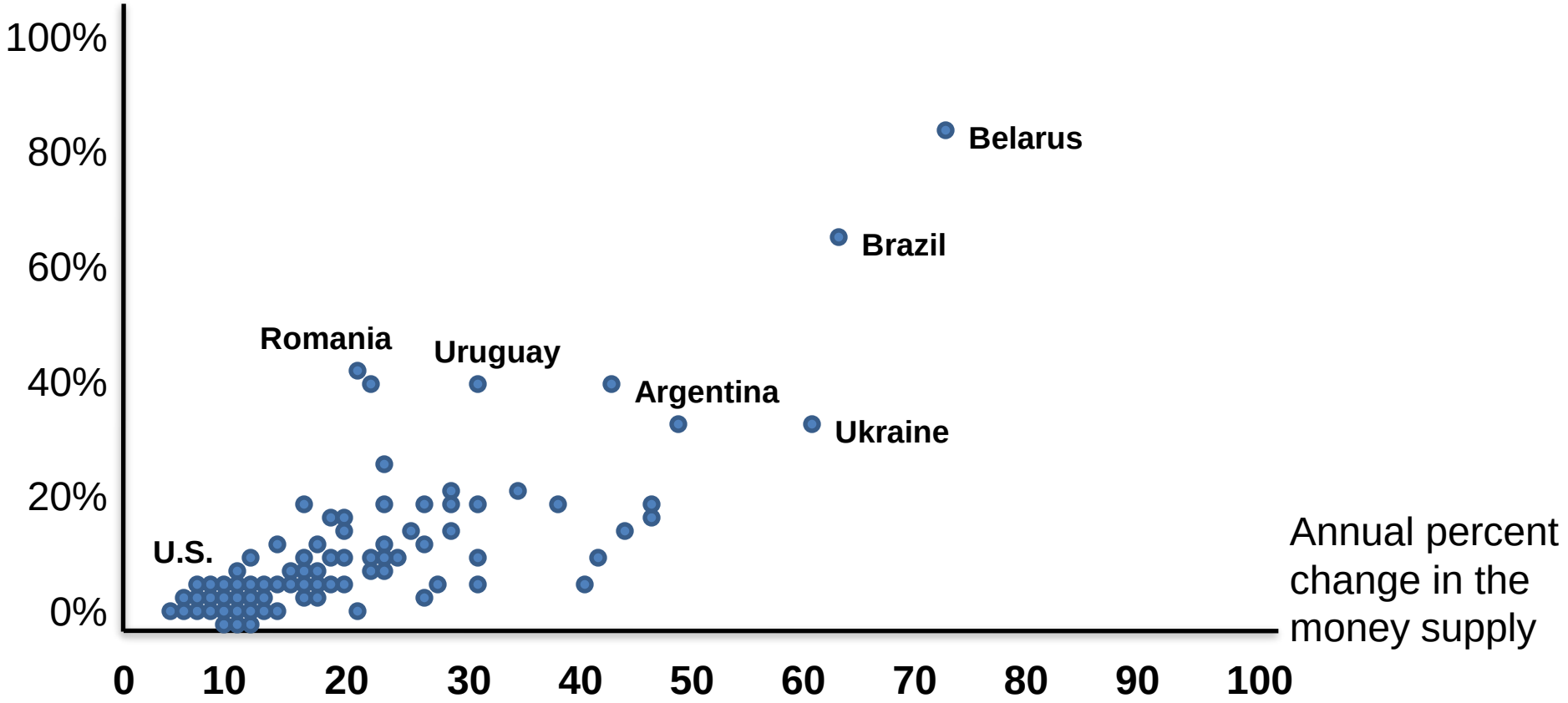
The Quantity Theory of Money and Inflation

Three assumptions of quantity theory:

1. Velocity is constant
2. Real output (Q) is independent of money supply
   - Q is autonomous, determined by forces outside those in the quantity theory
3. Causation goes from money to prices
   - The quantity theory says that the price level varies in response to changes in the quantity of money
   - $\%\Delta M \rightarrow \%\Delta P$

Inflation and Money Growth

The empirical evidence that supports the quantity theory of money is most convincing in countries that experience significant inflation



Why Central Banks Increase the Money Supply

- If the central bank must buy government bonds to finance a government deficit, the money supply increases and inflation may occur
- This inflation works as a kind of tax on individuals, and is often called an **inflation tax** because it reduces the value of cash
- Central banks have to make a policy choice:
  - Ignite inflation by bailing out their governments with expansionary monetary policy
  - Do nothing and risk recession

Institutionalist Theories of Inflation

- Both quantity theorists and institutionalists agree that money and inflation are positively related, but they have different causes and effects
- Quantity theorists believe that increases in money cause direct increases in prices
- Institutionalists believe that increases in prices force government to increase the money supply or cause unemployment

Institutionalist Theories of Inflation

- According to the quantity theory, changes in money cause changes in prices
  - MV → PQ
- According to the institutionalists, increases in prices force the government to increase the money supply
  - MV ← PQ

Institutionalist Theories of Inflation

- The source of inflation is firms who pass on higher wages, rents, taxes, or other costs on to consumers in the form of higher prices
- If the government increases the money supply so that demand is sufficient to buy the goods at higher prices, inflation is the result
- If the government doesn't increase the money supply unemployment increases

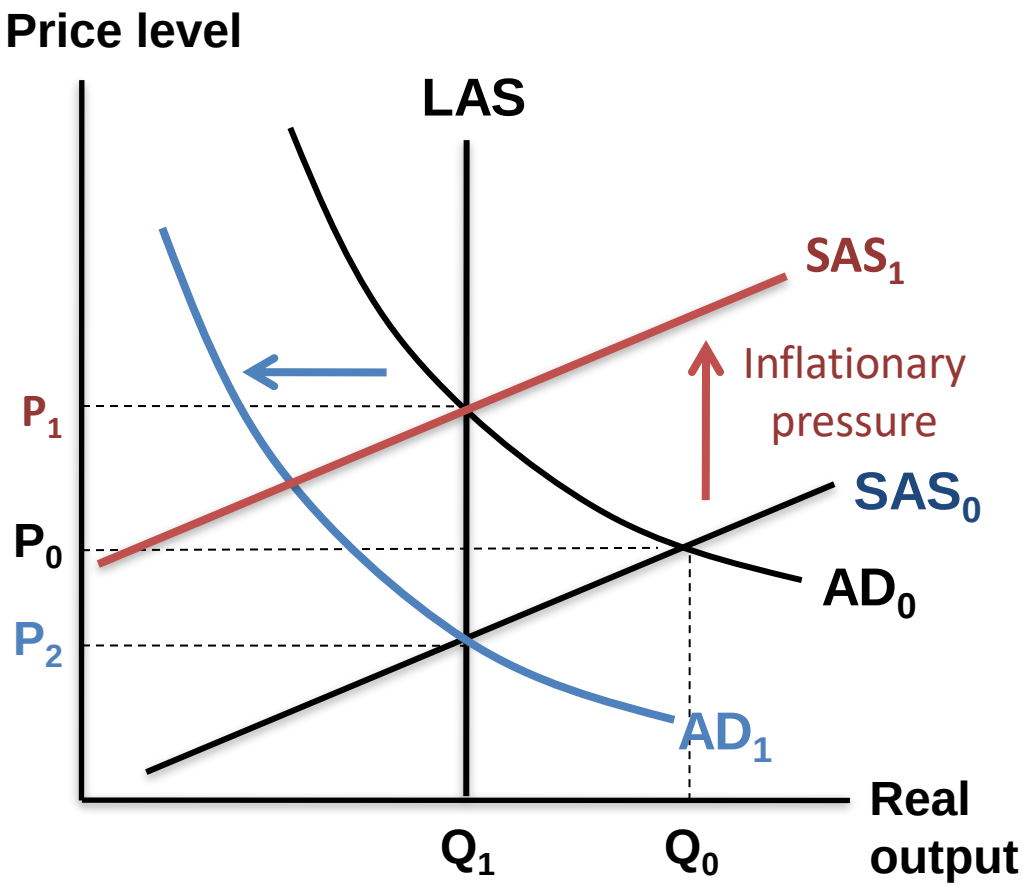
The Insider/Outsider Model and Inflation

- The **insider-outsider model** is an institutionalist story of inflation where insiders bid up wages and outsiders are unemployed
- If markets were purely competitive, wages, profits, and rents would be pushed down to equilibrium levels
- Because insiders develop barriers such as unions and brand recognition to prevent outsider competition, outsiders must take dead-end low paying jobs

Demand-Pull and Cost-Push Inflation

- **Demand-pull inflation** occurs when the economy is at or above potential output
  - It is generally characterized by shortages of goods and workers
- **Cost-push inflation** occurs when the economy is below potential output
  - Significant proportions of markets or one very important market experience price increases not related to demand pressure

Addressing Inflation with Monetary Policy



Some policy makers believe there is a tradeoff between inflation and unemployment

Government can:

Keep output high **(AD_0)**

- Low unemployment
- Higher inflation

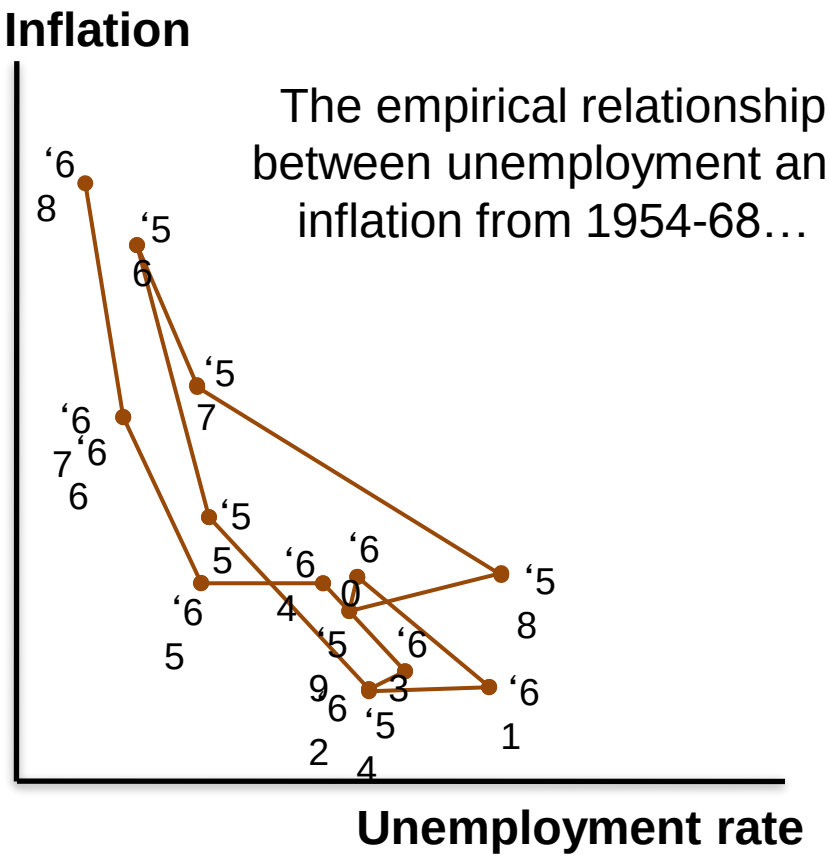
Lower AD **(AD_1)**

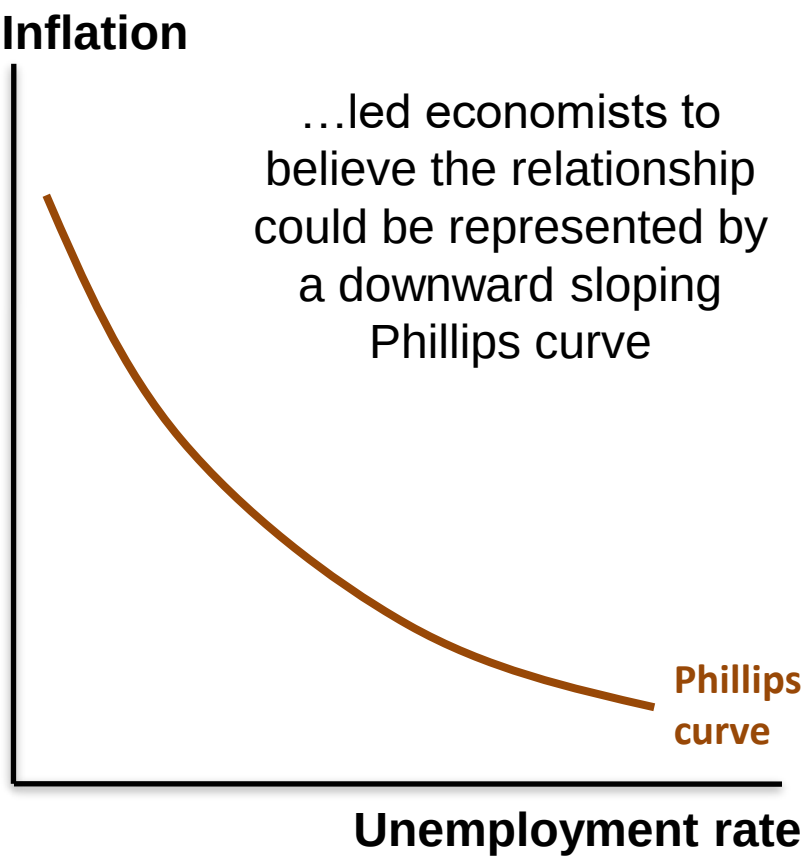
- Low inflation
- Higher unemployment

The Phillips Curve

- The Phillips curve began as an empirical relationship
- In the 1950s and 1960s, when unemployment was high, inflation was low; when unemployment was low, inflation was high
- The **short-run Phillips curve** is a downward-sloping curve showing the relationship between inflation and unemployment when expectations of inflation are constant
- In the 1970s, there was **stagflation**, the combination of high and accelerating inflation and high unemployment

The Phillips Curve

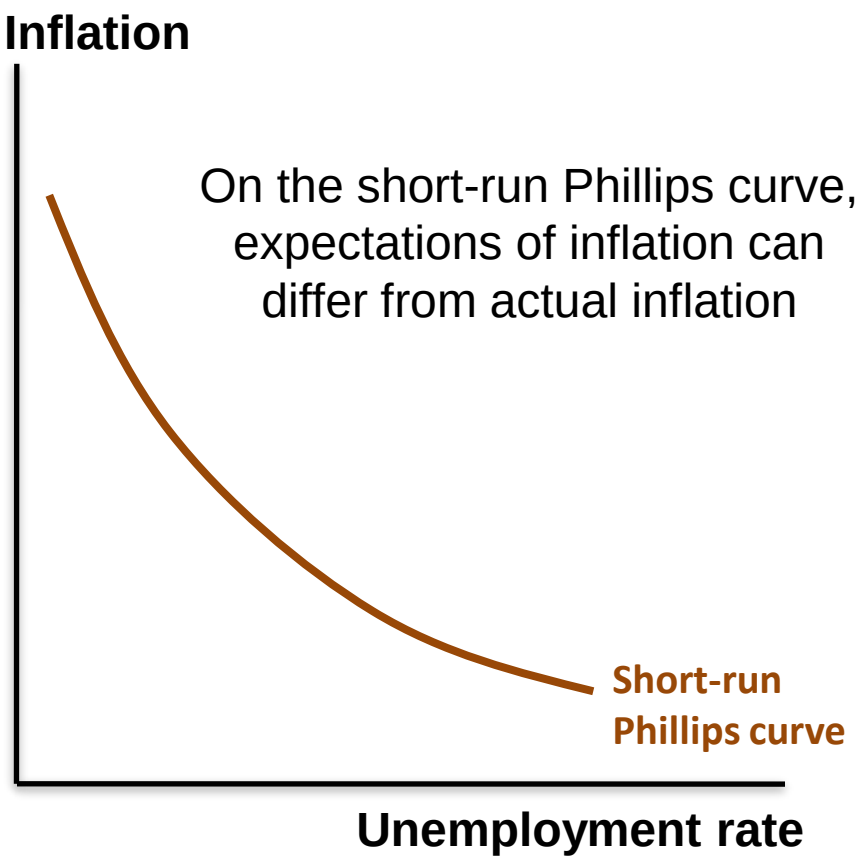


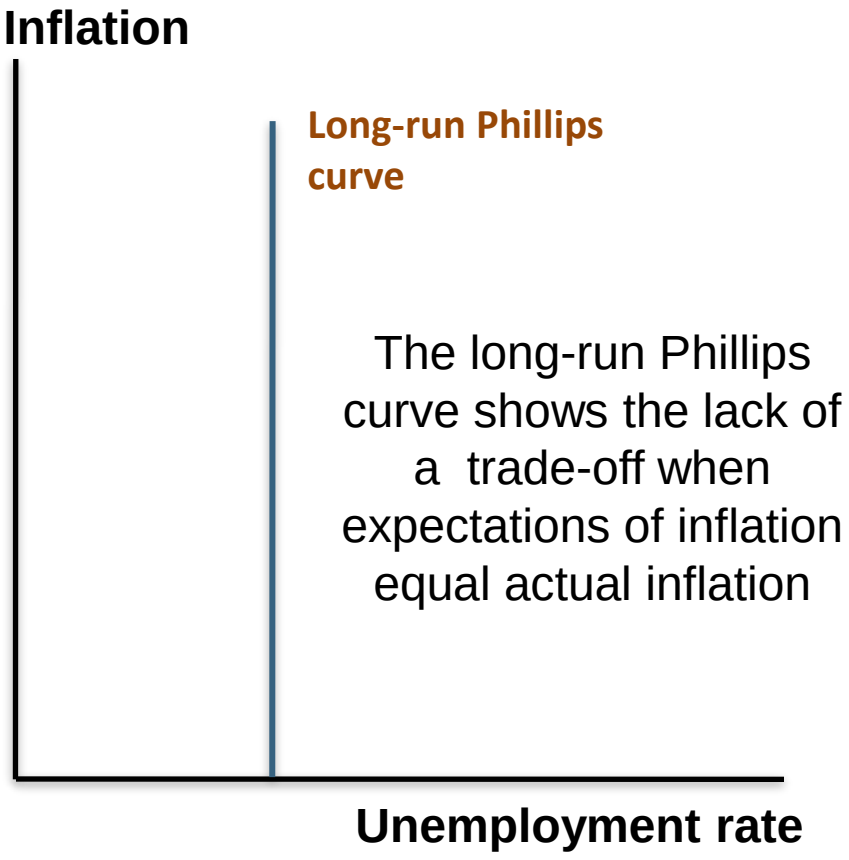


The Long-Run and Short-Run Phillips Curves

- Actual inflation depends both on supply and demand forces and on how much inflation people expect
- At all points on the **short-run Phillips curve**, expectations of inflation (the rise in the price level that the average person expects) are fixed
- At all points on the **long-run Phillips curve**, expectations of inflation are equal to actual inflation
- The **long-run Phillips curve** is a vertical curve at the unemployment rate consistent with potential output

The Phillips Curve

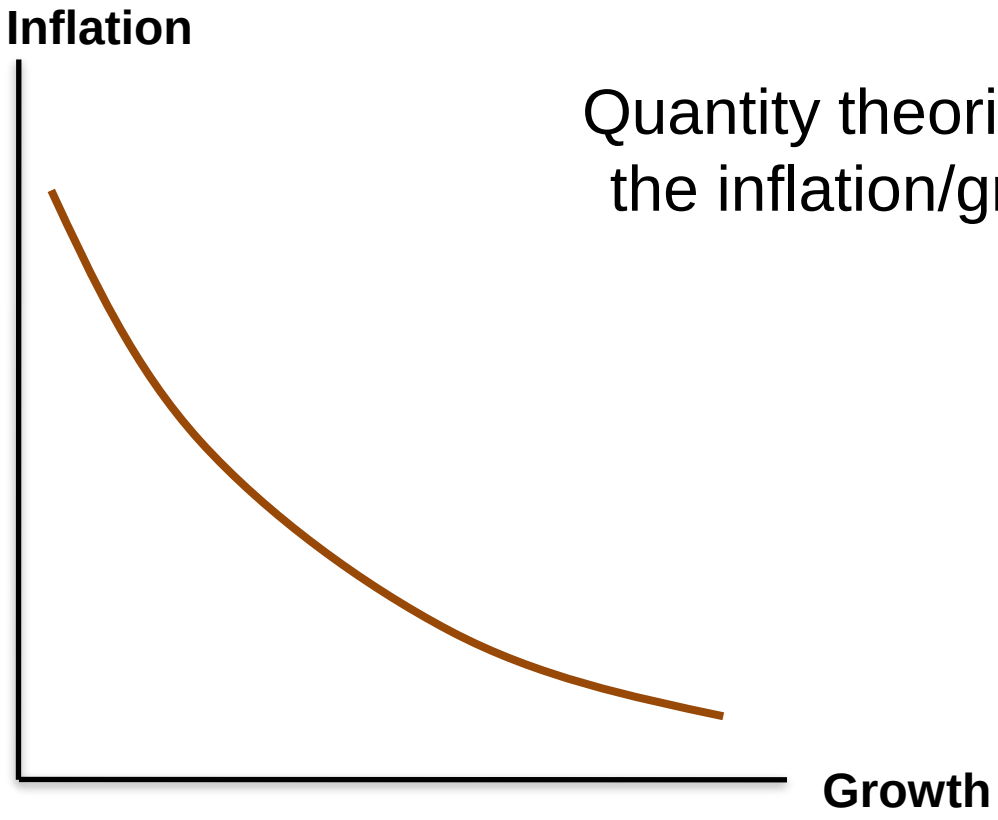




Quantity Theory and the Inflation/Growth Trade-Off

- Quantity theorists believe that low inflation should be the priority of policy
- They believe that low inflation leads to growth because:
  - It reduces price uncertainty, making it easier for businesses to invest in future production
  - It encourages businesses to enter into long-term contracts
  - It makes using money much easier

Quantity Theory and the Inflation/Growth Trade-Off

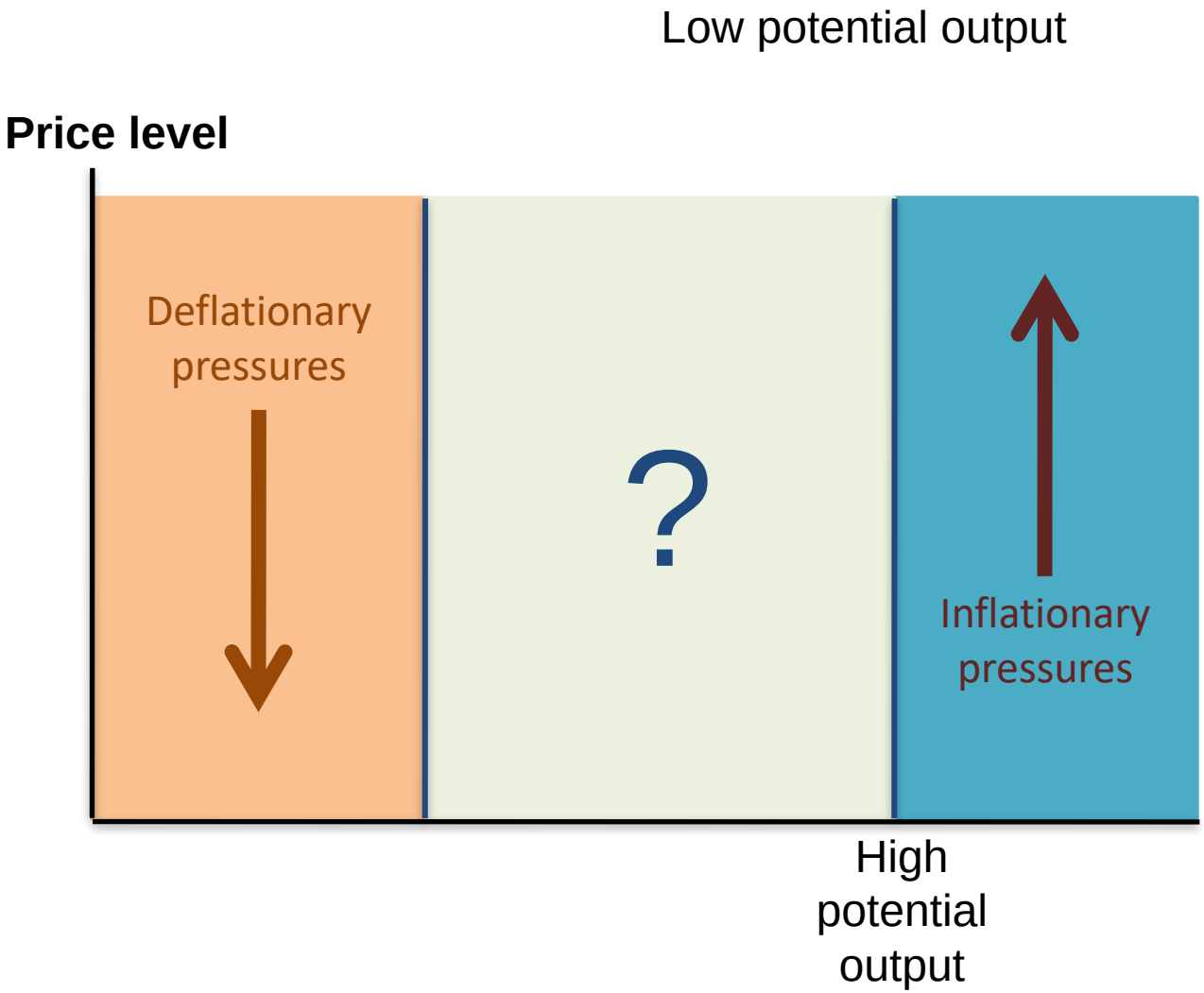


Quantity theorists emphasize the inflation/growth tradeoff

Institutional Theory and the Inflation/Growth Trade-Off

- Institutionalists are less sure about a negative relationship between inflation and growth
- They do not agree that all price level increases start an inflation
- If inflation does get started, the government has tools to get rid of it relatively easily

Institutional Theory and the Inflation/Growth Trade-Off



Institutionalists argue that the inflation threshold is at high potential output

Chapter Summary

- The winners in inflation are people who can raise their wages or prices and still keep their jobs or sell their goods
- The losers are people who can’t raise their wages or prices
- People form expectations in many ways
- Three ways are to base expectations on economic models, on an average of the past, or on trends
- A basic rule to predict inflation is: Inflation equals nominal wage increases minus productivity growth

Chapter Summary

- The equation of exchange is MV = PQ
    - When velocity is constant, real output is independent of the money supply, and causation goes from money to prices
- The equation of exchange becomes the quantity theory, and it predicts that the price level varies in direct response to changes in the quantity of money
    - That is %ΔM leads to an equal %ΔP

Chapter Summary

- Central banks sometimes print money knowing that it will lead to inflation because the alternative might be a breakdown of the economy
- The institutional theory of inflation sees the source of inflation in the wage-and-price setting institutions
- Institutionalists see the direction of causation going from price increases to money supply increases

Chapter Summary

- The long-run Phillips curve is vertical, and it allows expectations of inflation to change
- The short-run Phillips curve is downward sloping, holds expectations constant, and shifts when expectations change
- Quantity theorists see a long-run trade-off between inflation and growth, but institutionalists are less sure about this trade-off