**The Inflation and Unemployment Trade-Off**

Chapter 15

---

**Some Basics about Inflation**

- *Inflation* is a continuous rise in the price level.
- It is measured using a price index.

---

**The Distributional Effects of Inflation**

- There are individual winners and losers in an inflation.
- The composition of the winners and losers from an inflation changes over time.

---

**The Distributional Effects of Inflation**

- The winners are those who can raise their prices or wages and still keep their jobs or sell their goods.
- The losers in an inflation are those who cannot raise their wages or prices.

---

**The Distributional Effects of Inflation**

- Unexpected inflation redistributes income from lenders to borrowers.
- People who do not expect inflation and who are tied to fixed nominal contracts are likely lose in an inflation.

---

**Expectations of Inflation**

- Expectations play a key role in the inflationary process.
  - *Rational expectations* are the expectations that the economists' model predicts.
  - *Adaptive expectations* are those based, in some way, on what has been in the past.
  - *Extrapolative expectations* are those that assume 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.

The basic rule of thumb:

\[ \text{Inflation} = \text{Nominal wage increases} - \text{Productivity growth} \]

Demand-Pull and Cost-Push Inflation

- **Demand-pull inflation** – inflation that occurs when the economy is at or above potential output.
- It is generally characterized by excess demand for goods and workers.

- **Cost-push inflation** – inflation that occurs when the economy is below potential output.
- Producers who raise their prices believe that they will sell their goods and workers who raise their wages believe they won’t lose their jobs.

Theories of Inflation

- The *quantity theory* emphasizes the connection between money and inflation.
- The *institutional theory* emphasizes market structure and price-setting institutions and inflation.

Quantity Theory of Money

- The quantity theory of money is summarized by the sentence:
  
  Inflation is always and everywhere a monetary phenomenon.
**Equation of Exchange**

- **Equation of exchange** – the quantity of money times velocity of money equals price level times the quantity of real goods sold. 
  \[ MV = PY \]
  - \( M \) = Quantity of money
  - \( V \) = Income velocity of money
  - \( P \) = Price level
  - \( Y \) = Real output
  - \( PY \) = The economy’s nominal output

**Converting to percentage changes,**

\[ %\Delta M + %\Delta V = %\Delta P + %\Delta Y \]

%\(\Delta\) means “percentage change in”

**Velocity of money** – the number of times per year, on average, a dollar is exchanged to generate a dollar’s worth of income.

Income velocity is constant, so %\(\Delta V = 0\).

**Rewriting the equation of exchange as**

\[ %\Delta M - %\Delta Y = %\Delta P \]

If real income growth is about 2.5%, then if money supply increases 6% per year, then inflation will be 3.5%:

6% - 2.5% = 3.5%

**Money's Role in Inflation**

- The quantity theory appeared to break down in Canada in the late 1980s and early 1990s.
- The relationship between money and inflation didn’t hold.

**The relationship between money and inflation broke down because of:**

- Technological changes
- Changing regulations in financial institutions.
- Increasing global interdependence of financial markets.
Inflation and Money Growth in Canada

The empirical evidence that supports the quantity theory of money is most convincing in Brazil and Chile.

Price Level and Money in Brazil and Chile

Inflation Tax

Central banks in nations such as Argentina and Chile are not as politically independent as in developed countries.

Their central banks sometimes increase the money supply to keep the economy running.

Inflation Tax

When their governments run a budget deficit and try to finance it domestically, their central banks often must buy the bonds to finance that deficit.

In essence, the increase in money supply is caused by the government deficit.
Inflation Tax

- Financing the deficit by expansionary monetary policy causes inflation.

Inflation Tax

- The inflation works as a kind of tax on individuals, and is often called an inflation tax.
- It is an implicit tax on the holders of cash and the holders of any obligations specified in nominal terms.

Inflation Tax

- Central banks have to make a monetary policy choice:
  - Ignite inflation by bailing out their governments with an expansionary monetary policy.
  - Do nothing and risk recession or even a breakdown of the entire economy.

Policy Implications of Quantity Theory

- Supporters of the quantity theory oppose an activist monetary policy.
  - Monetary policy is powerful, but unpredictable in the short run.
  - Because of its unpredictability, monetary policy should not be used to control the level of output in an economy.

Policy Implications of Quantity Theory

- Quantity theorists favour a monetary policy set by rules, not by discretionary monetary policy.

Policy Implications of Quantity Theory

- A monetary rule takes money supply decisions out of the hands of politicians.

Policy Implications of Quantity Theory

- In Canada, in 1991 the Bank of Canada announced targets for the inflation rate based on the CPI.
- Canadian monetary policy is aimed at maintaining a low and stable inflation of between one and three percent.
Many central banks use monetary regimes or feedback rules.

- New Zealand has a legally mandated monetary rule based on inflation.
- The U.S. Federal Reserve does not have strict rules governing money supply, but it works hard to establish credibility that it is serious about fighting inflation.

Supporters of institutional theories of inflation accept much of the quantity theory.

While they agree that money and inflation move together, they have different causes and effects.

According to the quantity theory, the direction of causation moves from left to right:

\[ MV \Rightarrow PY \]

Institutional theories see it the other way round.

Increases in prices forces government into positions where it must increase money supply or cause unemployment.

\[ MV \Leftarrow PY \]

Therefore, the source of inflation is the price-setting process of firms.

- Firms find it easier to raise prices than to lower them.
- Firms do not take into account the effect of their pricing decisions on the overall price level.

Any increase in firms’ wages, rents, taxes, and other costs are simply passed on to consumers in the form of higher prices.

This works so long as the government increases the money supply so that demand is there to buy the goods at the higher prices.
Focus on Price-Setting Decisions of Firms

- Whether the firm selects this price-raising strategy depends on the state of the labour market.
- If the labour market is tight, the firm knows that it will lose workers if it doesn’t raise wages.

Price-Setting Strategies

- The state of the labour market plays a key role in firms’ decisions whether to give in to workers’ demands for higher wages.
- That is why economists look at unemployment to measure inflationary pressures.

Changes in the Money Supply Follow Price-Setting by Firms

- One group pushes up its nominal wage or price, and other groups respond by doing the same.
- The first group finds its relative wages or prices have not increased, so they raise them again.
  - And the process begins anew.

Changes in the Money Supply Follow Price-Setting by Firms

- At this point, government has two options:
  - Increase money supply, thereby ratifying the inflation.
  - Refuse to ratify the inflation, thereby causing unemployment to rise.

Insider/Outsider Model and Inflation

- The insider-outsider model is an institutionalist story of inflation where insiders bid up wages and outsiders are unemployed.

Insider/Outsider Model and Inflation

- Insiders are business owners and workers with good jobs with excellent long-run prospects; outsiders are everyone else.
Insider/Outsider Model and Inflation

- If markets were purely competitive, wages, profits, and rents would be pushed down to competitive equilibrium levels.

Insider/Outsider Model and Inflation

- Insiders don’t like this, so they develop sociological and institutional barriers to prevent competition from outsiders.

- Barriers include unions, laws restricting the firing of workers, and brand recognition.

Insider/Outsider Model and Inflation

- Outsiders must take dead-end, low-paying jobs or try to run marginal businesses that pay little return per hour worked.

- Outsiders are the first to be fired and their businesses are the first to fail in a recession.

Insider/Outsider Model and Inflation

- The economy is only partially competitive – the invisible hand is thwarted by social and political forces.

- Insiders push to raise their nominal wages to protect their real wages while outsiders suffer.

Policy Implications of Institutional Theory

- The quantity theorists have a simple solution for stopping inflation – just cut the growth of the money supply.

Policy Implications of Institutional Theory

- The institutional theorists agree with this prescription, but they argue that it is not only inefficient but unfair.

- It causes unemployment among those least able to handle it.
Policy Implications of Institutional Theory

- They favour contractionary monetary policies used in combination with an incomes policy to directly slow down inflation.

- *Incomes policy* – places direct pressure on individuals and businesses to hold down their nominal wages and prices.

---

Policy Implications of Institutional Theory

- Formal incomes policies have been out of favour for a number of years.

- Informal incomes policies exist in many European nations.

---

Inflation and Unemployment: The Phillips Curve

- The AD/AS model expresses a tradeoff between inflation and unemployment.
  
  - A low unemployment rate is generally accompanied by high inflation.
  - A high unemployment rate is generally accompanied by low inflation.

---

Inflation and Unemployment: The Phillips Curve

- The tradeoff can be represented graphically in the short-run Phillips Curve.

  - A *Short-run Phillips Curve* – a downward-sloping curve showing the relationship between inflation and unemployment when expected inflation is constant.

---

Hypothesized Phillips Curve

- In the 1950s and 1960s, whenever unemployment was high, inflation was low and vice versa.

- The tradeoff between unemployment and inflation seemed relatively stable during this time.
History of the Phillips Curve

- In the 1960s, the short-run Phillips Curve began to play an important role in discussions of macroeconomic policy.

- Conservatives generally favoured contractionary monetary and fiscal policy that meant high unemployment and low inflation.

- Liberals generally favoured expansionary monetary and fiscal policy that meant low unemployment and high inflation.

Breakdown of the Phillips Curve

- In the early 1970s, the relationship between inflation and unemployment began breaking down.

- Unemployment was high, but so was inflation.

- This phenomenon was termed *Stagflation* — the combination of high and accelerating inflation and high unemployment.

Questions About the Phillips Curve (1981-2002)

- Inflation fell substantially after the early 1980s.

- A Phillips-Curve-type relationship began to reappear beginning in 1986.

- Both inflation and unemployment remained relatively low in the mid- to late-1990s.
Questions About the Phillips Curve (1981-2002)

The continually changing relationship between inflation and unemployment has economists somewhat perplexed.

Expectations of inflation have been incorporated into the analysis by distinguishing between short-run and long-run Phillips curves.

Long-Run and Short-Run Phillips Curves

- The continually changing relationship between inflation and unemployment has economists somewhat perplexed.
- Expectations of inflation have been incorporated into the analysis by distinguishing between short-run and long-run Phillips curves.

Importance of Inflation Expectations

**Expectations of inflation** – the rise in the price level that the average person expects.

- Expectations of inflation do not change along a short-run Phillips curve.

Importance of Inflation Expectations

- **Long-run Phillips curve** – a vertical curve at the unemployment rate consistent with potential output.
- It shows the relationship between inflation and unemployment when expectations of inflation equal actual inflation.

Importance of Inflation Expectations

- When expectations of inflation are higher, the same level of unemployment will be associated with a higher level of inflation.

Importance of Inflation Expectations

- It makes sense to assume that the short-run Phillips curves moves up or down as expectations of inflation change.
The only sustainable combination of inflation and unemployment rates on the short-run Phillips curve is at a point where it intersects the long-run Phillips curve.

If government decides to increase aggregate demand, this pushes output above its potential.

Demand for labour goes up, pushing wages higher than productivity increases.

Workers are initially satisfied that their increased wages will raise their standard of living.

But if productivity does not go up, inflation will wipe out their wage gains.

Workers ask for more money when they find their initial raise did not keep up with unexpected inflation.

This can result in a wage-price spiral.

If unemployment is lower than the target level of unemployment, inflation and the expectation of inflation will increase.

The short-run Phillips curve will shift up.

The short-run Phillips curve will continue to shift up until output is no longer above potential.

If the cause of inflation is expectations of inflation, any level of unemployment is consistent with the target level of unemployment.
Stagflation and the Phillips Curve

- Expectational inflation can be eliminated if aggregate demand falls.
- Lower aggregate demand results in unemployment above the target rate.
- Higher unemployment puts downward pressure on wages and prices, shifting the short-run Phillips curve down.

Economists believe that the stagflation of the late 1970s and early 1980s was caused when government tried to lower inflation with contractionary aggregate demand policy.

This resulted in unemployment, along with inflation.

Inflation Expectations and the Phillips Curve

The Price/Output Path

Inflation/Growth Trade Off

Quantity Theory and the Inflation/Growth Trade-Off

- Quantity theorists are much more likely to err on the side of preventing inflation.
- For them, erring on the low side pays off by stopping any chance of inflation.
- It also builds credibility for the Bank of Canada.
Quantity Theory and the Inflation/Growth Trade-Off

- Quantity theorists justify erring on the side of preventing inflation by arguing that there is a high cost associated with igniting inflation.
- Inflation undermines the economy's long-run growth and hence its future potential income.

Institutional Theory and the Inflation/Growth Trade-Off

- Supporters of the institutional theory of inflation are less sure about a negative relationship between inflation and growth.

Quantity Theory and the Inflation/Growth Trade-Off

- Quantity theorists argue that there is no long-run trade-off between inflation and unemployment.

Institutional Theory and the Inflation/Growth Trade-Off

- Institutional theorists agree that increases in the price level have the potential of generating inflation.
- They agree that high accelerating inflation undermines growth.
- They do not agree that all price level increases start an inflation.

Growth/Inflation Trade-Off

- 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.
Institutional Theory and the Inflation/Growth Trade-Off

- If inflation does get started, the government has tools that will get rid of inflation relatively easily.

- This was highlighted in the debate about monetary policy in early 2000.

- Quantity theorist argued that inflation was just around the corner, and unless government instituted contractionary aggregate demand policy, the seeds of inflation would be sown.

- Other economists argued that the institutional changes in the labour market had reduced the inflation threat and that more expansionary policy was needed.

- The Bank of Canada deftly sailed between these two positions.

The Inflation and Unemployment Trade-Off

End of Chapter 15