

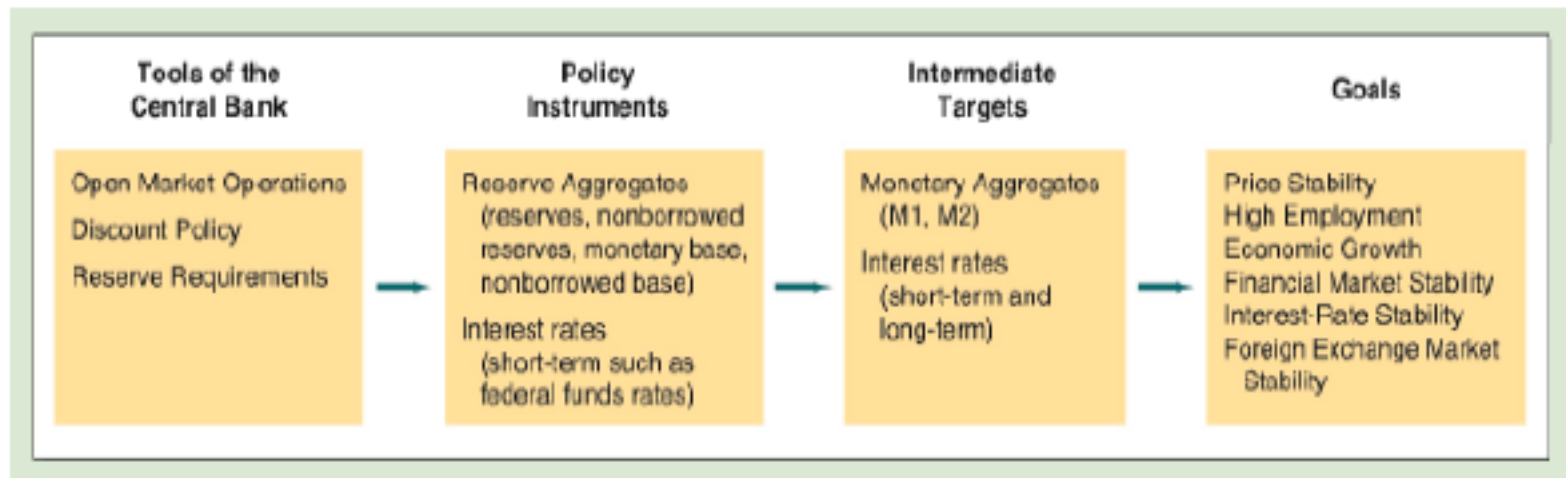
# **Monetary policy goals, strategies and tactics**

## **Lecture 12**

# Readings

- Mishkin, chapter 17, 10<sup>th</sup> edition (or chapter 16 and beginning of chapter 13, 9<sup>th</sup> edition)
- L. Svensson, "Inflation Targeting," New Palgrave Dictionary of Economics, 2nd ed.
- FOMC Statement on Longer-Run Goals and Monetary Policy Strategy (as amended effective on January 29, 2013)
- Bernardino Adão, 2019, "Why is price stability a key goal of central banks?" Revista Estudos Económicos do Banco de Portugal

# Tools, instruments, targets and goals of monetary policy



- **Tools:** actual tools of monetary policy
- **Instruments:** respond directly to policy tools, indicate monetary policy stance (easy or tight)
- **Targets:** closely linked to both instruments and goals, but not directly under CB control
- **Goals:** final objectives

# Price stability goal

Price stability (low and stable inflation) now perceived as most important goal of monetary policy

**Costs of Unanticipated Inflation** (or cost of short run inflation fluctuations)

- **Inflation may have important distributional effects:**
- **Surprises** in the inflation rate lead to redistributions of income and welfare between various groups of the population.
- Unexpected **inflation increases** redistribute wealth from lenders to borrowers, and unexpected **reductions of inflation** redistribute wealth in the opposite direction.
- This principle applies to other financial contracts besides the loan contracts.

# Price stability goal, cont.

## Costs of Unanticipated Inflation, cont.

- Inflation may have important distributional effects, cont.:
- In general the **holders** financial assets that are not fully indexed to inflation **lose with unexpected increases** in inflation and **win with unexpected decreases**.
- An inflation higher than expected redistributes wealth to the younger generations, since the older generations have a higher portion of nominal assets.
- It also takes income away from those that have **fixed nominal income contracts**
- Holders of variable income contracts that follow inflation do not suffer losses.

# Price stability goal, cont.

## Costs of Unanticipated Inflation, cont.

- Inflation may have important distributional effects, cont.:
- Two examples: an inflation above what was expected implies for the **pensioners** a deterioration in their **real pension** and for **workers** a deterioration in their **real wage**.
- A redistribution of income can occur between countries. When the **exchange rate is fixed**, a higher inflation rate in one country is going to make that country exports more expensive and affect that country trade account.

# Price stability goal, cont.

## Costs of Unanticipated Inflation, cont.

- **Relative price dispersion :**
- A **variable inflation rate** makes it difficult to **distinguish** changes in the **relative prices** from changes in the **aggregate price**, which implies an efficiency loss in the allocation of the resources in the economy.
- For instance, assume that a firm expects low inflation and inflation turns up to be high. As it **confuses** the increase in inflation with an increase in the demand for its product it increases production. If this behavior is repeated by many firms there will be an increase in aggregate supply that leads to a **distorted** level of output in the economy.

# Price stability goal, cont.

## Costs of Unanticipated Inflation, cont.

- **Relative price dispersion, cont.:**
  - Relative price dispersion due to **price stickiness**
  - Only a fraction of firms change their prices each period
  - With inflation, firms not changing prices have low relative prices, firms that change prices have high relative prices
  - Relative price dispersion not caused by changes in preferences or technology → **prices become bad allocation mechanism**



# Price stability goal, cont.

Costs of Anticipated Inflation, (cost of long run average inflation):

- Shoe-leather cost,
- Refers to the cost of time and effort that people spend trying to counter-act the effects of inflation, such as holding less cash and having to make additional trips to the bank (term comes from the fact that more walking is required, thus wearing out shoes more quickly)

# Price stability goal, cont.

## Costs of Anticipated Inflation, cont.:

- **Distortion from un-indexed tax**
- Due to progressive income taxes: Inflation increases the effective marginal tax rates. If the marginal **tax brackets** are set in nominal terms, or are not **fully indexed** to inflation, the tax payers are pushed to higher marginal tax rates by the effect of inflation. In other words, when nominal income increases as inflation increases, people have to pay higher taxes even though real income stays the same→distortion on labor income
- Due to taxation on capital gains: when stock prices increase as inflation increases, people have to pay taxes even if no real capital gains→distortion on capital income
- Also, the effect of inflation over the **depreciation allowed** by the firms' tax code discourages productive investment. The value of the depreciation that firms can take depends on the historical value of its physical capital, and with inflation the real value of the depreciation falls.

# Price stability goal, cont.

## Costs of Anticipated Inflation, cont.:

- **Menu costs** are another effect of inflation. This costs are associated with the resources spend by sellers to adjust to the inflation the prices of the goods and services they sell. The concept is associated with the image of restaurants incurring in costs of printing new menus with higher prices for the dishes as the price of the ingredients used increase.
- Inflation is a **regressive tax**. As the income elasticity of the demand for money is less than one, the richer taxpayers pay a smaller portion of their income as inflation tax than poorer taxpayers.

# Price stability goal, cont.

## Costs of Anticipated Inflation, cont.:

- Inflation is a **tax** and as all taxes introduces distortions in the economy, implies smaller disposable income for the private agents and more revenue for the government.
- Part of that income can be recovered by the private agents through more public services or less of the other taxes.
- However, as the agents in the economy are going to reduce their demand for money they are going to have more difficulty in carrying their transactions.
- Unlike the other costs referred above, this **cost does not vanish** when the economic agents are homogeneous or prices are fully flexible.
- There recent estimates of this cost for the US: the costs of a ten percent inflation are between 1% and 2% of the GDP.

# Price stability goal, cont.

## Seigniorage as $iM/P$

	Seigniorage (% tax revenue) 1979-86 average	Monetary Base (% of GDP 1986)
Greece	9.1	22.6
Italy	6.2	18.6
Portugal	11.9	20.5
Spain	5.9	19.3
Belgium	0.4	8.2
France	1.3	5.9
Germany	0.8	9.9
UK	0.5	4.6

# Price stability goal, cont.

## Benefits of Inflation:

- A tax that is easier to collect
- Taxes foreigners when the base currency is a safe-haven currency
- The only way to tax transactions that take place in the underground economy
- However, if inflation increases above a threshold it is replaced by other as a safe-haven currency or as medium of payment in the shadow economy
- The revenue pattern of the inflation tax follows a inverted U pattern.

# Price stability goal, cont.

## Benefits of Inflation, cont.:

- **Zero bound on nominal interest rates**
- CB cannot make nominal rate negative
- CB sometimes needs to make real rate negative
- Risk of hitting the zero bound becomes lower when inflation target is positive
  
- **Upward bias in inflation measure**
- Personal computer in 2023: 1000 euro
- Personal computer in 2024: 1040 euro
- Price raised by 4 percent but quality is different (attributes such as memory, processing speed, video quality raised significantly)
- Need to measure increase in quality-adjusted prices; insufficient quality adjustment causes upward bias in inflation measure; the quality adjusted rate of inflation is lower than 4 percent
- In this case, targeting 0 inflation may mean targeting deflation → safer targeting positive inflation

# Price stability goal, cont.

## Benefits of Inflation, cont.:

- **Downward nominal wage rigidity**
- Lot of evidence of downward nominal wage rigidity (damage workers' morale and productivity; monetary illusion)
- With 0 inflation, very difficult for real wages to decrease
- With positive inflation, then real wage can decrease even if there is downward nominal wage rigidity



# Nominal anchor

- Price stability important goal of monetary policy
- Thus, central element in successful monetary policy is the use of a nominal anchor
- A nominal anchor is a nominal variable (money supply, exchange rate or inflation rate) which ties down the price level to achieve price stability

# Other goals of monetary policy

- High employment
- Economic growth

but also

- Stability of financial markets
- Interest-rate stability
- Foreign exchange market stability

# Hierarchical versus dual mandates

- Should price stability be the primary goal of monetary policy?
- In the long run there is no conflict between price stability and other goals of monetary policy
- In the short run price stability can conflict with the goals of high employment and interest-rate stability
- **Hierarchical mandates** have price stability as the primary goal of monetary policy (Bank of England, Bank of Canada, Reserve Bank of New Zealand and ECB)
- **Dual mandates** have price stability and maximum employment as co-equal goals of monetary policy (Fed)
- Either type of mandate is acceptable as long as it operates to make price stability the primary goal in the long run, but not in the short run

# Hierarchical versus dual mandates, cont.

- ECB, Maastricht Treaty:

*“The primary objective of the European System of Central Banks shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Community,”* which includes objectives such as “a high level of employment” and a “sustainable and non-inflationary growth”

- Mission of the Fed:

*“The Board of Governors of the Federal Reserve System and the FOMC shall maintain long run growth of the monetary and credit aggregates commensurate with the economy’s long run potential to increase production, so as to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates”*

# Inflation targeting

- Inflation targeting is a **monetary policy strategy** that was introduced in New Zealand in 1990, has been very successful in terms of stabilizing both inflation and the real economy, and as of today has been adopted by more than 20 industrialized and non-industrialized countries
- It is characterized by
  1. A publicly announced numerical medium-term target for inflation
  2. An implementation of monetary policy that gives a major role to an inflation forecast and has been called “inflation-forecast targeting”
  3. Information-inclusive approach in which many variables are used in making decisions
  4. A high degree of transparency
  5. A high degree of accountability

# Inflation targeting, cont.

- Numerical inflation target is typically around 2% at an annual rate for the CPI
- Numerical target takes the form of
  - a range (for example, 1 to 3% in New Zealand)
  - or a point target with a range (for example, 2% with a range/tolerance interval of plus/minus one percentage points in Canada and Sweden)
  - or a point target without any explicit range (for example 2% in the UK and 2.5% in Norway)
- Differences between these forms does not matter in practice:  
CBs with target ranges seem to aim for the middle of the range and the edges of the range are normally interpreted as “soft edges” (do not trigger discrete policy changes and being just outside the range is considered similar to being just inside)

# Inflation targeting, cont.

- In practice, IT is never “strict” inflation targeting but always “flexible” inflation targeting: CBs not only aim at stabilizing inflation around the target but also put some weight on stabilizing the real economy, i.e., stabilizing some measure of economic activity such as the output gap
- That is, the goals of CB include not only inflation but also the output gap
- Objectives under IT are well approximated by a quadratic loss function such as

$$L = \frac{1}{2} \left[ (\pi - \pi^*)^2 + \omega_x x^2 + \omega_i (\Delta i)^2 \right]$$

consisting of the sum of the square of inflation deviations from target and a weight ( $\omega_x$ ) times the square of output gap, and possibly also a weight ( $\omega_i$ ) times the square of instrument-rate changes (corresponding to a preference for interest-rate smoothing where instrument rate is the short term nominal interest rate)

- However, for new inflation-targeting regimes, where the establishment of a credibility is a priority, stabilizing the real economy has less weight than when credibility has been established (i.e., ECB)

# Inflation targeting, cont.

- Lag between monetary policy actions (instrument rate changes) and impact on CB goals (inflation and output gap)

⇒ monetary policy more effective if guided by forecasts

- Implementation of IT gives important role to forecasts of inflation and other goal variables
- Sometime called **forecast inflation targeting**: setting a path for the instrument rate such that the forecast for the goal variables look good, i.e., the inflation forecast approaches the inflation target and the output gap forecast approaches zero at an appropriate pace

$$L = \frac{1}{2} E_t \left[ (\pi_{t+f} - \pi^*)^2 + \omega_x (x_{t+f})^2 \right]$$

where  $E_t$  is the expectation at time  $t$  when policy is chosen, and  $f$  is the forecast horizon



# Inflation targeting, cont.

- IT characterized by a [high degree of transparency](#)
- Typically, an inflation targeting CB publishes an regular monetary policy report which includes:
  - CB's forecast of inflation and other variables
  - Summary of its analysis behind the forecasts
  - Motivation for its policy decisions
- High degree of transparency exceptional given the history of central banking: traditionally, CB goals, deliberations and even policy decisions subject to considerable secrecy
- Why secrecy in past? Probably desire not to be subject to public scrutiny and pressure from governments

# Inflation targeting, cont.

- Why transparency now? Because of belief that monetary policy to a very large extent is “management of expectations”
- Monetary policy has an impact on the economy mostly through the private sector expectations generated by current monetary policy actions and announcement of future actions. Examples:
  - Level of short term rates for the next few weeks matter very little to agents  
What matters is expectations of future short term rates, which affect long term rates , which in turn affect economic decisions and economic activity
  - Private sector inflation expectations matter for current pricing decisions and current inflation → anchoring private sector expectations on inflation target is crucial for stability of actual inflation
- An **inflation targeting regime** is said to be “credible” if private sector inflation expectations are close to the inflation target

# Inflation targeting, cont.

- Inflation targeting normally associated with a [high degree of accountability](#)
- Important to strengthen the incentives of CBs to achieve objective
- [Implicit accountability](#): explicit objectives and transparency of monetary policy reporting increases public scrutiny
- [Explicit accountability](#): in some countries CBs are subject to more explicit accountability (monetary policy subject to public hearings in Parliament, or subject to extensive review by independent experts)

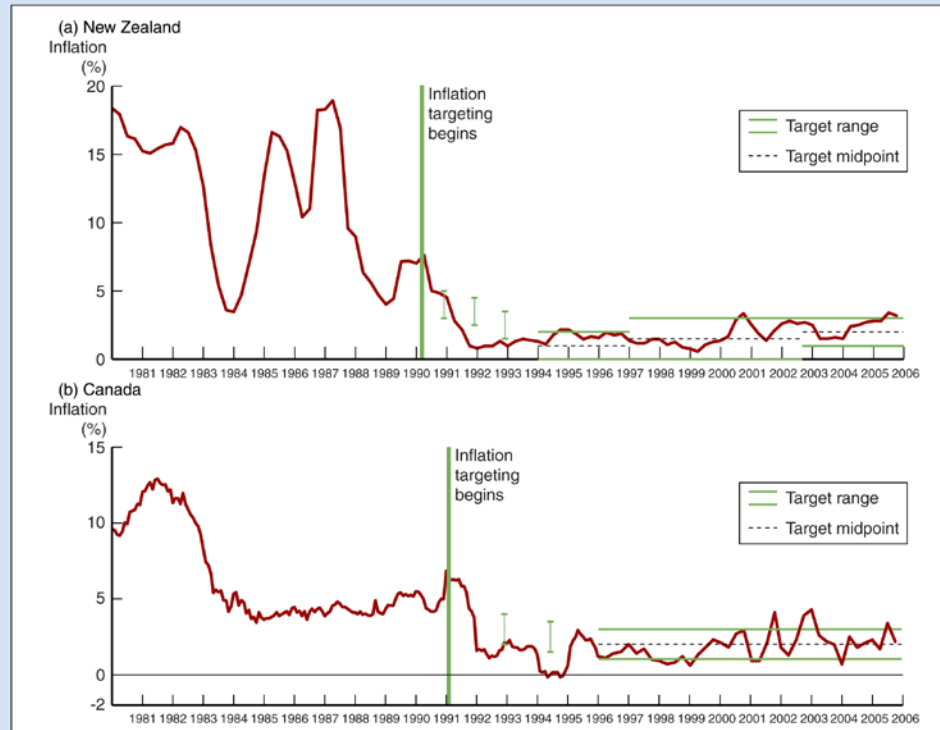
# Inflation targeting, cont.

- So far, inflation targeting has been a success, as measured by the stability of inflation and the stability of the real economy
- No evidence that IT has been detrimental to growth, productivity, employment and other measures of economic performances (even though in the initial phases of the introduction of IT, while bringing down inflation, most countries experienced a temporary recession)
- Success has been absolute and relative (to alternative monetary policy strategies such as [monetary targeting and exchange rate targeting](#))
- No country so far has abandoned IT and a long list of non-industrialized countries has asked the IMF help them to introduce IT

# Inflation targeting, cont.

- Still, the Fed, the ECB and the Bank of Japan have not yet adopted all the explicit characteristics of IT but are all moving in that direction
- The US FOMC regularly publicly state a desired target range for inflation (usually 1.7%-2%), but does not have an explicit inflation target. In a historic shift on January 25th 2012 Chairman Ben Bernanke set a 2% longer run target inflation rate, which brings the Fed in line with many of the world's other major central banks

# Inflation targeting, cont.

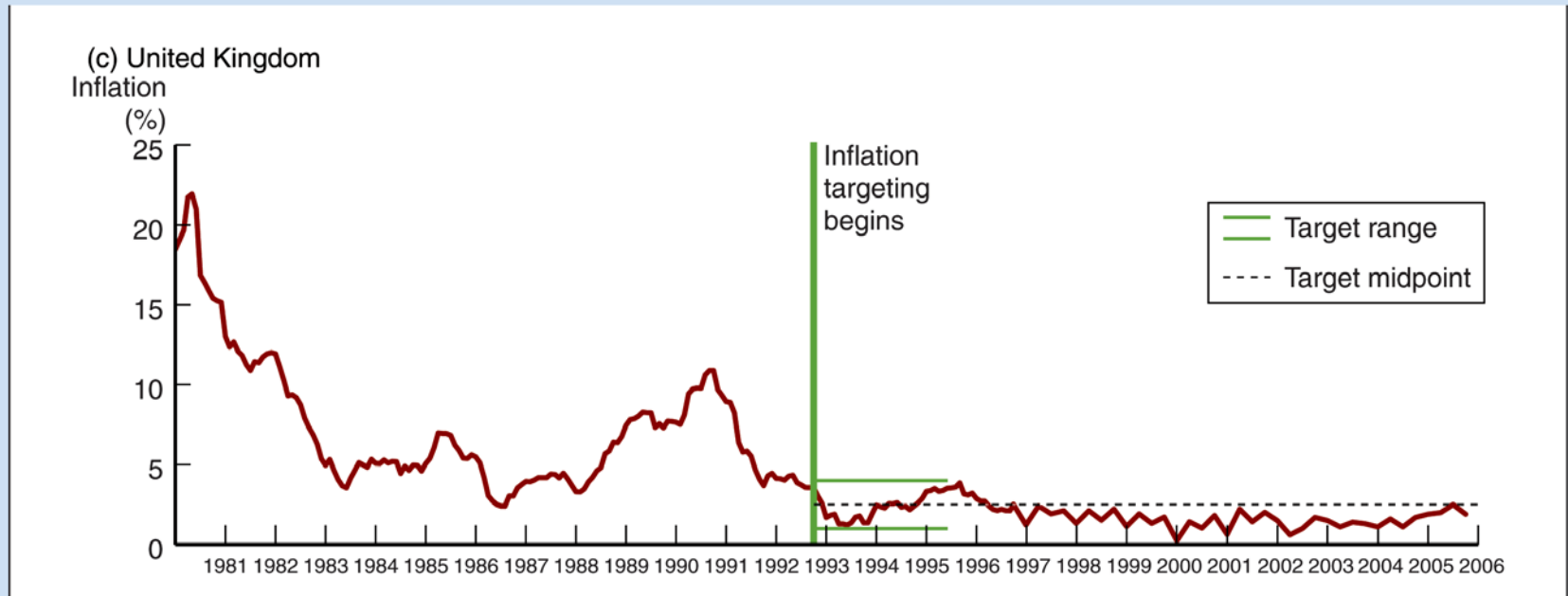


**FIGURE 1 Inflation Rates and Inflation Targets for New Zealand, Canada, and the United Kingdom, 1980–2005**

Source: Ben S. Bernanke, Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen, *Inflation Targeting: Lessons from the International Experience* (Princeton: Princeton University Press, 1999), updates from the same sources, and [www.rbnz.govt.nz/statistics/econind/a3/ha3.xls](http://www.rbnz.govt.nz/statistics/econind/a3/ha3.xls).

(continues)

# Inflation targeting, cont.



**FIGURE 1** Inflation Rates and Inflation Targets for New Zealand, Canada, and the United Kingdom, 1980–2005 (*continued*)

Source: Ben S. Bernanke, Thomas Laubach, Frederic S. Mishkin, and Adam S. Posen, *Inflation Targeting: Lessons from the International Experience* (Princeton: Princeton University Press, 1999), updates from the same sources, and [www.rbnz.govt.nz/statistics/econind/a3/ha3.xls](http://www.rbnz.govt.nz/statistics/econind/a3/ha3.xls).

# Inflation targeting, cont.

- Reservations /critics of IT based on:
  - IT may be too rigid and may give too much weight on inflation stabilization at the expense of stability of real economy; weak objection because “flexible” as opposed to “strict” IT is implemented in the real world
  - Delayed signaling as inflation outcomes are revealed only after a substantial lag



# Tactics: choosing the policy instrument

- Policy tools (directly controlled by the central bank):
  - Open market operations
  - Reserve requirements
  - Discount rate
  - Interest rate on reserves
- Policy instrument (respond directly to policy tools, indicates monetary policy stance, easy or tight)
  - Reserve aggregates (total reserves, nonborrowed reserves, monetary base)
  - Interest rates (federal funds rate or other short term rates)
  - May be linked to an intermediate target

# Criteria for choosing a policy instrument

- Observability and measurability
  - Important for the policy instrument to signal the policy stance rapidly
  - Reserves aggregates are straightforward to measure, but there is still some lag in reporting
  - Short term interest rates not only are easy to measure, but are also observable immediately
  - But nominal rate is observable, real rate is hard to measure (because expected inflation is hard to measure)
  - No clear cut superiority among the two policy instruments
- Controllability
  - Important for CB to be able to effectively control policy instrument
  - Nominal interest rates are more easily controllable than reserves aggregates
  - However real rates are not
  - Again, no clear cut superiority among the two policy instruments
- Predictable effect on goals
  - Most important characteristics of a policy instrument
  - Link btw interest rates and goals (output, inflation, ...) tighter than link btw reserve aggregates and goals
  - For this reason, CBs throughout the world now generally use short term rates as their policy instruments

## Tactics: the Taylor rule

- Policy instrument of CBs is a short-term nominal interest rate
- How should a CB choose the target for the short term nominal rates if it wanted to achieve stable prices while avoiding large fluctuations in output?
- John Taylor proposed the following simple rule for the federal funds rate

$$i = \pi + 2 + 0.5(\pi - 2) + 0.5x$$

# Taylor rule

- Formula designed to provide "recommendations" for how a central bank should set short-term interest rates as economic conditions change
- The rule states that the "real" short-term interest rate should be set according to three factors: (1) deviation of inflation from target (2) output or unemployment gap, and (3) level of the short-term interest rate consistent with full employment
- The rule "recommends" a relatively high interest rate ("tight" monetary policy) when inflation is above target or when output gap is positive, and a relatively low interest rate ("easy" monetary policy) in opposite cases
- Sometimes these goals conflict: inflation may be above target when output gap is negative; in such situations, the rule provides guidance to policy makers on how to balance these competing considerations when setting interest rates
- Although the Fed does not explicitly follow the rule, analyses show that the rule does a fairly accurate job of describing how monetary policy actually has been conducted in the last 30 years

## Taylor rule, cont.

- John Taylor proposed the following simple rule for the federal funds rate

$$i = \pi + 2 + 0.5(\pi - 2) + 0.5x$$

- When  $\pi$  is on target (2 percent) and  $x$  is zero, then the real rate,  $i - \pi$ , is 2 percent
  - For each percent point of inflation above target, federal funds rate raises by 1.5 percent
  - For each percent point of output below natural level, federal funds rate raises by 0.5 percent
- Taylor rule simple and reasonable and also describes well historical Fed behavior

# Taylor rule and actual federal funds rate

