



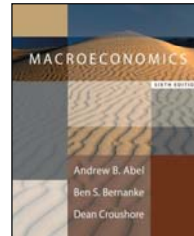
Business Cycles

Econ 402

Professor Yamin Ahmad

Lecture 6: Monetary Policy, Rules and Credibility

- Monetary Policy Channels
- Monetary Policy Rules
- Central Bank Credibility



Key Concepts...

- Monetary Policy Channels
 - Credit Channel
- Monetary Policy
 - Rules versus Discretion
 - Active versus Passive Policy
- The Taylor Rule
- Rules, Commitment and Credibility
 - Monetary Targeting
 - Inflation Targeting
- Alternative Methods for Central Bank Credibility

Note: These lecture notes are incomplete without having attended lectures

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Monetary Control in the United States

Making monetary policy in practice

- The *IS-LM* model makes monetary policy look easy—just change the money supply to move the economy to the best point possible
 - In fact, it isn't so easy because of lags in the effect of policy and uncertainty about the ways monetary policy works

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Monetary Control in the United States

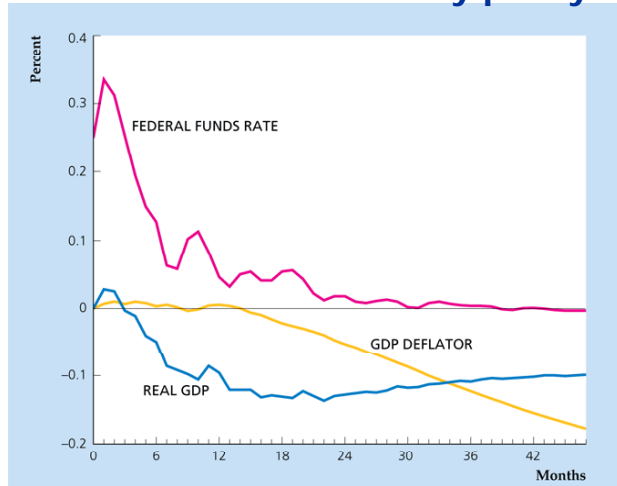
Making monetary policy in practice

- Lags in the effects of monetary policy
 - It takes a fairly long time for changes in monetary policy to have an impact on the economy
 - Interest rates change quickly, but output and inflation barely respond in the first four months after the change in money growth (see figure on next slide)

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Impulse Responses of output, prices, and the Fed funds rate to a monetary policy shock



Source: Bernanke, B. and M. Gertler (1995), "Inside the Black Box: The Credit Channel of Monetary Policy Transmission", *Journal of Economic Perspectives*, 9:4, pp 31

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Monetary Control in the United States

Making monetary policy in practice

- Tighter monetary policy causes real GDP to decline sharply after about four months, with the full effect being felt about 16 to 20 months after the change in policy
- Inflation responds even more slowly, remaining essentially unchanged for the first year, then declining somewhat
- These long lags make it very difficult to use monetary policy to control the economy very precisely
- Because of the lags, policy must be made based on forecasts of the future, but forecasts are often inaccurate
- The Fed under Greenspan has made preemptive strikes against inflation based on forecasts of higher future inflation

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Monetary Control in the United States

Making monetary policy in practice

- The channels of monetary policy transmission
 - Exactly how does monetary policy affect economic activity and prices?
- There are two effects discussed in the textbook so far; and a third new one
 - The interest rate channel
 - The exchange rate channel
 - The credit channel

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Monetary Control in the United States

- **The interest rate channel:** as seen in the *IS-LM* model, a decline in money supply raises real interest rates, reducing aggregate demand, leading to a decline in output and prices
- **The exchange rate channel:** in an open economy, tighter monetary policy causes the real exchange rate to appreciate, reducing net exports, and thus aggregate demand
- **The credit channel:** tighter monetary policy reduces both the supply and demand for credit
 - The credit channel refers to the effects monetary policy has on the supply and demand for credit

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Monetary Control in the United States

The channels of monetary policy transmission

- How important are these different channels?
 - Suppose real interest rates are high, but the dollar has been falling; is monetary policy tight or easy? It depends on the relative importance of the different channels
 - Or suppose real interest rates are low, but borrowing and lending are weak

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Monetary Control in the United States

- Making monetary policy in practice
 - These practical difficulties make monetary policy “an art as well as a science”
- See what happened between 2007 - 2008!

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Credit Channel of Monetary Policy

Credit Channel: Supply Side

- Tight monetary policy leads to reduced lending by banks
 - Tighter monetary policy reduces bank reserves
 - With fewer deposits, banks can't lend as much
 - With fewer loans available, firms can't obtain all the credit they want
 - So firms spend less on investment, reducing aggregate demand

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Credit Channel of Monetary Policy

Credit Channel: Demand Side

- Tight monetary policy makes borrowers less credit-worthy
 - **Impacts a firm's balance sheet:** A firm with outstanding debt (with a floating interest rate, interest rate tied to the prime rate, or short-term loan) has to pay more interest when tight policy makes interest rates rise, so its costs go up and profits decline
 - With lower profits, the firm is more likely to go bankrupt, so banks will be less willing to make loans to it
 - Consumers who use stock as collateral for loans find that tighter monetary policy reduces stock values as investors switch from stocks to bonds, so their collateral is worth less and they can't borrow as much
- The overall effect is reduced spending on investment and consumption, leading the *IS* curve to shift down and to the left

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Credit Channel of Monetary Policy

The credit channel of monetary transmission

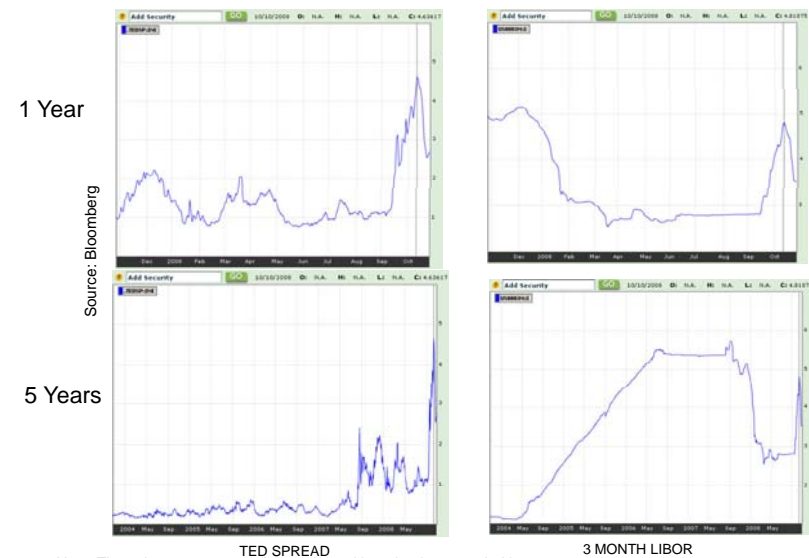
- Empirical evidence for the credit channel
 - On the **supply side**, the credit channel was powerful in the 1960s and 1970s, but had declined in importance recently because of deregulation in the banking sector and the elimination of most reserve requirements

- Between 2006 – 2008, the cost of credit had risen dramatically highlighting the lack of liquidity in credit markets

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Cost of Credit: 2006 - 2008



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Credit Channel of Monetary Policy

Empirical Evidence for Credit Channel

- On the demand side, the credit channel can be observed by noting that the spending of consumers and small firms is more sensitive to monetary policy than the spending of large firms
 - Consumers and small firms are financially riskier than large firms, so when monetary policy tightens they're more likely to be disqualified from loans
 - The data show that after a tightening of monetary policy, small firms and consumers are more likely to go bankrupt and receive less credit than large firms
 - The quantitative importance of the credit channel, relative to the interest rate channel and exchange rate channel, remains controversial, but it appeared to play a major role in the recession of 1990–91

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Credit Channel of Monetary Policy

Empirical Evidence for Credit Channel

- Given the current economic crisis (2007 – 2008), the Fed has aggressively lowered interest rates in an attempt to inject liquidity into the banking system.

- With increased liquidity in the banking system, banks should be more willing to lend to consumers and firms.

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Further Reading on Credit Channel

- Suggested Reading:
- Bernanke, B. and M. Gertler (1995), “Inside the Black Box: The Credit Channel of Monetary Policy Transmission”, *Journal of Economic Perspectives*, 9:4, pp. 27 – 48
- Meltzer, Allan (1995), “Monetary, Credit and (Other) Transmission Processes: A Monetarist Perspective”, *Journal of Economic Perspectives*, 9:4, pp. 49 - 72

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The Conduct of Monetary Policy: Rules Versus Discretion

- Monetarists and classical macroeconomists advocate the use of rules
- Rules make monetary policy automatic, as they require the central bank to set policy based on a set of simple, prespecified, and publicly announced rules
- Examples of rules
 - Increase the monetary base by 1% each quarter
 - Maintain the price of gold at a fixed level

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The Conduct of Monetary Policy: Rules Versus Discretion

- The rule should be simple; there shouldn't be much leeway for exceptions
- The rule should specify something under the Fed's control, like growth of the monetary base, not something like fixing the unemployment rate at 4%, over which the Fed has little control
- The rule may also permit the Fed to respond to the state of the economy

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The Conduct of Monetary Policy: Rules Versus Discretion

- Most Keynesian economists support discretion
 - Discretion means the central bank looks at all the information about the economy and uses its judgment as to the best course of policy
 - Discretion gives the central bank the freedom to stimulate or contract the economy when needed; it is thus called *activist*
 - Since discretion gives the central bank leeway to act, while rules constrain its behavior, why would anyone suggest that the central bank follow rules?

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The Conduct of Monetary Policy: Rules Versus Discretion

The Taylor rule

- John Taylor of Stanford University introduced a rule that allows the Fed to take economic conditions into account
- The rule is

$$i = \pi + 0.02 + 0.5y + 0.5(\pi - 0.02),$$

where i is the nominal Fed funds rate, π is the inflation rate over the last 4 quarters, y = the percentage deviation of output from full-employment output

The Conduct of Monetary Policy: Rules Versus Discretion

The Taylor rule

- The rule works by having the real Fed funds rate ($i - \pi$) respond to:
 - y , the difference between output and full-employment output
 - $\pi - 0.02$, the difference between inflation and its target of 2 percent
- If either y or π increase, the real Fed funds rate is increased, causing monetary policy to tighten (and vice-versa)

The Conduct of Monetary Policy: Rules Versus Discretion

The Taylor rule

- Taylor showed that the rule is similar to what the Fed does in practice
- Taylor advocates the use of the rule as a guideline for policy, not something to be followed mechanically

The Conduct of Monetary Policy: Rules Versus Discretion

- The monetarist case for rules
 - Monetarism** is an economic theory emphasizing the importance of monetary factors in the economy
 - The leading monetarist is Milton Friedman, who argued for many years (since 1959) that the central bank should follow rules for setting policy



The Monetarist Case For Rules

- Friedman's argument for rules comes from four main propositions
 - **Proposition 1:** Monetary policy has powerful short-run effects on the real economy. In the longer run, however, changes in the money supply have their primary effect on the price level
 - This proposition comes from Friedman's research with Anna Schwartz on monetary history
 - Friedman and other monetarists think monetary policy is a main source of business cycles

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The Monetarist Case For Rules

- **Proposition 2:** Despite the powerful short-run effect of money on the economy, there is little scope for using monetary policy actively to try to smooth business cycles
 - First, the information lag makes it difficult to know the current state of the economy
 - Second, monetary policy works with a long and variable lag, so it isn't clear how to set policy quantitatively
 - Third, wage and price adjustment is fast enough that by the time a change in policy begins to affect the economy, it may be moving the economy in the wrong direction, thus destabilizing the economy

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The Monetarist Case For Rules

- **Proposition 3:** Even if there is some scope for using monetary policy to smooth business cycles, the Fed cannot be relied on to do so effectively
 - Friedman believes the Fed responds to political pressure and tends to stimulate the economy in election years
 - Historically, monetary policy has tended to destabilize, rather than stabilize, the economy; so eliminating monetary policy as a source of instability would improve macroeconomic performance

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The Monetarist Case For Rules

- **Proposition 4:** The Fed should choose a specific monetary aggregate (such as M1 or M2) and commit itself to making that aggregate grow at a fixed percentage rate every year
 - The Fed needs to give up activist, or discretionary, policy completely and follow a simple rule
 - Friedman prefers a constant money growth rule, since the money supply is controllable by the Fed and the Fed would not follow destabilizing monetary policies
 - To reduce inflation to zero, the money growth target should be gradually lowered over time

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The Conduct of Monetary Policy: Rules Versus Discretion

Rules and central bank credibility

- New arguments for rules suggest that rules are valuable even if the central bank has a lot of information and forms policy wisely
 - The new arguments suggest that rules improve the credibility of the central bank
 - The credibility of the central bank influences how well monetary policy works

The Conduct of Monetary Policy: Rules Versus Discretion

Rules and central bank credibility:

- Dad, the kids, and the game: credible threats and commitment
 - Dad wants to take the kids to a ballgame and the kids want to go, too
 - But the kids like to fight and Dad doesn't like them fighting
 - To induce them not to fight, Dad says, "If you fight, we won't go to the game"

Some Game Theory...

Rules and central bank credibility

- A *game theory* model can tell us whether the kids will fight or not and whether Dad will take them to the game or not;
- Game theory explores situations (games) in which strategy is used by individuals (players) to achieve their goals, possibly at the expense of other players

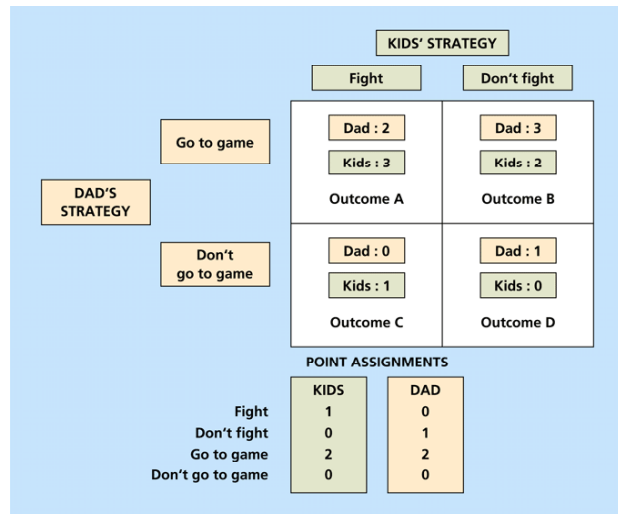
Game Theoretic Example

Rules and central bank credibility

- First, the value of different actions is specified
 - For the kids, fighting is worth 1, not fighting 0, going to the game 2, not going to the game 0
 - For Dad, fighting is worth 0, not fighting 1, going to the game 2, not going to the game 0
- This means the payoffs to the combinations of whether the kids fight or not and whether they all go to the game or not can be laid out as in the next slide



The game between Dad and the kids



Note: These lecture notes are incomplete without having attended lectures

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Game Theoretic Example

Rules and central bank credibility

- Dad's statement isn't credible, because he would be worse off if he followed it
 - If the kids fight and Dad follows through on not going to the game, he gets a payoff of 0
 - But if they fight and Dad backs down from his statement and takes them to the game anyway, Dad's payoff is 2
 - Since the kids know that Dad will take them to the game whether they fight or not, and since they prefer to fight, they will fight

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Maintaining Credibility

Rules and central bank credibility

- Could Dad make his statement credible?
 - He could if he could commit himself somehow to following through
 - One possibility is to give the tickets to Mom, who doesn't care if they go to the game, who could enforce Dad's decision
 - Then both fighting and going to the game would not be possible, so the kids wouldn't fight, since they prefer not fighting and going to the game over fighting and not going to the game

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Game Between Central Banks and Firms

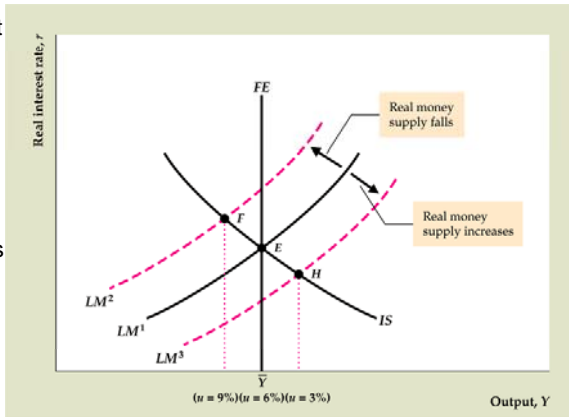
- A game between the central bank and firms
 - Consider a similar game between the central bank and firms
 - The inflation rate is 10% and the unemployment rate is 6%
 - The Fed tells firms that it will hold the money supply constant this year
 - Should the firms believe the Fed and hold prices constant, or should they doubt that the Fed will really hold the money supply constant, in which case they should raise prices?

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The game between the Fed and the firms

- Start at a full employment equilibrium, E where inflation is 10%
- Price level, P is chosen by firms
- Money supply, M is chosen by Fed
- If real money supply does not change, we remain at E
- If (M/P) rises, we go to LM³, and economy goes into boom at H
- If (M/P) falls, we go to LM², and economy goes into recession at F



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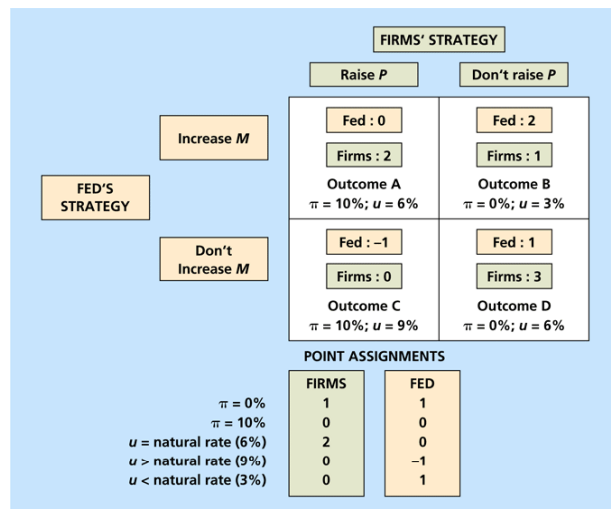
The game between the Fed and the firms

■ The payoffs

- For firms, 0% inflation is worth 1, 10% inflation is worth 0; unemployment at the natural rate is worth 2, unemployment above or below the natural rate is worth 0
- For the Fed, 0% inflation is worth 1, 10% inflation is worth 0; unemployment at the natural rate is worth 0, unemployment above or below the natural rate is worth -1, and unemployment below the natural rate is worth 1

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The game between the Fed and the firms



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The game between the Fed and the firms

■ If the Fed holds the money supply constant

- If firms don't raise prices, then inflation is zero and the LM curve stays put,
 - so unemployment remains at the natural rate
- If firms raise prices, inflation is 10%, the LM curve shifts up,
 - unemployment rises to 9%

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The game between the Fed and the firms

- If the Fed raises the money supply
 - If firms don't raise prices, then inflation is zero and the *LM* curve shifts down,
 - so unemployment falls to 3%
 - If firms raise prices, inflation is 10%, the *LM* curve stays put,
 - unemployment remains at the natural rate

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The game between the Fed and the firms

- The payoffs are such that if firms raise prices, the Fed is better off increasing M , so firms reason that the Fed's threat isn't credible
- Further, if the firms didn't raise prices, the Fed would increase the money supply, since its payoff is larger
- So firms will increase prices and the Fed will increase the money supply, leading to inflation of 10% and unemployment of 6%
- If the Fed's statement not to raise the money supply was credible, however, then firms would choose not to raise prices and inflation would fall to zero, with unemployment remaining at the natural rate

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Rules Commitment and Credibility

- How does a central bank (or a dad) gain credibility?
 - One way to get credibility is by building a reputation for following through on its promises, even if it's costly in the short run
 - Another, less costly, way is to follow a rule that is enforced by some outside agency (Mom, for example)

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Rules Commitment and Credibility

- Keynesians argue that there may be a trade-off between credibility and flexibility
 - To be credible, a rule must be nearly impossible to change
 - But if a rule can't be changed, what happens in a crisis situation?
 - For example, if a rule is based on economic relationships that change suddenly, then the lack of flexibility may be very costly
 - So a rule may create unacceptable risks

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Application ...

- Application: Monetary-growth targeting and inflation targeting
 - High unemployment and high inflation in the 1970s led central banks worldwide to experiment with alternative strategies for monetary policy, including targeting money growth and targeting inflation

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Application ... Money Growth Targeting

- Germany's Bundesbank introduced money-growth targets in 1975 and used the strategy until the European Monetary Union began in 1999
 - The U.S., Canada, the U.K., Switzerland, and others also adopted money targets in the 1970s
- Money-growth targeting means the central bank announces a money-growth rate that it will aim for over the next year or so
 - The idea is that by having money grow at the optimal rate, inflation and output will be at desired levels
 - Germany had been quite successful in targeting money growth

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Application ... Money Growth Targeting

- The United States began targeting money in 1975
 - But the Fed tried to target three monetary aggregates (M1, M2, and M3) all at the same time, and often missed its targets badly

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Application ... Money Growth Targeting

- Most countries that used money-growth targeting (including the United States) were able to reduce inflation in the early 1980s, but output and employment growth were often unstable
 - The Fed began to de-emphasize money-growth targeting in 1982 because of instability in money demand and moved gradually toward interest-rate targeting
 - Many other countries also weakened their reliance on money-growth targets in the 1980s, except for Germany and Switzerland

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Application ... Inflation Targeting

- Since 1990, some countries have switched from targeting money growth to targeting inflation
 - New Zealand was the pioneer, announcing explicit inflation targets that had to be met or else the central bank's governor could be fired
 - Canada, the U.K., Sweden, Australia, Spain, and others followed with some version of inflation targeting
 - The new European Central Bank uses a method of inflation targeting that retains a role for money-growth targets

- Under inflation targeting, the central bank announces targets for inflation over the next 1 to 4 years

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Application ... Inflation Targeting

- Advantages of inflation targeting over money-growth targeting
 - It avoids the problem of instability in money demand
 - It's easy to explain inflation targets to the public (since they understand what inflation is) than money-growth targeting (which most people don't understand)
 - Better communication of the central bank's goals will reduce uncertainty about what the central bank will do and may increase the bank's accountability

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Application ... Inflation Targeting

- Disadvantages of inflation targeting relative to money-growth targeting
 - Inflation responds to policy actions with a long lag, so it's hard to judge what policy actions are needed to hit the inflation target and hard for the public to tell if the central bank is doing the right thing
 - Thus central banks may miss their targets badly, losing credibility

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Other Methods To Achieve Credibility

- Other ways to achieve central bank credibility besides targeting money growth or inflation
- Appointing a "tough" central banker
 - Appointing someone who has a well-known reputation for being tough in fighting inflation may help establish credibility for the central bank
 - For example, in 1979 the appointment of Paul Volcker to be chairman of the Fed was designed to convince people that President Carter was serious about stopping inflation
 - Even in Volcker's case, however, disinflation proved to be costly

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Other Methods To Achieve Credibility

- Changing central bankers' incentives
 - People are more likely to believe a central bank is serious about disinflation if it has the incentive to care a lot about inflation
 - In New Zealand, for example, the head of the central bank must be replaced if inflation targets aren't met; as a result, inflation was reduced significantly, but at a cost of higher unemployment

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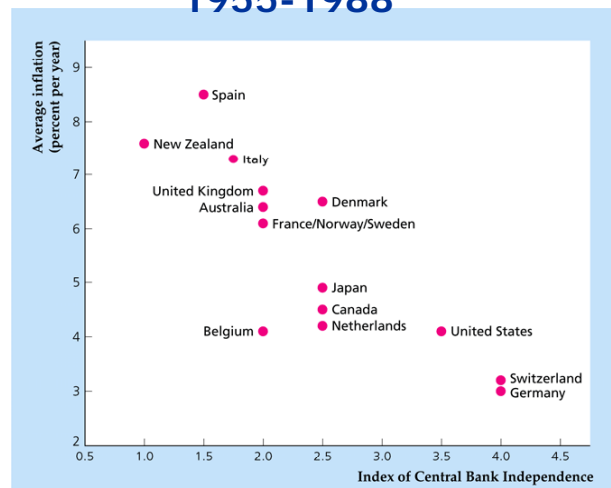
Other Methods To Achieve Credibility

- Increasing central bank independence
 - If the executive and legislative branches of government can't interfere with the central bank, people are more likely to believe that the central bank is committed to keeping inflation low and won't cause a political business cycle
 - Looking at evidence across countries, Alesina and Summers showed that the more independent the central bank, the lower the inflation rate from 1955 to 1988; also, the long-run level of unemployment is no higher in those countries

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Central bank independence and inflation, 1955-1988



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