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Plan for today:

Inflation Targeting (I)

1. General concepts and implications

2. A simple static way of modeling inflation targeting

Literature: Bernanke and Mishkin (1997, *Journal of Economic Perspectives*); Walsh (2001, downloadable on website)

Inflation targeting: General concepts and implications

- A growing number of countries have adopted **inflation targeting** in recent years

  – Beginning with New Zealand in 1990 (or 1988?)....

  – ...followed by, e.g., Canada (1991), United Kingdom (1992), Sweden (1993)....

  – ...succeeded by, e.g., Peru (1994), South Africa (2000), Norway (2001), Hungary (2001), etc., etc.

- Clearly a new and growing "trend" in design of monetary policy strategies

- What is it?

- ....and what is it not?

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- Early warning: only one (and not terrible surprising) **common aspect:**

  – The definition of a **numerical specification** of the inflation rate monetary policy should aim to achieve

  – Definition made by government and/or central bank

- The ways of defining operationally the inflation target regime differ widely across countries:

  – Some specify a **range** to be targeted

  – Some specify a **point target** with a **tolerance band**

  – The **numerical values** for ranges and point target are **different** and may **vary over time**

  – The **inflation concept** to target differs

  – The **horizon** at which policy should "hit" target differs

  – "**Escape clauses**" may or may not exist

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- In the legal mandates for monetary policy, the inflation target is often referred to as the "overriding" objective

- Reflects view that monetary policy cannot affect real quantities in the long run

  – ...and that inflation is mostly a monetary phenomenon in the long run

  – Hence, monetary policy should aim directly at low and stable inflation...

  – ...which is believed to be conducive for good overall economic performance

- However, should **not** be (and usually often is not) viewed as "**strict inflation targeting**"

  – However, the adoption of tolerance bands, ranges, various horizons point to inflation targeting as a...

  – ..."**flexible**" monetary regime, where the short- to medium-run effects of monetary policy on real quantities are acknowledged

  – I.e., the terminology "overriding objective" should be seen as referring to the **long run**

- Many, but not all, inflation targeting central banks are held **accountable** for the success of monetary policy

  – If they "don't deliver," they must "pay" or at least "explain" .....

  – Most famous "accountability example" is the one in New Zealand: The Governor can be **fired** in case of (policy) misconduct

  – (credibility of such measures???????)

- Note that targeting inflation is equivalent of going directly to the welfare relevant issue of (long run) monetary policy

  – Helps pin down inflation expectations (if credibility of the regime is established)

- The role of explicit intermediate targets are therefore downplayed in inflation targeting regimes (unless the intermediate target contains all the relevant information about inflation)

- Nevertheless, variables good at forecasting inflation are, of course, used by central banks

  – =⟩ the **inflation forecast** becomes an intermediate target

  – If inflation is forecasted to exceed the target value (or move out of range), it is an indication that policy should be tightened

- Many, but not all, inflation targeting central banks are characterized by high degree of openness about policy

- I.e., high degree of **transparency** in policymaking

- Typically in the form of publication of **Inflation Reports** meticulously describing the deliberations leading to policy decisions

  – Clearly, such measures are helpful in enforcing accountability

  – Also, they make up for the "democratic loss" often associated with inflation targeting:

    * Monetary policy is put in the hands of bureaucrats; non-elected officials

    * So, even if the government decides on the "rules of the game" the central bank has **instrument independence**

  – It helps enlightening the public's understanding about what determines the course of policy

- As indicated, most (if not all) inflation targeters, are "flexible," i.e., put some weight on short-run fluctuation in economic activity

- Therefore, it is **not** — as emphasized by Bernanke and Mishkin — **a rule**

  – ...when a rule is understood as a rigid set of instructions and objectives

  – Like a "K% money growth rule"....

  – ...or some interest rate rule to be followed mechanically

- Instead, it should be viewed as a suitable **framework** for monetary policymaking; i.e.,

  – One that makes clear what the main objectives of monetary policy are

  – One that through openness and information sharing explains how they are attained (and which objectives monetary policy cannot achieve)

  – One that secures that missing the objectives will carry a cost for the practitioners (accountability)

  – One that explains when certain events may call for certain deviations from previous plans

  – ...i.e., it is a framework that appropriately "**constrains discretion**"

- Controversies:

  – What is the appropriate rate of inflation? 0%? 2%? 20%

  – Which inflation rate is appropriate to stabilize?

  – Is inflation at all controllable?

  – Can "misses" not always be blamed on outside events????

- Is this in any case the one and only and best regime for monetary policy?

  – Time will show......(and of course, you can be a "bad" inflation targeter)

  – One undisputable positive thing about inflation targeting is how its emergence has put **increased focus and debate on monetary policymaking**

A simple static way of modeling inflation targeting

- While the practical implementation of inflation targeting takes many different forms, it is inherently a dynamic business

  – There are lags and uncertainties involved from a policy decision is made until it has effects on output and inflation

- Nevertheless, a simple static model can be illustrative in formally modelling inflation targeting

  – How is policy conduct adjusted in response to shocks?; changes in the inflation target?; changes in inflation expectations?; how is policy preferences affecting performance?; and so forth

- Model is part of recent trend of taking out the LM-curve in macroeconomic teaching

- Conventional IS-LM-AS modelling is rather ill-suited to evaluate inflation targeting, as it

  – Focuses on the price **level**

  – Ignores policy preferences

- Through elimination of the LM curve, the nominal interest rate is taken to be the policy instrument, and the model consist of primarily two equations

  – An expectations-augmented Phillips curve

  – A relationship between inflation and the output gap describing the policy choice (and preferences); an "inflation targeting rule"

  – The nominal interest rate can then residually be derived from an IS relationship (cf. Clarida et al., 1999)

- The Phillips curve:

$$\pi = \pi^e + ax + e, \qquad a > 0 \qquad (1)$$

  – π and π^e is actual and expected inflation, respectively

  – x is the output gap

  – e is an inflation shock

  – Positively sloped **PS curve** in (x, π)-space with intercept $\pi^e + e$

- The "inflation targeting rule" (note the word rule is **not** meant in a "strict" sense)

  – A description of how the central bank minimizes fluctuations in inflation around the numerical inflation target, π^T, **and** fluctuations in the output gap

  – Implicit output gap target value is zero — reflecting that monetary policy cannot permanently raise output above the natural rate ==> no inflation bias considerations under inflation targeting

  – Targeting rule: marginal cost of policy equals marginal gain

  – Marginal cost of output gap fluctuations

  $$\lambda x, \quad \lambda > 0$$

  – Marginal cost of inflation fluctuations

  $$k\left(\pi - \pi^T\right), \quad k > 0$$

  – Assume a recession, $x < 0$; the central bank expands policy by $\Delta x > 0$ obtaining a marginal gain in terms of output:

  $$-\lambda x \Delta x$$

  – The inflation target will be overshot, i.e., a marginal loss occurs in terms of inflation. Inflation raises by $a\Delta x$, so the marginal loss is

  $$ak\left(\pi - \pi^T\right)\Delta x$$

- Equating marginal gain and loss yields the (flexible) monetary policy rule:

  $$-\lambda x \Delta x = ak\left(\pi - \pi^T\right)\Delta x$$

  ==>

  $$x = -\left(ak/\lambda\right)\left(\pi - \pi^T\right) \qquad (2)$$

  (note it is a simple first-order condition!)

- Assuming policy cannot respond to any contingency (say due to imperfect information), the rule is amended to

  $$x = -\left(ak/\lambda\right)\left(\pi - \pi^T\right) + u \qquad (3)$$

  with u representing any unforecastable impacts on output and demand

- This is written as

  $$\pi = \pi^T - \alpha\left(x - u\right), \quad \alpha \equiv \lambda/\left(ak\right)$$

  – **Negatively sloped MPR curve** in (x, π)-space with intercept $\pi^T + \alpha u$

  – Note that slope depends on policy preferences: More weight on inflation (higher k) means flatter slope

- With the PS and MPR curves, inflation and output gap can be determined

- Figure 1: Example where initially $\pi^e > \pi^T$
- Result of policymaking: contractive policy to bring down actual inflation closer to target

  – Note the flexibility imbedded: Actual inflation is **between** π^e and π^T

  – Only with $k \to \infty$ (inflation is all that matters for the central bank), $\alpha \to 0$, and the central bank contracts so strongly that the inflation target is attained immediately

  – As actual inflation is lower than expected, inflation expectations are revised downwards, and PS curve moves down

  – Over time, $\pi^e = \pi = \pi^T$ and $x = 0$ are attained (requires formally an expectations adjustment equation....)

  – Reflects the common practice of attaining the inflation target **over some time horizon** (k can be viewed as proxy for how short this horizon is)

- Figure 2: Similar exercise, but the case where the central bank lowers it numerical inflation target; i.e., reduces π^T
- Result is contractive policy to bring down actual inflation towards new target

  – Adjustment mechanism is as before: Inflation expectations adjust downwards, and new long-run equilibrium is attained

- The impacts of shocks e and u can be analyzed in similar ways

- How is actual monetary policy implemented? I.e., what is "behind the MPR curve"?
- The actual instrument of the central bank, the nominal interest rate, i, is introduced by simple "IS curve" formulated in terms of the output gap

$$x = x_0 - b(i - \pi^e) + u, \qquad b > 0$$

- In the long run, $x = u = 0$, so the long-run equilibrium real interest rate is

$$r^* = x_0/b \tag{6'}$$

- The IS curve is then written as

$$x = -b(i - \pi^e - r^*) + u \tag{7}$$

- One can then find the nominal interest rate that implements the targeting rule

  – One way: "Solve the PS and MPR curves" for x and combine with IS curve:

  $$i = r^* + \pi^e - \left(\pi^T - \pi^e - e\right)/\left[b\left(a+\alpha\right)\right]$$

  Note i increases by **more** than one-for-one with π^e to increase the **real** rate (and more strongly the flatter is the MPR curve; or less interest rate sensitive demand; or the flatter is the Philips curve)

  – Expressed differently:

  $$i = i^T + \{1 + 1/[b(a+\alpha)]\}\left(\pi^e - \pi^T\right) + e/[b(a+\alpha)]$$
  $$i^T \equiv r^* + \pi^T$$

  i^T is long-run nominal interest rate consistent with inflation target

  – This expression highlights inflation forecasts in policy implementation:
  If expected inflation is above the inflation target, raise the interest rate

- Note that it is a "Taylor-type" interest rate rule, but the approach here **highlights the preferences of the central bank,** which are absent if analysis starts out with a postulated interest rate rule

  – I.e., it highlights particular aspects of the inflation targeting regime

Concluding remarks

- Inflation targeting is wide-spread new policy framework for monetary policymaking

- Has helped to increase awareness about monetary policy issues

- Does not imply ignorance of the real economy in the short-to-medium run

- Can be readily analyzed in simple static model framework

- Model framework, of course, ignores important dynamic considerations in the actual implementation of inflation targeting

- ...next time

Plan for next lectures

Lectures are cancelled on Monday, May 17.

Wednesday, May 19:
Inflation Targeting (II)

1. Example of a dynamic modeling inflation targeting
2. The importance of inflation forecasts
Literature: Svensson (1997, *European Economic Review*). Supplementary reading: Svensson (1999, 2000a,b).

(**Final**) Lectures, Monday, May 24:
Transparency of Monetary Policymaking
1. A formal model of the effects of transparency
2. Pros and cons of transparency
Literature: Jensen (2002, *Scandinavian Journal of Economics*).
Supplementary reading: Faust and Svensson (2001); Geraats (2002).