

Monetary Policy

Introduction

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The role of monetary policy

- The role for monetary policy action derives from the belief that inflation is ultimately **a monetary policy phenomenon**
- The current consensus is that in a world with full information, complete markets and flexible prices, monetary policy would have a very limited or no role. In that case nominal interest rates should be set to zero (the so called Friedman rule, which is robust to other distortions)
- In a world with **frictions** (for instance price and wage rigidity but also financial frictions, for instance) the role of monetary is to try to overcome those distortions so that the economy behaves in a way that is close to the fictionless flexible price equilibrium

A stylized view of a framework for monetary policy analysis

The objective of monetary policy making, is to solve the following problem:

$$\max E_t(\text{Welfare}(Y, X))$$

s.t.

$$Y_t = f(Y_{t-k}^{t+k}, X_{t-k}^{t+k}, i_{t-k}^{t+k}) \quad (1)$$

$$i_t = g(Y_{t-k}^{t+k}, X_{t-k}^{t+k}) \quad (2)$$

- Y - Vector of endogenous non-policy variables
- X - Vector of exogenous variables (including shocks)
- i - Monetary policy instruments
- f - function describing the monetary policy transmission mechanism
- g - monetary policy rule
- k - leads and lags

What are the objectives of monetary policy

The main objectives of monetary policy are then to maximize welfare. In practice this is formulated in varied forms:

- According to the ECB the primary objective of monetary policy is price stability. The ECB aims to maintain the inflation **rate below, but close to**, 2% over the medium term.
- The US Federal Reserve states that the objective of monetary policy is *“to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates”*

What are the objectives of monetary policy

- The literature has considered several other objectives (asset price stability, financial stability, product variety, inequality)
- Price stability is generally perceived to be the main goal of monetary policy

The importance of price stability

Central banks aim at achieving price stability in order to overcome the costs of inflation.

Steady or anticipated inflation tends to lead to lower costs

- Shoe-leather costs
- Menu costs
- Relative price distortions due to nominal rigidities

The importance of price stability

Unanticipated or variable inflation has larger costs

- **Relative price** distortions can lead to misallocation of resources
- **Financial planning** becomes more difficult (e.g. saving for retirement, mortgages, longer-term investments, wage decisions)
- Uncertainty about inflation leads to **higher risk premia** and higher real interest rates
- There is strong evidence that countries with higher inflation tend to grow by less

Objectives versus monetary policy targets

- The notion of **objective or ultimate target** should be distinguished from the notion of **intermediate target**
- An **intermediate target** is a variable that is not directly under the control of the policy maker but reacts to policy and has a predictable relationship with the ultimate objectives.
- Examples of such intermediate targets include monetary aggregates (monetary targeting), credit and exchange rates (exchange rate targeting)
- Central banks also usually target short-term interest rates in the interbank market (money market). These interest rates could be considered intermediate targets (e.g. Euribor).

In the modelling framework there are two main approaches to assess the fulfilment of the macroeconomic policy objectives

- **Welfare based approach**
- **Loss function approach**

Monetary is assumed to attempt to maximize an **objective function function**. Two approaches can be distinguished:

- Barro and Gordon(1983) - Maximize expected value of:

$$U = \lambda(y - y_n) - 0.5\pi^2 \quad (3)$$

where y is output, y_n is the economy's natural rate of output and π is the inflation rate

- Maximize Utility of representative agent = $U(\text{Consumption } (+), \text{Leisure } (+))$

Examples of utility functions:

- Separable utility function

$$U(C_t, L_t) = \frac{C_t^{1-\sigma}}{1-\sigma} - \frac{L_t^{1+\phi}}{1+\phi} \quad (4)$$

- Non-separable utility function:

$$U(C_t, L_t) = \frac{1}{1-\sigma} [C_t(1-L_t)^\nu]^{1-\sigma} \quad (5)$$

where C_t is consumption and L_t represents hours worked (as a share of available time)

Loss function approach

The best policy is a policy that minimizes a **loss function** that measures the distance to the objectives. For instance, a loss function could be represented by:

$$Loss = unemployment + \lambda(Inflation - \pi^*)^2$$

This function implies that the best policy should aim both at reducing unemployment and keeping inflation close to the inflation objective of π^* (thereby penalizing both inflation and deflation).

λ is a parameter that can be adjusted to change the relative weight on the inflation term

- Another commonly used approach is the quadratic loss function

$$Loss = (y - y_n)^2 + \lambda(Inflation - \pi^*)^2$$

The main disadvantage of loss functions is that they are ad-hoc, but in practice they are often convenient

Loss function approach

Figure: US loss function (using IMF output gap and inflation deviations from target)

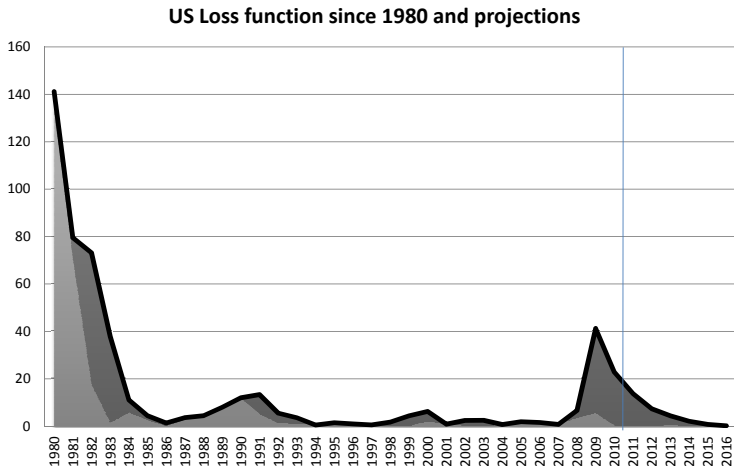
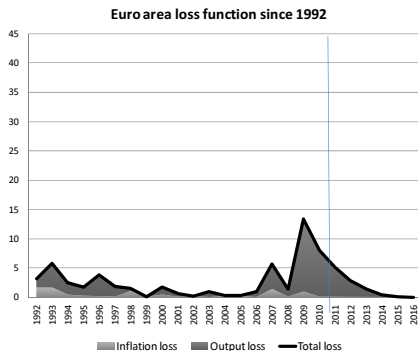
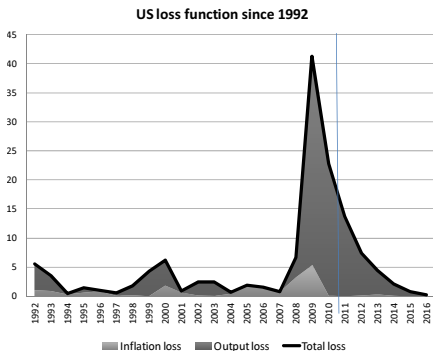


Figure: Euro area and US loss functions (using IMF output gap and inflation deviations from target)



The limitations of models and the Lucas critique

- Lucas pointed out that macroeconomic models are estimated with past data
- But past empirical regularities **may not be invariant** to policy intervention and therefore **not structural**
- This is particularly the case if the policy action changes the agents' economic behaviour and expectations
- In practice regime shifts (e.g. introduction of the euro, structural reforms) or very large shocks (e.g. financial crisis) are likely to make models estimated with past data unreliable for policy analysis

Possible solutions to the Lucas critique

- The Lucas critique emphasizes that we should model the **microeconomic behaviour** and aim at uncovering the so-called **structural** or "**deep parameters**" (that define preferences, technology and resource constraints). These characterize individual behavior and should be invariant to policy.
- Dynamic Stochastic General Equilibrium (DSGE) models attempt to go in this direction.

The role of rules versus discretion

- Policy is conducted by **discretion** if policymakers freely decide at each moment in time the appropriate policy
- Policy is conducted according to a **rule** if policymakers announce in advance their course of action and commit to the pre-announced policy

Arguments against discretion

- 1 Monetary policy is too important to be left to the discretion of policymakers who may be "incompetent".
"Incompetence" may arise due to:
 - Political instability
 - Insufficient knowledge by politicians
 - Opportunism related to the political cycle or special interests
- 2 Time inconsistency of discretionary policy

Time inconsistency of discretionary policy

- Even assuming that policymakers are competent and attempt to maximize welfare, discretionary policy may be **time inconsistent**.
- This problem arises because private agents form views about future economic policy and policymakers may have incentives to deviate from their promises.
- Such incentives may make private agents distrust governments which will make policy **less credible** and **less effective**.

Examples of time inconsistency

- A government may announce lower corporate taxes to attract foreign direct investment but once the companies are installed may have the incentive to raise taxes again.
- Governments vowed to abide by the stability and growth pact to join the euro but then failed to provide the required fiscal adjustment. The debate on including constitutional limits for public deficits and debt in euro area countries aims at imposing more binding rules.
- The inflationary bias - tendency for governments to aim at a higher than optimal inflation rate once expectations have formed.

Solutions to time inconsistency problem

- Have monetary policy determined by **binding rules**
- **Reputation** - policymakers can reduce dynamic inconsistency by pursuing low inflation policies
- **Delegation** to central bankers- central bankers with stronger preferences against inflation should be put in charge of monetary policy
- **Institutions** - central banks should be given a clear mandate to preserve price stability

Problems with binding rules as solutions to time inconsistency problem

Monetary policy rules have limitations to the dynamic inconsistency problem:

- Binding rules may be inflexible in the presence of large unexpected shocks
- Successful central banks have been able to avoid inflation while not following strict rules