Instituto Universitário de Lisboa (ISCTE-IUL) - Economics Department

Course: Macroeconomics | Program: Management

Week V: The Monetary Policy and Aggregate Demand

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These slides do not cover all the contents of the theoretical classes. They only provide a summary of the subjects which will be used in the practical exercises. This means you should attend theoretical classes as well.

The MP curve

Rational

- The Central Bank (CB) controls inflation by changing its short-term (nominal) interest rate, as follows:
  - According to the Fisher equation, by changing the nominal interest rate, the Central Bank affects the real interest rate:

$$r = i - \pi$$

  - Promoting changes in the real interest rate will have an impact for firms and families, as we recall from the IS curve components:

$$C = \bar{C} + cY_D - br;\ I = \bar{I} - d(r + \bar{f});\ NX = N\bar{X} - xr$$

  - This way:

$$\uparrow r \Rightarrow \downarrow Y \Rightarrow \downarrow \pi \text{ and } \downarrow r \Rightarrow \uparrow Y \Rightarrow \uparrow \pi$$

The MP curve

Definition

- The needed changes on r depend on the type of shock the economy faces.
- The Central Bank formulates a systematic policy in response which allows to decide how r should change.
- This policy (i.e., the choice of the needed r) depends on 2 main factors (ignore the output gap to simplify):
  - The natural real interest rate: $\bar{r}$ (unrelated to the level of the inflation rate when this is stable, or to any other variable in the model).
  - The rate of inflation itself: π (real returns should be adjusted for inflation).
- Summing up, the MP rule reflects the relationship between the real interest rate (r) and the inflation rate (π) for a given level of autonomous real interest rate $(\bar{r})$:

$$r = \bar{r} + \lambda\pi$$

The MP curve

Definition

- The relationship between r and π is positive to avoid inflationary spirals:

$$\uparrow \pi \Rightarrow \downarrow r \Rightarrow \uparrow Y \Rightarrow \uparrow \pi$$

- This implies that when CB adjusts i it follows the Taylor Principle according to which $\Delta i > \Delta \pi$
  - Example with $\Delta i = +1.5 > \Delta \pi = +1$ avoiding inflationary spirals:

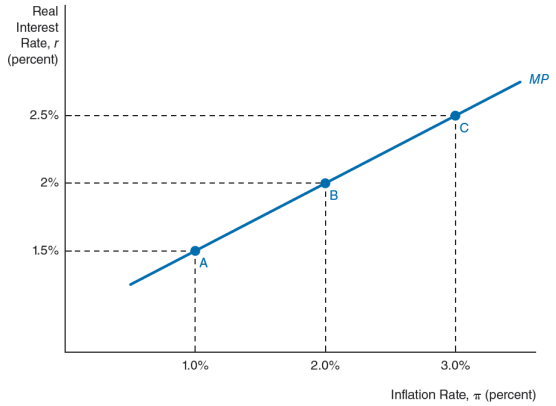
$$\Delta r = \Delta i - \Delta \pi = 1.5 - 1 = +0.5pp$$

  - Example with $\Delta i = +1 < \Delta \pi = +1.5$ leading to an inflationary spiral:

$$\Delta r = \Delta i - \Delta \pi = 1 - 1.5 = -0.5pp$$

The MP curve

Graphical representation (The same as in the book, but different from Professor Mendes' slides. You should consider the last one, for study and evaluation purposes.)



The MP curve

Movements along the curve

- Movements along the MP curve:
  - CB's normal response (endogenous response) of raising interest rates when inflation is rising.
  - Movement along the MP curve is the rise in the interest rate as inflation rises, being an automatic response of the central bank to a change in inflation.
  - Such a response does not involve a shift in the MP curve.
- Practical case:

$$r = 1 + 0.5\pi$$

  - Starting from $\pi = 2$ we have $r = 1 + 0.5 \times 2 = 2$
  - If $\pi = 3$ we have $r = 1 + 0.5 \times 3 = 2.5$
  - If $\pi = 1.5$ we have $r = 1 + 0.5 \times 1.5 = 1.75$

The MP curve

Movements in the curve

- What can cause shifts in the MP curve (examples):
  - Autonomous tightening of monetary policy (the curve goes up): when there is an inflationary pressure that the old rule can't accommodate, central banks may decide to increase $\bar{r}$.
  - Autonomous easing of monetary policy (the curve goes down): when inflation is stable and the aggregate product needs to be raised, monetary policy makers can decide to decrease $(\bar{r})$.
- Practical case (MP tightening from $\bar{r} = 1$ to $\bar{r} = 2$):

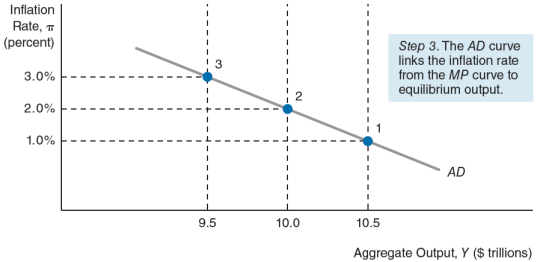
$$r = 2 + 0.5\pi$$

  - Starting from $\pi = 2$ we have $r = 2 + 0.5 \times 2 = 3$
  - If $\pi = 3$ we have $r = 2 + 0.5 \times 3 = 3.5$
  - If $\pi = 1.5$ we have $r = 2 + 0.5 \times 1.5 = 2.75$

The AD curve

Definition and graphical representation

- **AD curve**: relationship between the level of aggregated product (Y) and the inflation rate (π), for a given level of autonomous demand $(\bar{A})$ and autonomous real interest rate $(\bar{r})$.



The AD curve

Derivation and compact formula

- Substituting the MP curve in the IS curve:

$$Y = \frac{1}{1-c}\bar{A} - \frac{(b+d+x)}{1-c}r \Rightarrow$$
$$\Rightarrow Y = \frac{1}{1-c}\bar{A} - \frac{(b+d+x)}{1-c}(\bar{r} + \lambda\pi)$$

- This way:

$$Y = m \times \bar{A} - m \times \phi \times (\bar{r} + \lambda\pi),$$

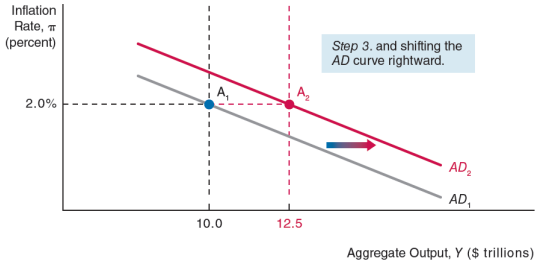
where

$$m = \frac{1}{1-c},\ \bar{A} = (\bar{C} + \bar{I} - c\bar{T} - d\bar{f} + \bar{G} + N\bar{X}) \text{ and } \phi = b + d + x$$

The AD curve

Shifts in the AD curve

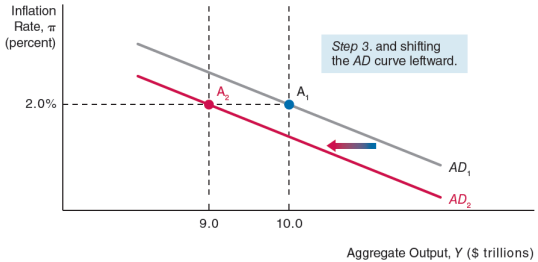
- Graphical representation of either an **increase** in the autonomous demand $(\bar{A})$ or a **decrease** in the autonomous real interest rate $(\bar{r})$ in the AD curve:



The AD curve

Shifts in the AD curve

- Graphical representation of either a **decrease** in the autonomous demand $(\bar{A})$ or an **increase** in the autonomous real interest rate $(\bar{r})$ in the AD curve:



References

- Mishkin, F. S. (2014), *Macroeconomics: Policy and Practice*, 2nd Edition, Pearson, Addison-Wesley, New York.