THE AGGREGATE DEMAND AND SUPPLY: MACROECONOMIC EQUILIBRIUM WEEK 8

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1. RECAP: THE AD & AS CURVES

THE AD CURVE

Recall the AD curve

$$Y = m \cdot \overline{A} - m \cdot \phi \cdot (\overline{r} + \lambda \pi) \tag{1}$$

where:

- $\overline{A} = \overline{C} + \overline{I} d \cdot \overline{f} + \overline{G} + \overline{NX} c \cdot \overline{T}$ (Autonomous Aggregate Demand)
- $m = \frac{1}{1-c}$ (multiplier)
- $\phi = b + d + x$ (to simplify notation)
- λ (parameter)

AD: MOVEMENTS-ALONG VS SHIFTS

$$Y = m \cdot \overline{A} - m \cdot \phi \cdot (\overline{r} + \lambda \pi)$$

A movement along the AD curve: π changes, everything else constant. For example:

$$\pi \uparrow \Rightarrow r \uparrow \Rightarrow \{I \downarrow, C \downarrow, NX \downarrow\} \Rightarrow Y \downarrow$$

A shift in the AD curve: π constant, everything else changes. For example:

$$\left\{ \overline{A} \uparrow, \ \overline{r} \downarrow \right\} \quad \Rightarrow \quad Y \uparrow$$

The AS curve

Recall the AS curve

$$\pi = \underbrace{\pi^e}_{=\pi_{-1}} + \gamma \left(Y - Y^P \right) + \rho \tag{2}$$

• Short-run:

$$Y \neq Y^P$$
 and $\pi \neq \pi^e$

and the AS has a positive slope given by γ .

• Long-run:

$$Y = Y^P$$
 and $\pi = \pi^e$

and the AS is vertical with $Y = Y^P$.

AD: MOVEMENTS-ALONG VS SHIFTS

$$\pi = \underbrace{\pi^e}_{=\pi_{-1}} + \gamma \left(Y - Y^P \right) + \rho$$

A movement along the AS: Y changes and everything else constant:

 $\begin{array}{ccc} Y &\uparrow \Rightarrow & \pi \uparrow \\ Y &\downarrow \Rightarrow & \pi \downarrow \end{array}$

A shift in the AS: Y constant, everything else changes. For example:

$$\rho \uparrow \Rightarrow \pi \uparrow \quad , \quad \pi^e \uparrow \Rightarrow \pi \uparrow \quad , \quad Y^P \uparrow \Rightarrow \pi \downarrow$$

2. Macroeconomic Equilibrium: AD = AS

THE SHORT RUN EQUILIBRIUM

On this equilibrium, we will have: $Y=Y^*$, $\,\pi=\pi^*$



Aggregate Output, Y (\$ trillions)

THE SHORT RUN EQUILIBRIUM ABOVE Y^P Suppose the economy starts with $Y_1 > Y^P$:



(a) Initial short-run equilibrium above potential output

Aggregate Output, Y (\$ trillions)

Consider that $Y_1 > Y^P$: point 1.

Unemployment is below the natural unemployment rate: $U < U_n$ and wages increase (Phillips curve).

Firms raise their prices.

Inflation rises above its initial level: $\pi > \pi_1$. In the next period, expectations of inflation, π^e , are revised upward due to rising inflation and the short-run AS curve shifts upwards from AS1 to AS2.

As long as $Y > Y^P$ wages and prices will continue to increase, causing the AS curve to shift upward: self-correcting supply mechanism.

The process repeats itself until $Y = Y^P$, i.e., the economy reaches its long-run equilibrium.

THE SHORT RUN EQUILIBRIUM BELOW Y^P Suppose the economy starts with $Y_1 < Y^P$:



(b) Initial short-run equilibrium below potential output

Aggregate Output, Y (\$ trillions)

The short-term equilibrium is below potential GDP: $Y_1 < Y^P$: point 1.

Unemployment is above the natural rate of unemployment: $U > U_n$ and inflation falls below its initial level: $\pi < \pi_1$.

Inflation expectations, π^e , are revised downward due to falling inflation, shifting the short-run AS curve downward from AS1 to AS2.

As long as $Y < Y^P$, expected inflation declines, shifting the AS down.

The process repeats until $Y = Y^P$ and the long-run equilibrium is reached.

3. Aggregate Demand Shocks

A POSITIVE DEMAND SHOCK

Consider that \overline{A} increases



Aggregate Output, Y (\$ trillions)

We start from the long-run equilibrium at point 1.

The AD curve shifts to the right: we will have point 2.

At this point, $Y > Y^P$ and inflation increases.

The supply self-correction mechanism comes into operation until it passes to AS3 and GDP equals Potential GDP.

The short-run effect: an economic expansion and an increase in inflation.

The long run effect: inflation rises, but the economy returns to Potential GDP (Y^P) .

4. Aggregate Supply Shocks

A TEMPORARY NEGATIVE SUPPLY SHOCK

Suppose that oil prices increase temporarily $(\rho \uparrow)$



Aggregate Output, Y (\$ trillions)

We start from the long-run equilibrium at point 1.

An increase in ρ shifts AS to the left, from AS1 to AS2.

We move to point 2, where $Y < Y^P$ leading to an increase in inflation.

However, the productive capacity of the economy (the LRAS) remains unchanged.

The self-correcting supply mechanism will make the adjustment along AD1, back to the initial equilibrium point.

The short run effect: an economic recession and an increase in inflation.

In the long run: output and inflation return to their initial equilibrium, Y^P and $\pi = 2\%$.

PERMANENT SUPPLY SHOCKS

- A permanent **negative** supply shock: a war that cuts off forever the supply of cheap oil or gas and leads to permanently higher energy costs. A permanent negative supply shock increases inflation and reduces output both in the short and long run.
- Another permanent **negative** supply shock: regulations that cause the economy to be less efficient.
- A permanent **positive** supply shock: the development of new technology that raises productivity or an increase in the supply of labor. A permanent positive supply shock lowers inflation and raises output both in the short and long run.

A PERMANENT NEGATIVE SUPPLY SHOCK A decrease in potential output from $Y_1^P = \$10$ trillion to $Y_1^P = \$8$ trillion.



We start from the long-run equilibrium at point 1.

A permanent (negative) supply shock shifts supply to the left, from LRAS1 to LRAS2.

Inflation increases, shifting short-run supply to the left, from AS1 to AS2, moving to point 2.

At this point we see $Y > Y^P$, which causes inflation to increase again, shifting AS to AS3.

The new long-run equilibrium occurs at point 3.

The short-run effect: a fall in GDP and an increase in inflation.

In the long run: potential GDP falls and inflation rises, both permanently.

5. READINGS

$\operatorname{Readings}$

• Read Chapter 12 of the adopted textbook:

Frederic S. Mishkin (2015). Macroeconomics: Policy & Practice, Second Edition, Pearson Editors.