

CHAPTER 22

Aggregate Demand and Supply Analysis

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Outline

Aggregate Demand

Aggregate Supply

Equilibrium and Self-Correction

Demand and Supply Shocks

Applications

Wrap-up

Reading and objectives

- ▶ Mishkin, *The Economics of Money, Banking, and Financial Markets*, 13th ed.
- ▶ This deck: **Chapter 22** — Aggregate Demand and Supply Analysis.
- ▶ We have spent the course on financial markets, the banking system, and the conduct of monetary policy (Ch 16). Now we build the *macro engine*: the framework that tells us how a policy move ends up moving output and inflation.
- ▶ Convention throughout: the **inflation rate** π is on the vertical axis and **aggregate output** Y on the horizontal axis.

Learning objectives

22.1 Build the aggregate demand curve and the factors that shift it.

22.2–22.3 Derive long-run and short-run aggregate supply, and their shifts.

22.4 Find short-run and long-run equilibrium; the self-correcting mechanism.

22.5–22.6 Trace demand shocks and supply (price) shocks, temporary vs. permanent.

22.7–22.8 Apply the model to real episodes and draw the conclusions.

PART 1

Aggregate Demand

What aggregate demand is

Aggregate demand is total planned spending on domestic goods and services at each inflation rate. Four components:

- ▶ **Consumption expenditure** (C) — household demand for goods and services.
- ▶ **Planned investment spending** (I) — firms' planned spending on capital, plus new housing.
- ▶ **Government purchases** (G) — federal, state, and local spending on goods and services.
- ▶ **Net exports** (NX) — net foreign spending on domestic output.

$$Y^{ad} = C + I + G + NX$$

The **aggregate demand (AD) curve** traces the quantity of output demanded against the inflation rate, holding the other determinants fixed.

Mishkin Ch. 22, Section 22.1.

Why the AD curve slopes downward

The modern reason runs *through monetary policy*:

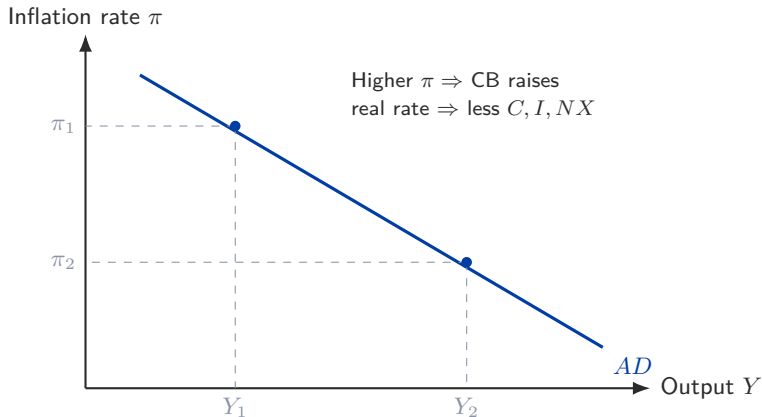
- ▶ When inflation π rises, the central bank — following the strategy of Ch 16 — **raises the real interest rate** (the Taylor principle: nominal rates move more than one-for-one with π).
- ▶ A higher real rate **depresses planned expenditure** — investment, interest-sensitive consumption, and (via a stronger currency) net exports all fall.
- ▶ So higher $\pi \Rightarrow$ lower Y^{ad} : the AD curve is **downward sloping**.

A second route: the quantity theory

With velocity roughly constant, a fixed money supply fixes nominal spending $M\bar{V} = PY$. A higher price level then buys *less* real output — the same downward slope, derived from $MV = PY$.

Mishkin Ch. 22, Section 22.1.

Figure 1 — The aggregate demand curve



Mishkin Ch. 22, Section 22.1. As inflation falls from π_1 to π_2 , the central bank eases, real rates fall, and the quantity of output

demanded rises from Y_1 to Y_2 .

Factors that shift the AD curve

A shift is any change in spending at a *given* inflation rate. AD moves **right** when:

- ▶ **Autonomous** consumption, investment, or government purchases rise; or **net exports** rise.
- ▶ **Taxes** fall (raising disposable income and C).
- ▶ The **money supply** rises (with velocity constant, $M\bar{V} = PY$ raises nominal spending).
- ▶ **Financial frictions** ease — a healthier credit channel raises I and C .
- ▶ The central bank adopts a more **expansionary autonomous stance** — a lower real rate at every π .

Bookkeeping

Anything that raises $C + I + G + NX$ at a given inflation rate shifts AD right; the reverse shifts it left. Movements *along* AD come only from changes in π .

PART 2

Aggregate Supply

Long-run aggregate supply

Long-run aggregate supply (LRAS) is what the economy can produce when wages and prices have fully adjusted.

- ▶ Determined by the stock of **capital**, the supply of **labor**, and **technology** — the real resources of the economy.
- ▶ It sits at **potential output** Y^P , the level generated by the **natural rate of unemployment**.
- ▶ Crucially, Y^P does *not* depend on inflation, so LRAS is **vertical** at Y^P .

The long-run dichotomy

In the long run, output is pinned down by real factors alone. Inflation determines *where* on the vertical LRAS the economy sits — not *how much* it produces.

Mishkin Ch. 22, Section 22.2.

Short-run aggregate supply

In the short run, wages and prices are **sticky**, so supply responds to inflation.

- ▶ When the price level rises faster than costs, production is temporarily more profitable, so firms expand output.
- ▶ This gives an **upward-sloping short-run aggregate supply (SRAS)** curve.
- ▶ Its position depends on three things: **expected inflation**, the **output gap** ($Y - Y^P$), and **price (supply) shocks**.

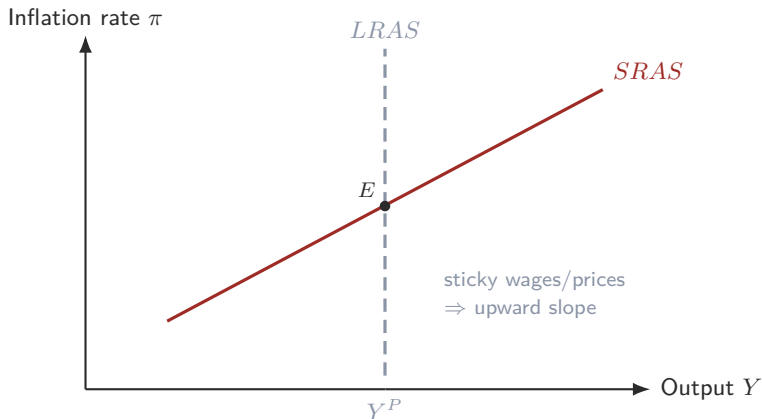
Microfoundation (appendix)

SRAS is the **Phillips curve** in output space. Replacing the unemployment gap with the output gap (via **Okun's law**) turns the inflation–unemployment trade-off into an inflation–output relation:

$$\pi = \pi^e + \gamma(Y - Y^P) + \rho.$$

Mishkin Ch. 22, Section 22.2; Appendix.

Figure 2 — Long- and short-run aggregate supply



Mishkin Ch. 22, Section 22.2. $LRAS$ is vertical at potential output Y^P ; $SRAS$ slopes up because nominal wages and prices adjust

slowly. They meet at the natural rate.
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Shifts in the supply curves

LRAS shifts *right* when potential output grows:

- ▶ more capital, more labor supplied, better technology, or a **lower natural rate of unemployment**. The reverse shifts it left.

SRAS shifts from three forces:

1. **Expected inflation** — higher π^e feeds into wage-setting and pushes SRAS *up*.
2. **Output gap** — a *persistent* positive gap ($Y > Y^P$) tightens labor markets and pushes SRAS up over time (and vice versa). This is the engine of self-correction.
3. **Inflation (supply) shocks** — a jump in input prices (e.g. oil) shifts SRAS up; a favorable shock shifts it down.

Why the output-gap channel matters

Because a positive gap *itself* pushes SRAS up, the economy cannot stay above potential forever — the seed of the self-correcting mechanism is built into SRAS.

PART 3

Equilibrium and Self-Correction

Short-run equilibrium

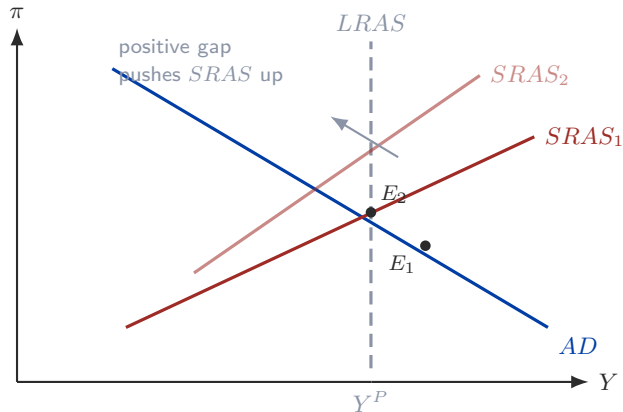
Put the two sides together. **General (macro) equilibrium** is where the quantity of output demanded equals the quantity supplied — the intersection of AD and SRAS.

- ▶ At point E , aggregate output is Y^* and the inflation rate is π^* .
- ▶ This is a **short-run** equilibrium: it can sit to the *left* of Y^P (a recession, output gap negative) or to the *right* (a boom, gap positive).
- ▶ Nothing forces the short-run equilibrium to coincide with potential output — in the short run, demand and sticky supply jointly set output.

The key question

If $Y^* \neq Y^P$, what brings the economy back? The answer is the **self-correcting mechanism** working through SRAS.

Figure 3 — Adjustment to long-run equilibrium



Mishkin Ch. 22, Section 22.4. Starting at the boom E_1 (output above Y^P), the positive output gap drives SRAS upward until equilibrium reaches E_2 on LRAS — inflation higher, output back at potential.

The self-correcting mechanism

The central result

Wherever output starts, it returns to the **natural rate** Y^P over time. A positive output gap pushes SRAS up (inflation rises until Y falls to Y^P); a negative gap pushes SRAS down (until Y rises to Y^P).

The open question is *how fast*:

- ▶ **Slow** adjustment — wages are inflexible, especially *downward*. If correction takes years, there is a case for **active stabilization policy**.
- ▶ **Rapid** adjustment — wages and prices are flexible, so the gap closes quickly and there is *less* need for government intervention.

Your view on the **speed** of self-correction is, in large part, your view on how activist policy should be — a debate we return to in Chapter 23.

PART 4

Demand and Supply Shocks

Aggregate demand shocks

A **demand shock** shifts the AD curve. Trace the short run and the long run:

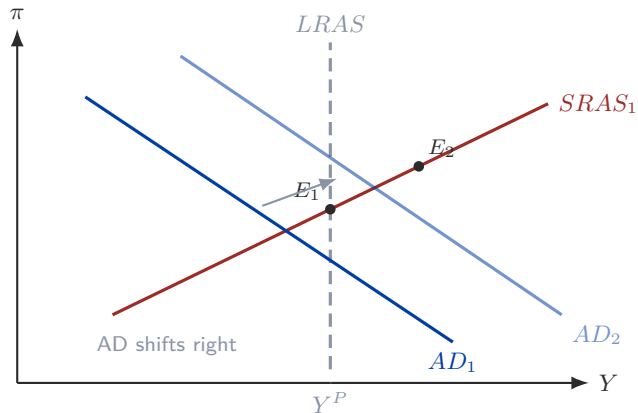
- ▶ A **positive** demand shock (say, a fiscal expansion or an easier policy stance) shifts AD *right*.
- ▶ **Short run**: output rises above Y^P and inflation rises — a boom with a positive output gap.
- ▶ **Long run**: the positive gap drives SRAS *up*; output slides back to Y^P , leaving *only higher inflation*.

Conclusion

A shift in AD changes output **only in the short run** and has **no long-run effect on output** — it changes only the inflation rate. This is the AD/AS version of long-run monetary neutrality.

Mishkin Ch. 22, Section 22.5.

Figure 4 — A positive aggregate demand shock



Mishkin Ch. 22, Section 22.5. AD shifts right: short-run equilibrium moves to E_2 with higher output and higher inflation. The positive gap then lifts $SRAS$ until output returns to Y^P at still-higher inflation.

Aggregate supply (price) shocks

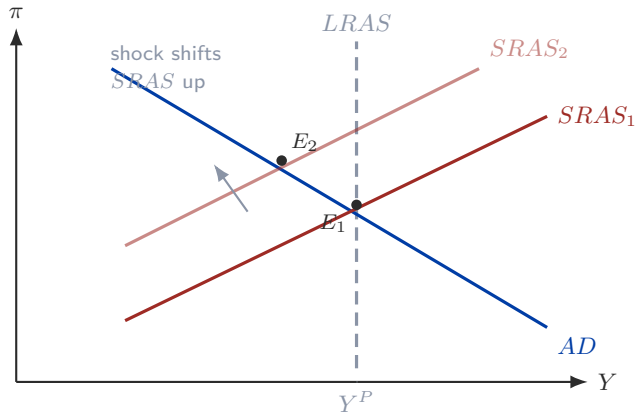
A **supply shock** shifts the aggregate supply side. Distinguish two kinds:

- ▶ **Temporary supply shock** — LRAS does *not* move. A *negative* (unfavorable) shock — e.g. a spike in oil prices — shifts SRAS *up and left*: inflation rises, output falls. This is **stagflation**.
- ▶ In the long run, with AD unchanged, the negative gap pulls SRAS back down: output and inflation **return to where they started**.
- ▶ A temporary *positive* shock does the mirror image — lower inflation, higher output short-run, then back.

Permanent supply shocks

A *permanent* negative shock (e.g. a lasting efficiency loss) shifts **LRAS left** and SRAS up — potential output itself falls. **Real business cycle theory** (Prescott) holds that such permanent supply shocks drive the cycle.

Figure 5 — A temporary negative supply shock

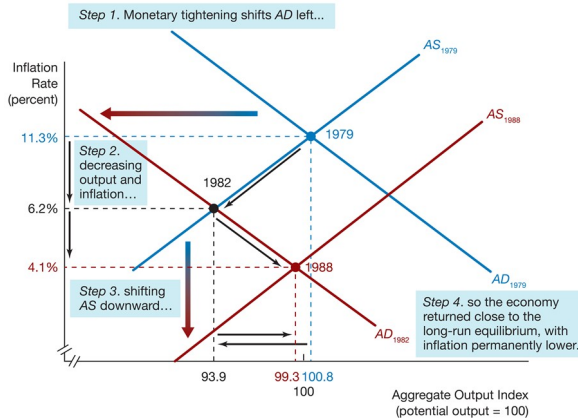


Mishkin Ch. 22, Section 22.6. A negative supply shock raises inflation and lowers output (stagflation, E_2). With AD and $LRAS$ fixed, the resulting negative gap returns the economy to E_1 over time.

PART 5

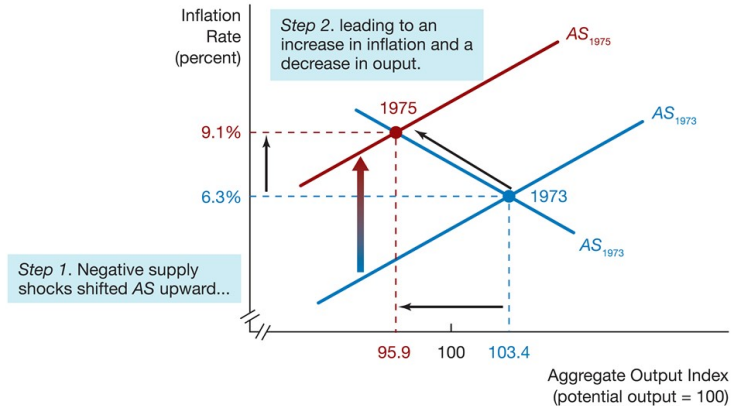
Applications

Figure 6 — The Volcker disinflation



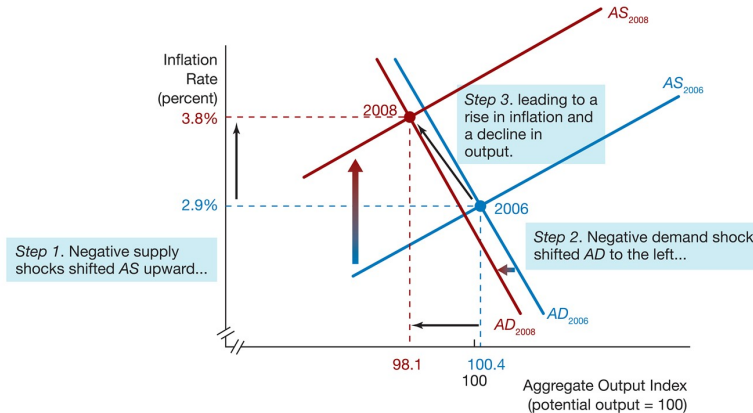
Mishkin Ch. 22, Figure 14. Monetary tightening shifts AD left (1979→1982): output and inflation fall; as expectations adjust, SRAS shifts down (1982→1988) and output recovers near potential with inflation permanently lower.

Figure 7 — Negative supply shocks, 1973–1975



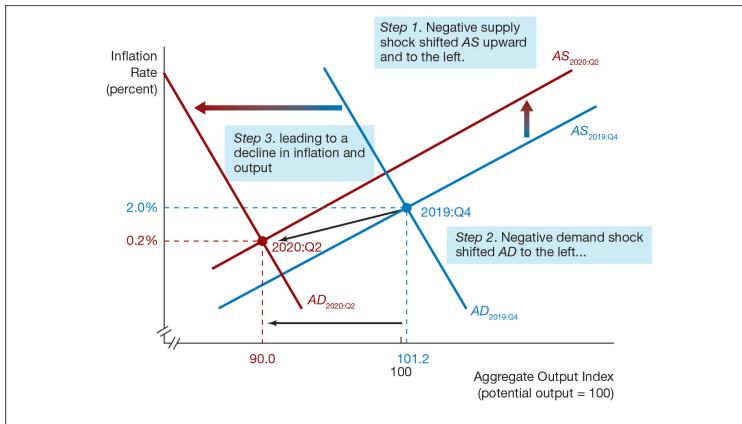
Mishkin Ch. 22, Figure 16. The 1973–75 oil shocks shifted SRAS up and to the left — inflation jumped from 6.3% to 9.1% while the output index fell from 103.4 to 95.9: textbook stagflation.

Figure 8 — First phase of the Great Recession



Mishkin Ch. 22, Figure 17. In 2007–08 supply shocks (commodity prices) shifted AS up while the financial crisis's negative demand shock shifted AD left — inflation rose to 3.8% as output began to fall.

Figure 9 — The Covid-19 recession



Mishkin Ch. 22, Figure 19. A massive negative supply shock (lockdowns) and a massive negative demand shock hit together; an offsetting oil-price collapse meant inflation fell only to 0.4% even as output plunged from 101.2 to 90.0.

Reading the applications through the model

The same three moves explain four very different episodes:

- ▶ **Volcker (1979–88)** — a deliberate, contractionary **demand** shock to break inflation; painful in the short run, durable disinflation in the long run.
- ▶ **1973–75** — a textbook **negative supply** shock: stagflation, with inflation and unemployment rising together.
- ▶ **2007–09** — a *combination*: adverse supply (commodities) and a sharp negative **demand** shock from the financial crisis.
- ▶ **Covid-19 (2020)** — a simultaneous **supply** and **demand** collapse, with the net inflation effect blurred by an offsetting oil-price drop.

The payoff

Two curves and three shift-factors let you decompose almost any macro episode into demand vs. supply and short run vs. long run.

Conclusions from AD/AS analysis

Three results to carry forward:

1. The economy has a **self-correcting mechanism** that returns it to potential output and the natural rate of unemployment over time.
2. A shift in the **aggregate demand** curve affects output **only in the short run** — no long-run output effect, only a change in inflation.
3. A **temporary supply shock** affects output and inflation **only in the short run** (holding AD constant); only *permanent* supply shocks move potential output.

The bridge to policy

These conclusions are exactly what a central bank needs. They tell it *which* shocks demand a response, and what the long-run cost of an inflationary demand stimulus really is.

PART 6

Wrap-up

Key terms from Chapter 22

- ▶ aggregate demand; $Y^{ad} = C + I + G + NX$
- ▶ aggregate demand (AD) curve
- ▶ autonomous spending; financial frictions
- ▶ long-run aggregate supply (LRAS)
- ▶ potential output; natural rate of unemployment
- ▶ short-run aggregate supply (SRAS)
- ▶ output gap; expected inflation
- ▶ inflation (supply) shock
- ▶ short-run vs. long-run equilibrium
- ▶ self-correcting mechanism
- ▶ demand shock; supply shock
- ▶ temporary vs. permanent shock; stagflation
- ▶ real business cycle theory
- ▶ Phillips curve; Okun's law

The one idea to take away

Demand sets output in the short run; supply sets it in the long run

The vertical **LRAS** pins output at potential Y^P in the long run, so **demand shocks change only inflation** once the dust settles. In the short run, sticky prices give an upward-sloping **SRAS**, so both demand and supply shocks move output — but the **self-correcting mechanism**, acting through the output gap, always drives the economy back to Y^P .

- ▶ This is the engine room. Every policy claim — about stimulus, disinflation, or supply shocks — is a statement about how these two curves move.
- ▶ Next: **Chapter 23** — *Monetary Policy Theory*. We put the central bank's reaction function inside this model and ask how it *should* respond to each kind of shock.