

# 14

## Policy in the AS/AD model

**Tools:** Aggregate supply and demand (AS/AD) graph.

**Key Words:** Policy objectives; potential output; output gap.

**Big Ideas:**

- The objectives of monetary policy are generally thought to be (i) stable prices and (ii) output near its long-run equilibrium level.
- A direct consequence is that monetary policy should respond differently to demand and supply shocks. As a general rule, policy should resist/offset changes in output triggered by shifts in demand and accommodate/reinforce changes triggered by shifts in supply.
- We can identify supply or demand shocks from whether output and prices move together or in opposite directions.

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We've seen that aggregate demand and supply can shift on their own or, sometimes, as a result of changes in policy, including monetary policy. But what policy changes are called for? Should we always shift the aggregate demand curve to maintain low inflation? High output? Are these two objectives in conflict? The short answer is that we should respond differently to changes in supply and demand. A somewhat longer answer follows.

### 14.1 Objectives of policy

The traditional guide to economic policy is the invisible hand. If markets work well, then we simply leave them to do their job. If not, we may act to

facilitate their operation. In the aggregate demand and supply framework, the idea is that the long-run aggregate supply curve is where the uninhibited operation of markets would lead us. In the short run, sticky wages (or other market imperfections) may delay the adjustment, but that's where the invisible hand ultimately would direct us. One consequence is that there's no compelling reason to change aggregate demand to increase output beyond its long-run equilibrium value. We might be able to do it, but it won't make us better off. In a sense, we will have tricked people into working more than they want, typically by reducing their real wages through unexpected inflation.

The first objective of policy, then, is to get output as near as possible to the level associated with the long-run aggregate supply curve  $AS^*$ . This is important enough a concept that people have given it lots of names: potential output, full employment output, and so on. We'll call it *potential output*, with the understanding that it's the long-run equilibrium, not an upper bound. The *output gap* is a related concept: the difference between actual and potential output. In practice, potential output is a little slippery, because the long-run aggregate supply curve isn't something we observe. We have a variety of ways of estimating potential output, ranging from the complex to the pragmatic (a smooth trend line drawn through actual output). We give some examples (and links) at the end of the chapter.

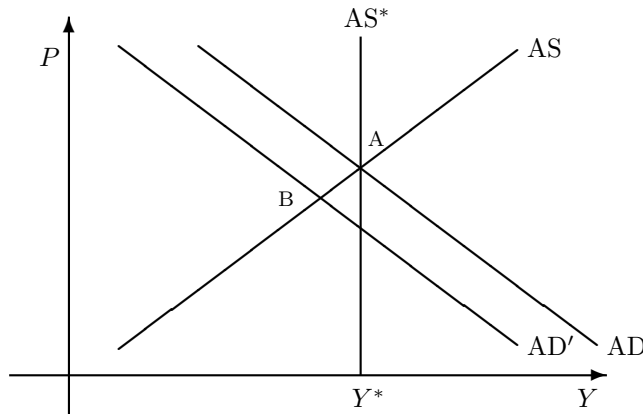
The second objective of policy is price stability. That's not an obvious implication of the invisible hand, but experience has taught us that low and (especially) stable rates of inflation are associated with good macroeconomic performance. You might ask whether we'd be better off with no inflation, low inflation (say, two or three percent a year), or even modest deflation (yes, there are theoretical arguments for that). However, experience suggests that it doesn't matter too much. Any stable target is better than the high and variable inflation that the US and many other countries experienced in the 1970s.

## 14.2 Policy responses to supply and demand shocks

With potential output and stable prices as our objectives, how should policy respond to changes in aggregate supply or demand? Curiously, the answer depends on whether we face supply shocks or demand shocks.

How should we respond to demand shocks? Consider a negative demand shock, illustrated by Figure 14.1. The long-run equilibrium is point A, where aggregate supply  $AS^*$  and aggregate demand AD cross. Suppose that consumer pessimism shifts the aggregate demand curve to  $AD'$ , leaving us

Figure 14.1: The impact of an adverse demand shock.



Aggregate demand  $AD$  shifts left to  $AD'$ , moving the short-run equilibrium from  $A$  to  $B$ .

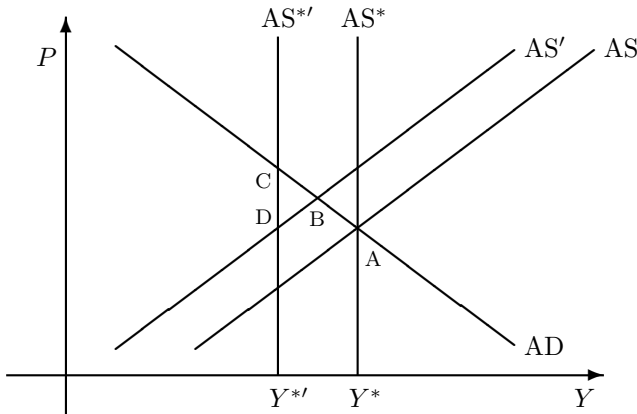
at point  $B$ . What should we do? If we do nothing, we fail on both of our objectives because output is below potential and prices have fallen. The appropriate policy, then, is to shift the demand curve back to  $AD$ , perhaps by expanding the money supply.

That's a general rule: Policy should offset demand shocks. In this case, there is no conflict between our two goals of hitting potential output and maintaining stable prices. The policy lesson: We should resist or offset demand shocks.

How should we respond to supply shocks? Consider the situation depicted in Figure 14.2: an adverse supply shock that moves us from  $A$  to  $B$ . Should policy try to offset the decline in output? If we follow our logic, the answer is no; we want to move output as close to the long-run aggregate supply curve  $AS^*$  as possible. We do this by moving the aggregate demand curve left (left!) until it intersects both aggregate supply curves at point  $D$ . At this point, the price level is the same as it was at  $A$ , so we have delivered stable prices. Output has fallen more than if we had not acted, but that's what the invisible hand suggests. The policy lesson: We should acquiesce to or accommodate supply shocks.

The basic lesson, then, is that we want to react differently to changes in output that result from supply and demand shocks. We should resist demand shocks and accommodate supply shocks. The difficulty, in practice,

Figure 14.2: The impact of an increase in the price of oil.



Aggregate supply curves shift left from  $AS/AS^*$  to  $AS'/AS^{*'}$ , moving the short-run equilibrium from A to B.

is knowing which is which. If we guess wrong, we can make things worse, perhaps a lot worse.

By some interpretations, the Fed made exactly this mistake in the 1970s. With output falling and inflation rising, the Fed increased the money supply to keep output up. With hindsight, the OPEC oil price increase is understood to be an adverse supply shock. It reduced output, but there was little we could do about it. When we increased the money supply, the consequence was that low output was accompanied by even higher inflation than before. Having failed to understand the problem, we decided to give it a name: stagflation.

## Executive summary

1. We typically think of the goals of macroeconomic policy as keeping inflation low and output near the long-run supply curve.
2. As a general rule, policy should resist changes in output triggered by shifts in demand and accommodate/acquiesce to changes triggered by shifts in supply.

## Review questions

1. Consider the situation in Figure 14.1, where an adverse demand shock moves us from A to B.
  - (a) What is your welfare analysis of the change? In what ways is B better than A? Worse?
  - (b) How would your answer change if AD shifted to the right, rather than the left?

Answer.

- (a) Recall the objectives of policy: (i) stable prices and (ii) output at its long-run equilibrium value  $Y^*$ . In this case prices fall, so we fail on (i), and output moves away from  $Y^*$ , so we fail on (ii).
  - (b) In this case output and prices both rise, but both are bad from a welfare point of view. Note specifically that it's not true that more output is better.
2. Current economic conditions.
  - (a) What have inflation and GDP growth been over the past year?
  - (b) Would you say demand has shifted or supply relative to the year before?
  - (c) Using this information and anything else you think is appropriate, where is the economy relative to the long-run equilibrium level of output  $Y^*$ ?

Answer.

- (a,b) The idea is to look at the numbers and decide whether we seem to be experiencing a shift in supply or demand — or perhaps neither. If inflation and output growth have moved together, we'd say demand. If they've moved in opposite directions, we'd say supply.
  - (c) Good question. What would you suggest?
3. Stimulus in China. In 2009, China responded to the financial crisis by implementing a massive program of government spending on infrastructure. Your mission is to outline the argument for or against such a program using the aggregate supply and demand (AS/AD) framework.
  - (a) Over the last year, output growth and inflation have both fallen in China. Would you say this comes from a shift in supply or demand? Illustrate your answer with the appropriate diagram.
  - (b) Describe the impact of a large increase in government spending on infrastructure projects. What is the likely impact on output? On inflation?

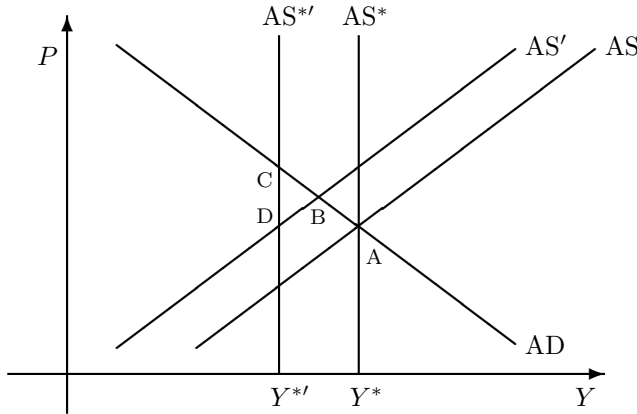
- (c) What are the traditional goals of macroeconomic policy, expressed in terms of aggregate supply and demand? Does the Chinese spending program move them closer to these goals?

Answer.

- (a) Shifts in demand move output and prices in the same direction, shifts in supply move them in opposite directions. (By longstanding tradition, we interpret output as output growth and prices and inflation.) Since they both fell, we would interpret this as a shift left in demand.
  - (b) This is a *purchase* of goods; therefore, it affects demand. A shift right in demand increases both output growth and inflation.
  - (c) The goals are (i) output equal to the long-run aggregate supply curve  $AS^*$  and (ii) stable prices. The answer depends where you start: Are we to the left of  $AS^*$  prior to the stimulus? If so, then the stimulus program moves output in the right direction. Ditto with inflation: If we start with stable prices, the stimulus generates inflation.
4. Aggregate implications of employer-provided health insurance. By an accident of history, health insurance in the US is generally provided by employers. Suppose a sharp rise in healthcare costs leads firms to hire fewer workers.
- (a) How would you represent this in an aggregate supply and demand diagram? Which curve shifts? In which direction?
  - (b) What is the new short-run equilibrium? Long-run equilibrium? What happens to inflation and output?
  - (c) How should the central bank respond? Be specific about its goals and how it would accomplish them.

Answer.

- (a) Since we're talking about firms and production, this must involve the supply side of the model. We shift  $AS$  and  $AS^*$  to the left, both by the same amount. See the figure below.
- (b) We started at A. After the shift, we move to a new short-run equilibrium at B, where the new  $AS$  crosses  $AD$ . Evidently output falls and prices rise.  
Eventually we move to a new long-run equilibrium at C, where  $AD$  crosses the new  $AS^*$ . At this point, output has fallen more and prices have risen more.



- (c) The central bank has two goals: stable prices and output at its long-run equilibrium. Here we've moved from  $A$  to  $C$ . We're ok at  $C$  on the second goal: output fell, but that's the long-run equilibrium so there's nothing monetary policy can do about that. (We could consider other policies, but they're not the job of the central bank.) Where  $C$  is bad is with respect to price stability: prices are higher. So the central bank could shift  $AD$  to the left, giving us the same long-run output but lower prices. The central bank would accomplish this by reducing the money supply, which it might do by targeting a higher interest rate.

5. The supply and demand of Abenomics. Shinzo Abe was elected Prime Minister of Japan in December 2012 after two decades of slow growth and falling prices. He pledged dramatic policy changes to revive the Japanese economy, dubbed the "three arrows" of "Abenomics." We consult the Economist Intelligence Unit for specifics:

- Fiscal stimulus. A sizeable economic stimulus package was passed by parliament in February 2013, and a smaller one in October.
- Monetary stimulus. A plan to double Japan's money supply within two years was implemented in April 2013 to help to achieve the Bank of Japan's target of 2% inflation.
- Structural reform. This is less clearly articulated, but some observers hope for a range of micro-based reforms, including loosening product-market regulations that reduce productivity, tightening corporate requirements for funding pensions, creating a more flexible labor market, and reducing subsidies to an inefficient agricultural sector.

Your mission is to explore the impact of the three arrows using the aggregate supply and demand framework.

- (a) Explain, for each “arrow,” whether it affects supply or demand. Which way does each one shift the appropriate curve(s)?
- (b) Compare the short- and long-term impact on output of the three policies. Which are likely to have the greatest impact in the short term? In the long term?

Answer.

- (a) We have:
  - Fiscal stimulus. This shifts aggregate demand to the right.
  - Monetary stimulus. Same.
  - Structural reform. This shifts both aggregate supply curves to the right.
- (b) Fiscal and monetary stimulus raise output in the short run. They have no long-run impact on output.  
Structural reform is likely the most important of the arrows for the long-term performance of the Japanese economy. It should raise output long term, in large part by increasing productivity, but short-term transition issues could go the other way. It’s also the arrow that’s been executed least aggressively.

## If you’re looking for more

The measurement of potential output has generated some interesting debate. The bottom line, in our view, is that there’s usually some question where the long-run aggregate supply curve is. Here is a range of opinion on the subject:

- The Congressional Budget Office (CBO) reviews a number of approaches. Search: “cbo potential output.”
- Former Fed Governor Frederic Mishkin’s speech, “Estimating potential output,” is another good overview. Search: “mishkin potential output.”
- The Kansas City Fed’s 2005 Jackson Hole Symposium has an interesting exchange between Robert Hall and Greg Mankiw. Hall argues that potential output may very well not be smooth, which would contradict most measures of it. As a practical matter, this would change our view of monetary policy dramatically since many of the movements we see in GDP would be the result of the invisible hand and, therefore, not something for policymakers to resist. Mankiw says maybe, maybe not. Search: “Jackson Hole Symposium 2005.”



## Symbols and data used in this chapter

Table 14.1: Symbol table.

Symbol	Definition
$Y$	Real output (=real GDP)
$Y^*$	Equilibrium (or potential) output
$Y^{*'} $	New equilibrium (or potential) output
AS	Short-run aggregate supply
AS*	Long-run aggregate supply
AD	Aggregate demand
AD'	Aggregate demand after a shock
AS'	Aggregate supply after a shock

Table 14.2: Data table.

Variable	Source
NBER recession indicator	USRECM
CBO real potential GDP	GDPPOT
Oil Price (WTI)	OILPRICE

To retrieve the data online, add the identifier from the source column to <http://research.stlouisfed.org/fred2/series/>. For example, to retrieve oil prices, point your browser to <http://research.stlouisfed.org/fred2/series/OILPRICE>



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