

Aggregate demand & aggregate supply, recessions, and fiscal policy

1. A downward spiral

Suppose the stock market crashes, as it did in 1929, or the housing market collapses, as it did in 2008. If either were to happen again, a significant asset for many people (stocks or homes) would suddenly decline in value. This means that household wealth would decline, which means that consumption expenditures would also decline. This pattern could then easily develop:

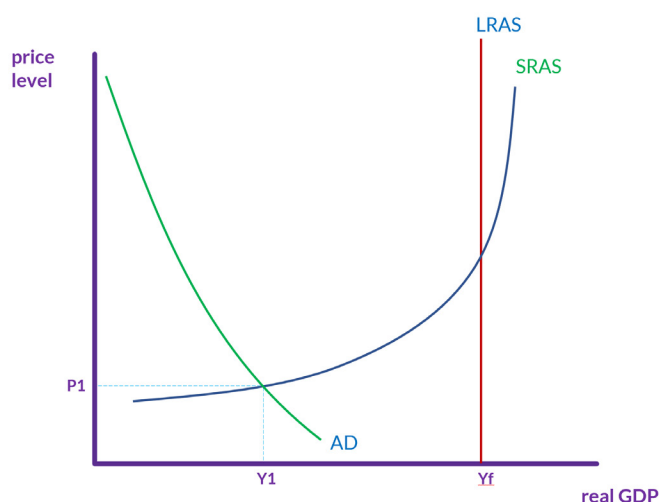
- (a) Businesses would see that consumer spending was falling, and they would reduce investment expenditures and the number of people that they employ.
- (b) This increase in unemployment and decline in business spending would further decrease consumer spending.
- (c) This further decline in consumer spending would motivate businesses to further reduce investment expenditures and the number of people that they employ.
- (d) This further increase in unemployment and decrease in business spending would further decrease consumer spending.
- (e) and on it goes . . .

One trigger can cause a cycle that drives the economy into a recession or, worse, a depression. And this can happen while the economy's potential to employ a lot of people and produce lots of goods and services remains largely unchanged. During the Great Depression, for instance, the physical capacity of the economy to supply goods did not alter much. No flood or earthquake or other natural disaster ruined factories in 1929 or 1930. No outbreak of disease decimated the ranks of workers. No key input price, like the price of oil, soared on world markets. The U.S. economy in 1933 had just about the same factories, workers, and state of technology as it had had four years earlier in 1929—and yet the economy had shrunk dramatically. This also seems to be what happened in 2008.

As we discussed in the chapter on unemployment, wages are *sticky downward*. There are a number of possible reasons why this might be, but the effect is that, when demand for labor declines, wages don't adjust downward (as we expect that they would based on the supply and demand model). Consequently, we end up with some amount of cyclical unemployment, and until wages adjust or companies have a reason to begin increasing production (and hiring more workers to do so), we are likely to be stuck with it—unless there is some other way to increase aggregate demand.

2. Low aggregate demand

In the figure below, the point where aggregate demand and aggregate supply intersect is well below potential GDP (i.e., long-run aggregate supply), and so, among other effects, unemployment is high. How can aggregate demand be increased?



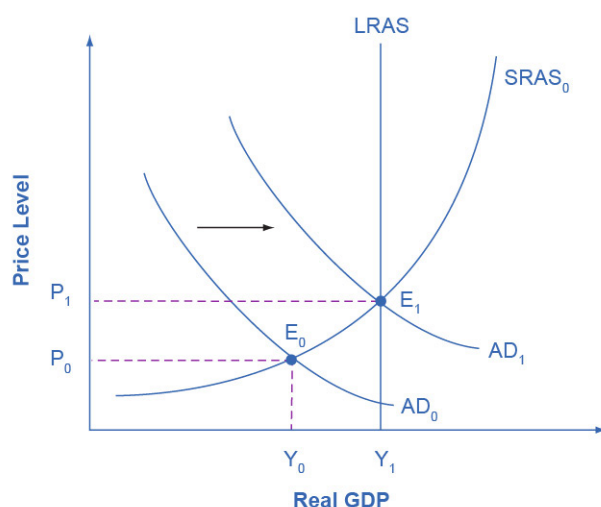
Although wages are sticky downward, they will, over time, adjust, and so one solution is to just wait for that to happen. When it does, aggregate demand will increase, and the point where AD is equal to SRAS will move closer to potential GDP. Because wages are sticky, however, this can take a long time and high unemployment (and its effects) is a serious problem that generally requires a more immediate response.

Hence, to get out of recessions, most governments turn to fiscal policies: “the use of government spending and tax policy to influence the path of the economy over time” (p. 418). The rationale here is easy to see if we consult the table on p. 301. The government can—in a way that no individual consumer or firm can—increase or decrease aggregate demand through its own spending and by raising or lowering taxes.

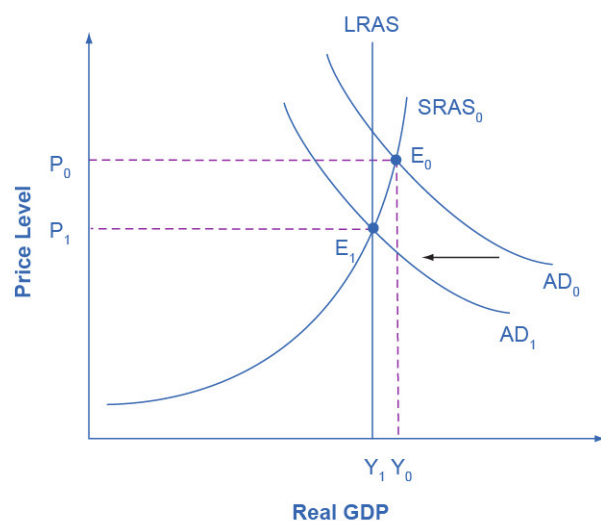
3. Fiscal policy

Expansionary fiscal policy increases the level of aggregate demand, through either increases in government spending or reductions in tax rates. Expansionary policy can do this by (1) increasing consumption by raising disposable income through cuts in personal income taxes or payroll taxes; or by (2) increasing investment spending by raising after-tax profits through cuts in business taxes; and (3) increasing government expenditures through increased federal government spending on final goods and services and providing federal grants to state and local governments to increase their expenditures on final goods and services. *Contractionary fiscal policy* does the reverse: it decreases the level of aggregate demand by decreasing consumption, decreasing investment, and decreasing government spending, either through cuts in government spending or increases in taxes.

Consider the situation in the figure below. The intersection of aggregate demand (AD_0) and aggregate supply ($SRAS_0$) is occurring below the level of potential GDP (i.e., LRAS). At the equilibrium (E_0), the economy is in a recession and unemployment is above the natural rate. In this case, expansionary fiscal policy using tax cuts or increases in government spending shifts aggregate demand to AD_1 , at which point we have reached full employment.



Fiscal policy can also be used to reduce aggregate demand when the intersection of aggregate demand (AD_0) and aggregate supply ($SRAS_0$) occurs at equilibrium E_0 as in the figure below. Here, output is above potential GDP, and although unemployment is low, even small increases to aggregate demand will cause significant inflation without much increase to output (i.e., without much increase to real GDP). In this situation, contractionary fiscal policy, which involves federal spending cuts or tax increases, will shift aggregate demand to the left (to AD_1) and move the new equilibrium (E_1) to the point where aggregate demand = short-run aggregate supply = long-run aggregate supply.



4. The multiplier effect

If you are familiar with the AD-AS model, then the basic description of fiscal policy given in the previous section should make sense. A less intuitive aspect of fiscal policy—in particular, expansionary fiscal policy—is the *multiplier effect*. This is the effect that government spending has on aggregate demand as this spending cycles through the economy.

Let's say that, in an effort to increase aggregate demand, the government spends \$1,000 on a project that Mary executes. This government spending constitutes a \$1,000 increase to aggregate demand, and so the AD curve shifts to the right by this much. Mary does the work and is paid \$1,000. She pays 20 percent of this in taxes (\$200) and spends the rest (\$800). This is an \$800 increase to aggregate demand, and so the AD curve shifts to the right by this much again.

The people who receive the \$800 pay 20 percent in taxes (\$160) and spend the rest (\$640). The people who receive the \$640 do the same, and on it goes. This can't go on forever (if we can't spend less than \$0.01), but it takes many rounds of people paying and being paid to get there. When it does end, the government, Mary and everyone else has spent almost \$5,000. Moreover, almost \$1,000 has been paid in taxes, and so the government has recouped its initial expenditure. If we assume that this money is spent on domestically produced goods and services, then this is a \$5,000 increase to aggregate demand (and so, a \$5,000 increase to GDP). (If we, theoretically, consider being able to spend ever smaller fractions of 1¢, then this process will go on forever and move ever closer to \$1,000 back to the government in taxes and \$5,000 in total expenditures. In the calculations that we will introduce shortly, we will presume that we are able to reach those points.)

	expenditures	taxes	
1. the government spends & Mary receives:	\$ 1,000.00	\$ 200.00	\$ 800.00
2. Mary spends & other people receive:	\$ 800.00	\$ 160.00	\$ 640.00
3.	\$ 640.00	\$ 128.00	\$ 512.00
4.	\$ 512.00	\$ 102.40	\$ 409.60

5.	\$ 409.60	\$ 81.92	\$ 327.68
6.	\$ 327.68	\$ 65.54	\$ 262.14
7.	\$ 262.14	\$ 52.43	\$ 209.72
8.	\$ 209.72	\$ 41.94	\$ 167.77
9.	\$ 167.77	\$ 33.55	\$ 134.22
10.	\$ 134.22	\$ 26.84	\$ 107.37
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totals after 52 rounds:	\$4,999.96	\$ 999.99	

If instead of spending all of the after-tax income, Mary and everyone else in our example saves 10 percent of it, then the government will only collect a little more than \$714 in taxes, and Mary and everyone else will only spend about \$2,571. This will still, however, create a \$3,571 increase in aggregate demand (that is, government's \$1,000 expenditure plus everyone else's expenditures).

The calculation that produces the figures given in the table above is relatively easy with a spreadsheet, but there is also a formula. If we assume that each person's extra income that comes from the government's expenditure goes either to taxes or to spending on goods and services, then we use this formula, where t is the tax rate:

$$\text{spending multiplier} = \frac{1}{1 - [1 - (t)]}$$

So, our example yields this:

$$\text{spending multiplier} = \frac{1}{1 - [1 - (.20)]} = \frac{1}{1 - [.80]} = \frac{1}{.20} = 5$$

The multiplier, 5, means that, after many rounds of spending cycling through the economy, aggregate demand has increased by five times the government's initial expenditure of \$1,000.

If our analysis includes savings, then we need to define the *marginal propensity to save* (MPS) and the *marginal propensity to consume* (MPC). These are the percentages of each additional dollar that a person or household will save or consume. Mary might act differently

with the first \$40,000 that she earns, but, right here, we just care about this extra or last \$1,000 that she has earned. Let $MPC = 1 - MPS$. This is the formula:

$$spending\ multiplier = \frac{1}{1 - [MPC - (t)(MPC)]}$$

In our example, $t = .20$ and $MPC = .10$, and we calculate the multiplier this way:

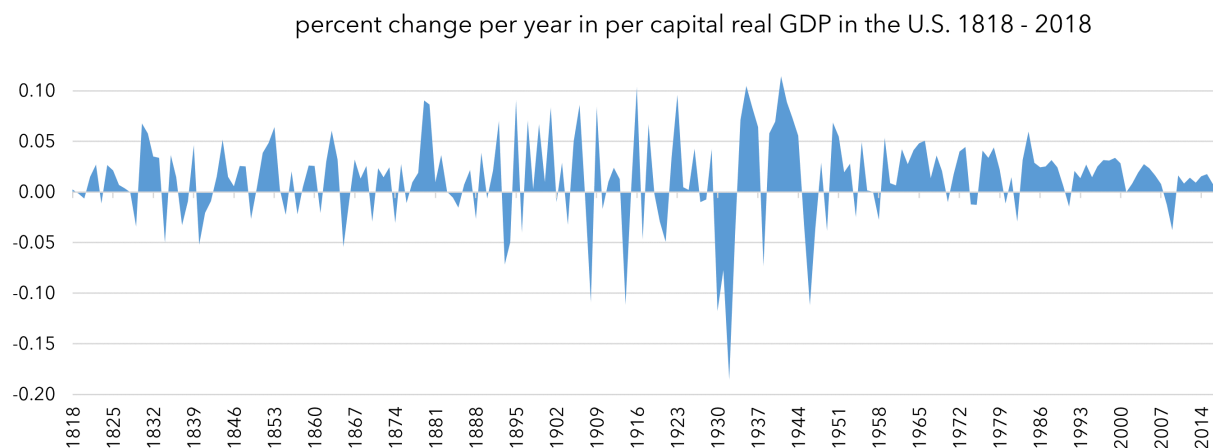
$$spending\ multiplier = \frac{1}{1 - [.90 - (.20)(.90)]} = \frac{1}{1 - [.90 - .18]} = \frac{1}{.28} = 3.571$$

This calculation tells us that the government's \$1,000 expenditure increased aggregate demand by \$3,571 (i.e., $\$1,000 \times 3.571 = \$3,571$).

5. Automatic stabilizers

In the case of a recession, especially a severe one, the U.S. Congress and President can and often will implement new policies to shift aggregate demand and bring the country out of recession. But some changes to taxes and spending happen automatically, without policymakers taking any new action. These automatic effects do not completely prevent recessions, but they seem to have minimized them since the end of the Great Depression. Here is how it works.

When aggregate demand is falling and the economy is at risk of entering a recession (or already has), the policy prescription is for an expansionary fiscal policy: some mix of tax cuts and spending increases. To an extent *both* happen automatically. Low aggregate demand and higher unemployment lowers personal incomes and corporate profits, which automatically reduces the amount of taxes that are paid by individuals and by firms. (Making less money entails paying less taxes, even if the percentage one pays in taxes stays the same. And sometimes making less money moves someone into a lower tax bracket, which means that the person will pay a smaller percentage of taxes on the highest part of his or her income.) Higher unemployment also causes the government to increase its spending on unemployment benefits, food stamps (SNAP), temporary relief for needy families (TRNF), and Medicaid. These automatic changes will, to an extent, increase aggregate demand, or at least prevent it from sliding too much lower.



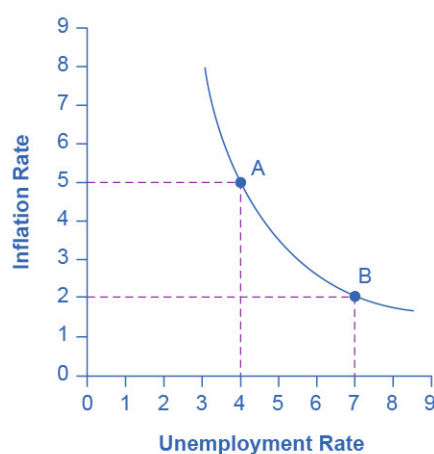
data from the Maddison Project Database 2020 (<https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020>)

A look at economic history provides an illustration of the power of automatic stabilizers. The chart right above shows the yearly percent change to per capita real GDP in the United States. The dips in the graph—that is, when the values are below 0.0—are when per capita real GDP has fallen relative to the previous year. These will, therefore, all be recessions. If we look at the frequency and the size of these negative values, we see that they have become much less frequent and smaller since 1950. One reason why the economy has encountered recessions less frequently since then is because both the tax system and the government programs that serve as a safety net have expanded since the Great Depression. Consequently, even without policymakers doing anything, fiscal policies that adjust to changes in individuals' economic situations are a countervailing force to declines in aggregate demand.

6. The Phillips curve

In the AD-AS model, when SRAS is constant and AD is declining, the price level is falling (and so there is deflation) and unemployment is increasing. On the other hand, if AD is increasing while SRAS is constant, then the price level is increasing (and so there is inflation) and unemployment is decreasing. In the 1950s, A.W. Phillips, an economist at the London School of Economics, was studying the AD-AS model (which was still relatively new at the time). He noticed that the model suggested that, during a recession, inflationary pressures are low, but

when the level of output is at or even pushing beyond potential GDP, the economy is at greater risk for inflation. Phillips analyzed 60 years of British data and found this tradeoff between unemployment and inflation, which became known as the Phillips curve. The graph right below shows a theoretical Phillips curve with the rate of inflation and unemployment rate on the vertical and horizontal axes.



During the 1960s, economists viewed the Phillips curve as a policy menu. A nation could choose low inflation and high unemployment, or high inflation and low unemployment, or anywhere in between. Governments could use fiscal and monetary policy to move up or down the Phillips curve as desired. This neat relationship only holds, however, when SRAS is roughly constant and aggregate demand is increasing or decreasing.

There is, of course, the scenario where aggregate demand is constant and SRAS is decreasing. The U.S. economy experienced this pattern in the deep recession from 1973 to 1975, and again in back-to-back recessions from 1980 to 1982. Many nations around the world saw similar increases in unemployment and inflation. This pattern became known as *stagflation*: a combination of high unemployment and high inflation. This was a scenario that the Phillips curve (at least in its traditional form, shown in the graph above) implied was not possible. Perhaps most important, stagflation was a phenomenon that manipulating aggregate demand could not easily fix.

Economists have concluded that two factors cause this stagflation. The first is supply shocks, like the mid-1970s oil crisis, which first brought stagflation into our vocabulary. The

second is changes in people's expectations about inflation. In other words, there may be a tradeoff between inflation and unemployment when people expect no inflation, but when they realize inflation is occurring, the tradeoff disappears.