Short-run aggregate supply notes

1. Why the SRAS curve has a positive slope

You may recall that the *market supply curve* slopes upward—that is, it has a positive slope—because of the law of diminishing returns. To increase, for instance, the number of bushels of wheat that are produced, resources must be shifted to wheat production and away from other kinds of production. As wheat production is increased, the costs of these shifts increase and it is more difficult to produce each additional bushel. Initially, let's say, wheat is only being grown on the land that is most suited to growing it. But then, to increase its production, land and other resources that are more suited to growing other crops begin to be used for wheat. However this works out—more time, or more water, or more maintenance of the land—producing wheat on this new land is more difficult and costly. Even more wheat production would, then, require using more land and other resources that are even less suited to producing wheat. And on it would go with increasing costs. These increasing costs translate into higher prices, and so as the production of wheat increases, the price at which it is sold increases. That's why the market supply curve slopes upward.

The aggregate supply curve also slopes upward, but it can't be for the same reason. When we are talking about *aggregate* (that is, total) supply, there isn't any shifting of resources from the production of one good to another. Everything is already included in the aggregate supply. So, why does the short-run aggregate supply (SRAS) curve have a positive slope? We will consider three theories for why this is: the *sticky wage theory*, the *sticky price theory*, and the *misperceptions theory*. Before we begin, here are three points to keep in mind:

(*a*) The first two theories maintain that wages and prices are sticky downward and upward. Thus, in both directions, wages and prices are slow to adjust when other economic factors change.

(*b*) These theories seek to explain the effects of unexpected changes to the price level.

(*c*) These are theories about why the *short-run* aggregate supply curve slopes upward, and so they all describe effects in the short-term. In the long-term (i.e., eventually), we expect

that wages and prices will adjust, and, for the third theory, producers and workers will figure out that *all* prices are changing.

The first theory is the **sticky-wage theory**. The central idea for this theory is that nominal wages are slow to adjust—upward and downward—to changes in the price level. Here are the two scenarios.

(a) The price level falls, but employers are unable to (or just don't) adjust wages downward. Goods and services are being sold for less, but firms still have high labor costs. Hence, they reduce the number of employees that they have (either by not hiring or by laying people off). This reduction in the number of employees reduces output.

(b) The price level increases, but employers don't increase wages right away. Goods and services are being sold for more, and firms have low labor costs. Hence, they can hire more employees or give their current employees more hours, which increases output.

The second theory is the **sticky-price theory**. This theory is similar to the previous one, but, as its name suggests, its focus is on all prices, not just wages. In this theory, it is the prices for some goods and services that are slow to adjust when the price level changes. One aspect of this theory that is a little odd is the idea that, while the price level (which is based on all prices) is rising or falling, some individual prices are not changing. Clearly it can't be all or even most prices that aren't changing (or the price level wouldn't be changing). But it is possible for changes to the price level to be driven by increases or decreases in the prices of only certain very significant goods (e.g., gas, used cars, food, rent) while many other prices are slow to change.

(*def.*) menu costs: The costs of changing the price of a good or service (p. 303). This includes the costs associated with changing price tags, websites, printed materials, and any other places where the (nominal) price has already been given. Menu costs also include the costs incurred by confusing or angering customers, and the cost of determining what the new price should be.

Here are the two scenarios:

(a) The price level decreases, but, because of menu costs or existing contracts, some firms don't adjust their prices downward. Consequently, because their prices are too high, their sales decline. These firms, then, reduce employment and output.

(b) The price level increases, but, because of meu costs or existing contracts, some firms don't raise their prices. Their sales increase, and so they increase investment and employment, which increases output.

Third is the **misperceptions theory**. This theory is different than the previous two in that it doesn't include the idea that prices or wages are sticky. Rather, it states that all prices adjust but that people misinterpret the change to the price that they watch the most closely. If a perfectly informed person understood that all prices (including wages) were changing, then this person would have no reason to change his or her behavior in response to a change to the price level. According to this theory, however, producers and workers see that certain prices are changing, and they misinterpret these changes as being changes to either (1) only the goods or services that they produce or (2) only their own wages. Not realizing that all (or most) prices are rising or falling, they change their behavior. We will just focus on the producers' misperception.

(a) Let's say that the price level is decreasing. A type of producer—say, wheat farmers—watches the price of wheat closely, and they see that this price has fallen. At the same time, they don't immediately notice that the prices of the inputs that they use have also fallen. Believing that they still have high costs while they are getting a low price for their wheat, they reduce employment and other costs. Consequently, they produce less wheat (and the same happens for many other kinds of producers), and SRAS falls.

(b) When the price level is increasing, producers—in our example wheat farmers—see that the price at which they can sell wheat has increased. They don't, however, immediately notice that the prices of their labor and other inputs have also increased. So, they produce more wheat (and the same happens for many other kinds of producers), and SRAS increases.

Remember that these three theories seek to explain why the SRAS curve is positively sloped. Hence, each explains why a change to the price level causes actual output to move to a different spot on the SRAS curve (while the curve itself stays in the same place). Next, we will examine the factors, other than price level, that affect SRAS. These factors, since they are not price level changes, cause the SRAS curve to shift to the right or to the left.

2. Factors that shift short-run aggregate supply curve

(1) Productivity growth will shift both long-run aggregate supply (LRAS) and short-run aggregate supply (pp. 278 – 279, 317, 328). Productivity is what it sounds like, and one way to measure it is as *output per worker*. This increases as workers become more educated, healthier, computers and computer programs improve, agricultural equipment and practices improve, factory equipment and practices improve, and so forth. An increase in productivity will increase LRAS and SRAS. A decrease in productivity will decrease LRAS and SRAS.

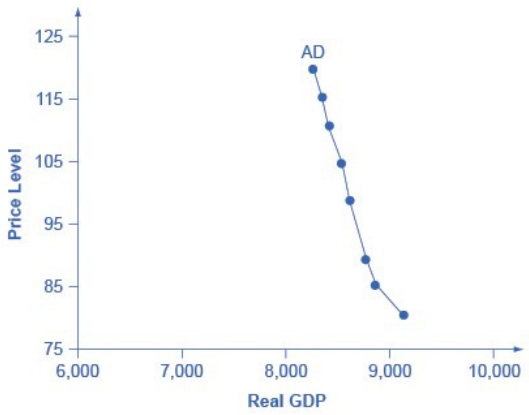
(2) Changes to the cost of all inputs or to inputs that are particularly important for many products (e.g., oil, computer chips, or labor) will affect just the SRAS, not the LRAS (pp. 279 – 280). An increase to the cost of inputs will decrease short-run aggregate supply, and a decrease to these costs will increase short-run aggregate supply.

3. The shapes of the aggregate demand, short-run aggregate supply and long-run aggregate supply curves

We have covered the reasons why aggregate demand and aggregate supply (in the short-run and long-run) will increase or decrease—and so why the curves will shift to the left or the right. We have also covered the reasons why the aggregate demand curve has a negative slope and the short-run aggregate supply curve has a positive slope. These latter reasons—why the curves have positive and negative slopes—also determine the shape and exact (or estimated) slope of the aggregate demand and short-run aggregate supply curves.

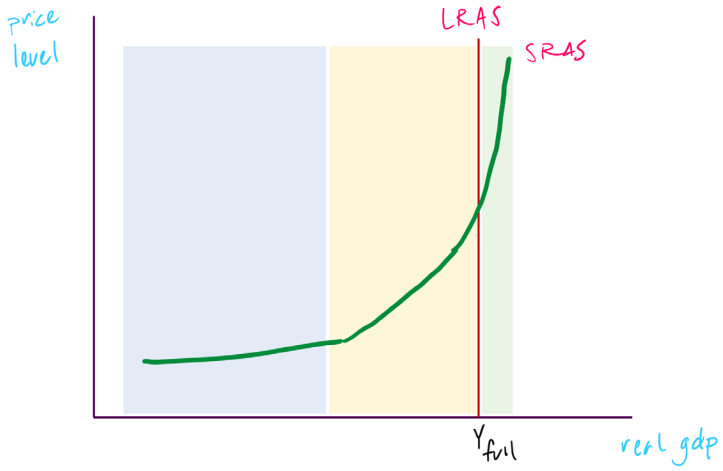
Recall that the three effects that cause the aggregate demand curve to slope downward are the *real wealth effect*, the *interest rate effect*, and the *foreign price effect*. These are, actually, thought to not be very large effects. Hence, a change to the price level does not seem to have too much affect on the quantity of goods and services demanded. This might be what we should expect. For most people, most of their purchases can't change too much. They still need food, clothing, somewhere to live, and transportation. And, especially if the price level is only changing by a low single digit percent, most people won't have too much incentive to make much of a change to what they purchase. (See also p. 275.)

This is not to say that a change to the price level won't have any effect on aggregate demand. If a change to the price level had no effect on the quantity of goods and services demanded, then the aggregate demand curve would be a vertical line. Because of the *real wealth effect*, the *interest rate effect*, and the *foreign price effect*, it's not that, but it is a curve with a very steep slope as shown in this figure.



The slope of long-run aggregate supply curve, on the other hand, is a vertical line. Recall that LRAS is *potential GDP*, which is the amount of production that is possible in a country when it is "fully employing its existing levels of labor, physical capital, and technology, in the context of its existing market and legal institutions" (p. 273). This level of production has nothing to do with the price level. Rather it's a factor of all of the workers, factories, inputs, roads, technologies, and so forth that are available. The price level can be high or low and these will all be the same, which is why the LRAS curve is a vertical line.

The exact slope of the short-run aggregate supply curve is a little more complex. The central factor here is where SRAS is relative to potential GDP (i.e., LRAS). We will break this into three categories: (1) far below potential GDP, (2) above potential GDP, and (3) in between these two extremes.



At the far left, the SRAS curve is has a very minimal slope. (In the standard SRAS curve that we use today, it's not flat, but at this extreme it is nearly so.) Here we are well below potential GDP, and so output is very low. As a result, there is plenty of capacity to supply more goods and services, and a small increase in the price level or shift to aggregate demand will have a big effect on output supplied. (And similarly, a decrease in either will also have a big effect but in the opposite direction.)

At the far right, and to the right of LRAS, the SRAS is almost vertical. Here aggregate supply is above potential GDP, and so output cannot increase much more. At this part of the SRAS curve, even a large increase in the price level or AD will not have a big effect on output.

The slope of the middle part of the SRAS curve is between the two extremes. Here, changes to the price level or AD will increase output, although not as much as further to the left on the SRAS curve—but more than we get once we pass LRAS.