

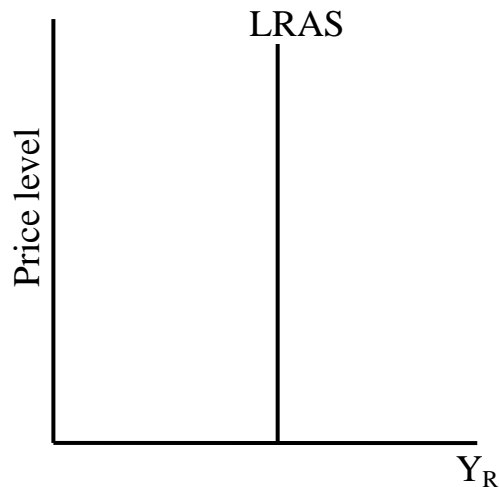
## LECTURE 19: BASICS OF AD-AS

### I. The Axes

- a. We begin with something that looks a bit familiar. We have something like “price” on the y-axis and something like “quantity” on the x-axis.
- b. This is the beginning of our aggregate (total) model.
  - i. Thus y-axis is the *price level*: all prices. Note this isn’t the same thing as inflation. Inflation is a rate; inflation describes how the price level is changing. It’s like the difference between velocity and distance traveled.
  - ii. Similarly, the x-axis is *real GDP*: all quantities. It is the total output of the entire economy.

### II. The Shape of Things

- a. The Long-Run Aggregate Supply Curve captures the fundamentals of an economy. As such, it is a vertical line: the real GDP is \$50 billion or \$9 trillion. No matter what inflation is.



- i. Recall real growth rates are *adjusted* for inflation. If prices double, GDP should double. But GDP adjusted for inflation should be the same.
- ii. One of the most fundamental assumptions of the LRAS is that wages and prices are completely flexible—that’s what the “long-run” means.

- iii. Thus higher prices don't induce higher output. Why should it? If the price level increases, input prices (including materials and labor) also increased.
- iv. This also means we're at full-employment at the LRAS. If equilibrium output didn't match full-employment, wages would adjust so the only unemployment was the natural rate.

### III. A Sticky Situation

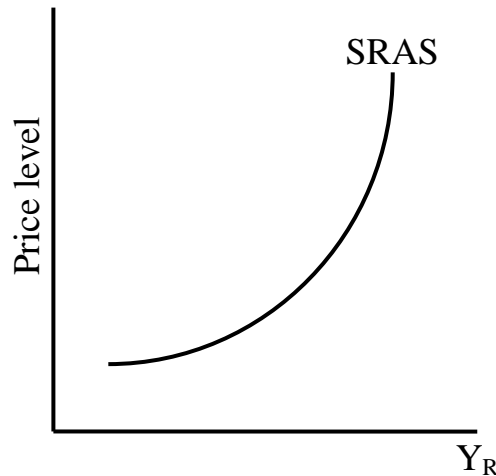
- a. It's now that things get sticky...literally! Well, kind of literally.
- b. Economists typically assume immediate adjustments. If the government prints a bunch of money, wages will automatically compensate. Prices will instantly increase. Really?
- c. In reality, prices and wages are "sticky." They don't immediately adjust to changes in the money supply or money velocity.
  - i. Contracts inhibit price and wage movement. Billy the farmer has a contract with Andrea the restaurateur where Andrea will buy 1,000 pounds of lettuce per month at \$0.50 a pound. This contract lasts a year, which allows both Billy to plan his crop and Andrea to plan her menu. That price is locked in.
  - ii. Menu costs inhibit price movement. At Andrea's restaurant, a Big Salad cost \$5. If the price of tomatoes increases, it would be costly to change the menu to reflect the new cost. She probably won't bother, especially if she thinks this is a temporary change in cost.
  - iii. Consumer expectations inhibit price movement. Customers expect many prices to be consistent even if costs are not. They hate it if, say, their daily intake of Starbucks costs a few nickels more today than it did yesterday. They hate it more than they like it when prices unexpected fall because, in general, consumers like consistency. It helps them plan their budget, enabling comfortable routine and consumption smoothing. So firms often opt to absorb higher costs and reap the benefits of lower costs—which in theory will even out profit-wise—rather than constantly change prices.

### IV. The Shape of Things

- a. In the *long-run*, both input and output prices are flexible.
  - i. This is a completely vertical line, as we discussed.
- b. In the *immediate short-run* both input and output prices are sticky.
  - i. This is a completely flat line because the price level can't change. This is pretty boring, though, and limiting our analysis

to just the very near future doesn't happen much. We will ignore any further details on this subject.

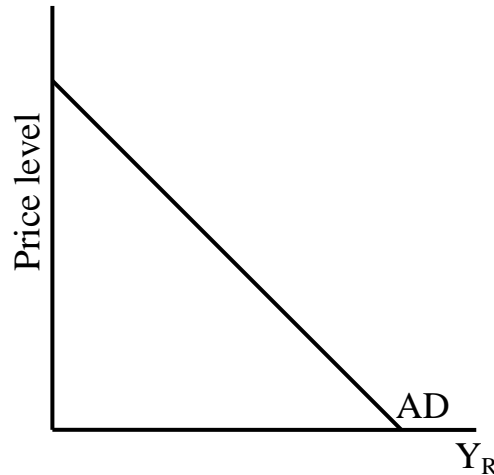
- c. In the *short-run*, input prices are sticky but output prices are flexible.
  - i. This is the first curve that actually looks like a curve. It's upward sloping and convex.



- ii. SRAS slopes up because changes in the price level will change what something is sold for (output prices) but not what it costs to produce (input prices). This causes profits to increase and additional productivity to follow. (In this way, it is very similar to our micro-supply curve...greater profits to the supplier induce greater output.)
- iii. SRAS is convex because at GDP levels below full employment (left of LRAS), the economy's not at full capacity. As idle people and equipment are put to work (increase in GDP), there is little upward pressure on price. But above full employment (right of LRAS), further expansion creates disproportionately more inflation.

## V. The Shape of Things

- a. There is also a downward sloping line which should remind us of demand. Indeed, it is demand but now we look at demand across the whole economy, not just a single sector. We look at *aggregate demand*.



- b. Like the demand curves of yore, aggregate demand assumes *ceteris paribus*. As the price level increases, all other things being equal, real output will fall.
- c. That the aggregate demand slopes down might make sense just like a normal demand curve. As prices across the board rise, people should buy less stuff. That intuition is wrong; it's not why the aggregate demand curve slopes down.
  - i. Why is it wrong? Recall what real GDP is. Income equals expenditures. If prices rise, people might have to spend more to afford something but they also get more income. Money is neutral in the long-run.
- d. So why does AD slope down? Here's a big reason:<sup>1</sup>
  - i. *Interest Rate Effect*. As the price level rises, people will want more money; they will borrow more. But the amount of money in the system is the same (remember, *ceteris paribus*). So if more people are borrowing but there is the same amount available to borrow, the interest rate—or the price of borrowing money—will rise. Higher interest rates will cut investment and consumption and thus real GDP falls. We can see this with our old friend:

$$Mv = p_L Y_R$$

If  $p$ , the price level, increases and the left half of the equation remains the same, real GDP must fall.

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<sup>1</sup> There are two other reasons—real-balances (wealth) effect and foreign purchases effect—but the interest rate is the big one and what we'll focus on for this class.