Aggregate Demand and Aggregate Supply

Building a Model of Short-Run Fluctuations

AD and AS

The model we will build in this presentation includes both an expenditure (**aggregate demand**) and a production side (**aggregate supply**).

The AD/AS model will **endogenize the price level**, showing **both** how the price level helps **determine equilibrium** and how the price level is **affected by changes** in the AD/AS curves.

Aggregate Demand

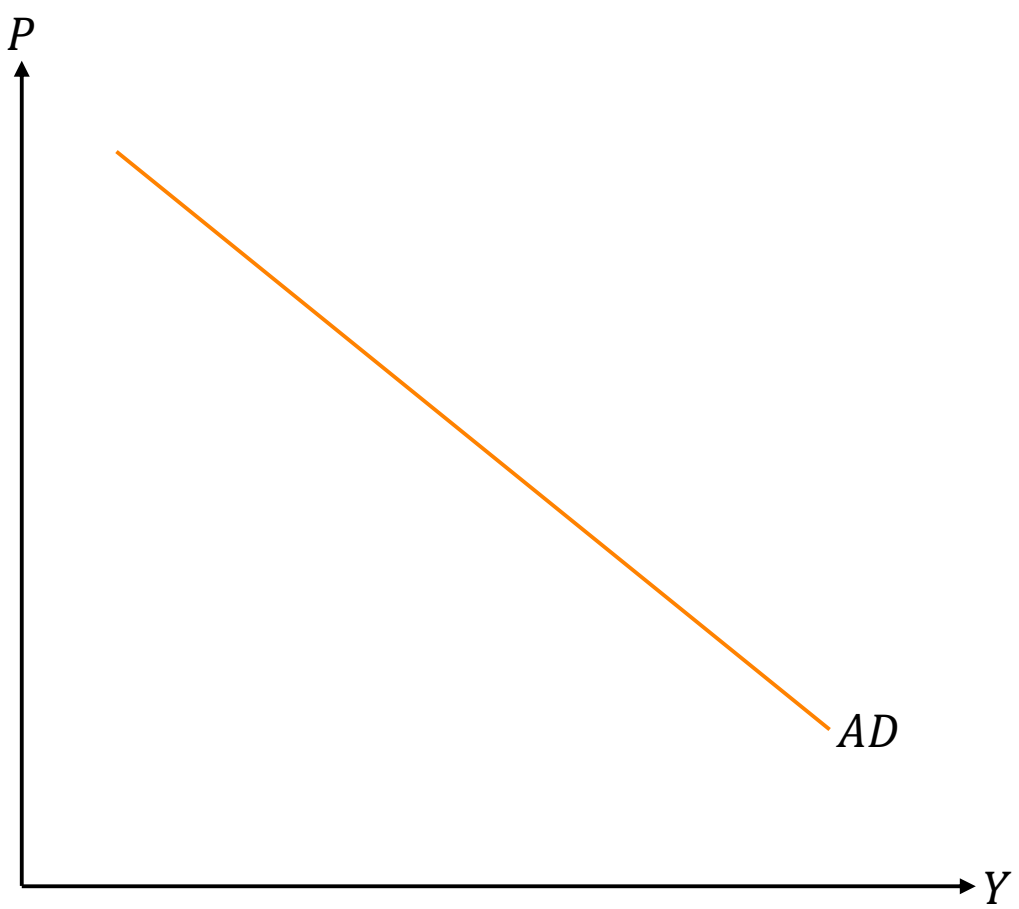
The aggregate demand curve relates two variables, the **price level** (P) and **real GDP** (Y).

Like market demand curves, **aggregate demand** curve is **downward-sloping**, but *not* because of diminishing marginal utility or opportunity cost. Instead, aggregate demand derives its negative slope from a couple of different effects.

The Shape of Aggregate Demand

3 reasons the aggregate demand curve is downward-sloping:

1. Wealth Effect – higher P reduces household wealth and lowers C
2. Interest rate – higher P increases borrowing, discourages C and I; also the Fisher effect
3. Export price – higher P hurts X (unless exchange rates mitigate this)



A More Intuitive (Easier?) Demonstration

In our discussion of chapter 13, we used the **equation of exchange** to understand and discuss causes of **inflation**.

We can also use the equation of exchange to understand **why aggregate demand is downward-sloping**.

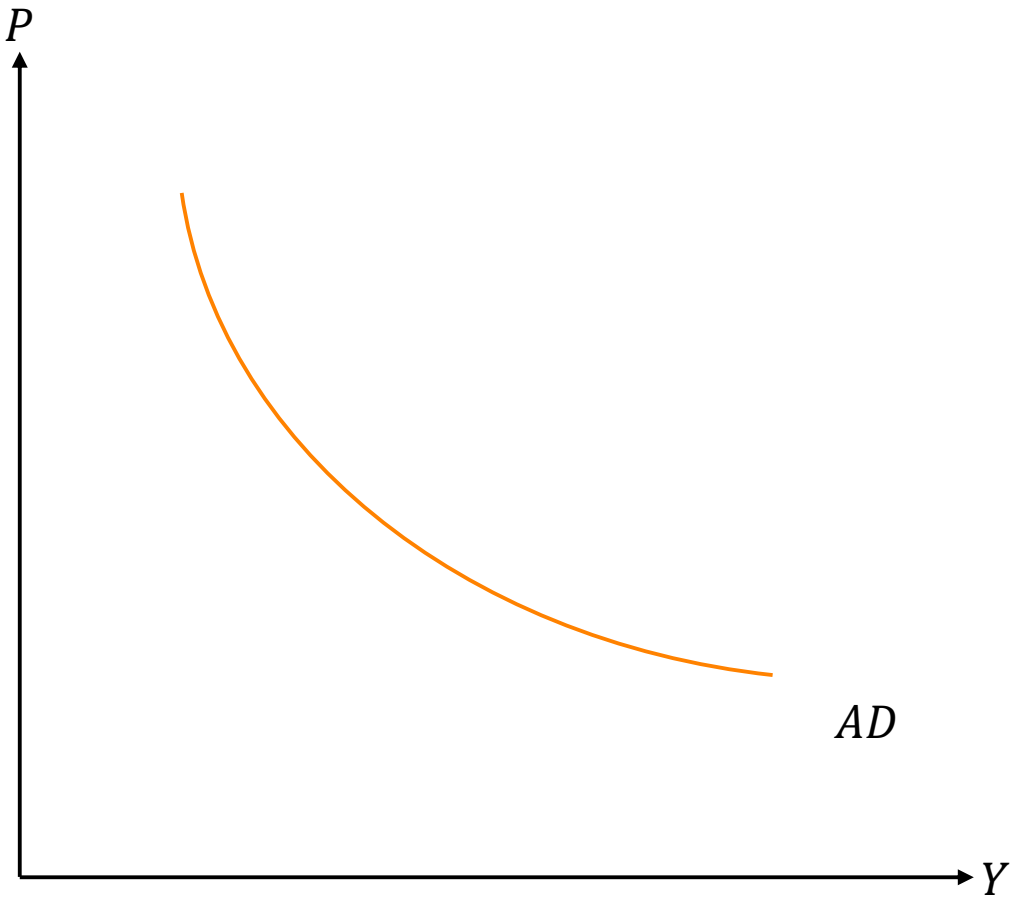
The **equation of exchange** is $\boldsymbol{MV = PY}$.

The Shape of Aggregate Demand

The AD curve is all combinations of P and Y that correspond to a given level of spending.

Spending? Yes!

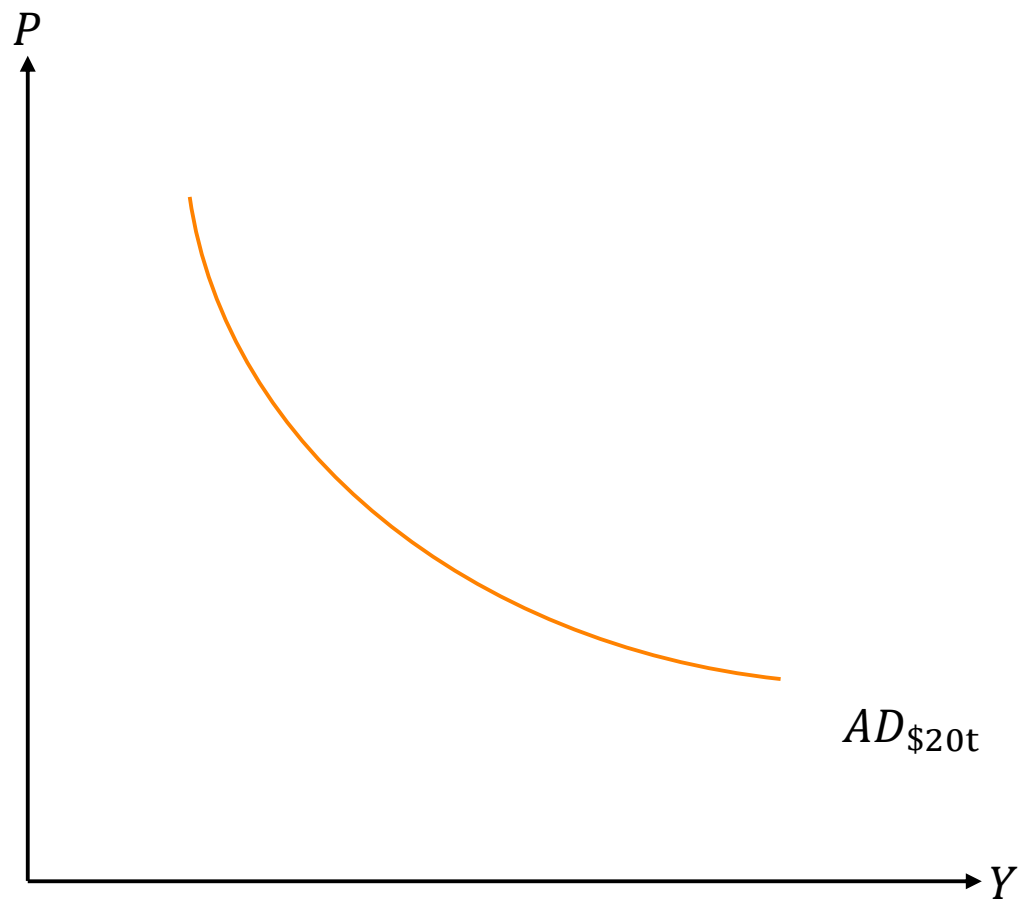
$M \times V$ equals total spending, or nominal GDP, or $P \times Y$.



The Shape of Aggregate Demand

Suppose total spending was $20 trillion. The money supply (M) is $10 trillion. That means velocity (V) is 2.

Aggregate demand is all the different values of the price level (P) and real GDP (Y) that correspond to $20 trillion spending.



Shifting the AD Curve

Anything that **increases or decreases spending** will give us a new higher or lower AD curve.

What could increase or decrease M? **Monetary policy** or changes in **the demand for money** (chapters 16 & 17)

What could increase or decrease V? For a given M, changes in **real spending**, just like the GDP **expenditure model**:

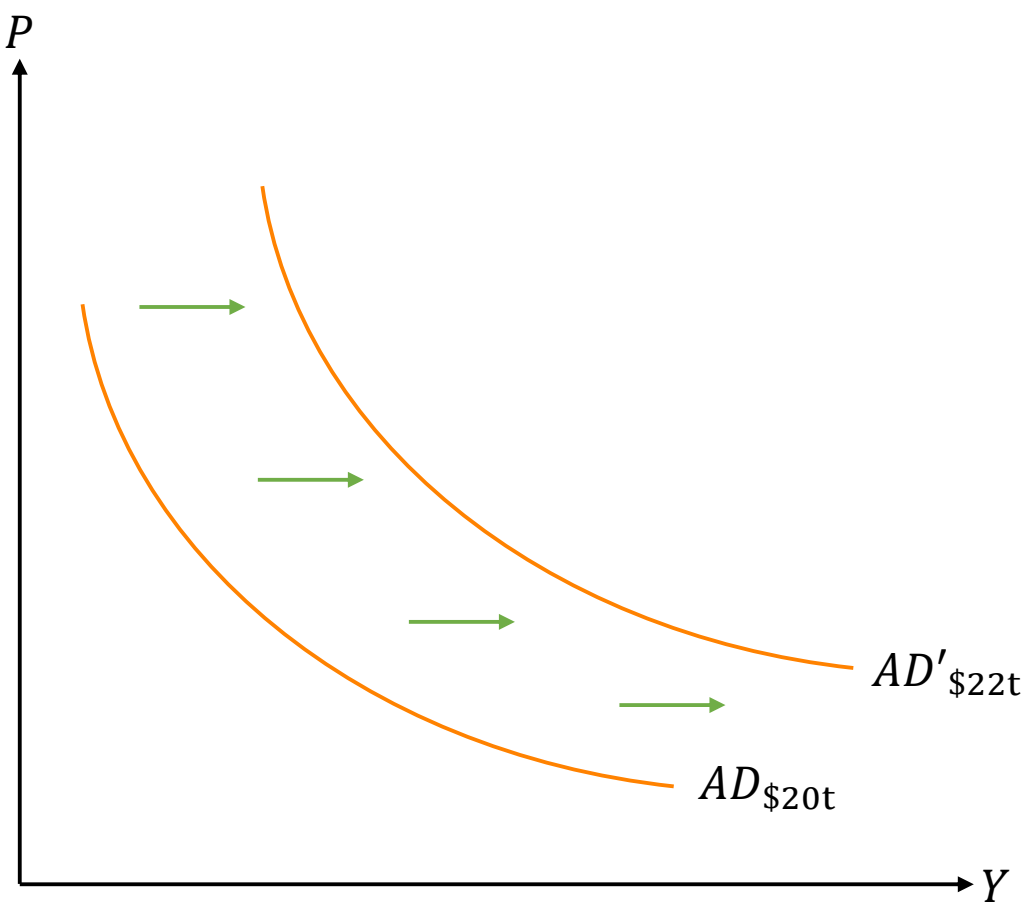
$$Y = C + I + G + NX$$

Shifting Aggregate Demand

Suppose total spending was \$20 trillion, M is \$10 trillion, and V is 2.

If $V = 2$, and we increase M to \$11 trillion, our new AD corresponds to \$22 trillion.

We could also keep M the same and increase V through G! Or both M and V!



Aggregate Supply

Our *AD/AS* model will include **two aggregate supply** curves: a **long-run** aggregate supply curve and a **short-run** aggregate supply curve.

These two aggregate supply curves and our aggregate demand curve will together help us explain changes in real GDP and the price level as the conditions of the economy change.

Long-Run Aggregate Supply

The **long-run aggregate supply** curve is a **vertical line** (implying no influence of the price level on output) and reflects **real productive capacity** (Y_F) in the economy:

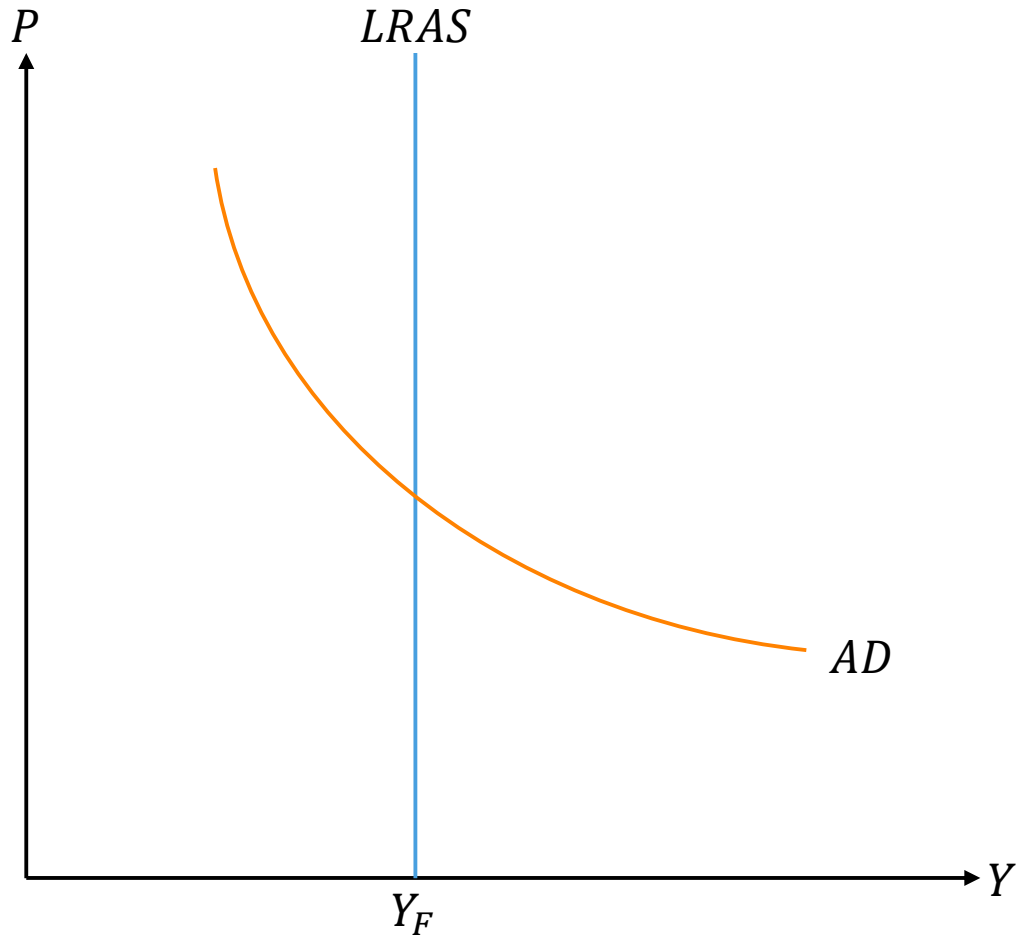
1. Resources
2. Technology
3. Institutions

AD and *LRAS*

Changes in *AD* would only move the **price level up or down**. Why?

The *LRAS* is determined by ***real*** factors: **institutions**, **technology**, and **resources**

The price level is largely a ***nominal*** variable, which does not influence real factors in the long run.



Short Run Aggregate Supply

The **short-run aggregate supply** curve is **upward sloping** because **changes in the price level** will influence **the amount that firms are willing to produce** (Y). Why?

1. Input prices, wages, and factor prices might be sticky
2. Output prices might be downward-sticky
3. Inflation misperception: signal extraction problem

Shifting *SRAS*

What causes *SRAS* to move left or right?

1. Input prices (availability of resources)
2. Productivity (technological change)
3. Taxes and regulation (institutions)
4. Inflationary expectations
5. Market power of firms

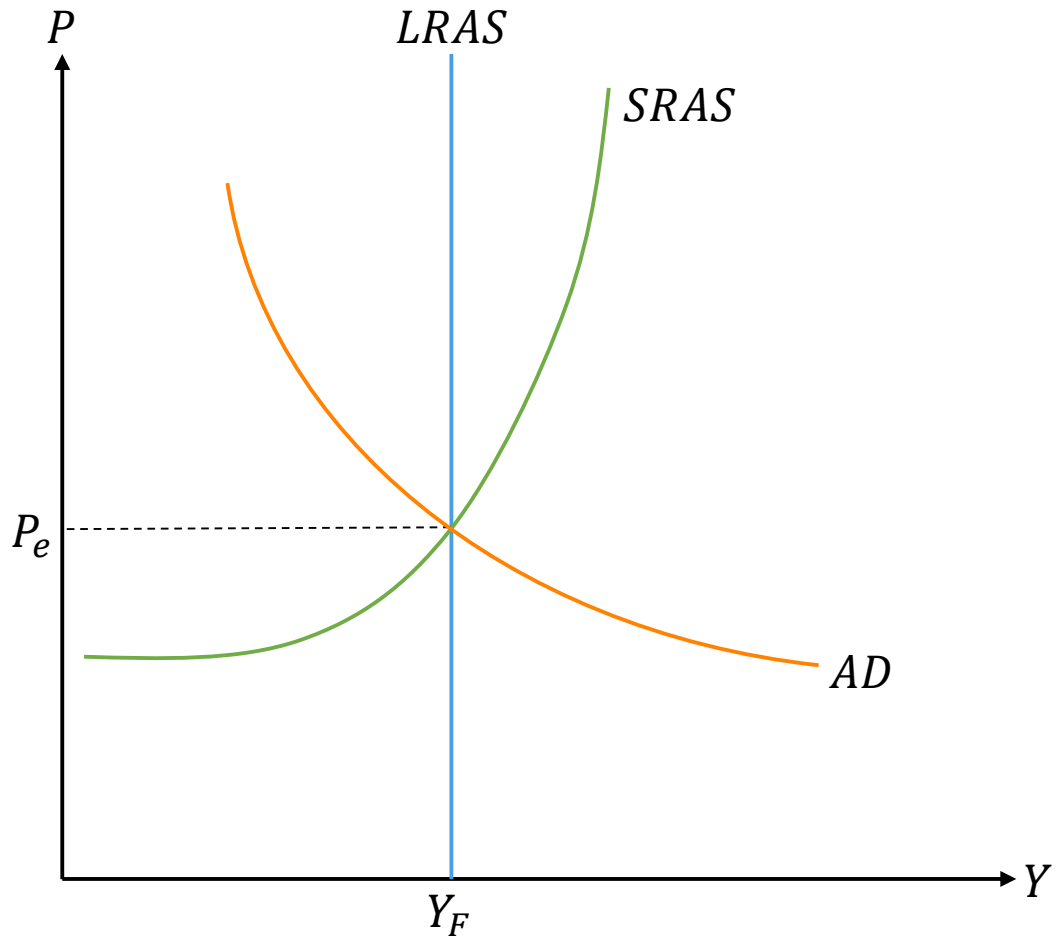
Same as LRAS, just a different time horizon!

Macroeconomic Equilibrium

$SRAS$ is flatter at very low levels of Y. Why?

However, it rises to nearly vertical beyond Y_F. Why?

The P_e is a constant-price-expectations price level consistent with equilibrium in this macro model.



Expenditures and Multipliers

GDP is equal to **aggregate expenditures**, such that

$$GDP = AE = Y$$

Recall the Expenditure method of figuring GDP:

$$Y = AE = C + I + G + (X - M)$$

Consumption Spending and Income

The largest category of expenditures is consumption (C).

Consumption is a **positive function of income** (Y), so that when income increases (decreases), consumption increases (decreases). Saving (S) is what's left over.

The rates at which people save or consume can be measured. Marginal propensities reflect how much of an additional dollar of income is consumed or saved.

$$MPC = \frac{dC}{dY};\ \ MPS = \frac{dS}{dY}$$

The Multiplier

The simple idea: Every dollar spent is a dollar earned. Earned income leads to more spending. More spending means more income. More income means more spending. More spending means more income. More income means more spending. More spending means more income, which means more spending. Which means more income, which means more spending, which means more income, which means more spending, which means more income, which means more spending, which means more income, which means more spending, which means more income, which means more spending, which means more income, which means more spending...

Mathematics of Multipliers

Suppose an MPC of 0.75, which means $0.75 of every $1.00 will be spent and $0.25 will be saved. Begin with $10.00 of income.

Consumption	Saving
$7.50 (75% of $10.00)	$2.50 (25% of $10.00)
$5.62 (75% of $7.50)	$1.88 (25% of $7.50)
$4.22 (75% of $5.62)	$1.40 (25% of $5.62)
$3.16 (75% of $4.22)	$1.06 (25% of $4.22)
$2.37 (75% of $3.16)	$0.79 (25% of $3.16)
$1.78 (75% of $2.37)	$0.59 (25% of $2.37)
$1.33 (75% of $1.78)	$0.44 (25% of $1.78)
$1.00 (75% of $1.33)	$0.33 (25% of $1.33)

Mathematics of Multipliers

There is a shortcut to all that adding and multiplying.

If the marginal propensity to consume $\left(\frac{dC}{dY}\right)$ is a constant fraction, we can find the multiplier with a simple formula

$$\text{Spending Multiplier} = \frac{1}{(1 - MPC)} = \frac{1}{MPS}$$

Multiplier Math

If $0 < MPC < 1$, then an additional dollar of any expenditure (C, I, G, or X) will increase income, Y, by more than a dollar.

Multipliers work in both directions, however, so if expenditure falls, total income will fall by more than a dollar.

Multipliers in Reality

Not all dollars that could go to consumption and increased spending actually go to consumption or other increased spending. These "**leakages**" make the multiplier smaller.

So, too, does the fact that rightward shifts in *AD* in our model cause increases in both *Y* and *P*! The "naïve" multiplier math assumes full price stickiness!