# Ch 12: Aggregate Supply and Demand

# Goals

- Build **aggregate demand**, which shows the relationship between the price level and real GDP, from the income expenditure model.
- Intuit **short-run aggregate supply** from what we know about supply.
- Introduce **long-run aggregate supply**
- Show how an economy reacts to a shock in both the short and long run.

# Big Intuition Time

Aggregate demand and supply show the relationship between real GDP and the price level.

The slopes are mostly because of **sticky nominal wealth and wages**.

- Your wage rate is nominal. When prices go up the value and cost of your wages fall. Basically, the higher the price level, the cheaper it is to pay you
- Your wealth is also nominal. When prices go up the value of those cash assets falls. Basically, the higher the price level, the poorer you feel.

# Building Aggregate Demand

Consider that you have \$1M in the bank and the CPI is 200.

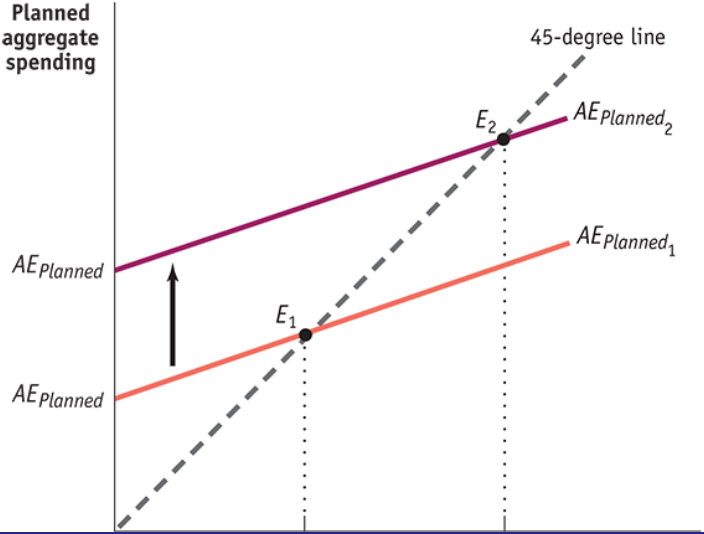
- You have real wealth of $\frac{\$1M}{200}100 = \$500K$
- Your savings makes you feel pretty bad about spending money now. It doesn't feel like enough. (BTW Better than most people.)
- So you reduce your autonomous spending, $A_0$ in $AE_{Planned} = A_0 + MPCyd$

# But Then the Price Level Decreases

Now the price level goes from 200 to 100.

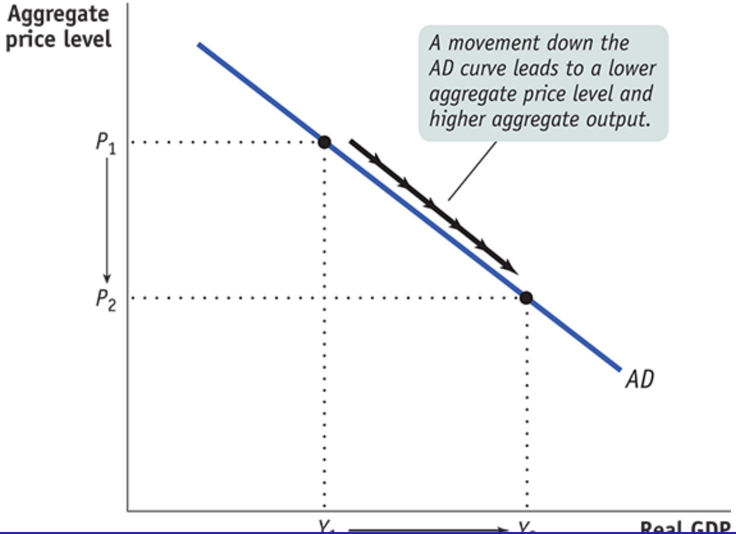
- You have real wealth of $\frac{\$1M}{100}100 = \$1,000K$
- You feel rich
- You increase autonomous spending.
    - That shifts up the expenditure function
    - That increases equilibrium expenditures

# Like This



Planned aggregate spending
45-degree line
$E_2$
$AE_{Planned_2}$
$AE_{Planned_1}$
$AE_{Planned}$
$E_1$
$AE_{Planned}$

# The Idea


Aggregate price level
A movement down the AD curve leads to a lower aggregate price level and higher aggregate output.
P1
P2
AD
Real GDP

# To be clear

- This is not about other goods being relatively more or less expensive.
- But, just like microeconomics
  - Increase is to the right
  - Decrease is to the left

# Things That Increase Demand

Flip the sign to decrease

- Consumers are optimistic about the future
  - I will have a better job in the future and will spend more now.
- There is an increase in the **real** value of wealth.
  - Not inflation, but what you can buy.
- Small existing physical capital stock
  - You need to grow it.
  - The 2008 crash was a housing bubble, lots were built, too much.
    - It took years to soak up those extra houses.
    - One reason why recovery took so long.

## Things That Increase Demand (Con't)

- Government cuts taxes or increases spending (Fiscal Policy)
  - Remember that tax cut we just got?
- More money or decreases in interest rates
  - Both increase investment
  - Note that we in an odd place with monetary policy.

# What About Aggregate Supply?

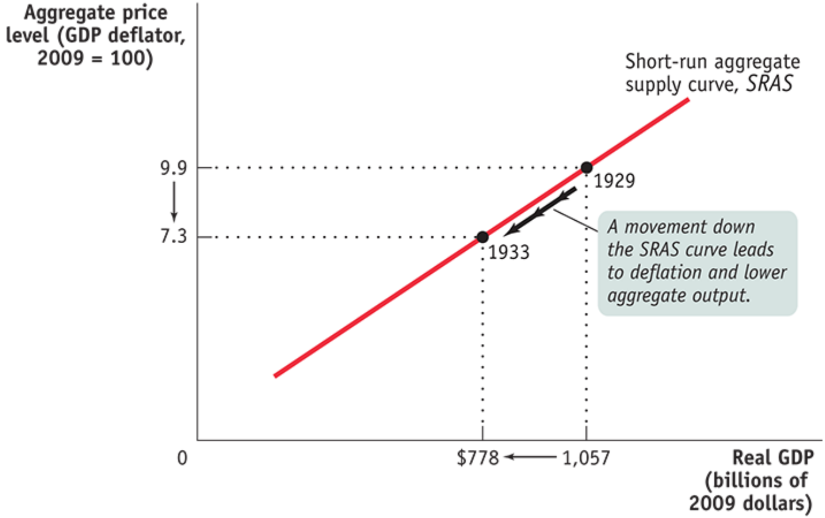
This depends on wages being sticky in nominal terms but prices of goods being flexible.

# Example

- Suppose the price level is 100 and your wages are 100K per year. Also suppose that your employer just breaks even on you.
  - The value of what you produce is exactly equal to your salary, 100K.
- Now the price level goes to 200
  - The value of what you produce is 200K
  - You are still paid 100K
  - Your employer hires more people just like you.
  - Output, real GDP, goes up

Price level goes up and output increases.

# Flip the arrows in this diagram

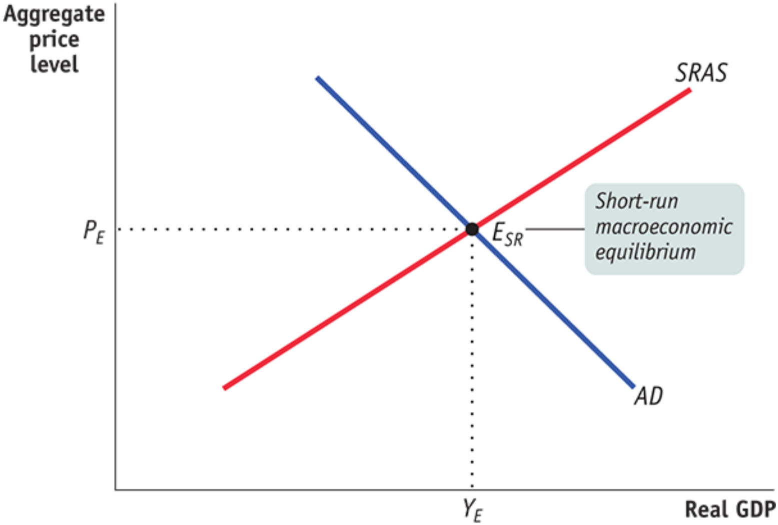


# Things That Increase Supply

Remember you can flip the increase/decrease to get decrease.

- Commodity Prices Fall
  - Energy prices are a classic.
  - BTW it gets tricky if you are a producer of commodities, but that changes demand.
- *Nominal* Wages fall
  - Cheap workers? Hire them to make more stuff.
- Productivity Increases
  - Remember TFP

# Put them Together



# You now can

- Determine the price level and real GDP at the same time.
- IRL, we think about the vertical axis being the inflation rate and not the price level. This is just easier to wrap your head around.

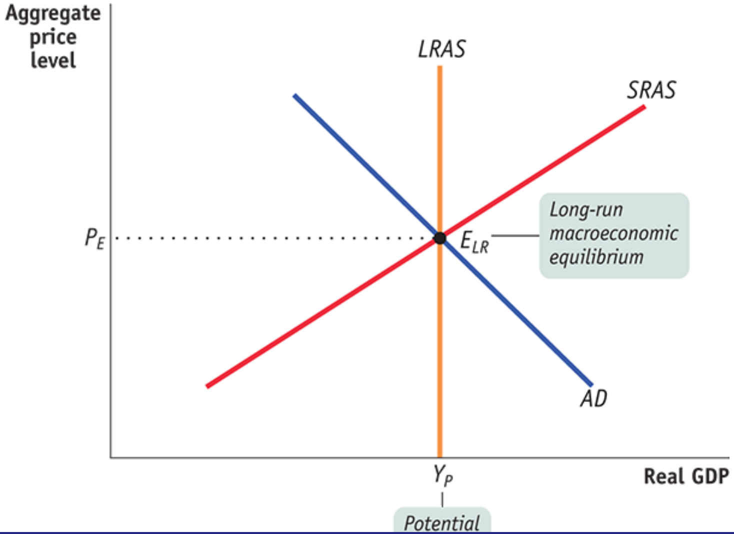
# That is Just Short-Term

There is also a long-term aggregate supply function

- It is a little odd.
- It could be the level of output consistent with no cyclical unemployment.
- Or output consistent with NAIRU
- Or built up statistically

In any case, it is a number that does not change with the price level.
The Congressional Budget Office Estimates it.
https://fred.stlouisfed.org/series/GDPPOT

# Long-Run and Short-Run Equilibrium



# Lets play with the Dynamics of this

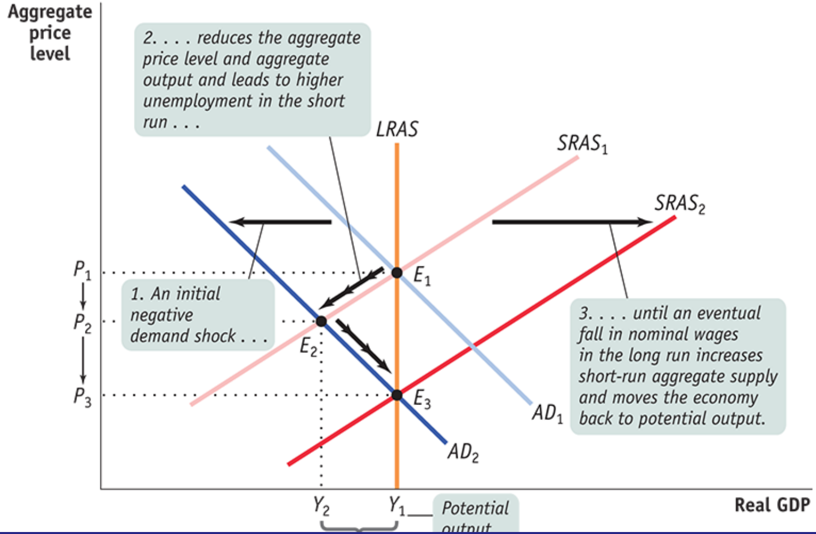
- Keep in mind that AD is the same in the short-run and the long-run
- In the long-run
  - Short-run AS shifts
  - Eventually shifts to where AD crosses LRAS.

## Lets Play Some Examples

People suddenly believe there will be a recession in the future.

- This actually causes a recession.
- AD shifts left
- Short-run
  - Price level falls
  - Real GDP fall (Here is the recession)
- Real GDP less than potential means there is unemployment.
- Long-Run (All prices are flexible, even wages)
  - Wages fall because unemployment
  - Wage decreases cause an increase in SRAS
  - Keeps happening till real GDP is equal to potential GDP

# Picture



Aggregate price level
2. . . . reduces the aggregate price level and aggregate output and leads to higher unemployment in the short run . . .
LRAS
SRAS$_1$
SRAS$_2$
$P_1$
$P_2$
$P_3$
$E_1$
$E_2$
$E_3$
1. An initial negative demand shock . . .
3. . . . until an eventual fall in nominal wages in the long run increases short-run aggregate supply and moves the economy back to potential output.
$AD_1$
$AD_2$
$Y_2$
$Y_1$
Potential output
Real GDP

# Try Again With AD Increase

# Next Up

Fiscal Policy