Aggregate Demand (AD) Curve

Q: What will happen to planned Aggregate Expenditures (AE) if the price level in the economy were to change? How will AE change, & thus, what will happen to equilibrium GDP (Y)?

⇒

The AD curve illustrates the relationship between Equilibrium Y (where Y = AE) and the general price level in the economy: It shows the level of GDP @ which planned expenditures equal production at each & every possible price level. We find that:

The lower the price level, the greater planned aggregate expenditures are &, hence, the greater the equilibrium level of real GDP will be. Why? Because

C, I_g, X_n are all sensitive to the change in the general price level.

Let's look at Three Effects that occur when the general price level changes:

(1) Real Balance Effect: When P (gen'l price level) increases, the value of wealth denominated in fixed monetary terms (such as accumulated savings in bank accounts) decreases, and thus Planned Consumption Expenditures decline.

$$\uparrow P \rightarrow \downarrow \text{Household Wealth} \rightarrow \boxed{\downarrow C}$$

(2) Real Interest Rate Effect: An increase in price tends to increase i_r -- the marginal cost associated with new investment projects -- and thus fewer investment projects in the economy will be profitable and in the aggregate planned investment expenditures will decline (move up along the given Investment Demand curve)

$$\uparrow P \rightarrow \uparrow i_r \rightarrow \boxed{\downarrow I_g}$$

(3) Foreign Purchases Effect: An increase in P (holding everything else constant, such as the exchange rate) makes U.S. goods relatively expensive and goods produced abroad relatively inexpensive. We would expect X to decrease and M to increase $\Rightarrow$ X_n will decline.

$$\uparrow P \rightarrow \downarrow X, \uparrow M \rightarrow \boxed{\downarrow X_n}$$

* The reverse will occur (all three components of AE will increase) when the general price level decreases.

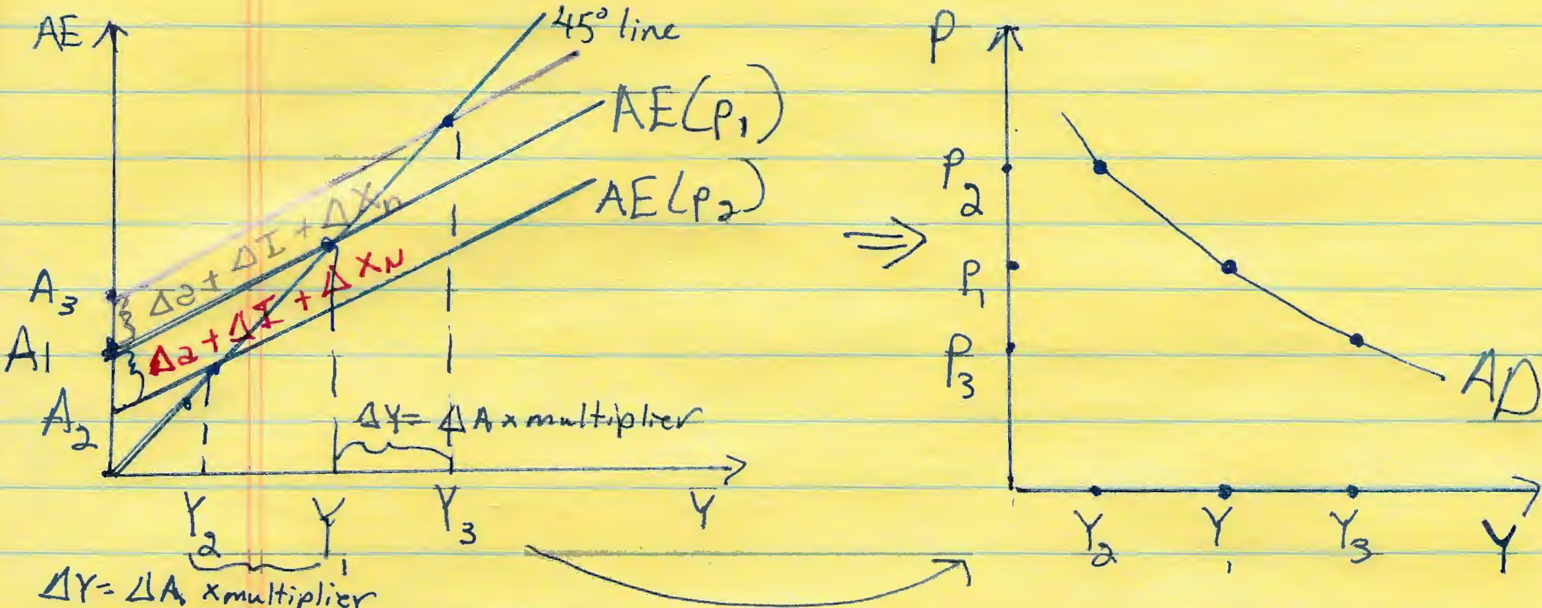
We can illustrate the effect of a change in the general price level on planned AE and trace out our AD curve!

Let P_1 = the initial price level in the economy. There is one unique equilibrium level of real GDP at that price level (P_1).

We will consider two cases!
Case I: when the price level increases ($P_1 \rightarrow P_2$)
Case 2: when the price level decreases ($P_1 \rightarrow P_3$)

Remember, $AE = C + I_g + G + X_N$

$\Rightarrow AE = A + bY$, where $A = a - bT_0 + \bar{I} + \bar{G} + \bar{X}_N$



A_1 = Autonomous Expenditures at price level P_1 (initial price level)

Y_1 = equilibrium GDP ($Y = AE$) @ P_1.

A_2 = Autonomous Expenditures @ price level P_2

$A_1 - A_2 = \Delta A$ ($\downarrow a + \downarrow I + \downarrow X_N$)

Y_2 = equilibrium GDP at P_2.

A_3 = Autonomous Expenditures at price level P_3

Y_3 = equilibrium GDP ($Y = AE$) at P_3.

$A_3 - A_1 = \Delta A$ ($\uparrow a + \uparrow I + \uparrow X_N$)

$P_3 < P_1 < P_2$

Case 1: $\uparrow P$ ($P_1 \rightarrow P_2$) $\Rightarrow$
$\downarrow C, \downarrow I_g, \downarrow X_N \Rightarrow \downarrow A$
(shift down in AE function)
$\Rightarrow$ New Equilibrium GDP at Y_2 ($\Delta A \times$ multiplier equals the ΔY).

Case 2: $\downarrow P$ ($P_1 \rightarrow P_3$) $\Rightarrow$
$\uparrow C, \uparrow I_g, \uparrow X_N \Rightarrow \uparrow A$
(shift up in AE function)
$\Rightarrow$ New Equilibrium GDP at Y_3 ($\Delta A \times$ multiplier $= \Delta Y$)

AD curve plots the relationship between a change in P and a change in equilibrium Y on the demand side of the economy.

* For each possible price level in the economy, there is one unique level of equilibrium Y on demand side of economy (where $AE = Y$)

Now we have to ask the following question:

Q: ~~All points along the AD curve represent equilibrium~~ insofar as at any point, planned AE equal Y (level of production of goods and services). That is, if output is forthcoming, then that output level can be supported by sufficient spending on the part of HH, firms, government and foreign buyers.

Thus, we can ask, at what point along the AD curve does the economy find itself?

To answer this question, we must introduce explicitly the supply side of the economy. Will producers be willing to supply the necessary output level to meet the desired level of spending at the different possible price levels? I.e., will output always be forthcoming?

Aggregate Supply (AS) Curve: The AS curve illustrates the amount of goods + services that will be produced (forthcoming) at each price level. It shows the relationship between the general price level in the economy and the amount of goods + services (real GDP) producers are willing to supply.

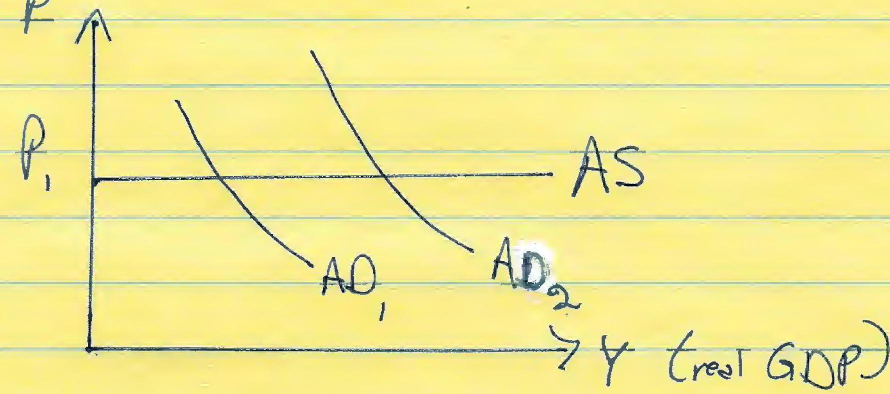
The key to understanding the AS curve is to understand the behavior of input + output prices + thus the change in profit margins for firms. Price behavior depends on time frame. The book introduces 3 time frames: immediate run, short run, and the long run. We will focus on the first two time frames: the immediate + short run.

Immediate Run

Both input prices ("costs" for firms) and output prices ("revenues") are fixed (or what economists call "sticky").

In this case, firms are willing to supply as much output as is demanded at the going price level in the economy, because profit margins remain constant.

Let's say P_1 is the current price level in the economy, then:



In other words, output will always respond to the level of AD in the economy. (This is basically our AE model — equilibrium output determines how much firms are producing.) If planned aggregate expenditures increase at the going price level, then firms will be willing to expend output to meet the increase in desired spending ($AD_1 \rightarrow AD_2$).

↳ Y is determined by AD (the level of equilibrium output, where AE=Y, at the current price level).

Short Run

Input prices remain fixed.
Output prices are flexible.
} Profit margins can vary.

↳ Outcome: AS curve will be upward-sloping, and will become more steep as the economy approaches the fullemployment level of output (Y_f) and moves beyond Y_f. (I.e., the price level increases more quickly as output continues to increase and surpass Y_f.)

Why? Two points are important for understanding the shape of the AS curve.

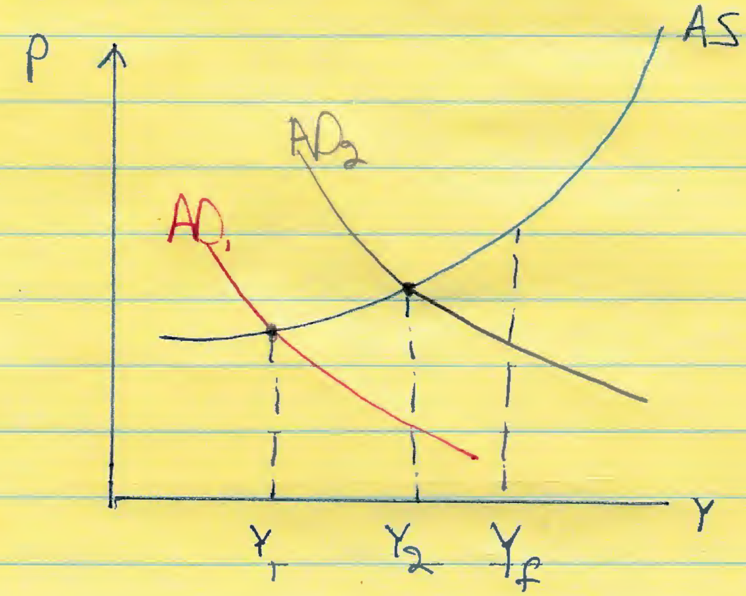
Changing profit margin

i) With fixed input prices, if the general price level increases, then all other things being equal, profit margins will increase & firms will be willing to expand production. And vice versa: if P decreases, profit margins decline & firms decrease production.

Changing unit cost of production

ii) At a low output level, there is underutilized capacity in the economy & relatively high unemployment. Firms can expand output without incurring higher unit cost of production. Thus, a higher price level signals a higher profit margin & firms are willing to increase output ⇒ AS curve is relatively flat: a small increase in P will call forth a higher level of production due to increasing profit margins w/ fixed input prices and a lot of excess capacity that can be put to use.

As the economy nears Y_f, firms start to experience increasing unit cost of production ⇒ profit margins are squeezed as firms try to expand output further. Thus, as the price level increases, the amount of additional output forthcoming is small (AS becomes steep). Why does the the unit cost of production increase when input prices are fixed? There is pressure in the labor market (w/ very few unemployed workers) which may lead to increase in overtime pay and/or need to pay premium wages to attract add'l workers) and decreased productive efficiency (production bottlenecks, using capital beyond optimal utilization rate, etc.)



$\rightarrow$ Y is determined by both AD + AS, that is by the level of equilibrium output on the demand side of the economy and firms' willingness to produce at the different possible price levels.

The intersection of AD + AS determine the P level and Y level that the economy will achieve.