1. AS-AD Model

Aggregate Supply.

→ increase in the level of output → increase in the level of employment → decrease in unemployment rate

→ decrease in unemployment rate increases bargaining position of workers + they are able to negotiate higher wages

→ increase in expected price level → increase nominal wages

→ increase in nominal wages → increase expected price

→ higher the mark up → the lower the real wage implied by price setting

→ natural rate of unemployment → rate of unemployment where the real wage chosen by the wage setting is equal to the real wage implied by the price setting.

→ higher the natural rate of unemployment → lower the natural level of employment → lower the natural level of output

→ increase in expected prices → ↑ wages → ↑ Prices
→ ↓ markup → ↓ P.
→ ↑ u (unemployment) → ↓ bargaining power → wages ↓ ⇒ P ↓
→ ↑ bargaining power ↑ wages ⇒ ↑ P

→ decrease output ↓ ⟹ ↑ u (unemployment) ⟹
  bargaining power of worker ↓ ⟹ ↓ wages ⟹ ↓ P.

Variables

			Relationship
expected prices →	Price level →		Possitive
wages →	Price level	⟹	Positive
mark up →	Price level	→	Possitive
unemployment rate →	Price level	→	negative
employment level →	Price level	→	Possitive
level of output →	Price level	→	Possitive

Aggregate supply realation → effects of outputs on
the price level.

→ Aggregate supply curve has a possitive slope
         → upward sloping
→ high economic activity puts preassoure on prices

P
Price level
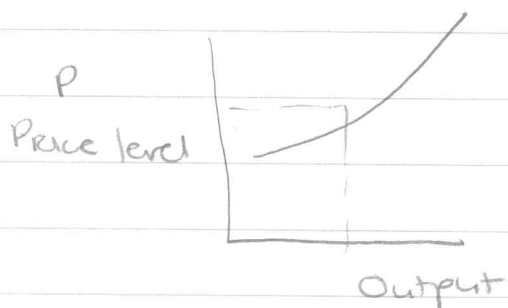
Output

→ increase in output leads to an increase in
   price level
→ if ouput Y = to natural level of output →
   Price is equal to expected price level

→ increase in expected price level shifts the Aggregrate Supply (AS) Curve up.

→ decrease shifts AS curve ↓

→ for a given price level, the price level is an increasing function of the level of output

    ↳ represented in an upward sloping curve called AS Curve.

→ increases in the expected price level shift the Supply curve ↑ while decreases shifts the curve ↓

Possitive slope indicates that the level of output increases, so does the price level.

→ increase in price level is the result of an impact of a decrease in unemployment on wages + prices.

$$Y\uparrow = N\uparrow = \mu\downarrow = W\uparrow = P\uparrow$$

→ As the level of output increases → level of employment increases ($Y\uparrow = N\uparrow$)

→ increase in employment causes a decrease in unemployment $N\uparrow = \mu$

→ This leads to increased bargaining position of employees + they demand higher wages $\mu \Rightarrow W\uparrow$

→ this process is captured by the wage setting relationship $W = P^e(u,z)$. Since prices are determined by firms as a markup over wage costs, the Price level increases

as wages increases ($W\uparrow = P\uparrow$)

→ This process is captured by the price-setting relationship
$P = (1 + \mu)W$ which also determines the real wage page.

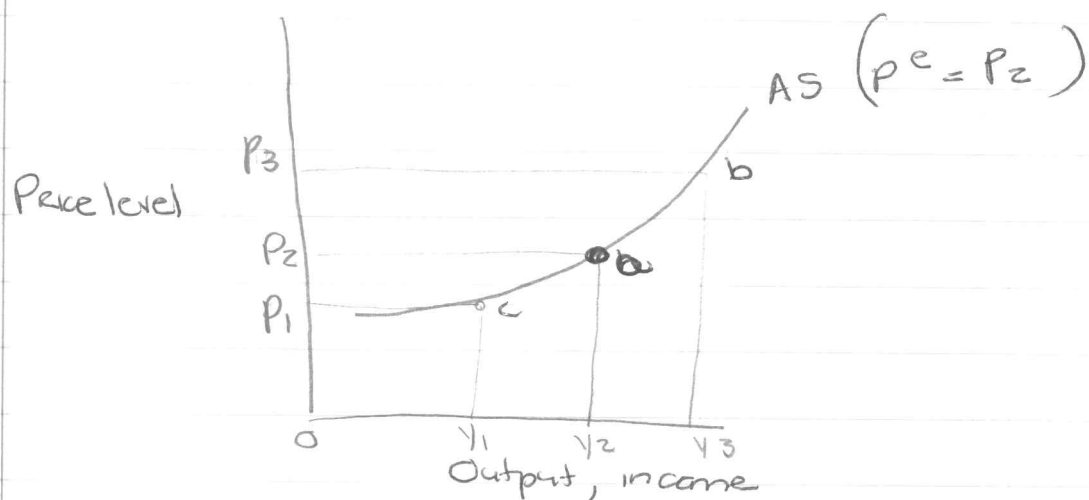→ The expected price level is the same along a given supply curve.

→ The AS Curve is derived from the wage setting + ~~the~~ price setting relationships (assumed the expected price level is given)

→ A given AS Curve passes through a point where the level of output is equal to the natural level of output ($Y = Y_n$) + the actual price is equal to the expected price. ($P = P_e$)

→ labour market → point where the level of unemployment is such that the ~~p~~ bargained real wage is equal to the real wage implied by price setting.

→ At points to the right of the natural level of output → actual price level is higher than the expected price level ($P > P_e$)
  ✳ left of the actual price level is lower than the expected price level ($P < P_e$)

At B → higher than natural level of output →
actual price is P₃ but the expected price level is
P₂

At c → lower than the natural level of output →
actual price is P₁ → expected price level is P₂

At any point on the AS Curve the real wage is
the same

→ increase in employment → increase in nominal wages →
increase price
→ increase in nominal wage is off set by increase in
price level causing real wage to remain unchanged.
→ ↑ in output + employment leads to 10% increase in
nominal wages. → price will also increase by 10%
+ real wage will remain unchanged.

If unemplyment increases

$$\uparrow \mu = W\downarrow = P\downarrow.$$

Shift of the AS Curve

$$P_e\uparrow \rightarrow W\uparrow \Rightarrow P\uparrow$$

→ shift occurs when the expected price level changes
→ Increase in expected price level leads to an increase in wages, which in turn increases prices + at each + every output level the price is higher.

Activity 7.2 + 7.3 Page 152/153 SG

7.2. Aggregate Demand AD

- the effect of the price level on output
- derived from equilibrium conditions in the goods + financial markets.
- Equilibrium in the goods market requires output = demand for goods (sum of consumption, investment, Goverment spending) IS relation.
- Equilibrium in the financial market requires supplied of money = the demand for money - LM relationship

· Left side of Lm side → real money stock. M/P

    ↳ changes in real money stock came from changes in nominal money

    ↳ also came from changes in price level P

       → 10% increase in the price level P has the same effect on real money stock as a 10% decrease in the stock nominal money. Either ~~lends~~ leads to a 10% decrease in real money stock.

→ Using Im + Lm relations we can derive the relation between the price level + level of output implied by equilibrium in the goods + financial market.

→ AD curve → increase in price level → decrease in output.

→ negative relationship between output + price is drawn as a downward sloping AD curve

    ↑ Price level → ↓ output

→ underlying negative relationship is called the aggregate demand relation

→ any variable other than price level that shifts the IS curve → also shifts the AD curve

    ↑ Government Spending → ↑ output (Y) → shift Right
    ↓ nominal ~~spendi~~ money → ↓ output → shifts left

→ Start from equilibrium positions in the financial + goods market to derive AD ~~de~~ curve

  − level of output is a decreasing function of price level →

downward sloping → called the aggregate demand curve
→ changes in monitary or fiscal policy → or any variable
other than price level that shifts the IS or LM curve
shifts the AD curve

SG p. 155 - Derivation of the AD curve.

$$P \uparrow = (M/P) \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \rightarrow Z \downarrow \rightarrow Y \downarrow.$$

increase in Price → decreases real money supply → int rate ↑
increase → Investment decrease → demand for Goods decrease
→ Youtput decreases
∴ equilibrium level of output + income declines

Equilibrium in the Short Run + the medium Run.

→ increase in ∧ expected price level → increases the nominal wage →
increase in price level.

→ increase in expected price level decrease output.
→ decrease in price level causes movement on AD curve
→ increase in price level decreases money supply.

Short Run

→ possible to be away from the natural level of production
but it will go back to the natural position of production
in the medium Run.

→ Position away from the natural level of production +
employment implies that the actual price level + the
expected price level differ
→ At such a position (A) → the expected price level is lower
the actual price level (Pe < P) → It is this upward
revision of the expected price level + the impact thereof.
on nominal wages that eventually moves the economy
back to the natural level of employment. In the medium
run,
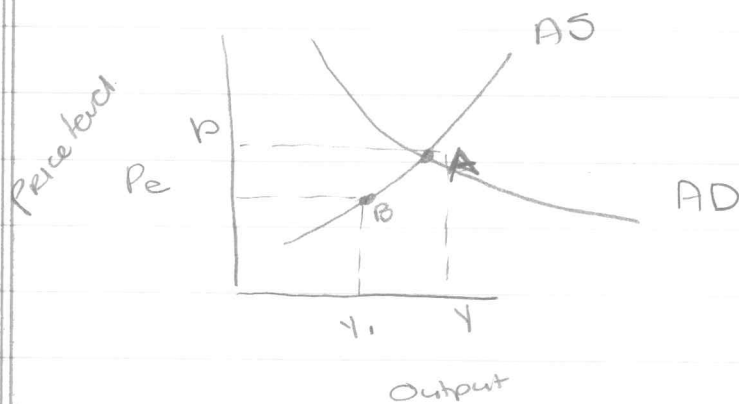
at production level Y → higher than the natural
level of production Yi → the unemployment rate is
lower than the natural unemployment rate
→ In terms of the wage setting relation → this implies
that workers will try to achieve a real wage (W/P₁)
that is higher than the real wage (W/P)
→ when workers bargained for the real wage - they
assumed incorrectly that the expected price level + the
real/actual price level would be the same (Pe = P)
→ as a result of the price setting behaviour of firms
the actual price level of Y turns out to be higher than
than the price level expected by workers when they bargained

→ They thought they were going to receive a higher real wage, but as it turns out that their real wage, owing to an increase in the price level was the same as before.

→ real wage that the workers received at output level of Y is the same as the real wage at Y_1

→ this is due to the fact that while workers can set the nominal wage, they cannot determine real wages as since the price level is determined by the price setting behaviour $P = (1+\mu)w$ of firms in the economy

→ Eventually workers will realise that the actual price level is higher than the price level that they expected and during the next level of negotiations, they will adjust the expected price level + nominal wage demands upwards. which is the medium Run.

Short to Medium Run

→ workers now revise their price expectations upwards + they increase their wage demands

→ firms react to this increase in nominal wages + increase the price of goods + services

→ this increase in the price level, affects the financial market where an increase in price level decreases the money supply which causes an increase in interest rate + a decrease in investment spending, which lowers the demand for goods + the level of output declines

$$P_e \uparrow \Rightarrow W \uparrow \Rightarrow P \uparrow \Rightarrow (m/p) \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow \Rightarrow Z \downarrow \Rightarrow Y \downarrow$$

→ this process continues until the natural ~~price~~ level of employment is reached where the expected price level $P_e = P$ (actual price level)

→ this increase in expected price level is represented by the upward shift in the <u>AS</u> curve

→ the impact on the financial + goods market is represented by an upward movement along the AD curve.

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Short Run $P_e \neq P$ Medium Run $P_e = P$
        $Y_n \neq Y$ $Y_n = Y$

<u>The effect of a monetary expansion</u>

→ expansionary money policy → central bank buys bonds in order to increase the nominal money supply.

→ increase in nominal money supply increases real money supply

→ increase in nominal money supply shifts the AD curve Right

→ At the natural level of employment the expected price is equal to the Real price

→ if the level of output is above the natural level of output the expected price level is lower than the actual price level.

→ increase in expected price level shifts the AS curve up.

7-

Short Run impact - expansionary monetary policy
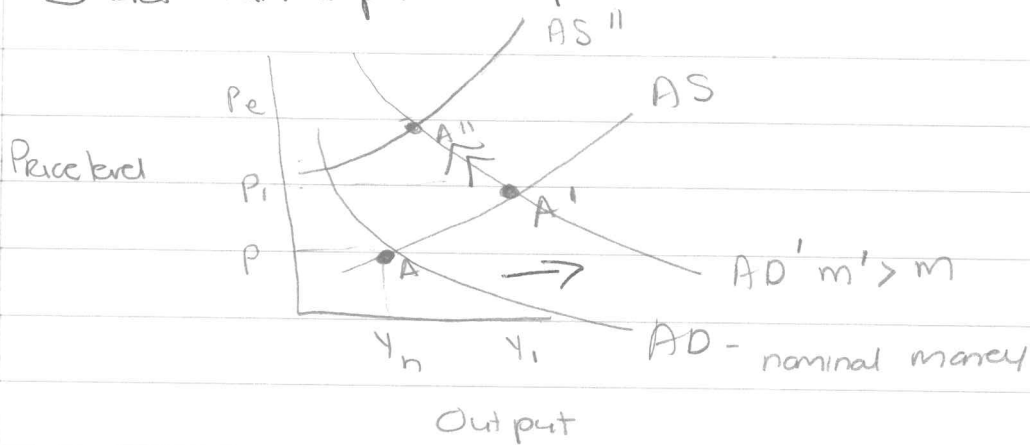
Short Run financial Market

$\Rightarrow$ initial $\quad m\uparrow \Rightarrow m/P\uparrow \Rightarrow i\downarrow$

increase in nominal money supply

$\Rightarrow$ to increase money supply $\Rightarrow$ Central bank buys bonds
on the financial Market

$\Rightarrow$ real money supply increases + interest rate declines.

Goods Market

$i\downarrow \Rightarrow I\uparrow \Rightarrow Z\uparrow \rightarrow Y\uparrow$

$\Rightarrow$ firms react to the decrease in interest rate by increasing
their investment spending.

$\Rightarrow$ the increase in investment spending increases the demand
for goods and through the multiplier process, the level
of output increases.

$\Rightarrow$ represented by the Rightward shift from $AD - AD'$

Labor Market

$Y\uparrow \Rightarrow N\uparrow \Rightarrow \mu\downarrow \Rightarrow W\uparrow = P\uparrow$

→ increase in level of output increases the level of employment + the unemployment rate decreases + the bargaining position of workers increases

→ This increase in the bargaining position of workers → increases the nominal wages

→ firms react by increasing the price level

∴ this is indicated by an upward movement along the AS curve + the short Run equilibrium position is reached by A'

Medium Run

labour Market

$$P_e \uparrow \Rightarrow W \uparrow = P \uparrow$$

→ At Point A' the expected price level on which workers based their negotiations turned out to be lower than the expected price level

→ they revised their expected price level upwards + negotiated for higher wages

→ in reaction to the higher nominal wages firms increase the price level.

→ this effect is captured by an upward shift in the AS curve.

financial + Goods market

$$P \uparrow = (M/P) \downarrow \Rightarrow i \uparrow \Rightarrow I \downarrow = Z \downarrow = Y \downarrow$$

→ As the price level increases + the real money supply decreases in the financial market, leading to an increase in the interest rate.

→ increase in the interest rate causes firms to decrease their investment spending + consequently aggregate demand + level of output decreases.

→ Upward movement from along the AD curve

→ this process continues until Point A" is reached where the level of output is at the natural level of output + the unemployment rate by implication is are equal to the natural rate of unemployment.

Monetary expansion → leads to an increase in the output in the short run but has no effect on output in the medium run.

→ medium run it only changes nominal variables and not the real variables

→ compare A" with point A → the level of output, level of employment → unemployment rate is the same as what they were before the increase in nominal money supply., but the real money supply, interest rate, investment spending, government spending + the real wage are also equal to their original values.

→ only thing changed is the nominal variables → money supply.

→ nominal wages + price level is higher

SG page 167 Relationships/ Diagrams.

Decrease in Budget deficit

→ decrease in government spending → given that taxes are unchanged, decreases the budget deficit.
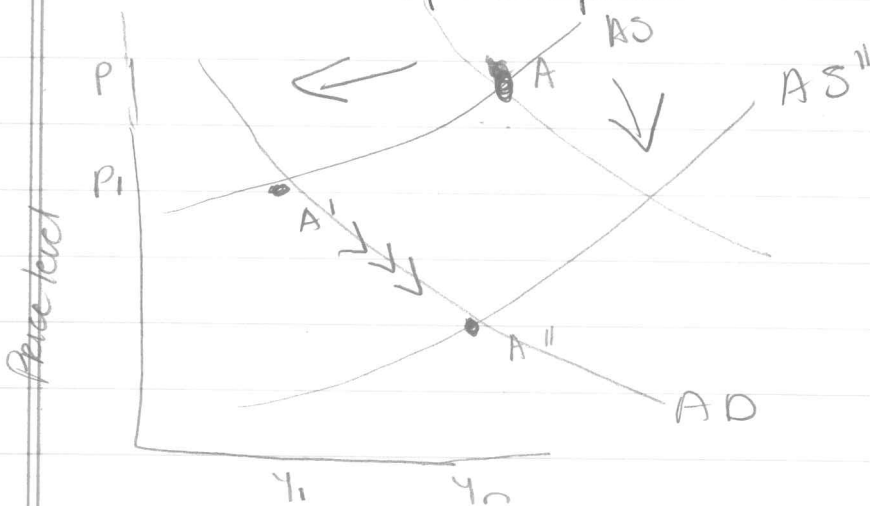→ decrease in government spending → decreases demand for goods
→ decrease in government spending shifts AD curve to the left.

→ decrease in the price level increases the real money supply.
→ at the natural level of employment the expected price level (Pe) is the same as the actual price level (P.)
→ if the level of output is below the natural level of output the expected price level is higher than the actual price level.
→ decrease in expected price shifts the AS curve downwards

Budget deficit decrease

Short Run
Goods + financial Market

→ decrease in Government spending initially affects the goods market, where the demand for Goods + level of output decreases

$$G \downarrow \Rightarrow Z \downarrow \Rightarrow Y \downarrow$$

→ decrease in output decreases the demand for money in the financial market + the interest rate declines

$$Y \downarrow \Rightarrow M^d \downarrow = i \downarrow$$

→ nobody knows in Investment increases at this stage
  → decrease in Int rate, increases investment spending,
  → decline in output decreases investment spending

$$i \downarrow \Rightarrow I \uparrow$$
$$Y \downarrow \Rightarrow I \downarrow$$

This is represented by a leftward shift in the IS curve to IS' + AS-AD -leftward shift in the AD curve from $AD \rightarrow AD'$

Labour Market

$$\rightarrow Y \downarrow \Rightarrow N \downarrow = \mu \uparrow = W \downarrow = P \downarrow$$

→ as the level of output declines the level of employment decreases + the unemployment rate increases

→ increase in unemployment rate, decreases the bargaining position of the workers + the nominal wage declines.

→ decrease in nominal wage → increase in price level.

∴ In terms of the AS/AD model → a downward movement along the AS curve to A' occurs

Medium Run

Labour Market
$$P_e \downarrow \Rightarrow W \downarrow = P \downarrow$$

→ At point A' → expected price level on which workers based their real wage negotiations turned out to be higher than the actual price.

→ workers revise their expected price level downwards + the nominal wage decreases

→ in reaction to the lower nominal wages → firms decrease price levels

→ AS/AD model → this is captured by a downward shift in the AS curve to AS''

Financial + Goods Market

→ decrease in price level causes a decrease in real money supply + the interest rate declines

→ decline in interest rate increases investment spending the demand for goods + level of output

$$P \downarrow = (M/P) \uparrow = i \downarrow = I \uparrow = Z \uparrow = Y \uparrow$$

∴ IS-LM model → downward shift of the LM Curve
AS-AD model → represented by a movement along the AD curve → process continues until point A'' is reached, where the level of output is at the natural level of output + the unemployment rate by implication is equal to the natural rate of unemployment.

Comparing equilibrium point A'' with the initial position A
→ clear that the level of output, level of unemployment + unemployment rates are the same as before the decrease in government spending.
→ real money supply is higher (due to a decrease in price level)
  → int rate is lower (due to higher real money supply)
    → investment spending is higher (due to lower int. rate)
      → Government spending is lower (budget deficit assumption)
→ What happened in the economy is that the decrease in government spending has been replaced by an increase in investment

Spending

→ decrease in budget deficit leads initially to a
decrease in output.
  → over time, output however returns to the natural
  level of output.

→ budget deficit

Short Run
* ↓ output (Y)

* ↓ interest rate
* ↑/↓ Investment (either)

Long Run
  Y increases
  Investment increases

Medium Run
* → output returns to natural
  level

* → interest rate ↓ further
* → investment ↑