



Lecture 20



Monetary policy theory

Roadmap:

- ▶ Examine the role of the monetary policy in creating inflation and stabilizing the economy.
- ▶ Answer 3 big questions:
 - 1) What are the roots of inflation?
 - 2) Does stabilizing inflation stabilize output?
 - 3) Should policy be activist (respond aggressively to fluctuation in economic activities) or passive?



Central bank's balance of risk:

Risk to growth



Risk to Inflation

Monetary authority try to stabilize economic activity

Monetary authority try to maintain inflation close to the target level

minimize output gap
(current output – potential output)

minimize inflation gap
(current inflation - target inflation)



Response of monetary policy to shocks

▶ Assuming that aggregate output is at natural rate, Y^P and inflation is at target, π^T

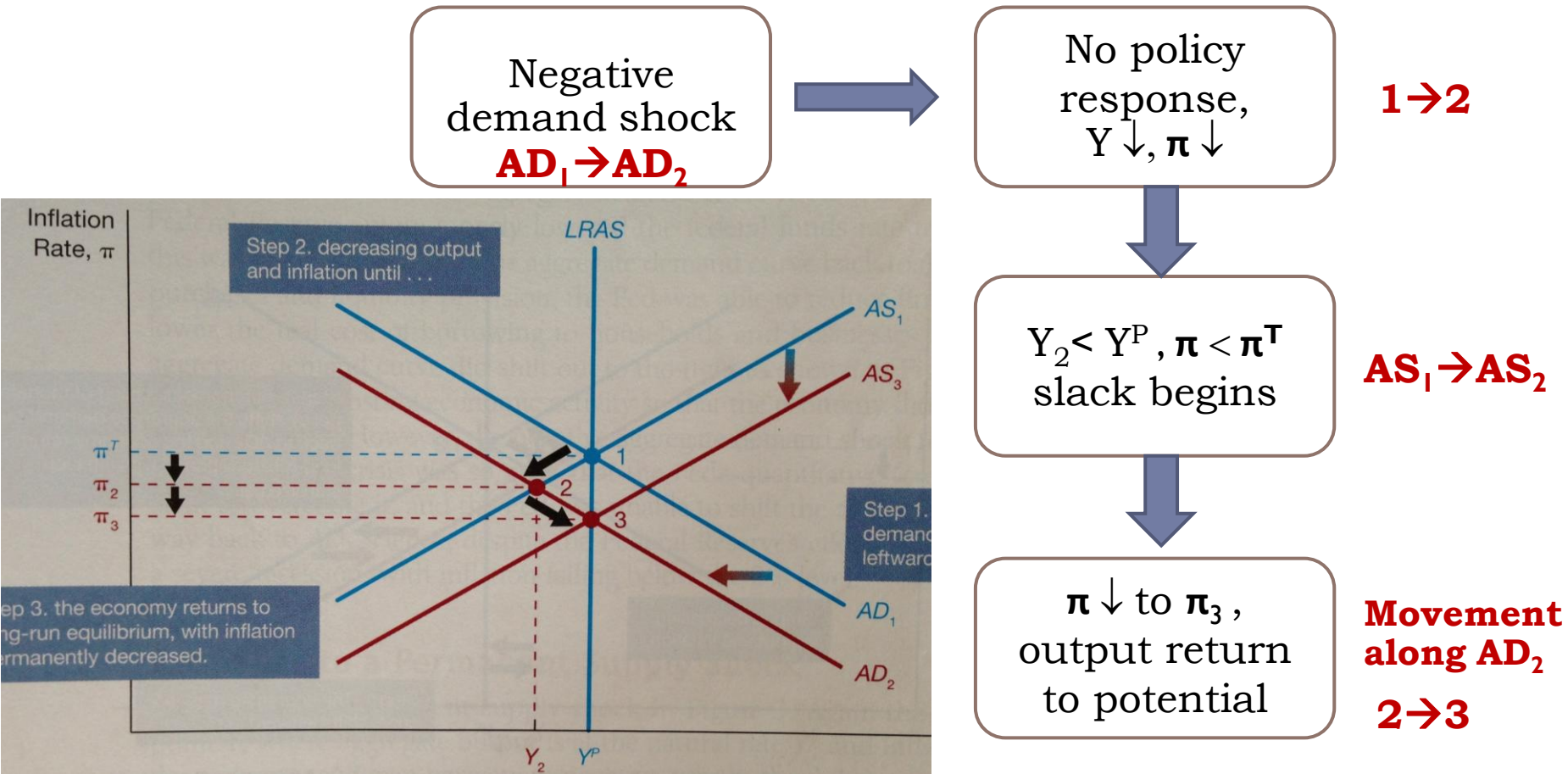
▶ There are 3 main types of shocks:

1. Aggregate demand shock
2. Permanent (aggregate) supply shock
3. Temporary (aggregate) supply shock

▶ Central bank respond to shocks by:

1. No policy response
2. Output and/or Inflation stabilization → changing autonomous component of monetary policy (↓, ↑ real rates at any given π)

1. AD shock: No policy response



Economy return to equilibrium with inflation permanently decreased

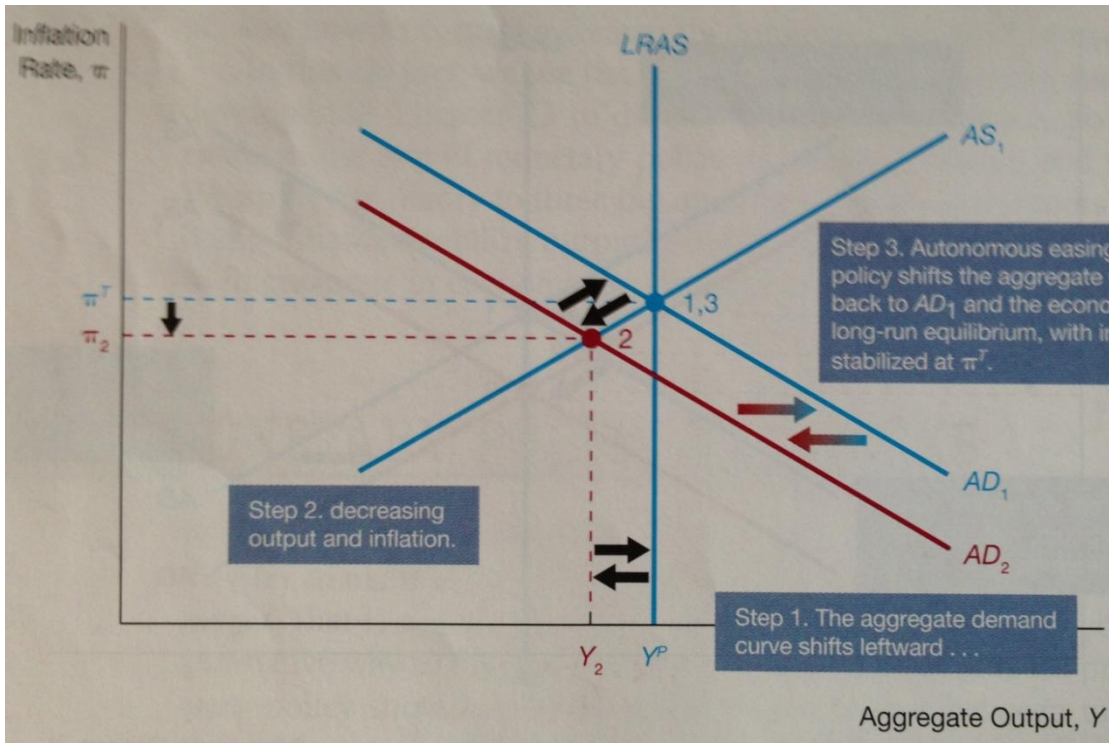
1. AD shock: policy to stabilize economic activity and inflation in short run

Negative demand shock
 $AD_1 \rightarrow AD_2$



Autonomous easing of MP

$AD_2 \rightarrow AD_1$



Stimulate investment spending and increase aggregate demand at any given π



Economy return to original level of inflation and output

$2 \rightarrow 3$

There is no tradeoff between pursuit of price stability and economic activity stability (stabilize inflation also stabilize economic activity)

Application: QE in response to a global financial crisis

- ▶ Apart from \downarrow real interest rates to counter AD shock (**AD shift left**) and stabilize output and inflation, unconventional MP plays role.
- ▶ Asset purchase and liquidity provision (QE) help \downarrow financial friction and \downarrow real cost of borrowing (**shift AD to the right**) to avoid deflation and boost economy.
- ▶ However, impact from GFC is so great that AD cannot shift back to original level. QE was insufficient to overcome it.
- ▶ Despite the fed's effort, economy still suffer severe recession with inflation falling below 2%.



2. Permanent supply shock: no policy response

Negative permanent supply shock ex) regulation permanently $\downarrow Y_1^P$ to Y_3^P
 $LRAS_1 \rightarrow LRAS_3$

+

Supply shock also trigger price shock
 $AS_1 \rightarrow AS_2$



No policy response, $\pi \uparrow$ to π_2 and $Y \downarrow$ to Y_2

1→2



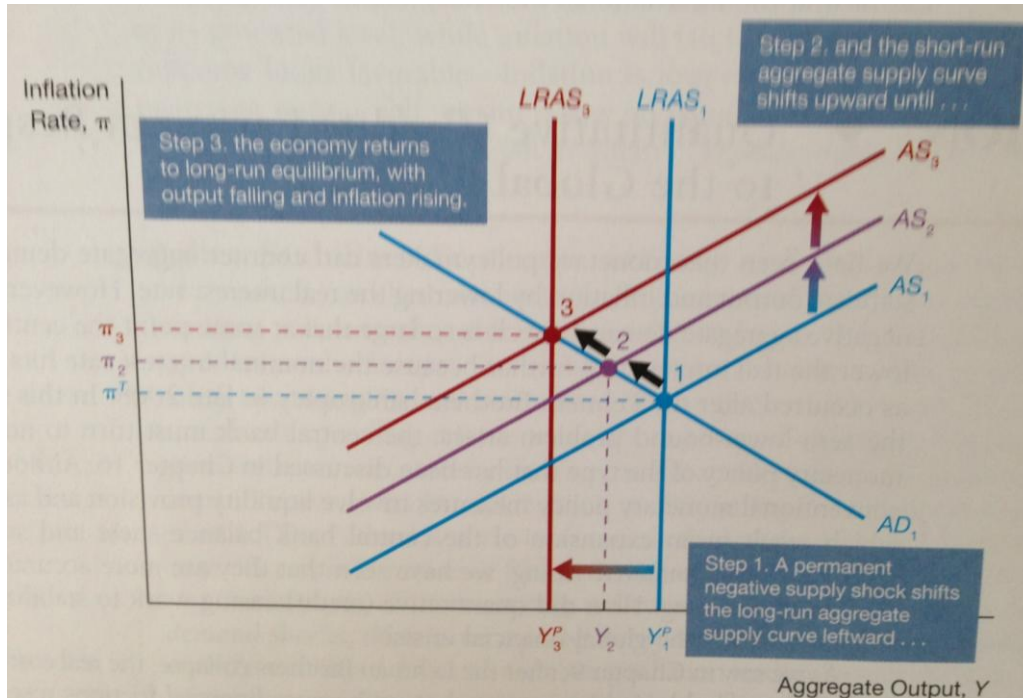
$Y_2 > Y^P$,
 pressure on π

$AS_2 \rightarrow AS_3$



Y gap eliminate,
 inflation \uparrow to π_3 ,
 potential output \downarrow
 to Y_3^P

2→3



2. Permanent supply shock: policy stabilize inflation

Negative permanent supply shock ex) regulation permanently $\downarrow Y_1^P$ to Y_3^P
 $LRAS_1 \rightarrow LRAS_3$

+

Supply shock also trigger price shock
 $AS_1 \rightarrow AS_3$



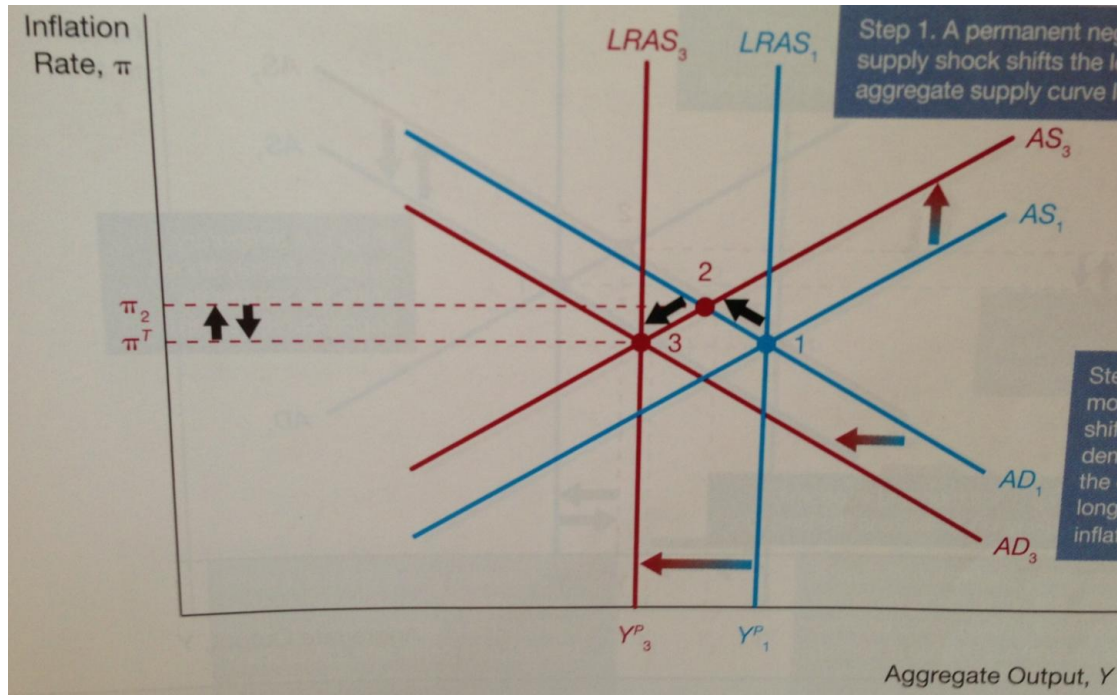
Autonomous tighten of MP
 $AD_1 \rightarrow AD_3$

\downarrow investment spending and \downarrow aggregate demand at any given π



Achieve zero output gap, inflation is at target level, π^T

2 \rightarrow 3



There is no tradeoff between pursuit of price stability and economic activity stability (stabilize inflation also stabilize economic activity)

3. Temporary supply shock: no policy response

Negative temporary supply shock ex) oil price surge from political unrest, hurricane
 $AS_1 \rightarrow AS_2 \Rightarrow Y \downarrow, \pi \uparrow$



No policy response

1 → 2



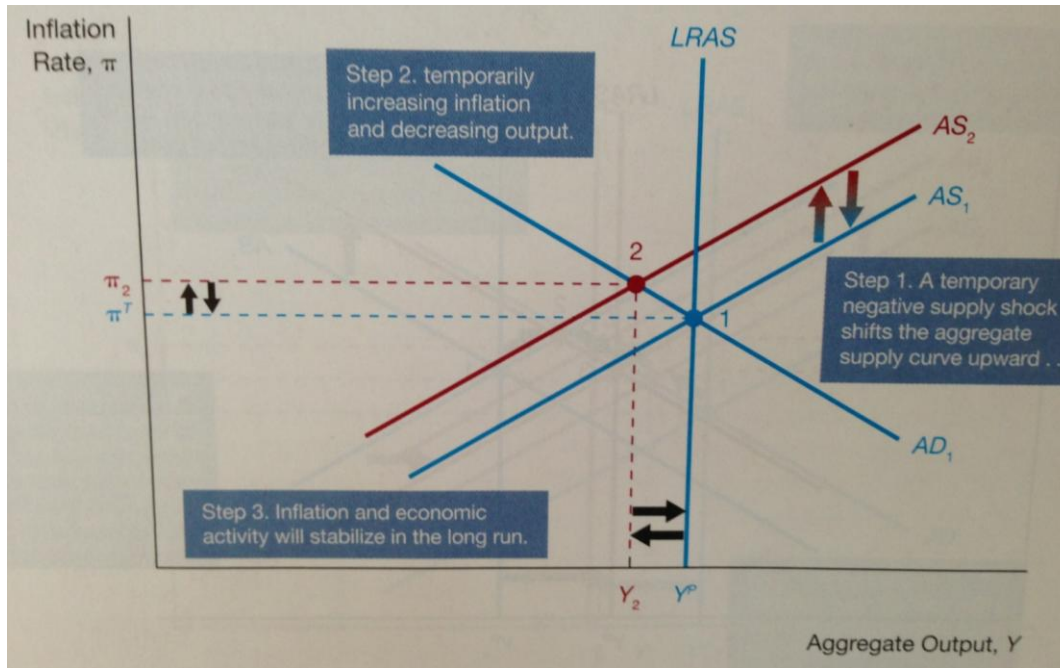
$Y_2 < Y^P$
slack begins

$AS_2 \rightarrow AS_1$



Output and inflation return to initial level

2 → 1



No tradeoff between pursuit of price stability and economic activity stability in long run, but economy undergo painful period in short run

3. Temporary supply shock: policy stabilize inflation in short run

Negative temporary supply shock ex) oil price surge from political unrest, hurricane
 $AS_1 \rightarrow AS_2 \Rightarrow Y \downarrow, \pi \uparrow$ 1→2



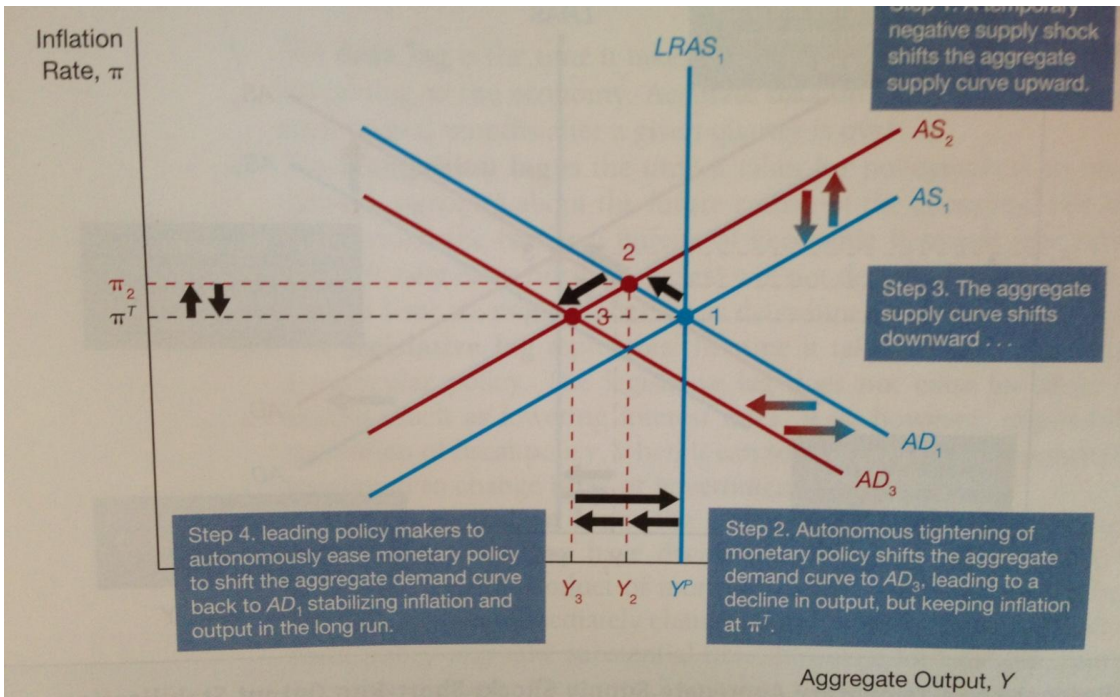
Autonomous tighten MP to keep inflation at target, π^T
 $AD_1 \rightarrow AD_3$
 2→3



$Y_3 < Y^P$
 slack begins
 $AS_2 \rightarrow AS_1$



To keep inflation at $\pi^T \rightarrow$ reverse the tightening MP
 $AD_3 \rightarrow AD_1$
 3→1



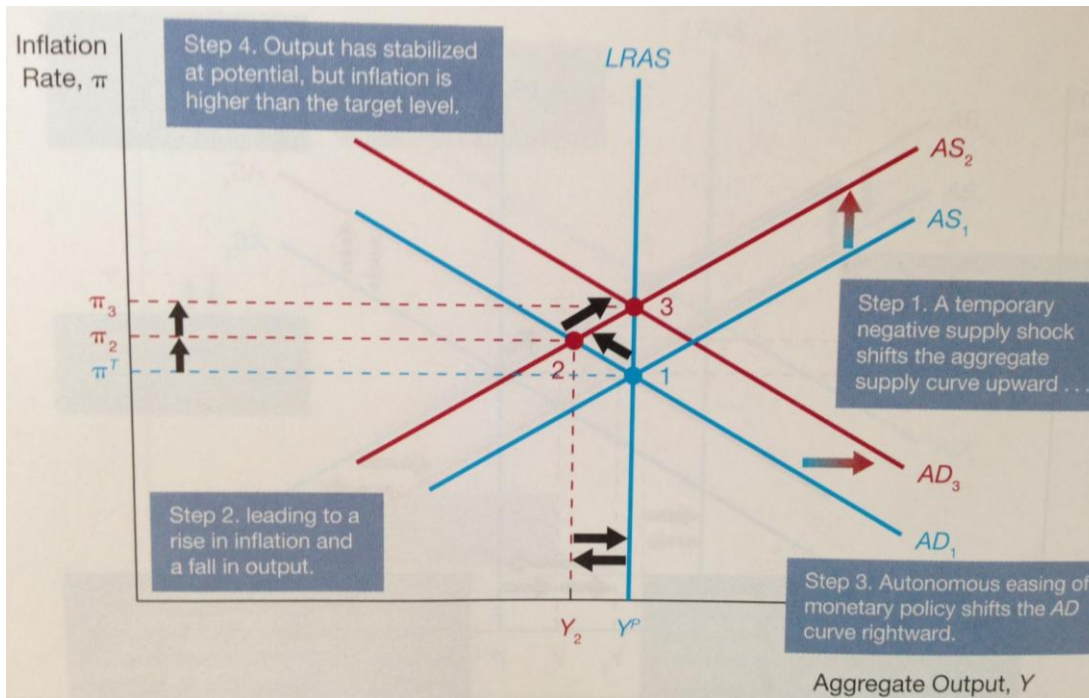
Stabilizing inflation (response to temporary supply shock) led to larger deviation of output in short run \rightarrow action has not stabilize economy

3. Temporary supply shock: policy stabilize output in short run

Negative temporary supply shock ex) oil price surge from political unrest, hurricane
 $AS_1 \rightarrow AS_2 \Rightarrow Y \downarrow, \pi \uparrow$ 1 \rightarrow 2



Increase AD
(autonomously ease MP)
 $AD_1 \rightarrow AD_3$
2 \rightarrow 3



Output gap closed
(AS does not shift) \rightarrow
economic activity stabilize

Inflation \uparrow to π^3
(inflation above target) \rightarrow
Inflation is not stabilized

Stabilizing economic activity (response to temporary supply shock) led to \uparrow inflation so inflation has not been stabilized

Relationship between stabilizing inflation and stabilizing economic activity

- ▶ 1. Most shocks are AD shocks or permanent AS shock, then policy that stabilize inflation also stabilize economic activity, even in short run.
- ▶ 2. If temporary supply shock are more common, central bank must choose between two stabilization objective in short run.
- ▶ 3. In long run, there is no conflict between stabilizing inflation and economic activity in response to shock.



How actively should policy maker try to stabilize economic activity?

- ▶ Policy goal is to promote high employment and price stability.
 - ▶ In response to negative demand or supply shock, there are 2 views:
 1. Non-activist: self-correcting mechanism is very rapid (wages and price are very flexible). Government action is unnecessary to eliminate unemployment. AS will shift down, returning economy to full employment quickly.
 2. Activist: (Keynesians) self correcting mechanism are very slow (wage and price are sticky). Government need to pursue active policy to eliminate high unemployment when it develops.
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How actively should policy maker try to stabilize economic activity?

- ▶ If policy makers could shift AD curve instantaneously, activist policy could be used to immediately move economy to full employment level.
- ▶ Several types of lags prevent immediate shift from occurring such as data lag, recognition lag, legislative lag, implementation lag, effectiveness lag.
- ▶ If policy lags are longer than time it takes the self-correcting mechanism to work, a policy of non-activism may produce better outcome.



Monetary policy maker can target any inflation rate in the long run by shifting AD curve with autonomous MP

Central banks believe that current inflation target π_1^T is too low and raise it to π_3^T



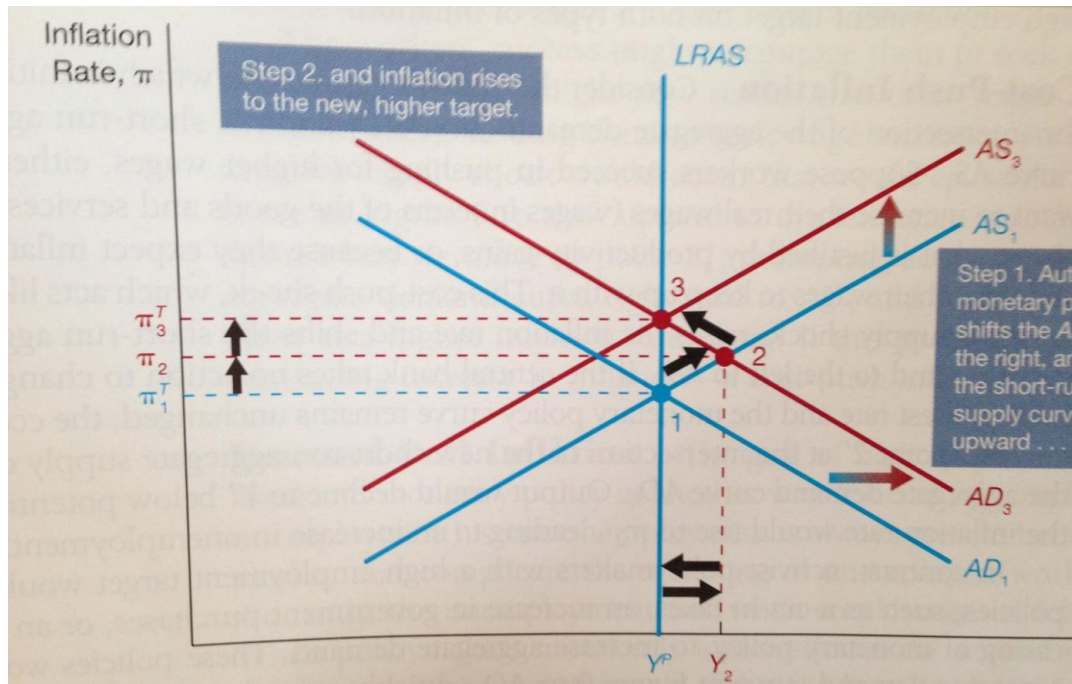
Autonomous easing of MP to \uparrow investment and \uparrow aggregate demand **$AD_1 \rightarrow AD_3$**
 $1 \rightarrow 2$



$Y_2 > Y^P$
pressure on inflation **$AS_1 \rightarrow AS_3$**



$\uparrow \pi^T$, output gap is back at zero **$1 \rightarrow 3$**



Monetary authority can target any π in long run with autonomous MP adjustment. Potential output is independent of MP.

High employment target and inflation

- ▶ 2 types of inflation can result from an activist stabilization policy to promote high employment:
- ▶ 1. Cost push inflation: result either from a temporary negative supply shock or a push by workers for wage hike (beyond what productivity gain can justify)
- ▶ 2. Demand pull inflation: result from policy makers pursuing policies that increase aggregate demand.



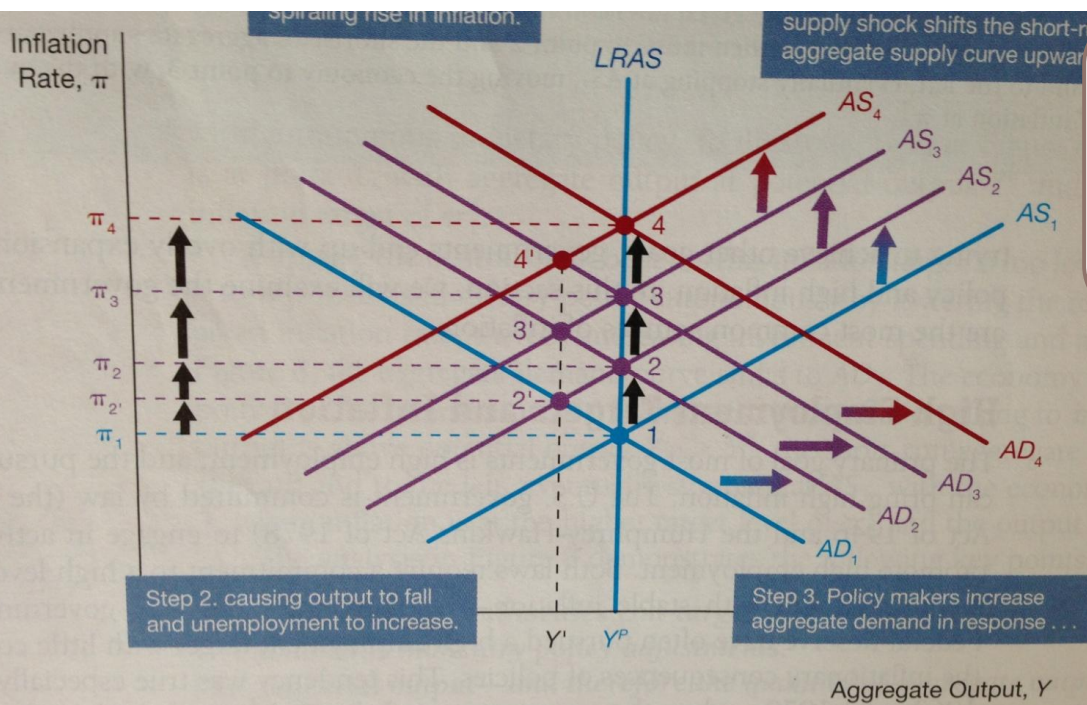
Cost push inflation

Cost push shock (temporary negative supply shock)
 ex) workers succeed in \uparrow wage
 $AS_1 \rightarrow AS_2 \rightarrow Y \downarrow, \pi \uparrow \quad 1 \rightarrow 2'$

Increase in unemployment, output to Y'_2

To keep output at Y^P , and \downarrow unemployment rate \rightarrow activist policy maker would 1) ease MP 2) tax cut, 3) \uparrow gov purchase
 $AD_1 \rightarrow AD_2 \quad 2' \rightarrow 2$

Further upward shift of AS to AS_3 and so on causes policy makers to keep on \uparrow AD leading to continue $\uparrow \pi$

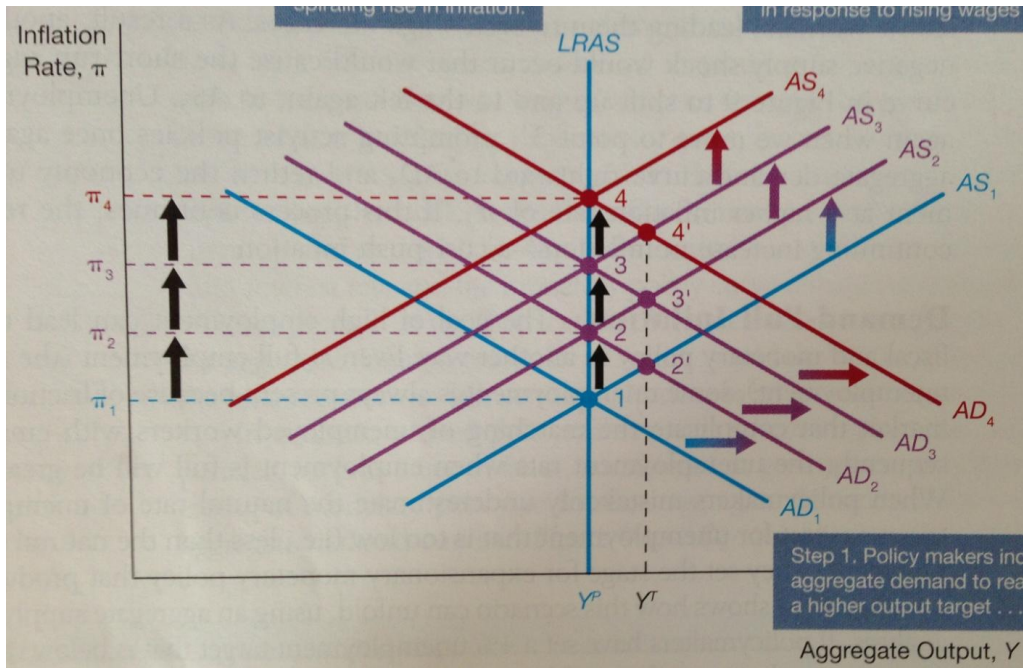


Demand pull inflation

Government \uparrow aggregate demand (too low unemployment target, too high output target) by expansion FP, MP

$AD_1 \rightarrow AD_2 \rightarrow Y \uparrow, \pi \uparrow \quad 1 \rightarrow 2'$

AD shift rightward from $AD_1 \rightarrow AD_2 \rightarrow AD_3$ and so on



Unemployment rate $<$ natural level \rightarrow wage $\uparrow \rightarrow$ AS shift up from $AS_1 \rightarrow AS_2 \rightarrow AS_3$

Continue rise in inflation know as demand pull inflation

Pushing too low unemployment target or equivalently, too high output target leads to inflationary MP or FP.

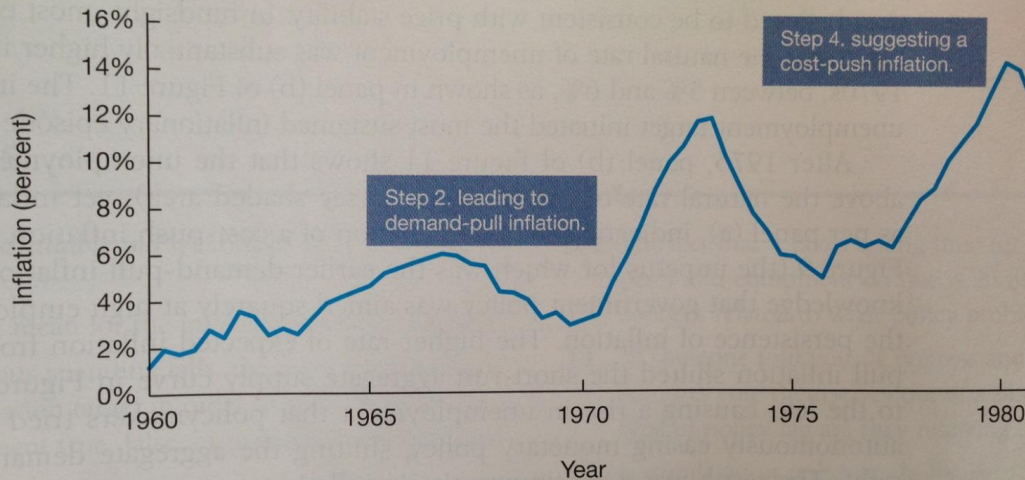
Identifying whether it is cost push or demand pull inflation?

- ▶ Normally, we could say that
 1. demand pull inflation occurs when unemployment is below natural rate level.
 2. Cost-push inflation is when unemployment is above natural rate level.
 - ▶ Unfortunately, measuring natural rate of employment is not easy.
 - ▶ Another complication is that a cost push inflation can be initiated by a demand pull inflation, blurring the distinction. Ex) expansionary MP or FP (demand pull inflation) $\rightarrow \pi^e \uparrow \rightarrow$ workers demand \uparrow wage (cost push inflation) so that real wage do not fall.
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Application: The great inflation

Panel (a) Inflation, 1965–1982



1965-1973: demand pull inflation (unemployment < natural rate of unemployment), autonomous MP Easing. → A shift to the right → (output target was too high, which increase inflation)

1975-1982: cost push inflation (unemployment > natural rate of unemployment). Persistent inflation from public perceive of government policy aim at high employment → AS shift up → unemployment ↑ with continue ↑ Inflation. Oil price shock in 1979 result in peak of inflation in 1980

Panel (b) Unemployment and the Natural Rate of Unemployment, 1965–1982

