EE432 Monetary Theory and Policy

Lecture 13 Understanding business cycle fluctuations

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Outline

- Sources of Fluctuations in Output and Inflation – Demand Shock and Supply Shock
- How Do Policymakers Achieve Their Stabilization Objectives?
- Positive Supply Shocks and the Opportunity They Create
- What Happens When Potential Output Changes?

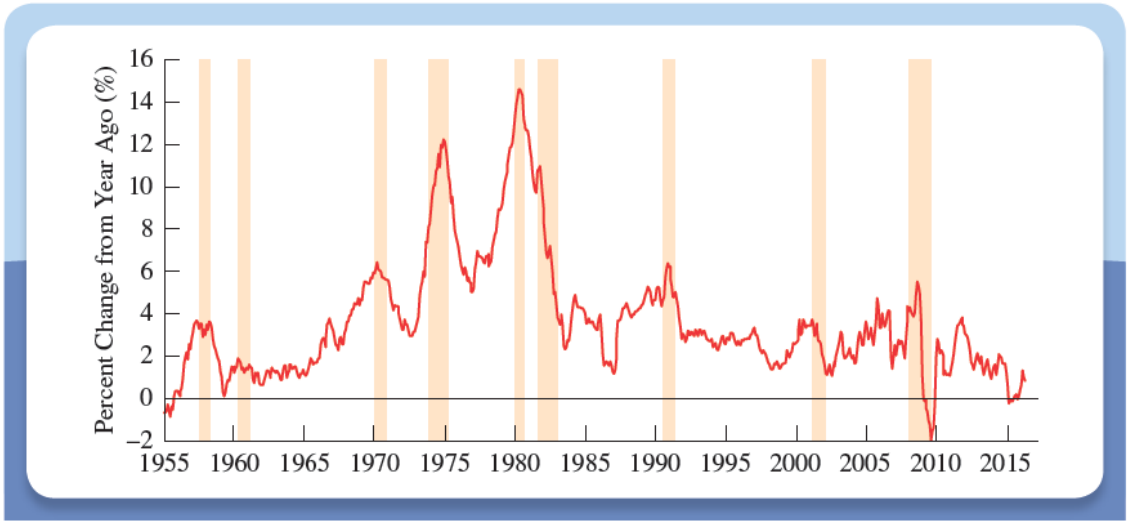
Chapter 22

Understanding Business Cycle Fluctuations

Sources of Fluctuations in Output and Inflation

Sources of Fluctuations in Output and Inflation

Figure 22.1 Inflation and the Business Cycle, 1955–2016



There appears to be a *connection* between **growth** and **changes in inflation**.

While there is no apparent *relationship between the level of inflation and recessions*,
It does appear that; the **inflation rate**, either ***falls*** when **the *economy is contracting***; or **rises** when it is **expanding**.

Sources of Fluctuations in Output and Inflation

Remember that **long-run equilibrium** means:

1. $Y = Y^P$ ***output = potential output***.
2. $\pi = \pi^T$ ***inflation = target inflation***.
3. $\pi = \pi^e$ ***inflation = expected inflation***.

Short-run equilibrium is:

The point where the ***dynamic aggregate demand curve*** (AD) **intersects** the ***short-run aggregate supply (SRAS) curve***.

Sources of Fluctuations in Output and Inflation

- Immediately after either the **SRAS curve** or **AD curve *shift***, the economy will *move away from its* ***long-run equilibrium*** – so called, **short-run fluctuations**.
- Economists define ***shocks*** as *something unexpected.*

Sources of Fluctuations in Output and Inflation

- A **shock** *shifts* the *AD* or *SRAS* curve.
  - A **supply shock** affects *costs of production*
    - For example; an **oil price increase**.
  - A **demand shock** affects *exogenous spending and thus aggregate expenditure*
    - For example; **change in consumer confidence**

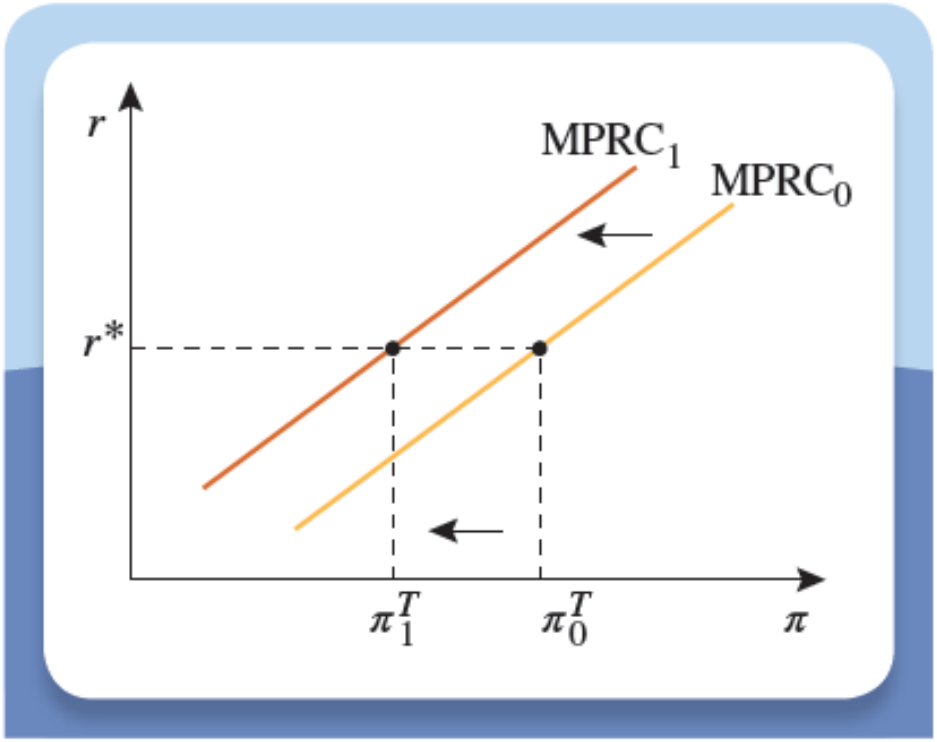
Demand Shock

A Decline in the Central Bank's Inflation Target

- A *fall* in π^T ***shifts*** *the* ***monetary policy reaction curve*** to the *left*.
  - The ***decrease*** in the ***inflation target*** **raises** the ***real interest rate*** policymakers s*et at each level of inflation*.
  - This **reduces aggregate expenditure *shifting*** the **AD curve** to the ***left*** as well.
    - The economy moves to a **new short-run equilibrium**.

A Decline in the Central Bank's Inflation Target

Figure 22.2 A Decline in the Central Bank's Inflation Target



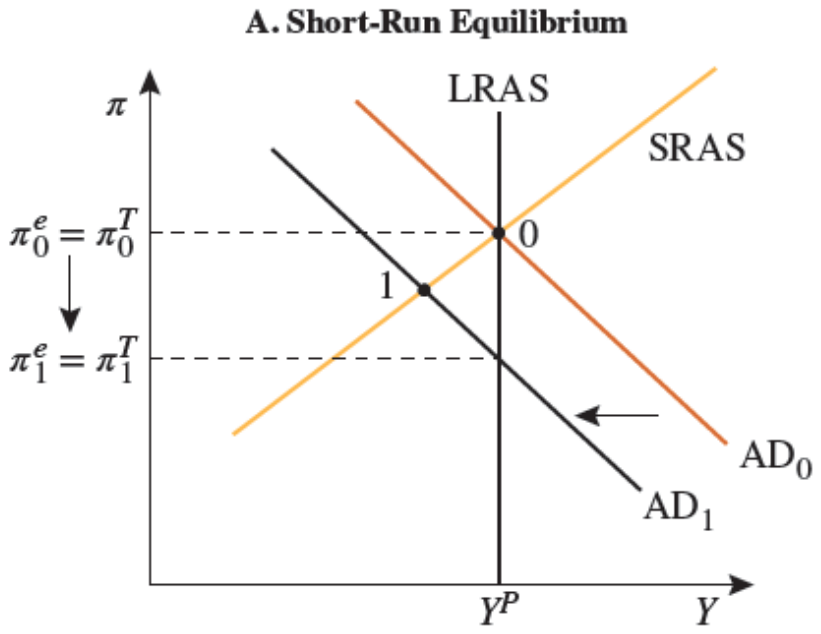
A decline in the inflation target from π_0^T to π_1^T shifts the monetary policy reaction curve to the left from $MPRC_0$ to $MPRC_1$

A Decline in the Central Bank's Inflation Target

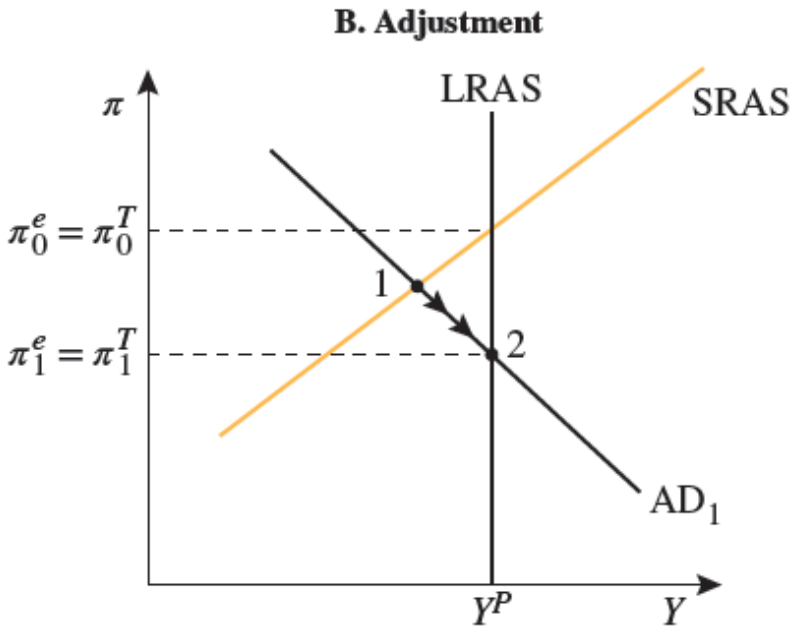
- At the new short-run equilibrium point, ***inflation*** and ***current output*** are **lower** than they were *prior to* the *monetary policy tightening*.
  - The **dynamic aggregate demand curve *shifts left***, moving the economy *along the SRAS*
- **Current inflation** is ***less than*** **expected inflation**
  - **Expected inflation *falls***, **shifting** the **SRAS *right***
- The **economy** will ***move*** along the new dynamic aggregate demand curve ***to*** *the* ***new long-run equilibrium*** where **inflation** *equals* the **new central bank's target**, and **output** *equals* **potential output**.

A Decline in the Central Bank's Inflation Target

Figure 22.3 A Decline in the Central Bank's Inflation Target



A decrease in the central bank's inflation target shifts the dynamic aggregate demand curve to the left from AD_0 to AD_1, moving the economy from point 0 to point 1.



When the economy is at point 1, current inflation is less than the initial level of expected inflation (π_0^e). As a result, expected inflation falls, shifting the short-run aggregate supply curve to the right. The process continues until the economy reaches point 2, where expected inflation equals the new inflation target ($\pi_1^e = \pi_1^T$).

An Increase in Government Purchases

- An ***increase*** in **government spending *shifts*** the **AD curve** to the ***right***.
- The *economy* moves from the original *short-run equilibrium* to a ***new short-run equilibrium***.
  - The immediate impact is to ***raise*** both **current output** and **inflation**.

An Increase in Government Purchases

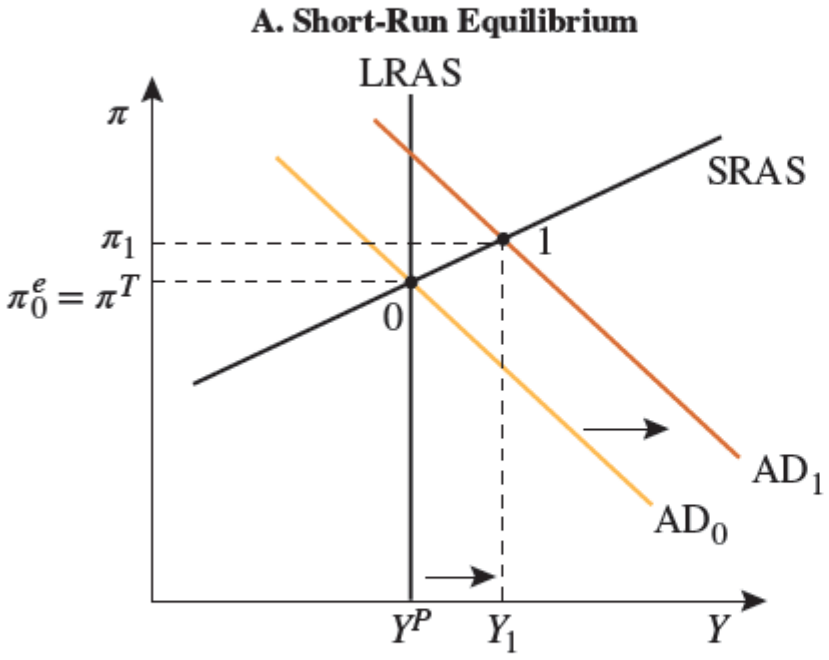
- Because **current inflation** *exceeds* **expected inflation**, this can't be the long-run effect.
- **Expected inflation *rises***, ***shifting*** the **SRAS** curve to the ***left***.
  - As the economy travels along aggregate demand, **current inflation *rises*** and **current output *falls*** until the point at which the **dynamic aggregate demand curve *crosses*** the **LRAS** curve

An Increase in Government Purchases

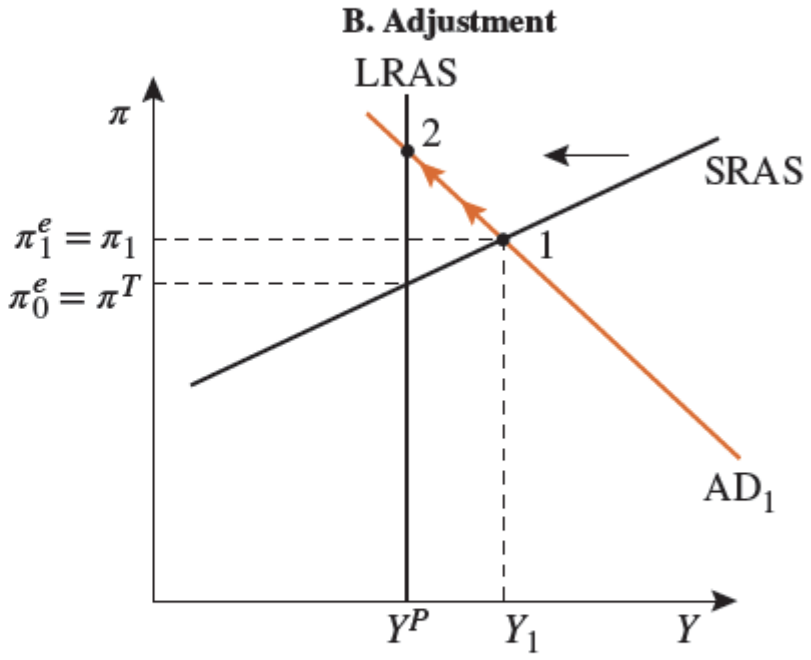
- **Inflation** is ***higher*** at the new equilibrium point than it at the original.
- This is ***above*** the **policymakers' original inflation target**, π^T
- **Unless** ***monetary policy adjusts***, when the *dynamic aggregate demand curve* shifts to the *right*, **inflation** *will* ***rise***.

An Increase in Government Purchases

Figure 22.4 An Increase in Government Expenditure



An increase in government expenditure shifts the AD curve to the right from AD_0 to AD_1. This moves the economy from point 0 to point 1. In the short run, output rises to Y_1 while inflation increases to π_1.



When the economy is at point 1, current inflation is initially above expected inflation ($\pi_1 > \pi_0^e$). As expected inflation rises in response, the short-run aggregate supply curve shifts to the left, moving the economy along AD_1 toward point 2.

An Increase in Government Purchases

- As long as monetary policymakers **remain committed to their *original inflation target***, they need to do something to *get the economy back to the point where it began*.
- In this case, **tighter monetary policy *shifts*** the **AD curve** to the ***left***.
  - This **brings the economy back** to the ***long-run equilibrium*** where **output** equals **potential output** and **inflation** equals the **central bank's target**.
- **Without a change in target inflation**, *an* ***increase in government purchases*** *causes a* ***temporary increase*** *in both* ***output*** *and* ***inflation***.

Supply Shock

Shifts in *Short-Run* Aggregate Supply

- **Changes in production costs *shift*** the **SRAS curve.**
- A ***negative supply shock*** that ***increases production costs***; for example, *increase in the price of oil*, will ***shift*** the **SRAS curve** to the ***left***, reducing the amount supplied at every level of inflation
  - **Higher inflation** and **lower growth**

Shifts in Short-Run Aggregate Supply

- The **short-run equilibrium** moves to where the **new SRAS curve *meets* AD**.
- This *creates* a condition referred to as ***stagflation***.
  - ***Economic* stagnation** coupled with ***increased* inflation**.
- **Expected inflation *rises*** as well and because **current inflation** is ***below*** this level, the **SRAS** curve ***shifts*** back to the ***right***

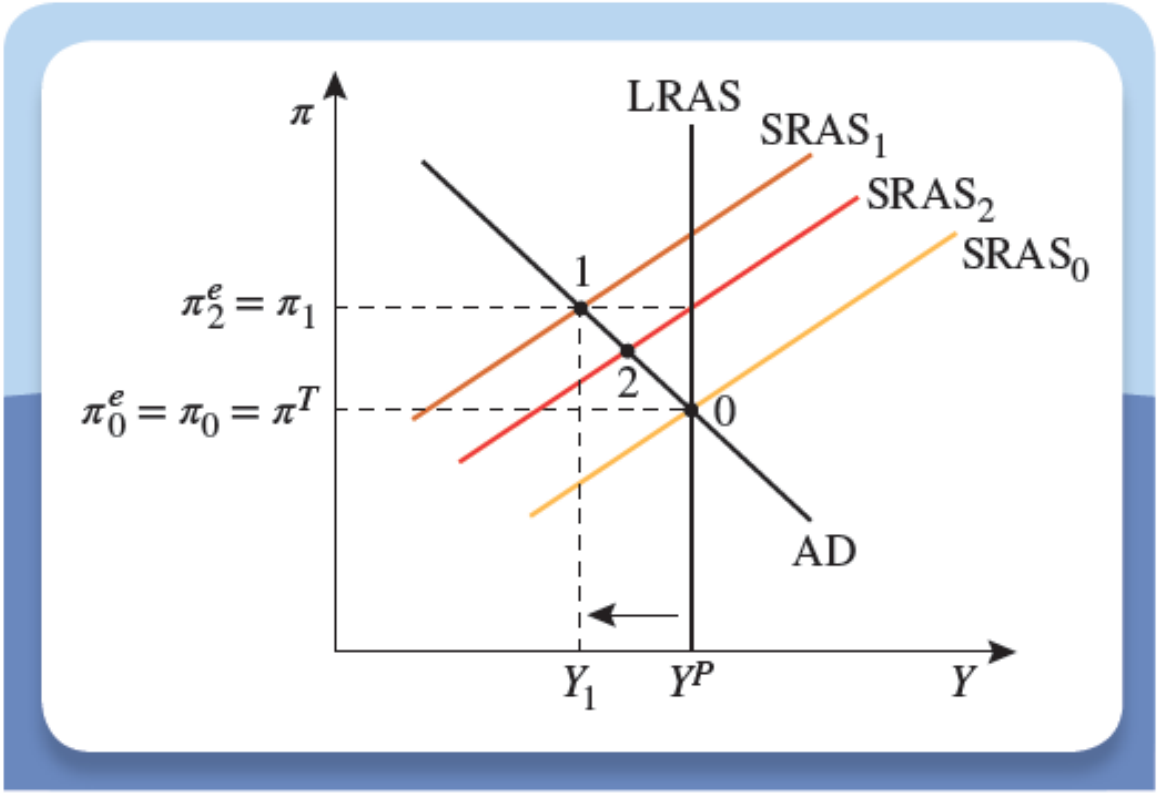
Shifts in Short-Run Aggregate Supply

- **Inflation** continues to ***fall*** and **output** *continues to* ***rise*** until **current inflation** and **expected inflation** ***return*** to the **central bank's inflation target**, and **output** equals **potential output**.

- ***Inflation*** *is at its* **highest** *and* ***output*** *at its* **lowest** *immediately,* ***following a negative shock to SRAS***
- ***Over time***, **self-correcting** forces *will unwind the shock,* ***restoring long-run equilibrium***

Shifts in Short-Run Aggregate Supply

Figure 22.5 A Negative Supply Shock



A negative supply shock shifts the SRAS curve to the left, moving the short-run equilibrium from point 0 to point 1, raising inflation to $\pi_1 > \pi^T$. At point 1, current inflation is *below* the intersection of $SRAS_1$ and LRAS that marks expected inflation in the long run, so the SRAS curve shifts back right to $SRAS_2$, which intersects the LRAS at the point where expected inflation (π_2^e) equals π_1. The SRAS curve continues to shift right until inflation and expected inflation again equal target inflation at point 0.

Shifts in Short-Run Aggregate Supply

- *As with an* ***increase in government purchases***, a **supply shock** has **no effect** **on** the economy's ***long-run equilibrium point***.
- A **supply shock** causes **inflation** to ***rise temporarily*** and *then* ***fall***.
  - This happens at the same time that **current output** ***falls temporarily*** and *then* ***rises***.
- In the **long run**, the economy ***returns*** to the point where **output** equals **potential output** and **inflation** equals the **central bank's target**.

How Do Policymakers Achieve Their Stabilization Objectives?

How Do Policymakers Achieve Their Stabilization Objectives?

- The aggregate demand-aggregate supply framework is useful *in understanding* **how *monetary and fiscal* policymakers** seek to **stabilize** *output* and *inflation* using ***stabilization policy***.

- When shifting their reaction curve, ***central bankers* shift AD**.
  - They **cannot shift** the **SRAS curve**.
- This means **monetary policymakers** can **neutralize demand shocks**, but *cannot* offset **supply shocks**.

How Do Policymakers Achieve Their Stabilization Objectives?

- **Positive supply shocks** that ***raise*** **output** and ***lower*** **inflation** *provide* policymakers with an *opportunity*
- Central bankers **can guide** the economy **to** a **new**, **lower inflation target** *without inducing a recessionary output gap*.

Using Monetary Policy

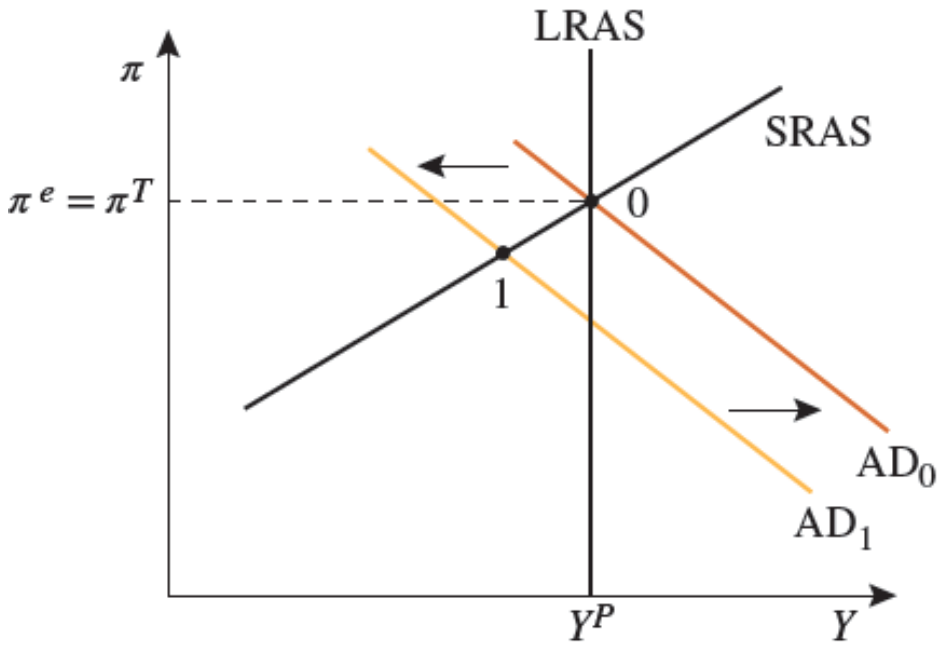
- A *reduction in consumption and investment*, ***shifts*** the **dynamic aggregate demand curve** to the ***left***
  - **Current inflation** would ***fall below*** **expected inflation** and **current output** to ***fall below*** **potential output**.

Using Monetary Policy

- **Drop in consumer or business confidence**:

  $AD_0 \rightarrow AD_1$

  Economy: points $0 \rightarrow 1$
- ***Stabilization*** *requires* ***shifting AD back*** *to where it started*.

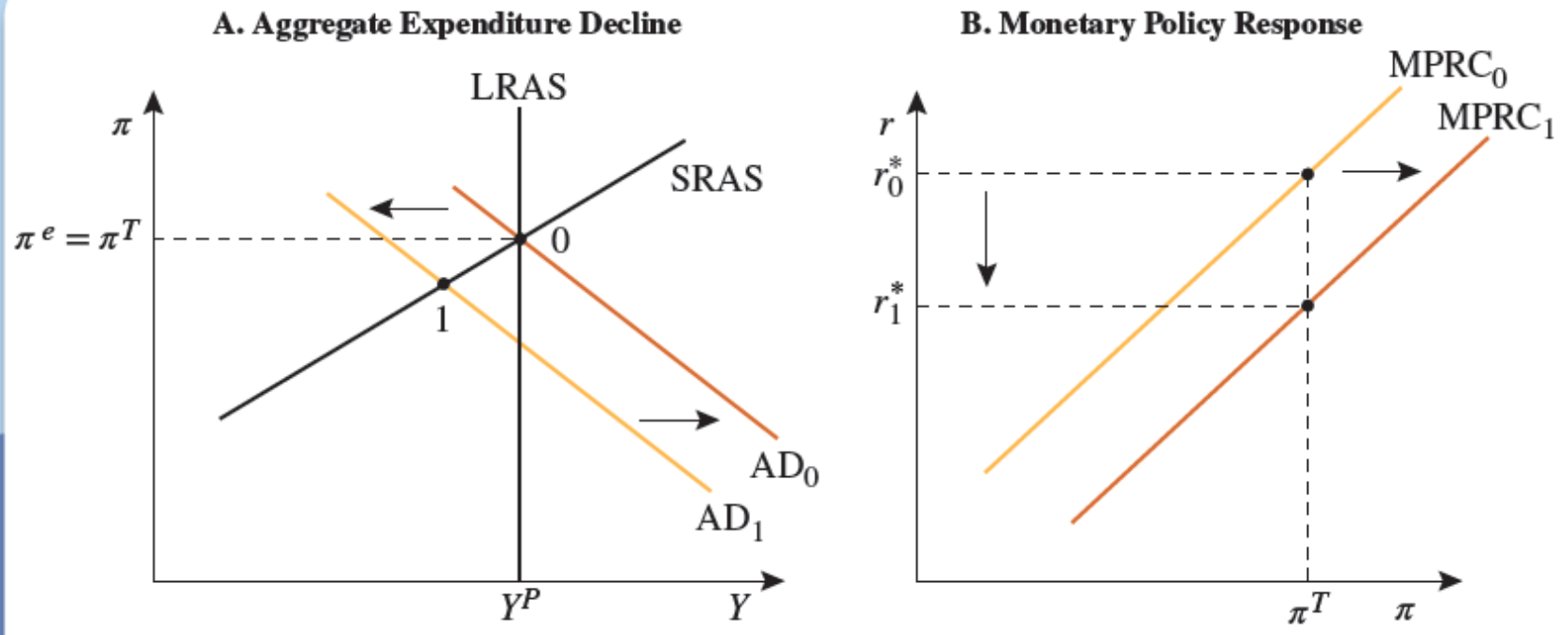


Using Monetary Policy

- Policymakers **realize to keep inflation on target** and thus conduct ***expansionary monetary policy***, implying **long-run real interest rate would be cut**.
- The ***drop*** in **aggregate expenditure** prompts policy maker to *shift the* ***monetary policy reaction curve*** to the *right*.
- The ***reduction*** in the level of the **long-run real interest rate** means the **AD curve** would then ***shifts right***, **back to its original level**.
- This policy response indicates that the **economy** will be **back** at **long run equilibrium**.

Using Monetary Policy

Figure 22.7 Stabilizing a Shift in Dynamic Aggregate Demand



Following a drop in consumer or business confidence the dynamic aggregate demand shifts to the left from AD_0 to AD_1, moving the economy from point 0 to point 1. Realizing this, monetary policymakers shift their MPRC to the right, shifting the dynamic aggregate demand curve back to where it started and returning the economy to point 0.

Following a drop in consumer confidence, the long-run real interest rate falls from r_0^* to r_1^*. Policymakers respond by shifting their reaction curve from $MPRC_0$ to $MPRC_1$, shifting the AD curve back to its original position, AD_0.

Using Monetary Policy

- *In practice*, it is extremely ***difficult*** *to* ***keep*** *inflation and output* ***from fluctuating*** *when* **aggregate expenditure changes**.
- There are two reasons:
  - It **takes time to recognize** *what has happened.*
  - ***Changes in interest rates*** do not have an ***immediate impact*** on the economy.

Discretionary Fiscal Policy

There are two types of **fiscal policy**:

1. **Automatic stabilizers**
   - ***Operate without any further actions*** *on the part of the government.*
   - Examples: *unemployment insurance* and the *proportional nature of the tax system.*
2. **Discretionary policy**
   - *Relies on* ***fiscal policymakers' decisions***.
   - ***Changes aggregate expenditures*** *shifting the* **dynamic aggregate demand curve**.

Discretionary Fiscal Policy

- **Fiscal policy** *can* act just like monetary policy to **offset** *shifts in the* ***dynamic aggregate demand curve*** and **stabilize** *inflation and output*.
- Two shortcomings:
  1. *Discretionary fiscal policy* ***works slowly***
  2. It is almost ***impossible*** *to* ***implement effectively***

Discretionary Fiscal Policy

- Because **economic data** only become *available several months* ***after they are collected***, the economy is *often* ***halfway through a recession*** *before* there is a *consensus that a downturn* has *actually started*.
- This means that **discretionary fiscal policy** is ***likely to*** *have its biggest* ***impact*** when it is ***no longer needed***.

Discretionary Fiscal Policy

- Economics clearly come into *conflict with politics* where *fiscal stimulus* is concerned.
  - For economists, the ***best policies*** are the ones that **influence** a **few key people** to ***change their behavior***, *avoiding rewarding people* who do what they would *have done* anyway.
  - For politicians, the ***best policies*** are programs that **reward** the ***largest number of people*** possible.
- Discretionary fiscal policy is a ***poor stabilization tool*.**

Positive Supply Shocks and the Opportunity They Create

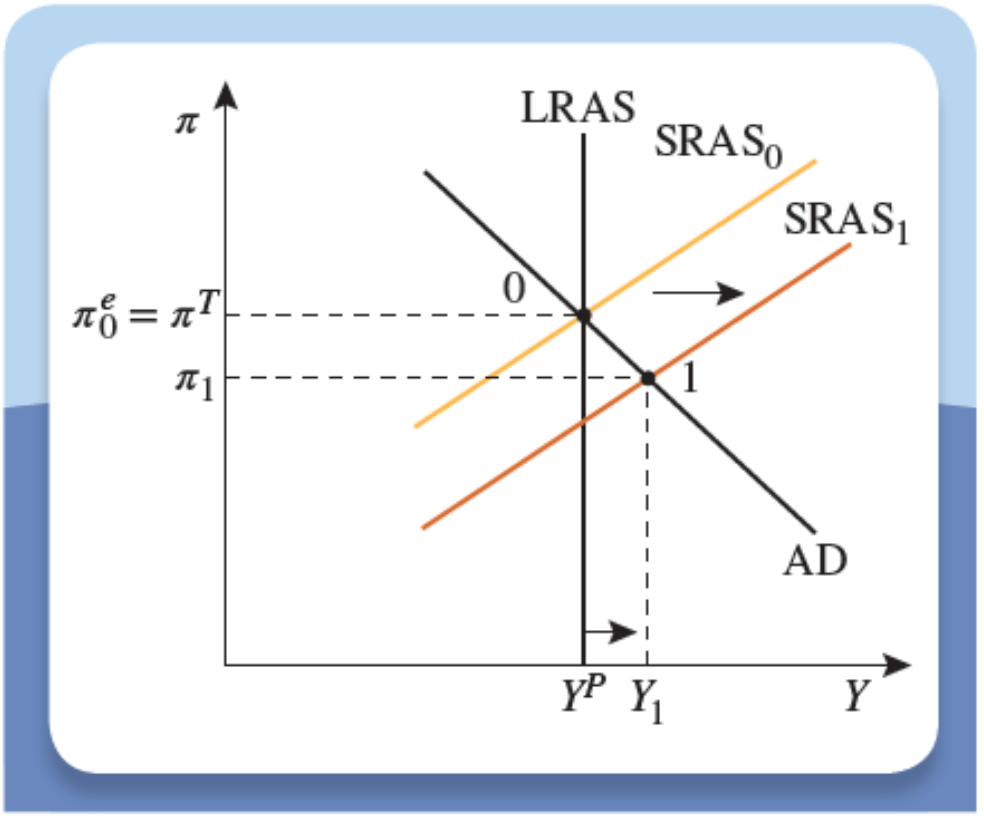
Positive Supply Shocks and the Opportunity They Create

- When **production costs *fall*** - a ***positive* supply shock**
- The **SRAS curve** *shifts* to the **right**.
  - This ***drives up* inflation** and **output** immediately.
  - **Current inflation** is ***below* expected inflation** and **expectations** initially ***fall***.
- This leads to **inflation** *above* **expected inflation** so ***expectations start to rise*** and the **SRAS curve** *shifts* to the **left**.
  - This continues **until the economy returns** to the ***original* long-run equilibrium**.

Positive Supply Shock

- ***Fall*** in **production costs** **shifts SRAS Right**.
  - Economy 0→1
- **Current inflation** is ***above*** **expected inflation** (given by the intersection between LRAS and $SRAS_1$), then **SRAS *moves back*** to *original level*.
  - Economy 1→0

Figure 22.8 A Positive Supply Shock

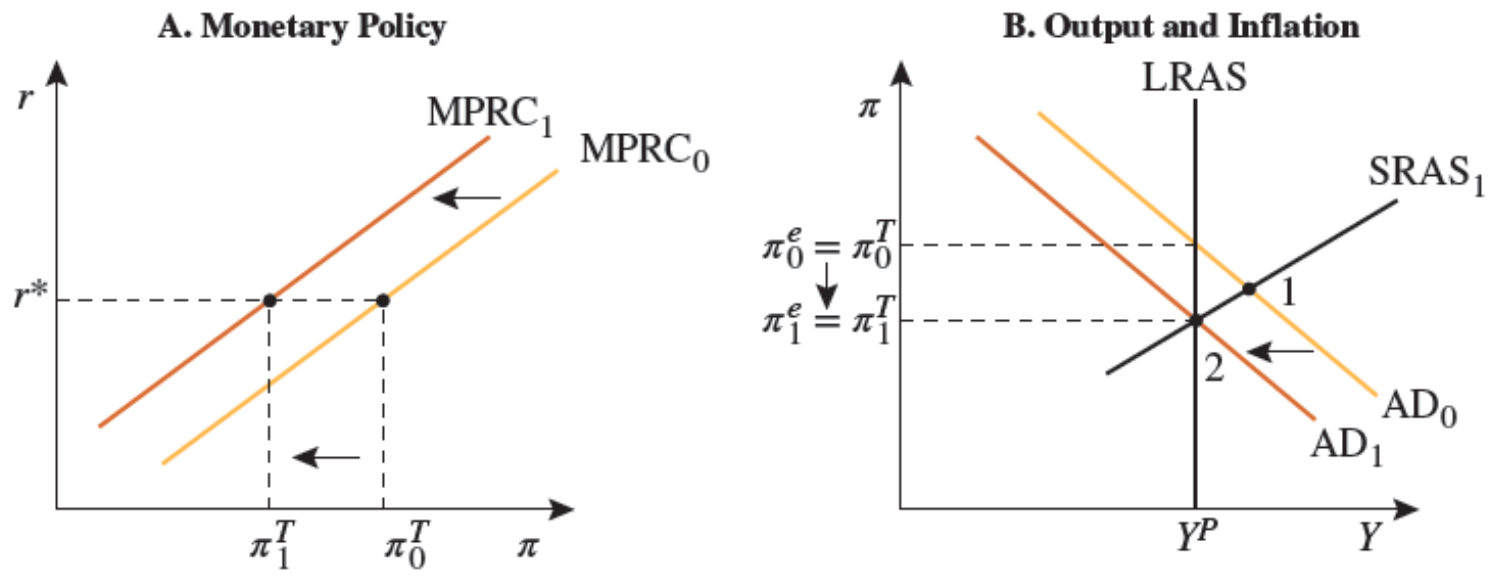


Positive Supply Shocks and the Opportunity They Create

- A **positive supply shock** *creates an* ***opportunity*** for policymakers to ***guide the economy*** *to* ***a new***, ***lower inflation target*** *without* inducing a *recession*.
  - Central bankers will *shift* the **monetary policy reaction curve** to the **left**.
  - The **AD** *shifts* **left** as well.
  - This **continues** *until* it reaches the point where the **new SRAS curve *intersects*** the **LRAS curve**.

Positive Supply Shocks and the Opportunity They Create

Figure 22.9 Lowering the Inflation Target



A decline in the inflation target from π_0^T to π_1^T shifts the monetary policy reaction curve to the left from $MPRC_0$ to $MPRC_1$.

Following a positive supply shock, policymakers can reduce their inflation target by shifting the dynamic aggregate demand curve from AD_0 to AD_1. This lowers expected inflation from π_0^e to π_1^e. Instead of going to point 1, the economy moves to point 2.

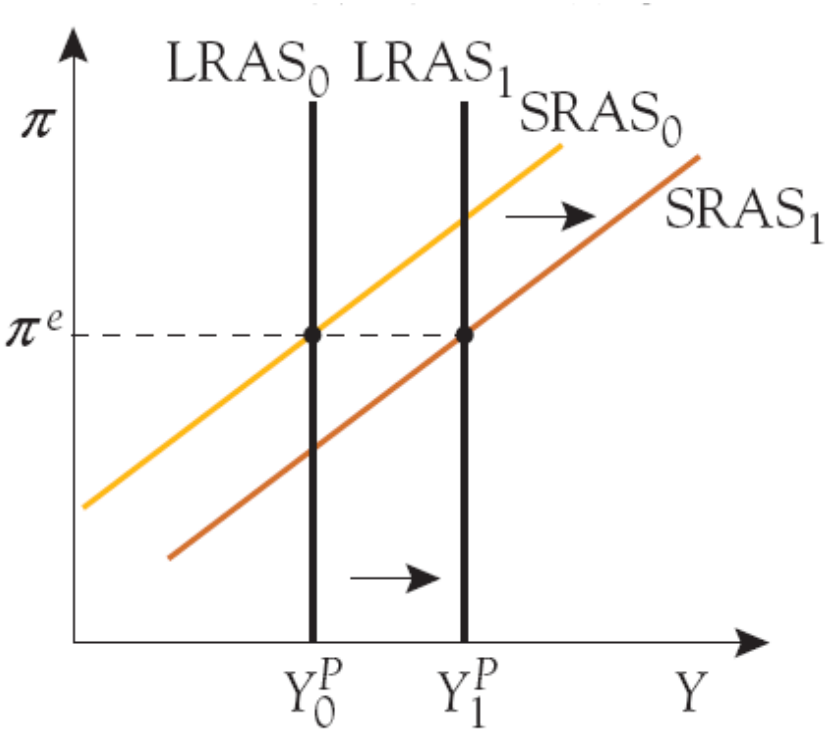
What Happens When Potential Output Changes?

What Happens When Potential Output Changes?

- *What happens* when **Y^P increases** due to an **increase in productivity**?
  - The **long-run aggregate supply curve** will *shift* to the **right** as **Y^P increases**.
  - An ***increase in productivity*** **reduces costs of production**, so it is a ***positive supply shock*** as well.
  - The **SRAS curve** will *shift* **right**.
    - Remember that the **SRAS curve** *intersects* the **LRAS curve** at the point *where* **current inflation** equals **expected inflation**.

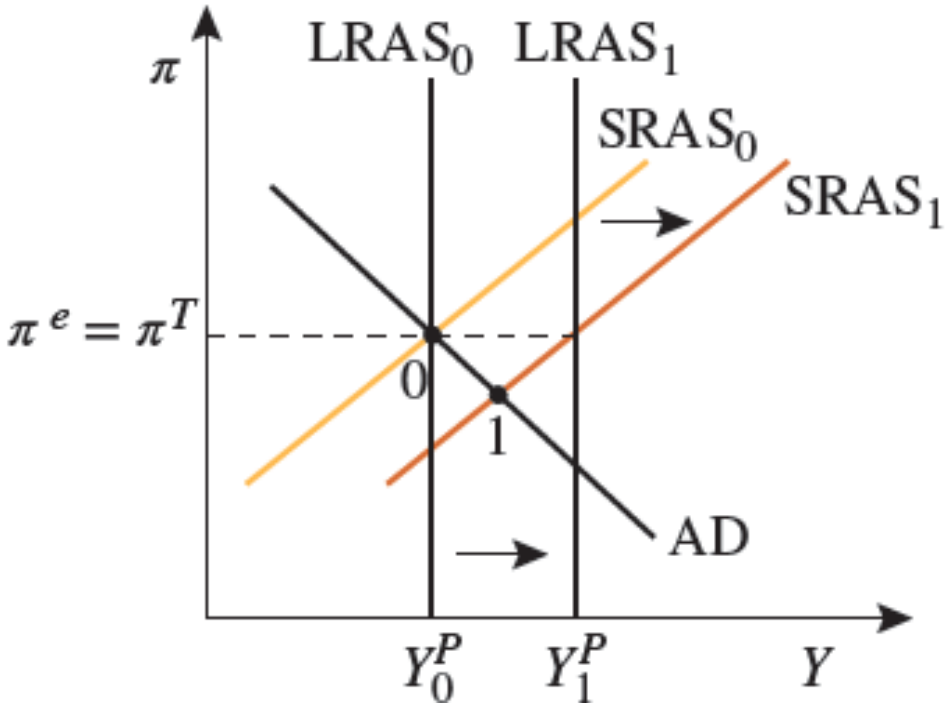
What Happens When Potential Output Changes?

- An **increase in Y^P** *shifts* **SRAS *right*** and shifts **LRAS** *right*.
- But **SRAS** still *crosses* **LRAS** where **$\pi = \pi^e$**.
- **SRAS** *shifts* the ***same distance*** as **LRAS**.



What Happens When Potential Output Changes?

- *In the short-run*, **output** *and* **inflation** are <u>determined by</u> the **intersection** of **SRAS** and **AD**.
- Since **AD** is **unchanged**, the ***economy is at <u>point 1</u>*** in the short-run.



What Happens When Potential Output Changes?

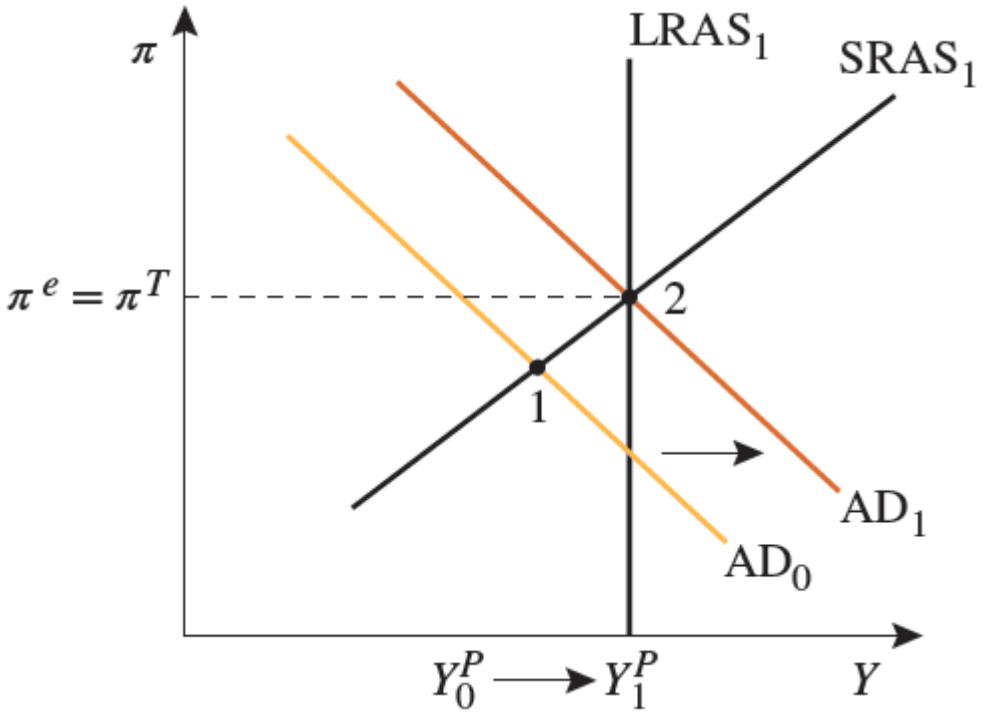
- In the **long run**, **output** must *go to the* ***new*** *level of* **potential output**, $\mathbf{Y^P_1}$.
- ***How it gets there*** depends on ***what monetary policymakers do*****.**
- *If* **policymakers** are happy with their ***inflation target***, they will ***work to move*** *the economy* to the point on the **LRAS curve *consistent with*** their **target**.

What Happens When Potential Output Changes?

- But the **higher** level of **potential output** *comes along with* a ***lower*** **long-run real interest rate**.
  - **Returning inflation** to its *higher level* means *shifting* the **MPRC** to the **right**.
  - This *shifts* **AD** to the **right**.
  - The policy adjustment will *drive* ***output*** and ***inflation*** *up* until they **reach their new LR equilibrium level** at the ***original inflation target*** and $\mathbf{Y^P_1}$.

What Happens When Potential Output Changes?

- With π^T **unchanged**, policymakers *shift* **AD right**.
- The economy *moves to* the **new** level of **potential output** *and* the **original** π^T *at point 2.*

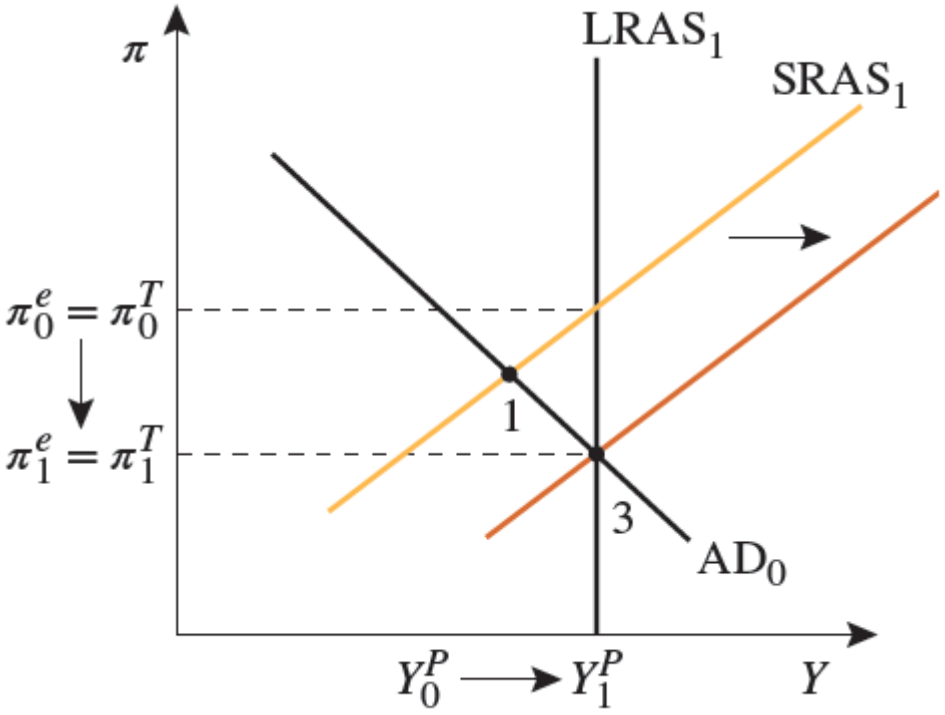


What Happens When Potential Output Changes?

- If **policymakers** now **do nothing**, **expected inflation** *exceeds* **current inflation**
  - The **SRAS curve** to the ***right***.
  - **Inflation *falls*** even *further*
- **Long run** in this case is at a ***new*** **lower inflation target** at the ***new*** **potential output**.

What Happens When Potential Output Changes?

- With a **new, lower π^T:** policymakers *allow the economy to move* to **point 3**.
- They do this by *leaving* the **monetary policy reaction curve** alone.



What Happens When Potential Output Changes?

- *In the 1990s* the **LRAS curve** *shifted* to the **right**, and the **Fed *took the opportunity*** to **reduce** their implicit **inflation target**.
- At the time, this was *referred to* as "***opportunistic disinflation*"**.
  - Declines in inflation
- **Real-business cycle theory**: ***prices and wages are flexible***, so ***inflation adjusts rapidly***, **current output** always equals **potential output**, and all ***business-cycle fluctuations*** arise *from* ***changes in potential output***

End of lecture