Shocks to aggregate demand and aggregate supply

Lecture 16

October 25th, 2019

Characterizing Changes in Values for key variables as Shocks

- Why Call Them Shocks?
- Most economic models are

  EQUILIBRIUM SEEKING
- When something occurs outside of the forces that drive the model it SHOCKS system and the model pushes toward a different equilibrium

Types of AD Shocks:

Changes in variables that determine the position of the AD curve.

Δ Household expectations → Δ autonomous C (Δ $\bar{C}$)

Δ Personal taxes → Δ Y_d → Δ C

Δ Profit expectations → Δ Investment = $\bar{I}$

Δ Interest Rates lead to Δ Investment = $\bar{I}$

Types of AS Shocks

Changes in variables that determine the position of the AS curve.

Wages = W_0

Productivity = Z_0

Capital Stock = K_0

Resource Prices = RP_0

Long-run macroeconomic equilibrium (Repeat slide)

In the long-run, we expect the economy to produce at the level of potential GDP—i.e., the LRAS level.

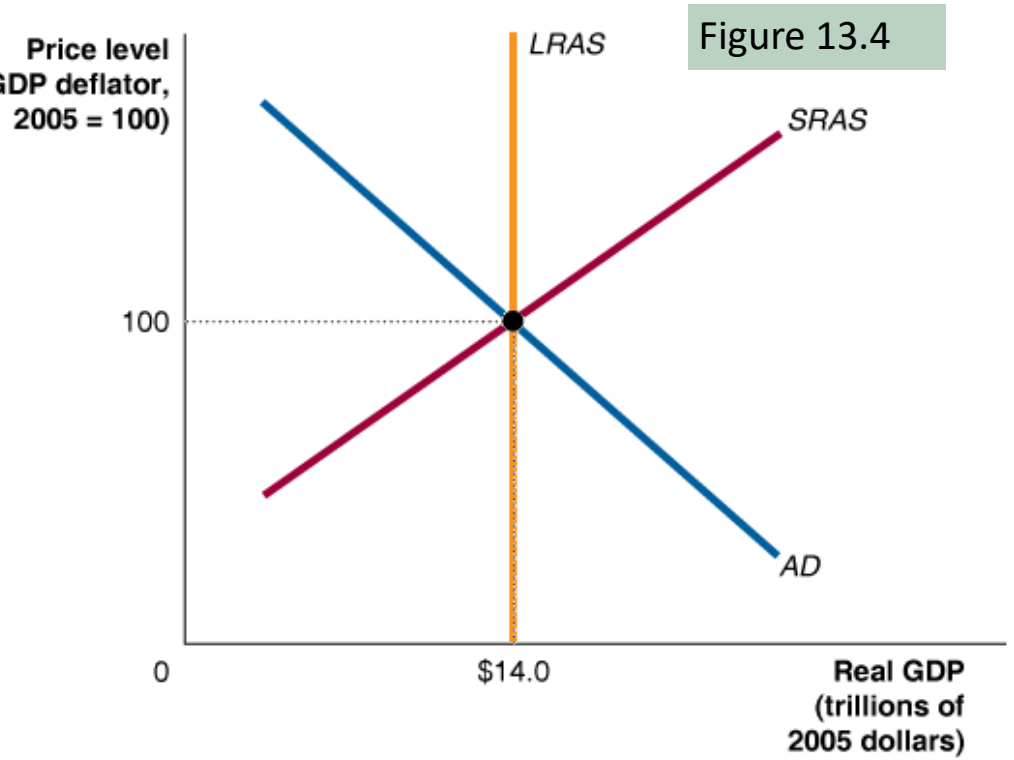
*Long-run macroeconomic equilibrium: AD and SRAS curves **intersect** at the LRAS level.*

Why is the economy in long-run macroeconomic equilibrium only at this triple intersection?

For simplicity, assume:

1. *No inflation; the current and expected-future price level is 100.*
2. *No long-run growth; i.e. the LRAS curve is not moving.*

Figure 13.4



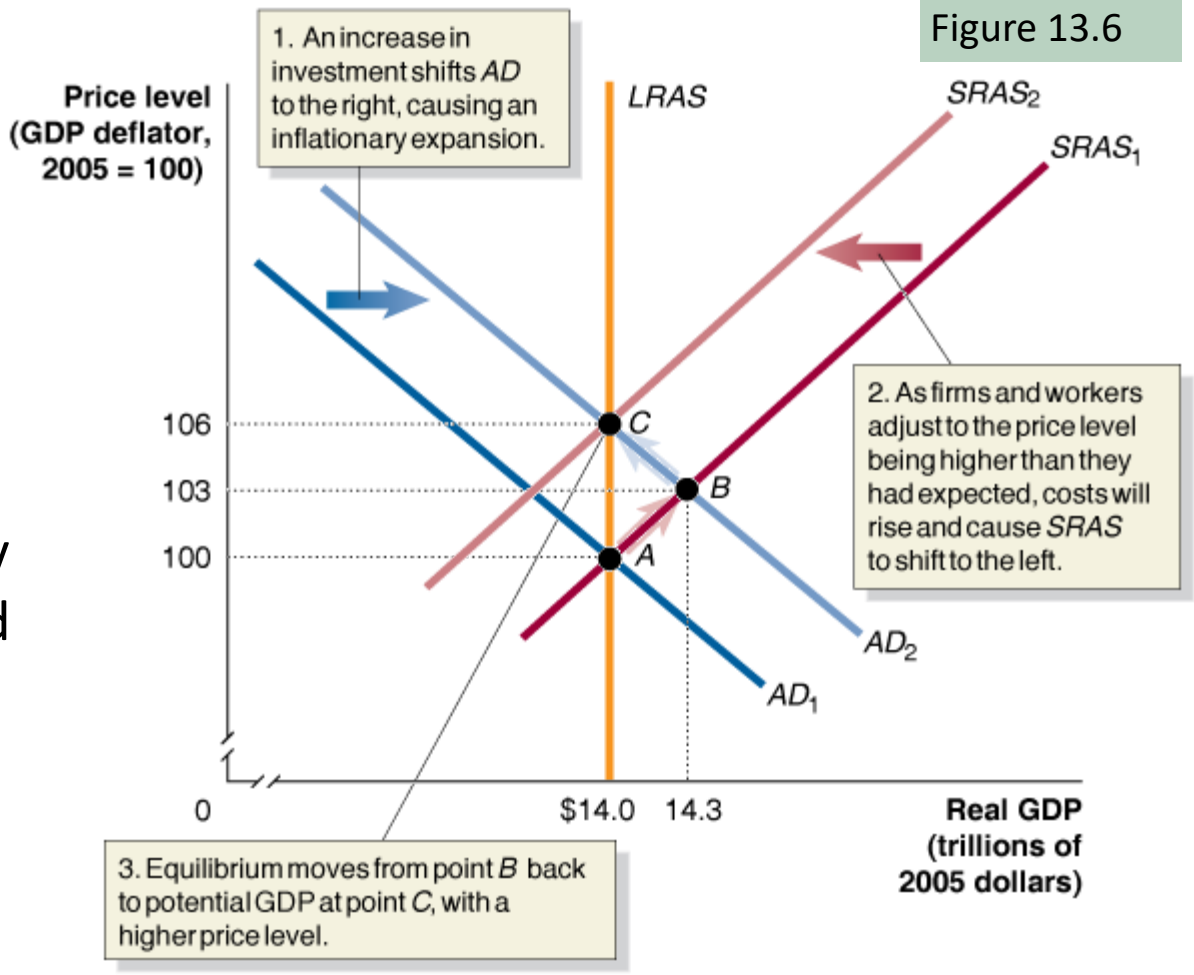
Imagine Positive Demand Shock, at Full Capacity

Suppose Firms become more optimistic:

They raise I, shifting AD to the right. (A to B)

Unemployment falls below its *natural rate*, forcing employers to pay more, W rises. Increased demand puts upward pressure on prices, P.

Figure 13.6



With firms and workers having higher price level expectations, the SRAS shifts to the left—restoring long run equilibrium. WITH THE SAME Y, HIGHER P

Supply shocks

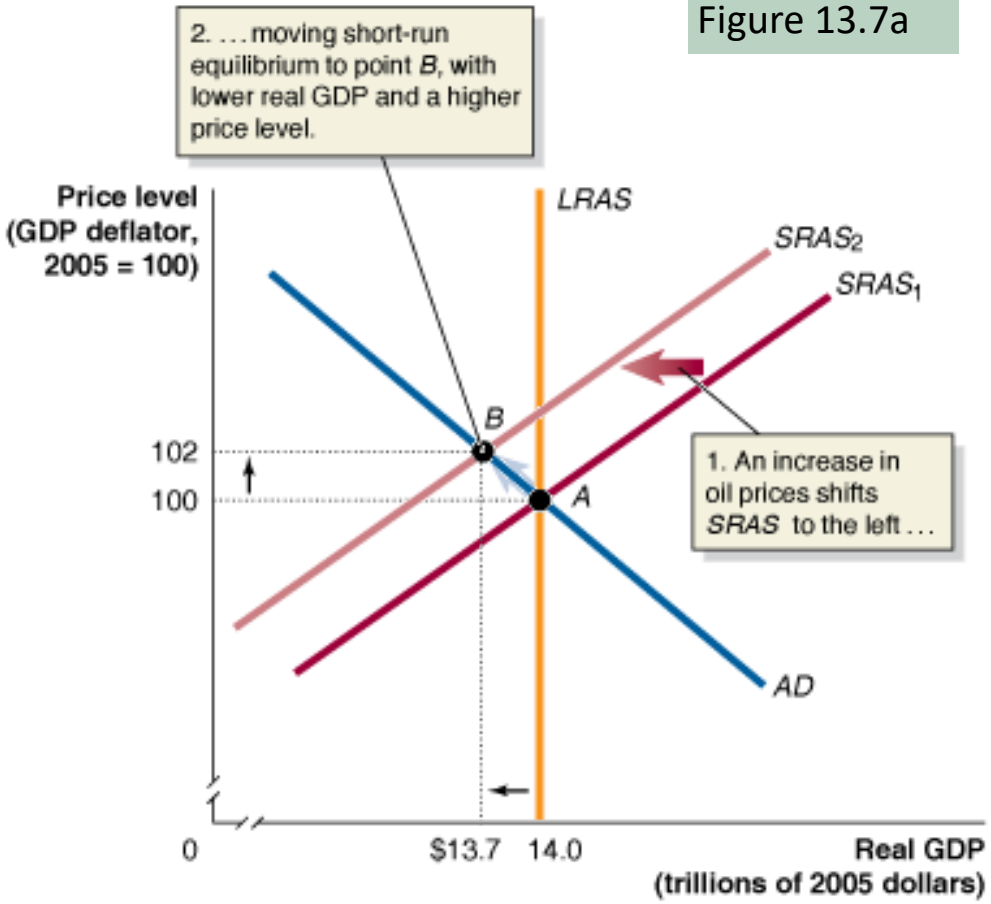


Figure 13.7a

(a) A recession with a rising price level—the short-run effect of a supply shock

What happens when we have a Mid-east War?

SRAS of oil shrinks suddenly. We call this a *supply shock*.

This causes *stagflation*, a combination of rising inflation and recession, usually resulting from a supply shock.

Adjustment back to potential GDP from a supply shock

Lower Y → lower employment, (unsold stuff, higher inv., you lay off people)

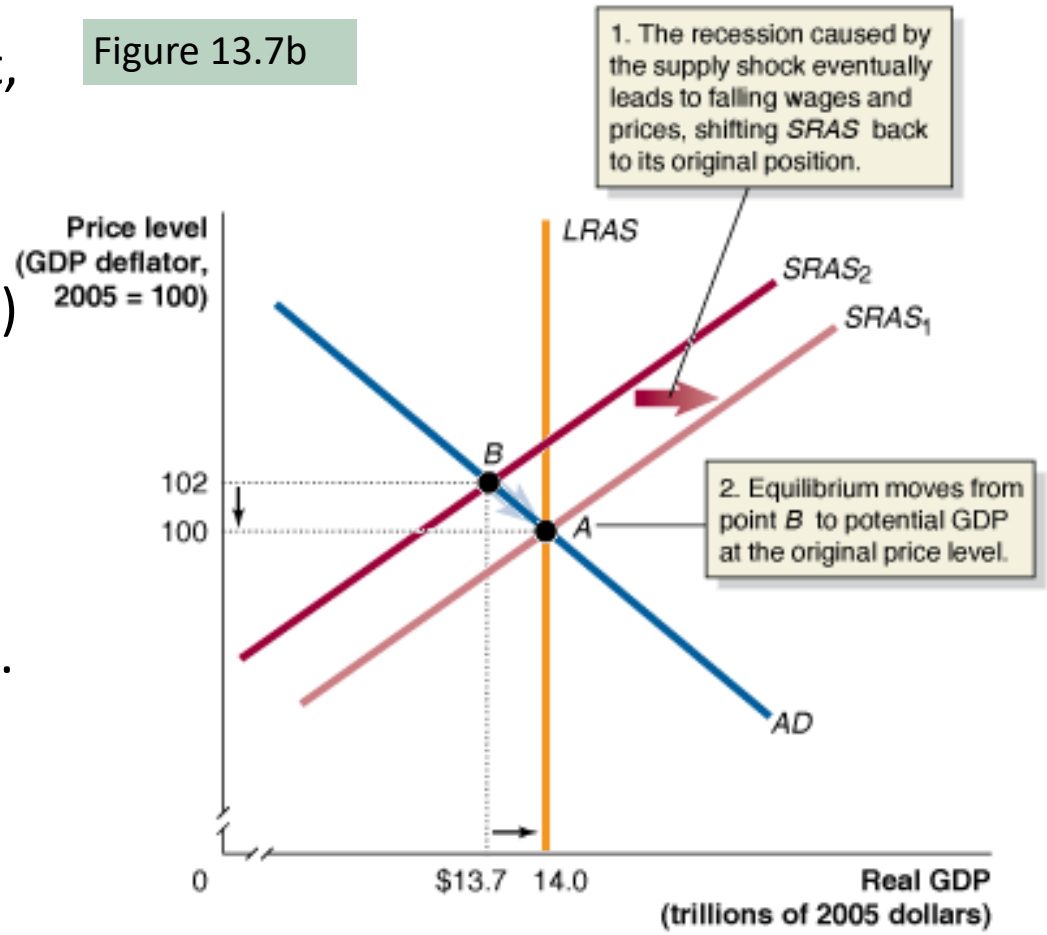
Higher U → lower wage (gains) Firms cut prices → clear inv.

Return to lower Prices →

SRAS moves to the right, restoring long-run equilibrium.

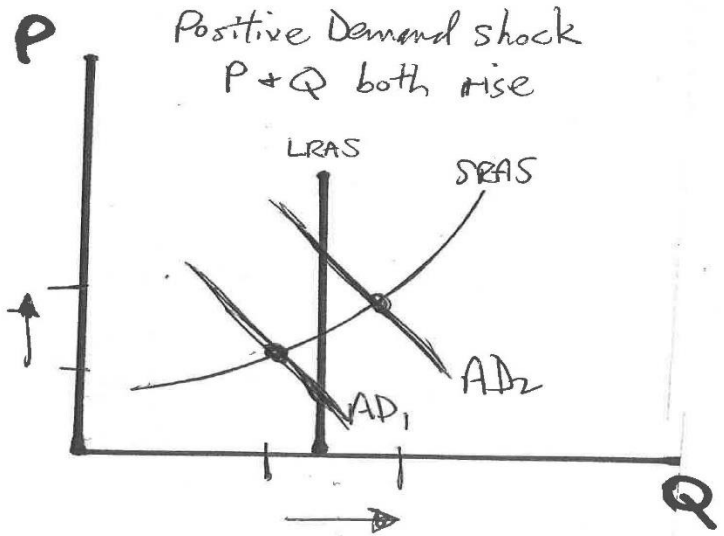
(But remember, in the long run…)

Figure 13.7b



(b) Adjustment back to potential GDP—the long-run effect of a supply shock

A positive demand shock may be a mixed blessing



Dynamic interpretation: (How policy makers, CEO's think about it)

- Few focus on the price level, or the level of GDP
- $\frac{\%\Delta P}{\Delta t} = \pi$ The world watches the inflation rate.

More specifically:

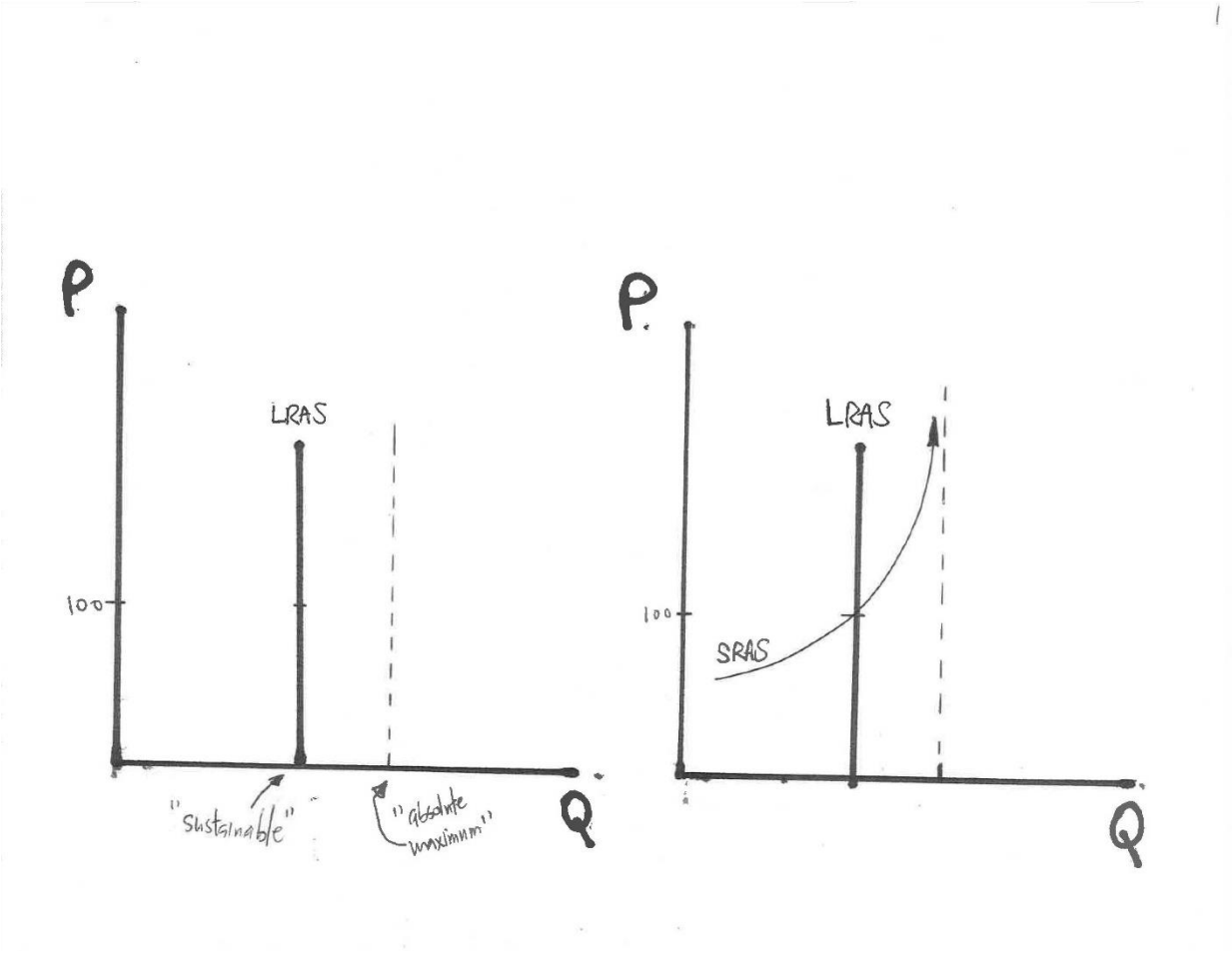
- $\frac{\Delta \pi}{\Delta t}$ = The change in the pace of price changes.

- $\frac{\%\Delta Y}{\Delta t} = \dot{Y}$ $\dot{Y}$ = real growth rate for the economy

- A Positive demand Shock:

π accelerates $\dot{Y}$ accelerates

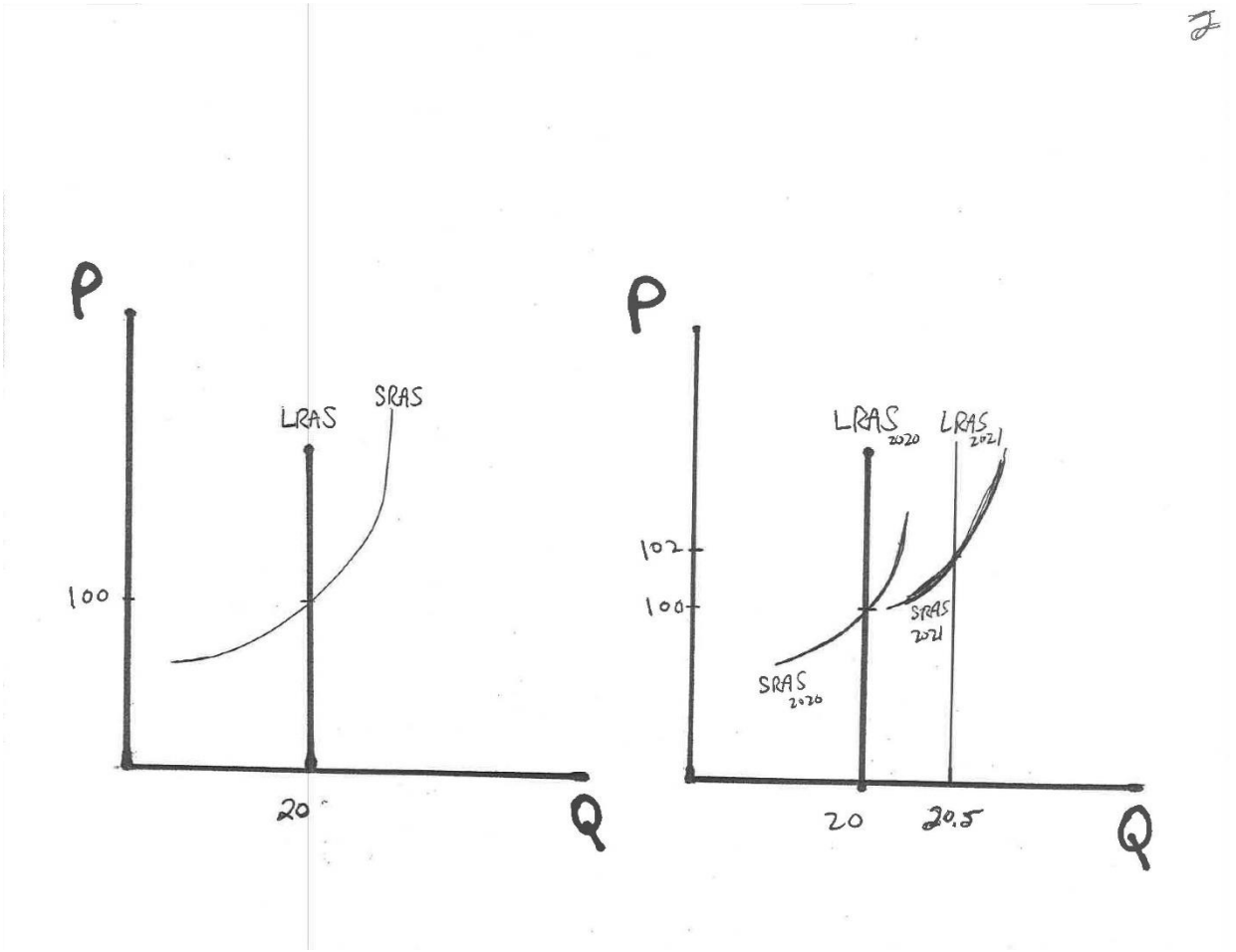
A ‘Curve’ for AS allows us to better characterize economic snapshots



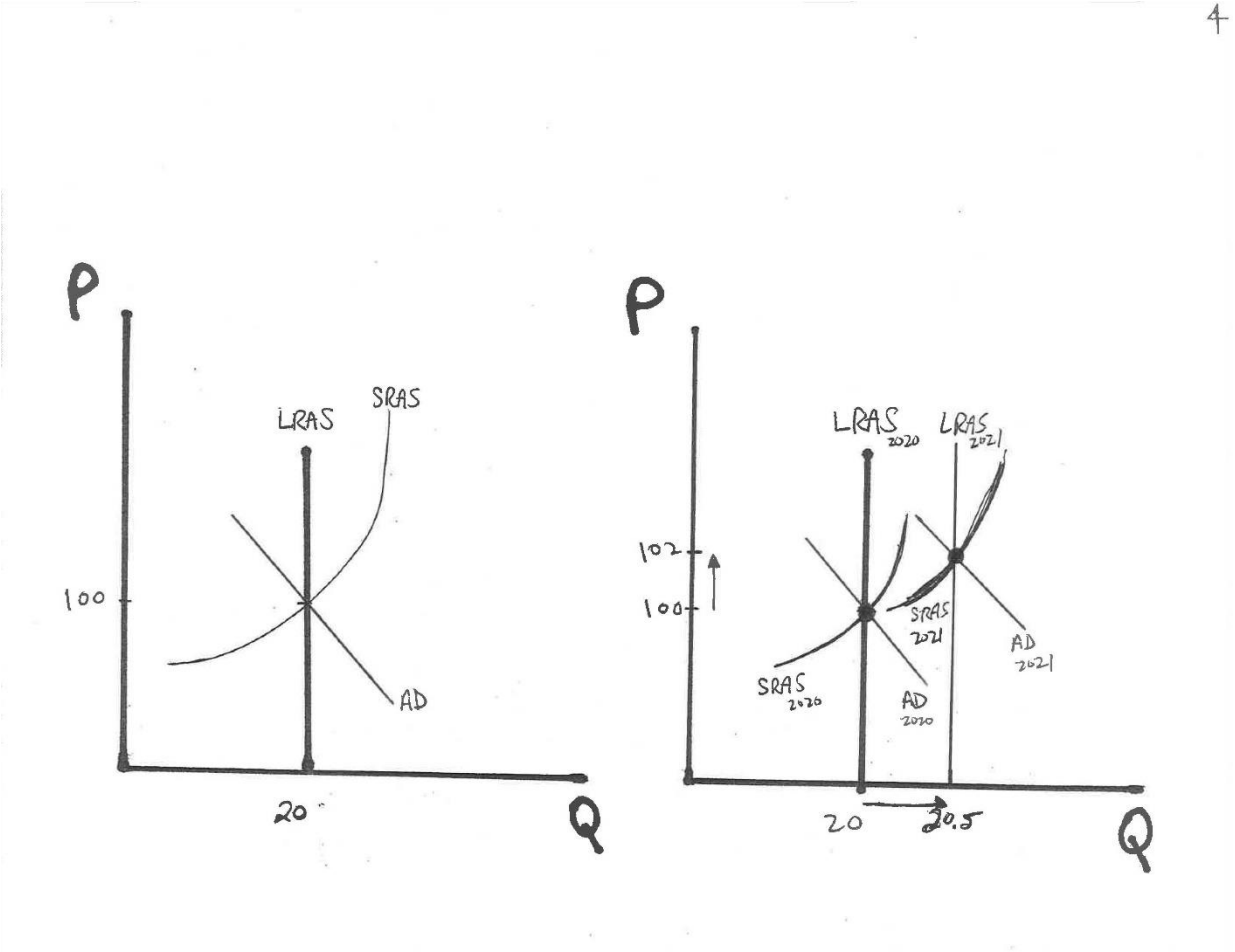
A Dynamic Depiction: 2020 to 2021

Assume LF grows by .75%, LP by 1.75%: LRAS up 2.5%

Assume FRB achieves its 2% π target: Prices rise 2%



2. Increased incomes lift Consumption and investment: AD grows



Dynamic Equilibrium:

- Over a year, potential GDP—LRAS—rises by 2% (labor force and productivity)
- Over the year, the SRAS curve similarly shifts

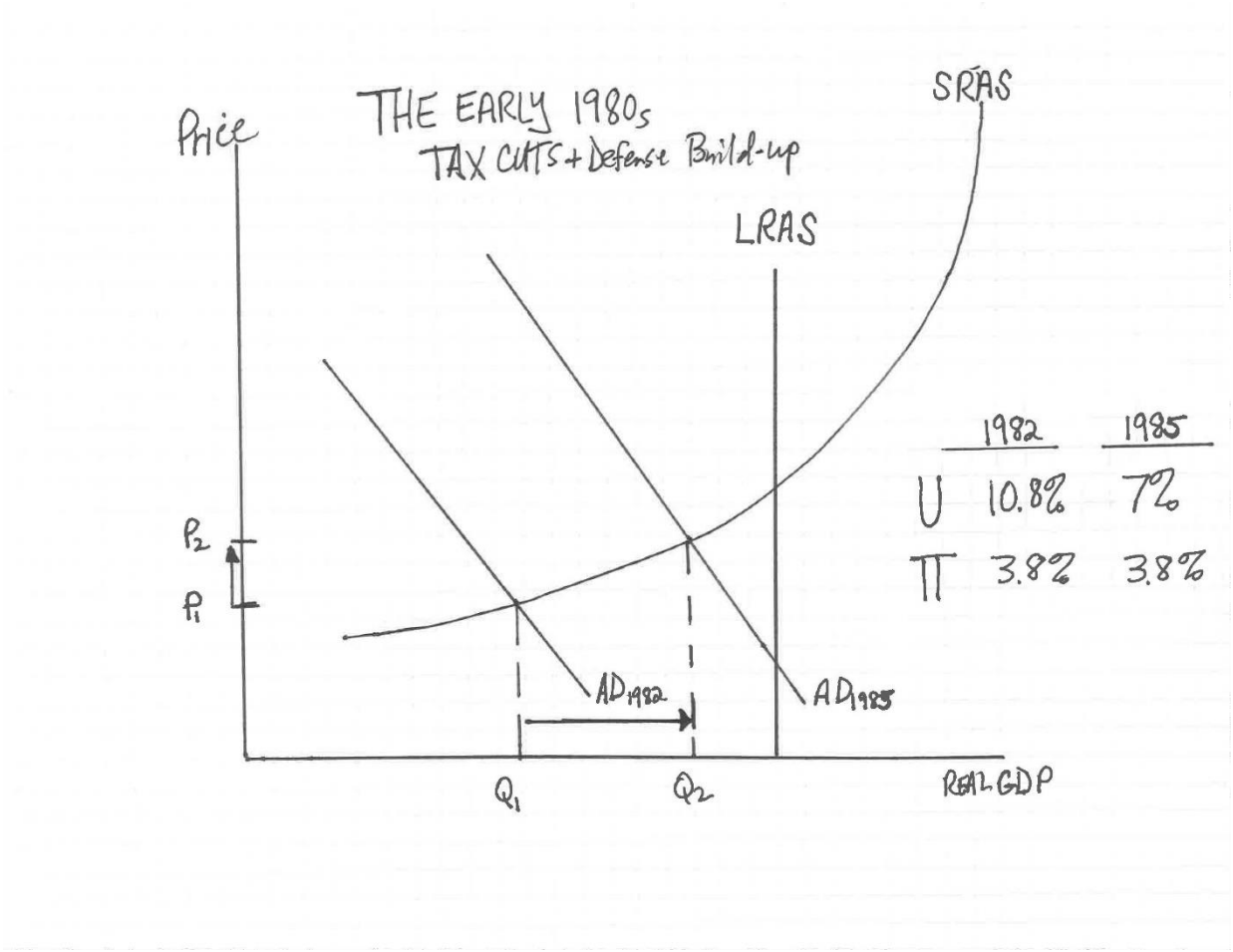
- Over the year, demand shifts, reflecting larger workforce and more investment
- A 2% rise in prices accompanies this equilibrium shift (inflation expectations well anchored)
- Real GDP gains 2%, prices rise 2%
- LRAS=SRAS=AD

Shocks deliver what?

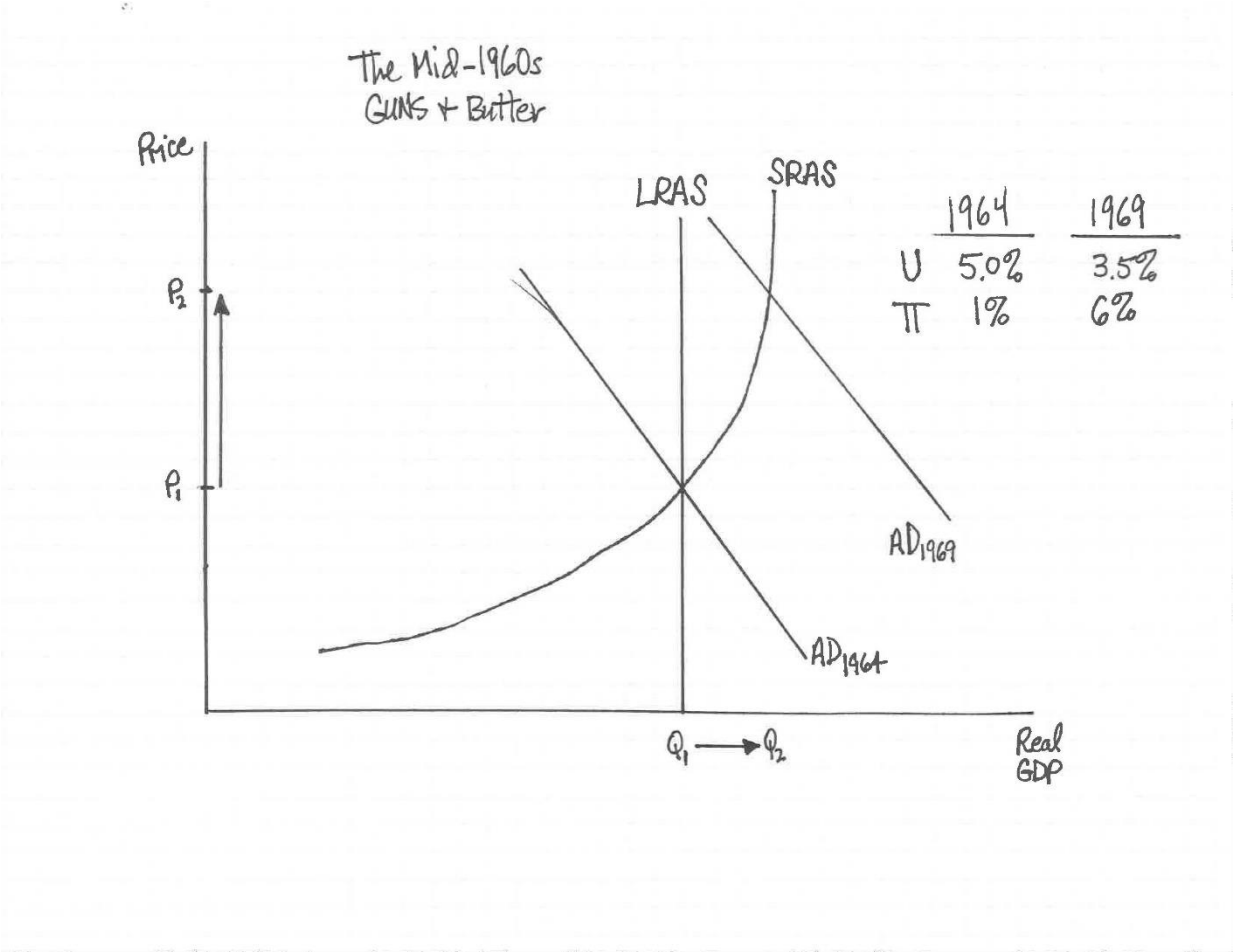
- The effects of demand and supply shocks depend, in part on the state of the economy before the shock.

- With high U and ample capacity, the supply curve is flattish.
- With very low U, there is less room for boom, the supply curve is steep.

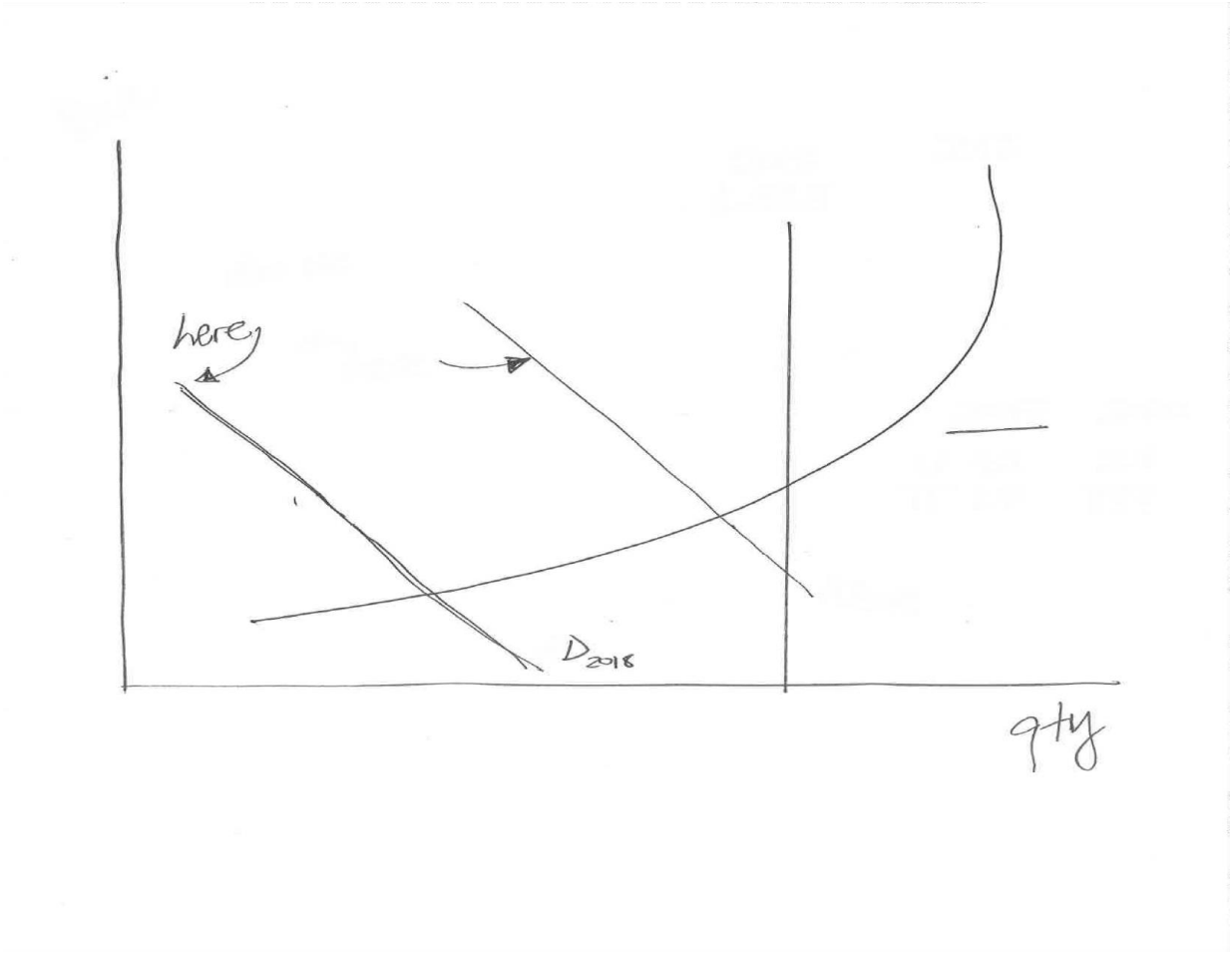
With ample excess capacity, a positive demand shock lifts output meaningfully and does little to prices



If the economy is operating at full employment
a positive demand shock lifts output modestly and prices leap



Where are we, late 2019? Can we afford big stimulus, or do wee need big changes in priorities, to effect big change?



Types of Aggregate Supply Shocks

- **Adverse Aggregate Supply Shocks**:

  Changes in Variables that shift AS to the **left**.

  Examples:

- **Rising wages (W), Rising resource prices (RP)**
- **Falling Productivity (Z), Falling Capital Stock (K)**

- **Favorable Aggregate Supply Shocks**: Changes in Variables that shift AS to the **right**. Examples:
- **Falling W, RP, Rising Z, K**

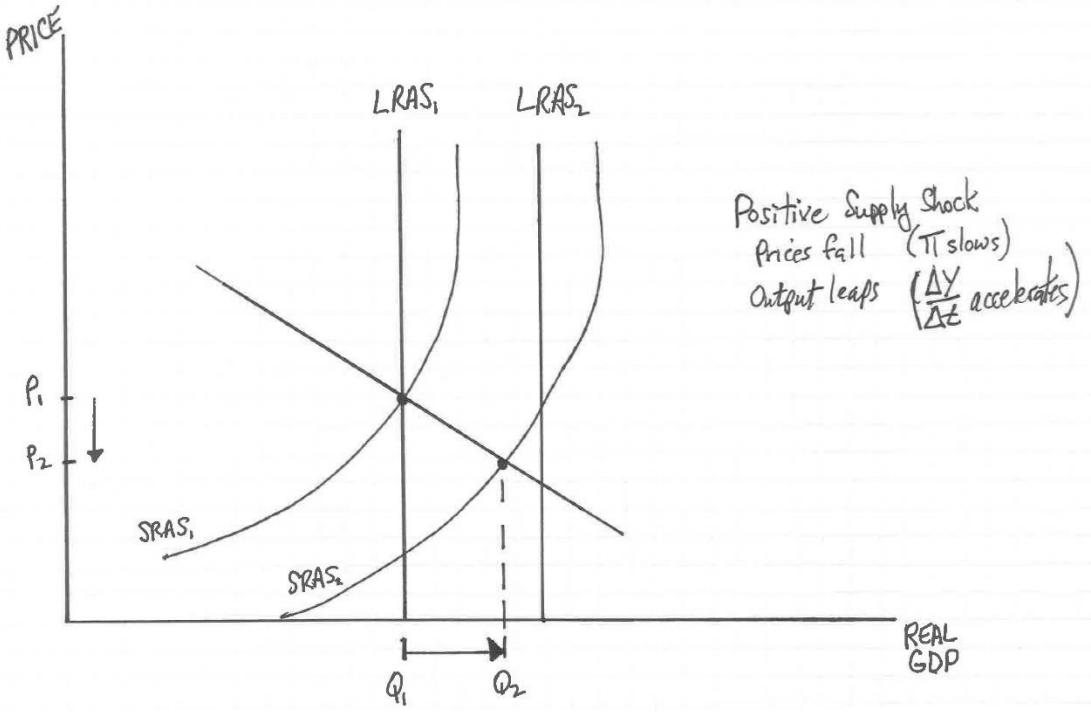
A positive productivity shock: (The best news for the long run)

- Technology inventions lay the groundwork
- Explosive investment drives I_0
- Productivity, we shift people to new endeavors, and their real wage rises.
- That means we have more output, at a given price level
- AS shifts to the right

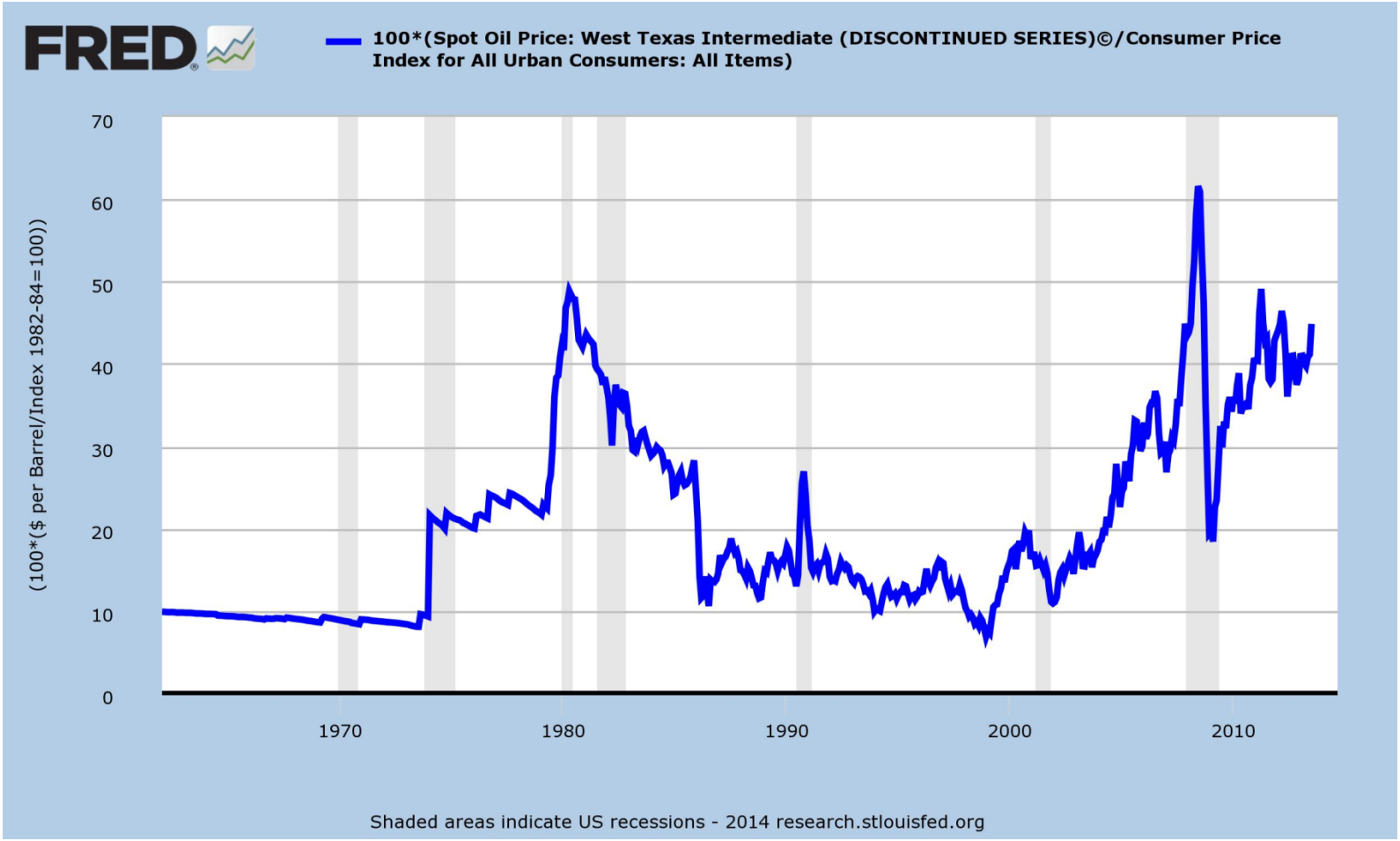
  Prices Fall

  Output Rises

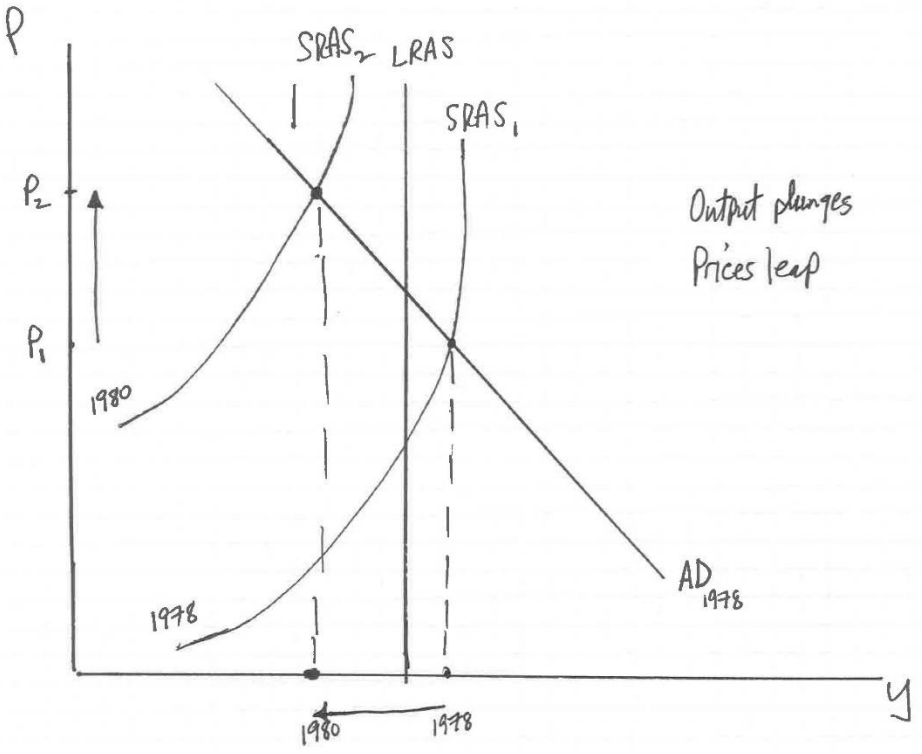
A jump in productive capacity allows for more growth amid little price pressure



Oil shocks: A Part of Every recession 1970 to 2014



OPEC quadrupled oil prices in 1978
Inflation surged and output plunged



AS Shocks: Equilibrium Price and Output move in opposite directions

- A Positive Supply Shock: (Surge in labor force)

  Prices Fall

  Output Rises

- An adverse supply shock: (Oil prices surge)

  Prices Rise

  Output Falls

The Great Recession/Recovery
A Three Part Story

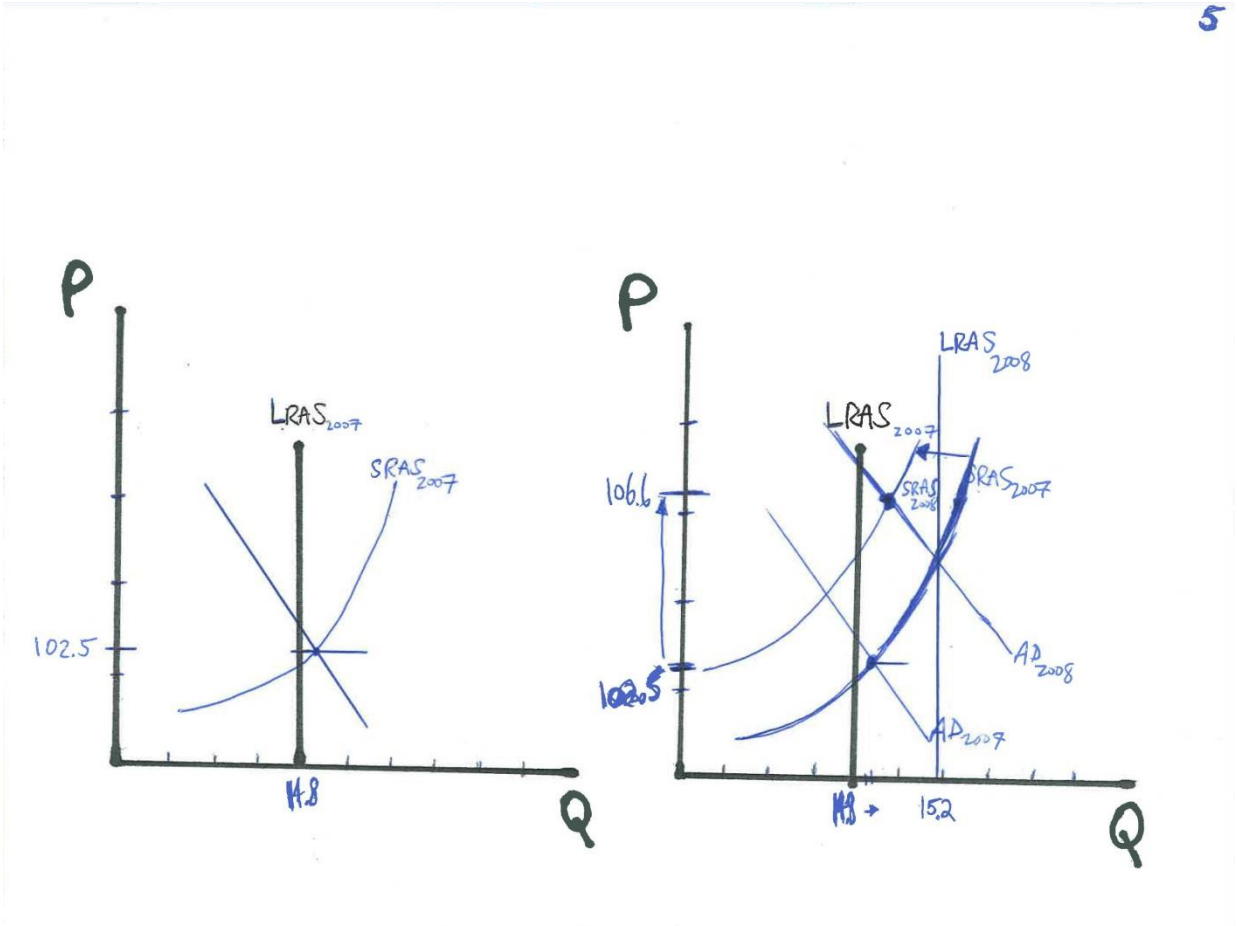
- Act I: Q2:2007 to Q2:2008
  - A standard adverse Supply Shock as Oil Prices surge
- Act II: Q2:2008 to Q2:2009
  - An Adverse Demand Shock as risky interest rates surge and consumer and business confidence plunge.
- Act III: Q2:2009 to Q2:2010
  - A Positive Demand Reversal as government spending jumps, confidence rises and interest rates fall.

The bare facts of the three year swing for output and inflation:

	output as % of potential
Q2:2007	1.003
Q2:2008	0.986
Q2:2009	0.928
Q2:2010	0.934

	REAL GDP ($ BILLIONS)	4-QTR CHANGE	CPI INDEX (LEVEL)	4-QTR CHANGE	Potential GDP	4-QTR CHANGE
Q2:2007	14,839		102.5	2.5%	14,800	
Q2:2008	14,963	0.8%	106.6	4.0%	15,170	2.5%
Q2:2009	14,356	-4.1%	107.5	0.8%	15,473	2.0%
Q2:2010	14,746	2.7%	108.7	1.2%	15,783	2.0%

Act I:Oil Prices surge.
A Negative SRAS Shock



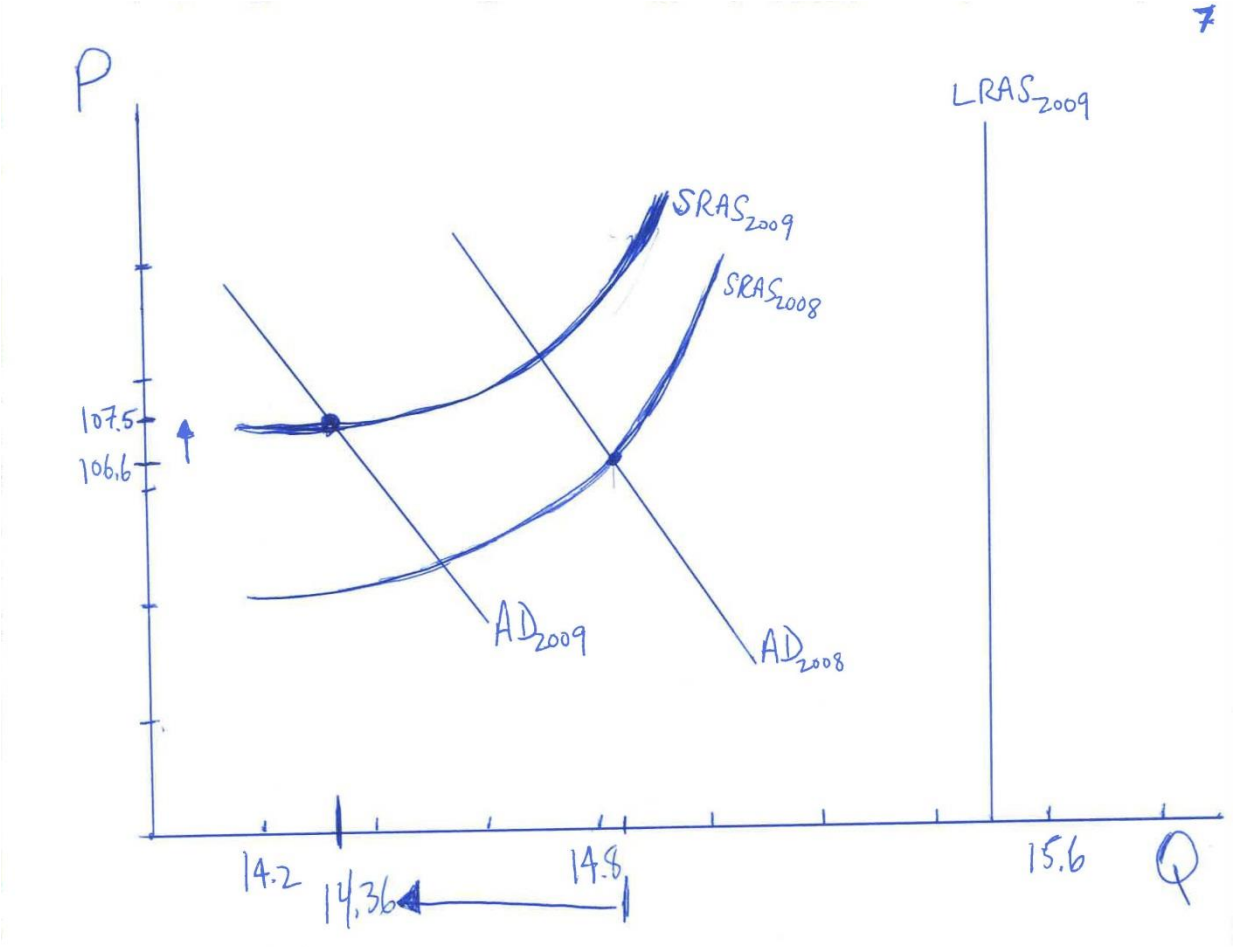
Act II: A Mild Supply Shock (Productivity is Soft) Plus a Wild demand Shock (Financial crisis)

Demand plunges:

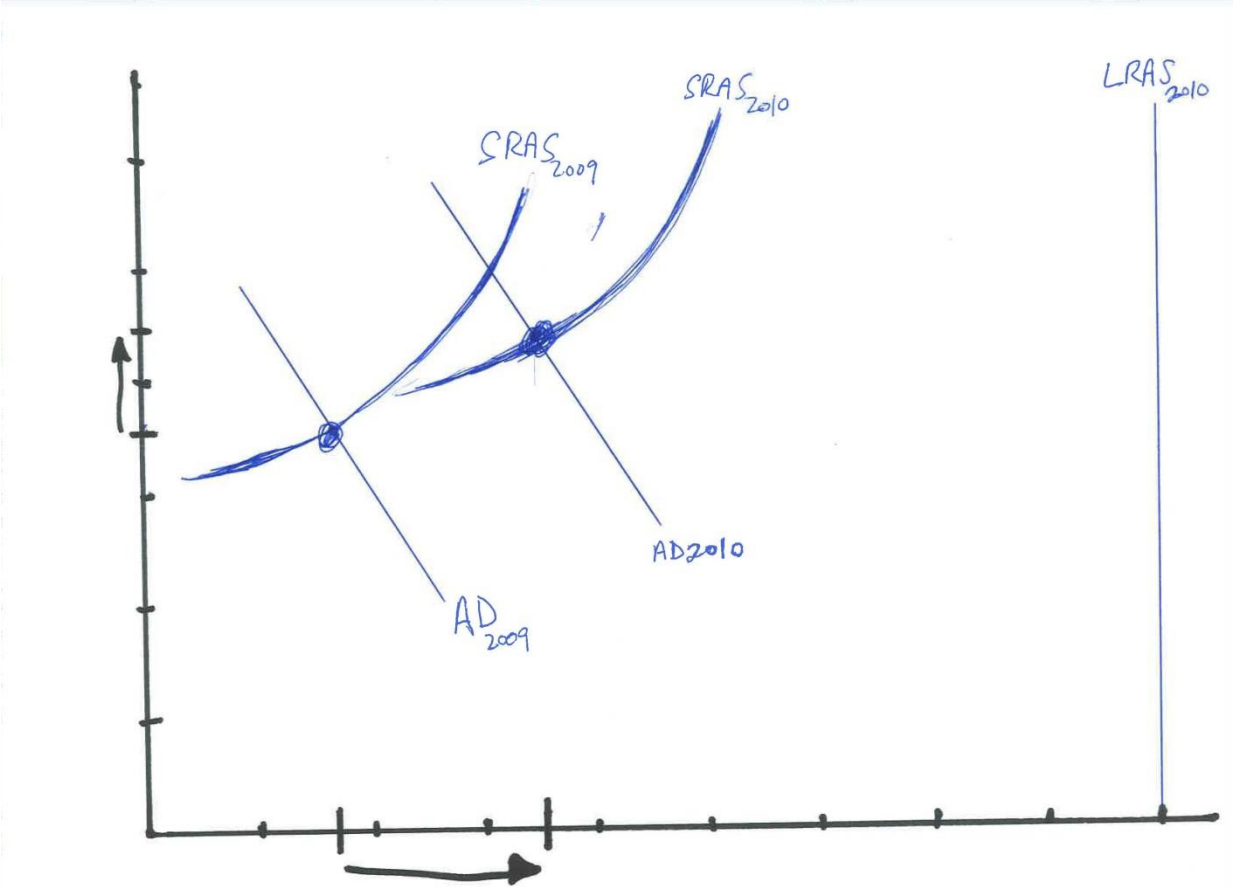
Investment down as risky interest rates surge and business confidence plunges.

Consumption plunges as interest rates rise confidence falls, despite falling oil.

(Note: prices rise LESS THAN 2%, NOT EQUILIBRIUM, as output plunges)



Act III:A Positive Supply Shock: Productivity jumps,
A positive demand shock: government stimulus lifts g
rising confidence lifts C, falling risky interest rates lift I.
NONETHELESS, INFLATION RISES LESS THAN 2%



THINGS TO PONDER ABOUT 2010

- Why did inflation rise less than 2% despite aggressive government fiscal stimulus?
- Why did risky interest rates fall despite an explosive increase in government borrowing?
- Why did confidence rise despite an explosive rise in the size of the U.S. budget deficit?
- Why did I draw the SRAS curve ‘very flat’?
- Despite stimulus, where is GDP vs potential?

The 1990s technology boom

- Technology companies connect the phone and the computer
- GPS
- Cash machines
- Personal airline check in
- Phone help lines in India

The View in 1993

- We assumed the USA underlying inflation rate was a bit less than 3% in the early 1990s:

  1993 CPI YOY change = 2.7%

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- We assumed the USA underlying real GDP growth rate was a bit less than 3% in the early 1990s:

  1993 real GDP growth = 2.7%

The View in 1998

- We assumed the USA underlying inflation rate was below 2% in the late 1990s:
  - 1997 CPI YOY change = 1.7%
  - 1998 CPI YOY change = 1.6%

- We assumed the USA underlying real GDP growth rate was above 4% in the late 1990s:
  - 1997 real GDP growth = 4.5%
  - 1998 real GDP growth = 4.5%

Conclusion #1

- Adverse supply shocks are the worst of both worlds:

  Inflation accelerates AND Output falls

- Positive supply shocks are the best of all possible worlds:

  Inflation rates fall AND Real GDP growth accelerates

Conclusion #2

- Adverse demand shocks have good and bad elements:

  Inflation decelerates AS Output falls

  (assuming you are not in or near a DEFLATION)

- Positive demand shocks have good and bad elements:

  Inflation rates accelerate AS Real GDP growth accelerates

How might we think of New York Senator Chuck Shumer's Proposal for 2020?

- **Chuck Schumer: A Bold Plan for Clean Cars**
- I have a proposal that is supported not just by environmentalists but also by labor and large automakers.
- Rebates for electric car buyers, if they JUNK their GAS GUZZLERS
- Funding of electric car charging stations for Federal and State highway rest stops
- Cost? $50 billion per year for 10 years