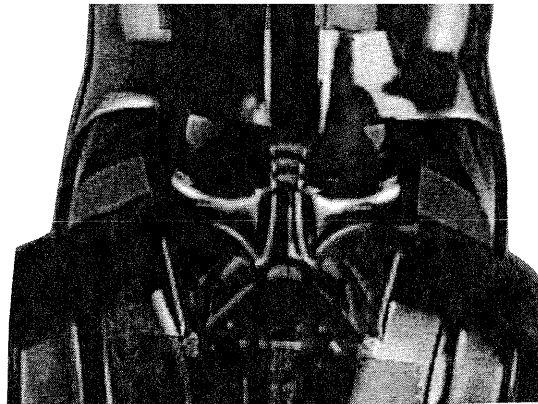


LRAS and the Consensus Model:

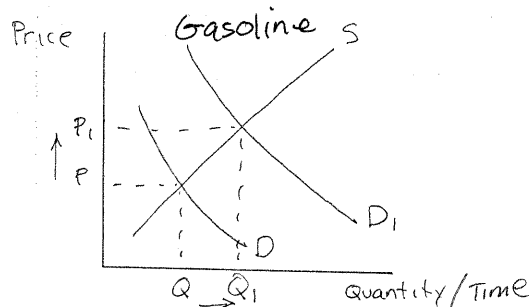
Natural Forces??

Classical Economists believe that 'natural' forces exist which cause output to gravitate towards 'potential output' – an imaginary quantity of output where a country's FOPs are being used in a sustainable manner.

If you have studied MICROeconomics, then you know something of these natural forces – MARKETS! Markets use a price system, the price mechanism, and this mechanism signals and provides incentives to households and firms. When people react to these signals, then market equilibrium is achieved. Consider basic supply & demand (Fig. 1).



At a price of P , when demand increases, there is excess demand, which causes prices to rise (in order to allocate the goods). Prices will rise to P_2 , where the $Q_d = Q_s$. At equilibrium, the market has cleared, and ceteris paribus, no additional forces are acting on this mkt.



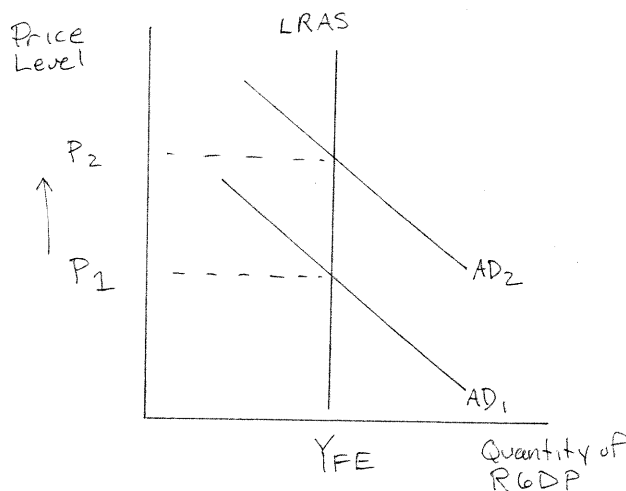
So, in some ways, markets do have an 'invisible hand', and exogenous changes to D and S create forces which eventually lead to market equilibrium – markets clear (achieve balance).

Potential Output?

At any given time, an economy has a fixed amount of FOPs. In Japan today, a population of 128 million people, 51 million cars, 7 billion rice plants and 14,000 car-welding robots exist, as well as other FOPs. If we assume (or guess, as I did above) that 100 million Japanese are employed, and they each work 8 hours each day, and all capital and land is being used at a sustainable rate, then we also will assume that there is one quantity of output that will be created today. We don't actually know what this quantity is, but logically we know that fixed factors, used at a sustainable rate, will yield an output figure. Classical economists refer to this as the 'natural rate' or the rate of output when the economy is at full employment. Full employment meaning that every FOP is being used, and for labor, it means that the number of people who want to work are matched by firms who want labor – so everyone who wants a job, has a job. The LRAS curve THEORETICALLY models this output, where full employment occurs (Fig. 2).

Notice that this model assumes that the price level in an economy has absolutely no impact on output – and therefore unemployment. This is because no matter what the price of goods and services are, an economy will utilize its resources in a sustainable manner.

In this model, if prices of final goods fall, then firms will continue to produce the same amount of stuff – because they will also pay less for labor, and other inputs. According to this theory, prices adjust so that labor and all other factor costs adjust to the new price level. If this is true, then firms will want to make the same quantity of stuff, no matter what the price level. Markets clear, meaning a fall in the price level causes all other prices to fall – so real wages and real input price have not changed.



What causes classical economists to believe that AS can change (why does the LRAS curve shift)?

The full employment level of output will change if the quality, or quantity of FOPs in an economy change. If we have more capital tomorrow, we can produce more and LRAS expands – we get more output. If the labor force grows (because people retire later) then LRAS expands. New technology and improved capital, as well as more skilled labor all will increase LRAS.

What does not, never, ever, cause LRAS to shift?

I'm glad you asked. LRAS will never change because of PRICES. If wages rise, this DOESN'T change the quantity or quality of labor – it simply means that firms will adjust prices upwards, and Real Wages will have stayed the same.

A Fresh Look at Economic Growth and the AD/AS model

Measuring National Income: Why do we measure national income?

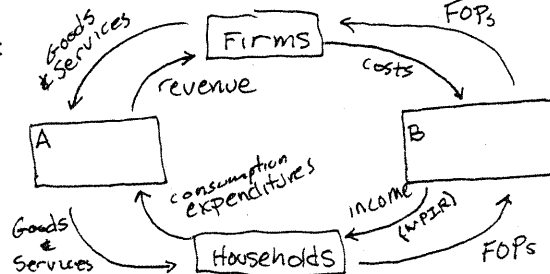
Economies generally tend to grow. For over one hundred years, Japan's economy has steadily grown. The total output that is produced has increased. WHY? Why is the avg. Japanese able to consume much more than their counterparts of the past?

The most basic reason that the ability of the people to produce has increased. Because each individual is more productive, they are able to consume more.

- remember the circular flow, as production increases, so do incomes.
- Productivity is the key: the output generated from a given level of input.

Quickly review the circular flow:

* fill in A & B →

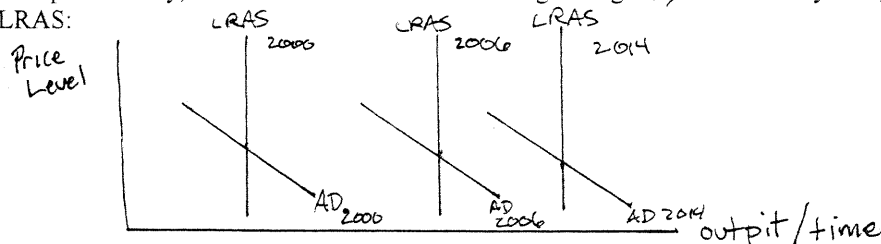


We know that Japan's economy has become much more productive over the past century. Japan's economy has GROWN larger (its able to produce more). How has Japan's economy been able to do this?

- More workers (labor, from increased birth, or a society finding it appropriate for women and minorities to take work outside the home)
- More capital (greater savings by people is used to finance capital investments. Adding capital to the labor force greatly enhances productivity)
- More Natural Resources (In the 1800's, Japan did not use oil. As Japan has gained access to oil, its economy has grown as oil has made many industries that were once dependant on coal or steam to produce more efficiently. Air travel would not have been possible without oil.)
- Technology { this is usually included in capital } greater technological knowledge has greatly impacted an economies ability to produce.

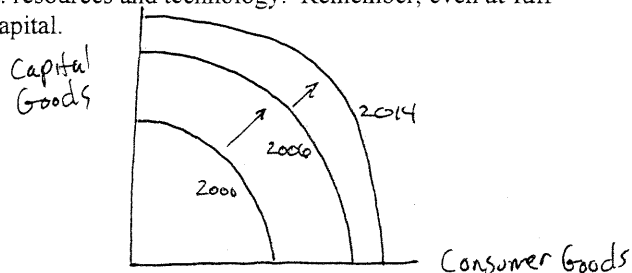
Combining our knowledge of how an economy grows, we come to a better understanding of LRAS.

- As our economy becomes better able to produce goods and services over time, primarily because of technological progress, the LRAS curve moves towards the left, i.e. it increases. Over the past century, this is how we would model the growing USA economy using AD/LRAS:



Thus: Over time (LR) an economies ability to produce is affected ONLY by: capital, labor, nat. resources and the state of technology. If we look again at the PPF, the curve represents the economies potential output, given full employment of labor, capital, nat. resources and technology. Remember, even at full employment, there will be unemployed labor and capital.

PPF:

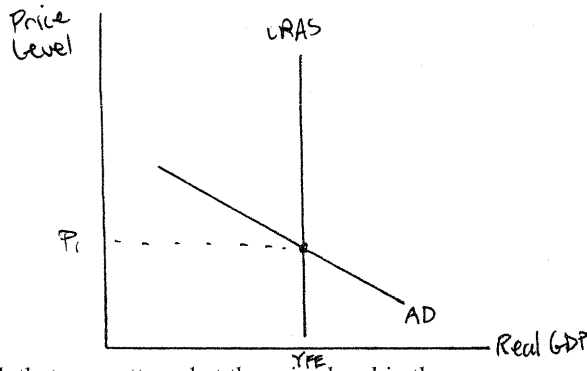


AND THAT, IS THE LRAS CURVE: by improving labor and capital (quality and quantity) growth occurs

How does the Price Level impact output over the long run?

-A: IT DOESN'T

* show the impact of a monetary or fiscal stimulus.

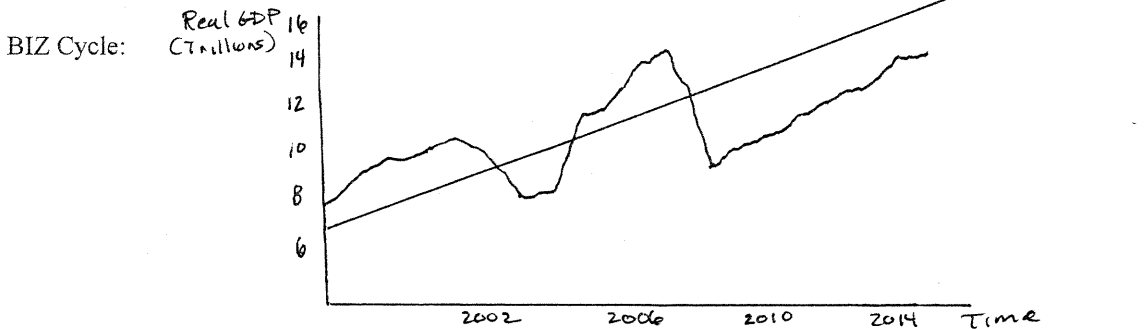


We can see from the above model, that no matter what the price level in the economy, output remains the same over the long run. This is because final prices and factor prices are flexible and will adjust to the new price level.

Ex: If the price level increases, this means that most businesses have already increased the price they charge for their product or service (remember, the price level is nothing more than an average of prices for commonly used goods and services). BUT, these businesses are NOT more profitable because, even though the final price they charge has gone UP, the price they pay for labor and inputs (factor prices) have increased as well. So, even though prices have gone up, payments have gone up, and firms will produce the same amount as before. The entire economy will produce the same quantity of output as before, therefore, when the price level changes over the LR, output is unaffected. Unemployment and household incomes are also unaffected by the changing price level.

* Why doesn't a change in the price level impact output in the LR?

Do economies always grow smoothly? Why?



Economies often grow, sometimes they grow slowly, sometimes growth is rapid. Some economies shrink. But, given enough time, most economies do grow, just as we proved minutes ago.

There are times however that businesses cannot sell all their product, consumers spend less and unemployment rises. When an economies output falls, this is called a recession. During recessions, household incomes decrease, government tax revenue decreases and more people find it hard to locate work. These economic fluctuations, shown by the business cycle, are costly to a country, and result in hardships for its people. Over the past decade, Ecuador's economy has shrunk. This means that people there are poorer than a decade ago, more are unemployed and poverty has increased.

How do we fix these fluctuations? Can we reduce their severity? When a recession hits, does it have to last for years, decades, can policy makers take action to improve the economy? These are all questions that we seek to answer when we study aggregates.

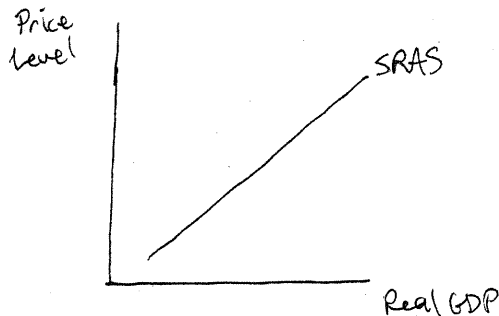
So, economies do grow over time, but there are painful fluctuations in output and the price level. The primary difference between the long run trend of growth, and the short run trend of fluctuation is: the behavior of AS.

So, we construct models of AD/AS to understand these fluctuations...not the long run trend. If an economy grew steadily ALL THE TIME, then there would be NO NEED for a model of aggregate demand and supply. So, lets look at SRAS.

Our model of short run fluctuations focuses on the behavior of two variables 1. Output 2. Price level

1. Output:
2. Price Level:

In our model, the level of output, and the price level, will adjust to the point at which the AD and AS curves intersect. -----



Why is the SRAS curve upward sloping?

-The SRAS curve is upward sloping because, unlike the LRAS, the Price Level DOES impact the quantity of output over the short run. When the price level increases, this causes firms to produce more, but only for a short periods. This is because: over the short run, sticky prices and sticky wages cause firms costs and profits to change as the price level changes.

Sticky Wages:

Sticky Prices:

Why does the SRAS curve shift?

- The SRAS curve tells us the quantity of goods and services supplied in the short run for any given level of prices. We can think of the SRAS curve as similar to the LRAS curve, but made upward sloping by the presence of sticky wages/prices.
- So, EVERYTHING that causes a shift in LRAS, also causes a shift in SRAS plus:
 1. a change in factor prices:
 2. a change in weather

* Evaluate the following changes to AS and identify whether it's a shift arising from a change in capital, labor, natural resources or technological knowledge. Shift one, or both curves.

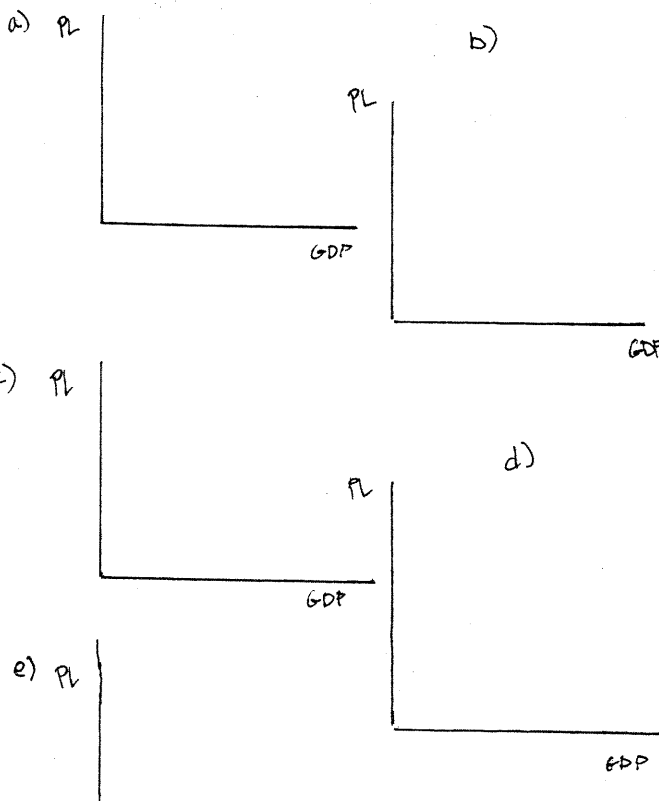
a) College enrollment hits 60%, up from 25% just 10 years ago.

b) New Smart Cars allow commuters to sleep or do work while traveling to work/school

c) Government grants large increase in immigrant visas to working age foreign families unless they are from Canada.

d) Unusually dry weather hits major rice growing region

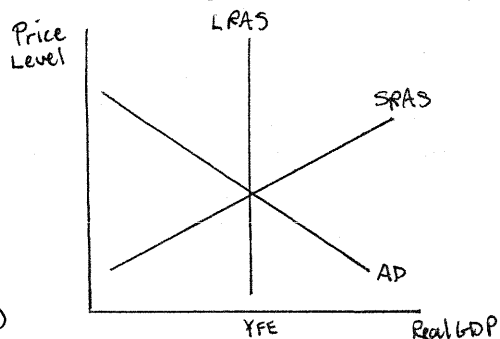
e) Labor unions demand and win 20% increase in wages.



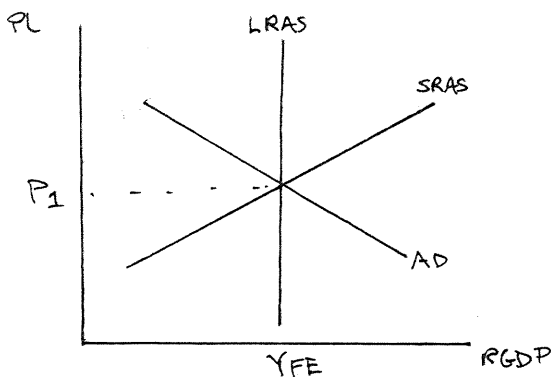
Using the graph below

Your first reaction might be disgust. Yes, two despicable AS curve on one graph. But it is simpler than you think. Examine each curve one at a time.

1. AD: its easy, it's a product of $C+I+G+NX$. Anything which increases any of those, will increase AD on the curve. The intersection of AD and LRAS gives us the LR equilibrium. AD and SRAS intersect to show us the short-run equilibrium; or, the output and price level during an economic fluctuation.
2. LRAS: the LRAS supply is the NATURAL RATE of output (aka, FULL EMPLOYMENT) . It's the "comfortable" level of output for the economy. Like a marathon runner, the economy can sustain a certain level of output. If the marathoner runs really fast at the beginning of the race, the runner will tire out and likely have to slow down much more than their normal pace to finish. The best strategy to win a race is to run a steady race. This is true for an economy too. The LRAS supply shows us the potential level of output when the economies labor and capital are being used at the natural rate/full employment rate. It is possible for an economy to produce ABOVE the natural long run level, but this economy will overwork its laborers and capital, and the result will be a slowdown.
3. SRAS: the entire purpose for studying aggregates is to understand economic fluctuations and why they occur. The SRAS curve shows us the economies output and price level, as determined by AD. Remember, over the short run, AD determines output. If AD increases, output will increase, even if the economy is already at full employment. When AD increases, the Price Level increases, and because wages and prices are "sticky" firms enjoy higher than normal profits and will supply a greater quantity. This increases the output of the entire economy.



- (below)
- * Using the same graph, show how the following will impact this economy: a) an increase in consumer confidence b) a government decision to decrease income taxes. Assume these changes happen simultaneously.



- * What happens to the price level and output?
- * What will happen as factor prices and final prices adjust to the economies new price level? (hint: sticky wages will eventually become unstuck as labor demands pay adjustments)?
- * Show and describe the impact to this economy once factor and final prices have adjusted. (above)

The Argentina Problem:

- Why Argentina can't use fiscal and monetary policy to increase growth & employment
- Why they will probably continue to try

Long Run Potential:

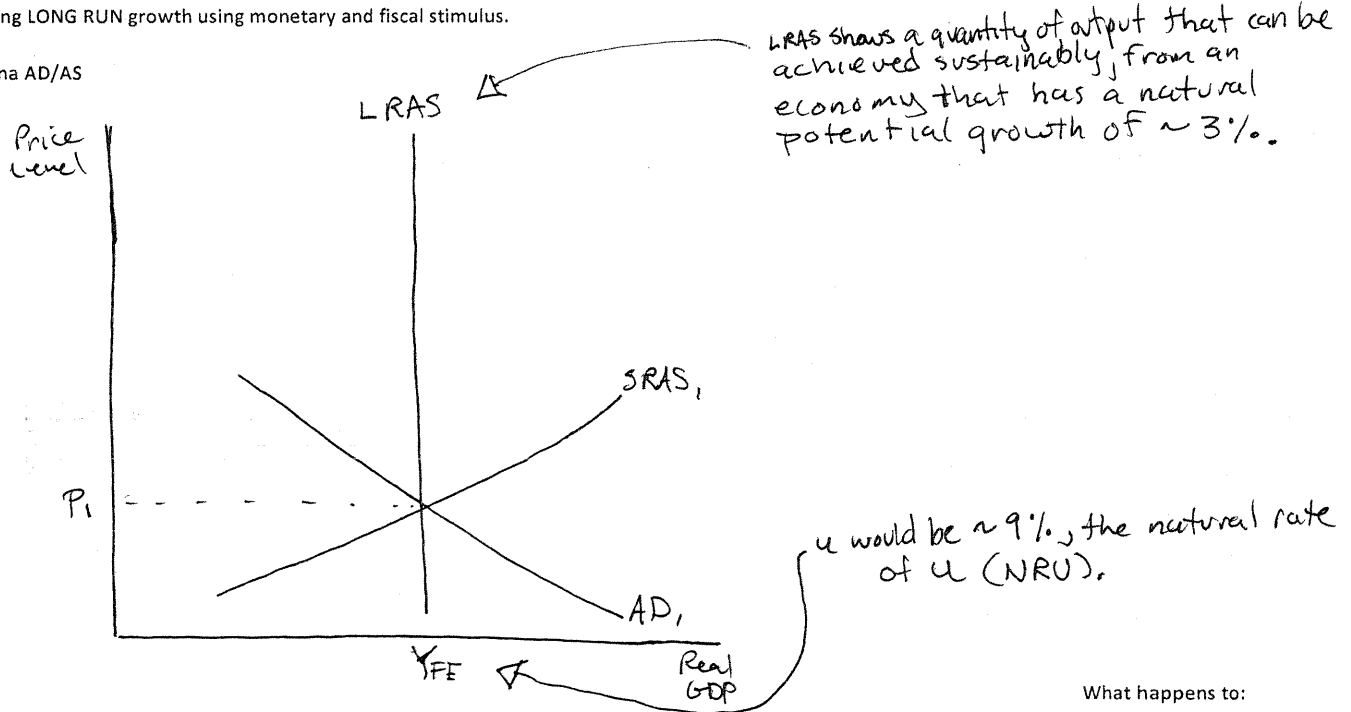
Assume Argentina has a potential growth rate of 3%, and a natural rate of unemployment of 9%. Compared to other similar countries, these figures are not that impressive. Judged by international standards, Argentina should be doing better, so many Argentinians think things should be better.

The problem with Argentina is that it's laws, governance, business and consumer culture are not conducive to higher rates of growth. For example, very strict and costly labor laws make hiring and firing very costly. The paperwork to start a business can take more than a year and cost thousands, and firms must devote a significant portion of their staffs to filing taxes and filing other forms for the government. These are but a few of the rules that limit Argentina.

It's as if an Argentinean soccer player is baffled by his inability to keep up with his competition. He practices constantly, but still is left behind. He dedicates himself to more practice... but gets the same results. Unfortunately, no one tells him that his shoes are tied together.

Increasing LONG RUN growth using monetary and fiscal stimulus.

Argentina AD/AS



What happens to:

1. On the graph above, show the SR when policy makers initially respond to the populations demand more jobs/income.

U / Prices / Y / RU

2. Show the LR changes to this stimulus policy.

U / Prices / Y / RU

3. How will policy makers need to respond in order to improve growth? Show it.

U / Prices / Y / RU

4. Show the LR changes to this policy.

U / Prices / Y / RU

Can fiscal and monetary stimulus create higher future growth? If not, how can it?

> **The Sticky-Wage Theory** The first and simplest explanation of the upward slope of the short-run aggregate-supply curve is the sticky-wage theory. According to this theory, the short-run aggregate-supply curve slopes upward because nominal wages are slow to adjust, or are "sticky," in the short run. To some extent, the slow adjustment of nominal wages is attributable to long-term contracts between workers and firms that fix nominal wages, sometimes for as long as three years. In addition, this slow adjustment may be attributable to social norms and notions of fairness that influence wage setting and that change only slowly over time.

To see what sticky nominal wages mean for aggregate supply, imagine that a firm has agreed in advance to pay its workers a certain nominal wage based on what it expected the price level to be. If the price level P falls below the level that was expected and the nominal wage remains stuck at W , then the real wage W/P rises above the level the firm planned to pay. Because wages are a large part of a firm's production costs, a higher real wage means that the firm's real costs have risen. The firm responds to these higher costs by hiring less labor and producing a smaller quantity of goods and services. In other words, *because wages do not adjust*

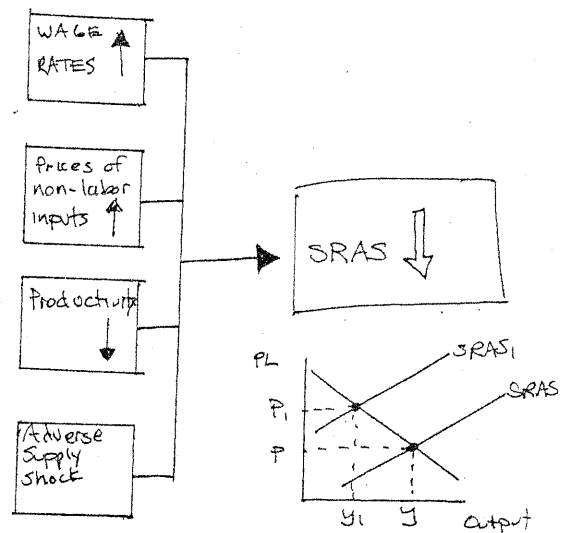
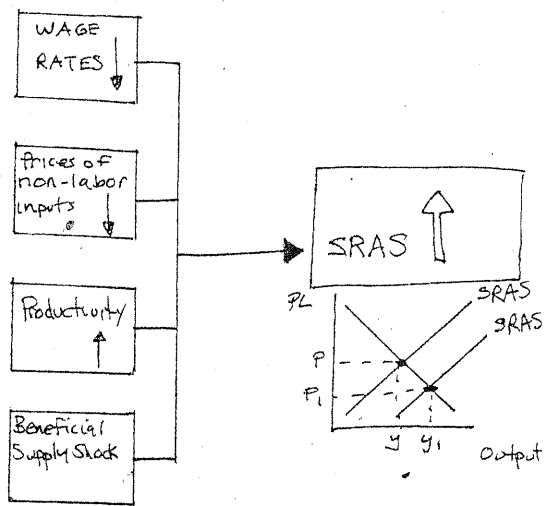
> **The Sticky-Price Theory** Some economists have advocated another approach to the short-run aggregate-supply curve, called the sticky-price theory. As we just discussed, the sticky-wage theory emphasizes that nominal wages adjust slowly over time. The sticky-price theory emphasizes that the prices of some goods and services also adjust sluggishly in response to changing economic conditions. This slow adjustment of prices occurs in part because there are costs to adjusting prices, called *menu costs*. These menu costs include the cost of printing and distributing catalogs and the time required to change price tags. As a result of these costs, prices as well as wages may be sticky in the short run.

To see the implications of sticky prices for aggregate supply, suppose that each firm in the economy announces its prices in advance based on the economic conditions it expects to prevail. Then, after prices are announced, the economy experiences an unexpected contraction in the money supply, which (as we have learned) will reduce the overall price level in the long run. Although some firms reduce their prices immediately in response to changing economic conditions, other firms may not want to incur additional menu costs and, therefore, may temporarily lag behind. Because these lagging firms have prices that are too high, their sales decline. Declining sales, in turn, cause these firms to cut back on production and employment. In other words, *because not all prices adjust instantly to changing conditions, an unexpected fall in the price level leaves some firms with higher-than-desired prices, and these higher-than-desired prices depress sales and induce firms to reduce the quantity of goods and services they produce.*

> **The Misperceptions Theory** A third approach to the short-run aggregate-supply curve is the misperceptions theory. According to this theory, changes in the overall price level can temporarily mislead suppliers about what is happening in the individual markets in which they sell their output. As a result of these short-run misperceptions, suppliers respond to changes in the level of prices, and this response leads to an upward-sloping aggregate-supply curve.

To see how this might work, suppose the overall price level falls below the level that people expected. When suppliers see the prices of their products fall, they may mistakenly believe that their *relative* prices have fallen. For example, wheat farmers may notice a fall in the price of wheat before they notice a fall in the prices of the many items they buy as consumers. They may infer from this observation that the reward to producing wheat is temporarily low, and they may respond by reducing the quantity of wheat they supply. Similarly, workers may notice a fall in their nominal wages before they notice a fall in the prices of the goods they buy. They may infer that the reward to working is temporarily low and respond by reducing the quantity of labor they supply. In both cases, *a lower price level causes misperceptions about relative prices, and these misperceptions induce suppliers to respond to the lower price level by decreasing the quantity of goods and services supplied.*

Summary There are three alternative explanations for the upward slope of the short-run aggregate-supply curve: (1) sticky wages, (2) sticky prices, and (3) misperceptions. Economists debate which of these theories is correct, and it is very possible each contains an element of truth. For our purposes in this book, the similarities of the theories are more important than the differences. All three theories suggest that output deviates from its natural rate when the price level deviates from the price level that people expected. We can express this mathematically as follows:



Shifts BOTH LR & SR

- **Shifts arising from labor:** Any change to the quantity of labor will impact AS. More immigrants means more workers and a shift in AS. A law that makes it more difficult for firms to hire labor will result in a reduction in AS. A rise in business taxes, or an increase in Unemployment Insurance would decrease AS.
- **Shifts arising from Capital:** If firms invest heavily in capital in 2007, then more capital will exist and AS will increase for 2007. The same logic applies for Human Capital. More college graduates will mean greater productivity (impact on labor and capital). A war, or natural disaster that destroys infrastructure/capital will reduce AS.
- **Shifts arising from Natural Resources:** Land, minerals and weather. A discovery of a large deposit of oil will increase AS. If the government opens a very large reserve to the lumber industry, then AS would increase (as it was not available before). For many countries (like Japan) many raw materials must be imported. Anything that makes this easier, or more difficult, will impact AS. In the 1970s, an oil embargo by OPEC caused a disruption in oil imports, and AS.
- **Shifts arising from Tech. Knowledge:** Perhaps the most important reason that the economy today produces more than it did a generation ago is that our technological knowledge has advanced. The invention of the computer, for instance, has allowed us to produce more g & s from any given amounts of labor, capital and natural resources. Productivity increased, and AS shifted. In a similar vein, some other changes are very similar to a change in tech. knowledge. Most significantly, international trade has effects similar to inventing new production processes, so it also shifts the AS curve. Ceteris Paribus, political stability, peace and cooperation will shift AS.

The lone variable: EXPECTATIONS and the SRAS Curve

- In addition to the determinates above, SRAS will change because of misperceptions by the people and firms. When our expectations as a population change, then this can CAUSE the change to occur. It might be like when you get up in the morning and think your going to have a bad day. This is very likely part of the reason why you might HAVE a bad day. When we expect the price level in an economy to change, it causes us to make plans for that change. Workers want higher wages, and businesses ponder the higher cost of their inputs. The following excerpt from N. Gregory Mankiw is helpful:

The important new variable that affects the position of the short-run aggregate-supply curve is people's expectation of the price level. As we have discussed, the quantity of goods and services supplied depends, in the short run, on sticky wages, sticky prices, and misperceptions. Yet wages, prices, and perceptions are set on the basis of expectations of the price level. So when expectations change, the short-run aggregate-supply curve shifts.

To make this idea more concrete, let's consider a specific theory of aggregate supply—the sticky-wage theory. According to this theory, when workers and firms expect the price level to be high, they are more likely to negotiate high nominal wages. High wages raise firms' costs and, for any given actual price level, reduce the quantity of goods and services that firms supply. Thus, when the expected price level rises, wages are higher, costs increase, and firms supply a smaller quantity of goods and services at any given actual price level. Thus, the short-run aggregate-supply curve shifts to the left. Conversely, when the expected price level falls, wages are lower, costs decline, firms increase production at any given price level, and the short-run aggregate-supply curve shifts to the right.

A similar logic applies in each theory of aggregate supply. The general lesson is the following: An increase in the expected price level reduces the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the left. A decrease in the expected price level raises the quantity of goods and services supplied and shifts the short-run aggregate-supply curve to the right. As we will see in the next section, this influence of expectations on the position of the short-run aggregate-supply curve plays a key role in reconciling the economy's behavior in the short run with its behavior in the long run. The economy is fixed, and the economy finds itself at the