

Aggregate Demand & Aggregate Supply

We have rationalized why Classical Economists believe that Governments have no role in the Economy. This segment of our Macroeconomic Analysis will rationalize why Keynesian Economists believe otherwise.

Classical Economics

Why doesn't classical Economics believe there is a role for the government?

1. Market's inherent ability to regulate itself and reaching equilibrium through the **Pricing Mechanism (Invisible Hand)**. Economy will always return to its **Potential Output**, and attaining the commiserating **Target Rate of Unemployment**.
2. Focus was on Long Run Economic Growth, and how it can be sustained. Since constraint on the economy is on the supply side, and by Say's Law, supply creates its own demand, Classical Economics focus on the **Long Run**, and particularly sources of growth from the **Supply Side** as we have enumerated earlier. The principal thrust for growth starts at encouraging **Savings**.

To Classical Economists, the best Economic policy is none at all, *laissez-faire*. Their prescription was for the government to eliminate Labor Unions, and policies that kept wages high. The argument is these elements prevented the Pricing Mechanism to function freely. Consider the following, if unemployment was high, there is an excess supply of labor, and there should hence be an incentive for wages to fall. They felt that it was these institutions that prevented the economy from reaching a new equilibrium.

Questions Raised During the Depression of the 1930s

1. What should the government do when the general populace can barely feed themselves nor have the ability to save?
2. Is there something else the government can do if eliminating minimum wage policies and unions is not an option?

Keynesian Economics

The key focus is on Stabilization.

1. We have learned that although an economy's growth follows a general trend which gives rise to its potential income, which in turn is dependent on its capacity, in the short run, GDP can and do differ from that of the general trend. In that same sense, the short run equilibrium income generated by the economy can differ from its potential income. It is during times when the economy's equilibrium falls well short of its potential income that a role for the government is generated. Keynes believed that the pricing mechanism may not bring the economy back into its potential income equilibrium level fast enough due to rigidities in wages within the economy. This would then create situations such as was seen during the depression when the economy was stuck at low income levels, and high unemployment (more than 20%).
2. The idea regarding savings being the fuel that generates growth ultimately relies on these savings being transferred back into the economy through investments.

However when there is a delay in the transfer of savings back into the economy such as when you have an unexpected demand shock (**Consider what would happen if OPEC were to constrain their oil output again. What would happen to economic outlook, and consequently demand for investment? Find out what happened after Black Monday. Or consider what happens to investment demand in S.E. Asia after most of the currencies were forced to devalue?**) an interesting phenomenon could occur. When there is such a delay, total expenditures (GDP/aggregate demand) would fall (recall your $AE=C+I+G+(X-IM)$). Savings is a withdrawal from income that could have been used in consumption. So when there is a delay, this sum of monies meant to raise investment (I) does not show up. Consequently the economy would suffer a drop in aggregate expenditure. This implies aggregate demand would fall. Because this is unexpected, the fall in aggregate demand would create an excess supply. To maintain profitability firms would reduce production through lay offs, and/or reducing their wage bill. This then further reduces income even further, and further reduces consumption. This process will continue till total saving in the economy equate with total investment. (Note that as income falls, savings and consumption falls. So if before savings had been high, the drop in income would eventually bring the saving back to the level of investment. Note further that this is at a lower level.) At such an equilibrium, the economy is now in recession, with high unemployment. This argument is known as the *Paradox of Thrift*. This argument is in stark contrast to Classical Economics' vision of savings, and is seen by Keynes and Keynesian Economists as justification for the role of government in goading the economy back to its long run equilibrium in the short run.

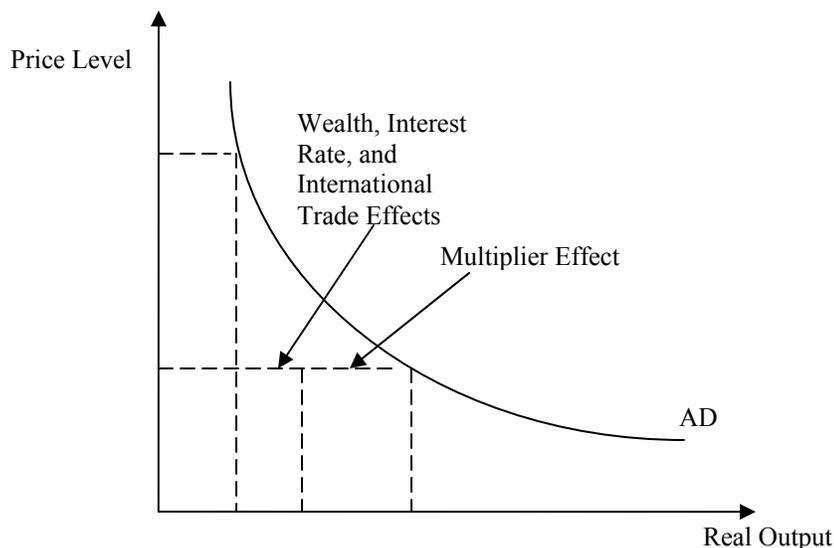
Common Tools Available to Government

1. Fiscal Policies:
 - a. Government Spending, example military expenditure, public projects.
 - b. Taxes and Subsidies
2. Monetary Policies
 - a. Controlling money supply in the economy
 - b. Controlling interest rates in the economy

AD/AS Model

It should be noted that although we will be using the AD/AS model to discuss Keynesian concepts the model that was developed is far more sophisticated than what our analysis here depicts. We will begin by discussing some of the key ingredients in the AD/AS model.

1. Aggregate Demand (AD) Curve
 - a. It shows the relationship between the price level the economy faces, and the real aggregate expenditure (AE) or equivalently real aggregate demand (AD) that the expenditure generates.
 - b. $AE=AD=C+I+G+(X-IM)$.
 - c. It is a downward sloping curve. Why the particular shape and curvature?



- i. As general price level fall, individuals would be able to consume more for each unit of currency they possess, i.e. wealthier. This is known as the **Wealth Effect**. That is a fall in price raises consumption C . So we can describe consumption in terms of real disposable income $C=a+bY_D$, where Y_D is real disposable income, and a and b are just constants, and a is the autonomous consumption spending (perhaps subsistence or minimum acceptable level of consumption), and b is the marginal propensity to consume. As we have discussed, disposable income, is income net of taxes, and we can characterize the relationship as $Y_D=Y(1-t)$ where t is the tax rate.
- ii. Just as prices gives value to goods, similarly money in itself has value, and it's value is the interest rate you get when you deposit it in your bank accounts. When prices of goods fall, the real value of money rises, and in effect banks can loan more monies. So in effect the fall in price raises the real supply of money. Just as an increase in supply for a good reduces prices, so to an increase in real supply of money reduces interest rates, which in turn raises incentives for firms to take loans and make relevant investments. Thus a fall in price raises I . Generally, we treat investment level as a given.
- iii. We no longer exist within closed economies. Consequently, a substantial proportion of an economy's output is generated via trade. When domestic price level falls, it not only increases our own consumption of our production, but so to would foreign economies find our goods desirable. This would then raise exports vis-à-vis imports, and net exports would rise, $X-IM$. This is know as the **International Trade Effect**. The level of exports in a given

in the model, while we can think of importing as dependent on the economy's income, and the relationship can be written as $IM=cY$. Where c is the economy's marginal propensity to import, consume foreign made goods.

- iv. The above effects would run its course through the first round. However, consider the following, the increase in output and growth raises the profitability of the firms, and there would be spillovers to the consumers again through increased dividends, and income, which in itself would raise consumption, driving an additional round of growth. This is known as the **Multiplier Effect**, and amplifies all the effects we have discussed above.

Can you find the equilibrium level of income in this aggregate economy? (Hint: Aggregate Expenditure, AE must be equal to income, Y . Further $AE=C+I+G+(X-IM)$) Together these effects reveal why the AD curve is downward sloping and convex in shape. You should convince yourself by reversing the reasoning by assuming an increase in price level instead. It must be noted that the rationale for the slope is not the same as the demand curve we learned in Microeconomics, where the shape is determined by two essential ideas of 1. Opportunity Cost, and 2. Substitution Effect.

d. Shift Factors

- i. **Foreign Income:** When our main trading partner's economy enjoys a boom (recession), trading activity would rise. When their economy's GDP/Income rises (falls), their ability to consume output produced by our economy rises (falls). Consequently the potential output of our own economy rises (falls), and the AD curve shifts upward (downward).
- ii. **Exchange Rates:** The demand for domestic currency gives rise to exchange rates between currencies. The greater the demand for a currency, there would be an appreciation or increase in its value vis-à-vis other currencies. Appreciation would make goods produced by the economy more expensive to foreign economies, and consequently reduce net exports through a lower demand in exports. This would cause a downward shift in the AD curve.
- iii. **Expectations:** The economy is often driven by expectations. Consider the following, when the CEO of a firm expects the demand for his firm's product to fall, do you think they would think about expanding investment in more machines? If a consumer believes the price of better cars will be released next year, will they buy one this year (assuming his current mode of transport is still functional), rather than wait. Now expand this reasoning to economy wide, and AD curve will shift. Expectations (bullish) will encourage sudden thrust in income growth and create an upward shift in AD. The reverse is true for bearish expectations.
- iv. **Distribution of Income:** Different individuals save at different rates (The rate at which individuals save, we term as marginal

propensity to save). Think about the percentage of income saved by someone with an annual income of \$30,000, as opposed to \$100,000, or even \$1m. Policies that change the distribution of income will then affect the savings rate of the economy, and its propensity to grow. What would happen to the AD curve when distribution of income tends toward skewing the distribution to the left.

- v. **Fiscal and Monetary Policy:** Fiscal policy refers to policies such as increasing government spending in military build up, or road works, and changes in the income tax rate etc. Monetary policy refers to changes in money supply through policies set by the Bank of Canada (Central Bank), such as changing interest rates. Each AD curve is drawn for a standing set of policies in place. Consequently, a change in policy will alter AD curve.
 - vi. **Multiplier:** Just as the multiplier effect causes the curvature of the AD, so to does the multiplier effect accentuates the original impetus for a shift in the AD. Consider the following, if businesses expect the future of the economy to be gloomy, investments will fall, causing a first round of shift in the AD. The outlook may reduce the demand for domestic currency through foreign investment, reducing the supply of money available within the economy, and consequently raising interest rates, which reduces investments even further. The story can go on. Think about how else you could extend this line of reasoning.
2. Short Run Aggregate Supply (SAS/SRAS) Curve
- a. The line describes how firms within an economy would adjust real output supplied as price level changes, holding all input prices fixed. Recall that GDP is calculated for final output and services.
 - b. The SAS is a upward sloping line because,
 - i. Firms exist in both quantity and price adjusting markets. That is they can adjust both prices and quantity in response to changes in aggregate demand. (When all firms are only quantity adjusting, we get a horizontal SAS.)
 - ii. As noted previously, businesses operate under expectations. When expectations, such as expectations on price level differ from actual price level, firms can erroneously change output and employment level on account of mistaking increase in general price level as an increase in demand.
 - iii. Most firms advertise a set of prices for the set of products they produce, i.e. a menu. Menus involve cost in creating. Hence unexpected changes in prices, or changes in price level that are not “substantial” will induce firms to change the quantities supplied, instead of incurring the cost of changing the menu.
 - iv. Firms often enter into contractual agreements with factor suppliers, such as the labor force. This contractual obligation means the costs are rigid. When price level changes, it alters the real cost of

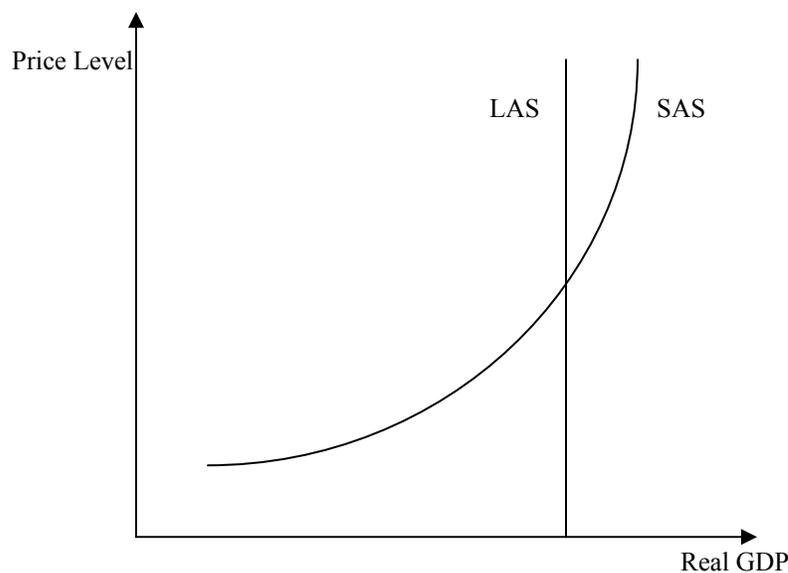
production, and consequently alter production along the SAS curve.

c. Shift Factors of SAS

- i. Productivity changes, for example due to changes in technology.
- ii. Changes in factor input prices, such as price of raw materials, wages, interest rates, energy prices, and price of land are some examples.

3. Long Run Aggregate Supply (LRAS/LAS) Curve

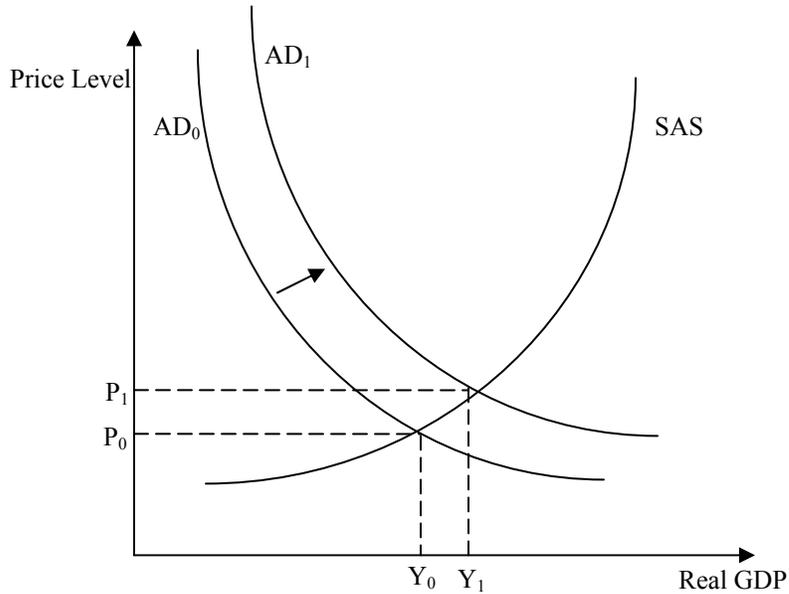
- a. It shows what an economy can produce in terms of total value of final output and services at the potential level of output, given the economy's capacity and technology, i.e. at "**full employment**" in terms of labor and capital.
- b. It is a vertical line at the potential level of output. The rationale is as follows, when we are at full employment, should prices rise, all that happens is that our income or wages would rise by the same percentage because the economy is at full employment. It is not possible for the economy to produce what it can.
- c. The SAS can and will intercept with the LAS. How is that possible if the LAS depict the potential output of the economy under full employment? Recall that potential output is not the full capacity, i.e. 100% usage. This means that it is possible that the economy can use more than the potential capacity to produce beyond the potential level of output.



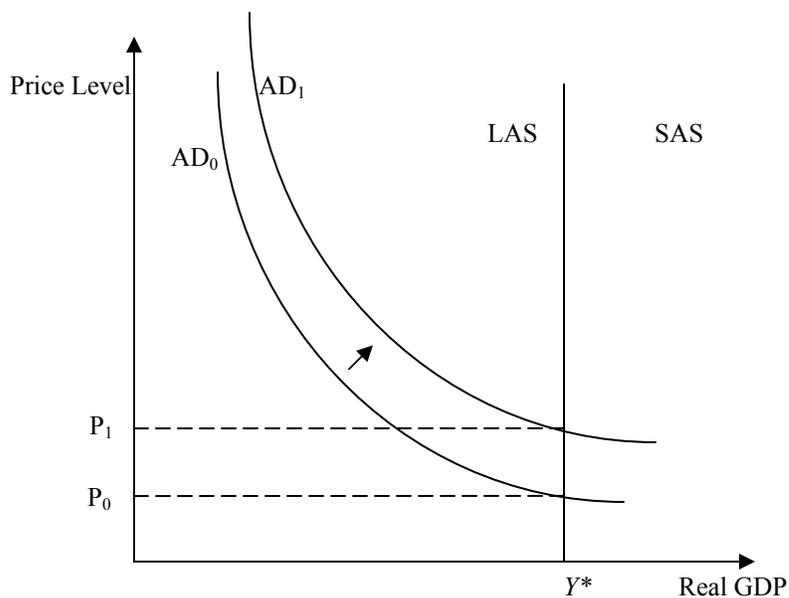
Equilibrium in the Aggregate Economy

Just like in the market demand equilibrium, illustrated as the point of intersection between the demand and supply. Equilibrium in the aggregate economy is simply the point of intersection between the AD and SAS in the short run and between the AD and LAS in the long run.

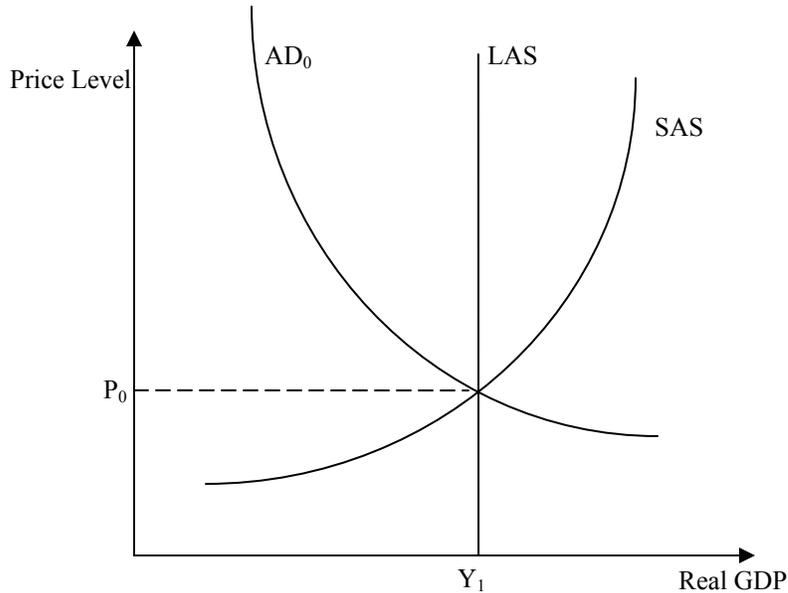
1. Short Run Equilibrium



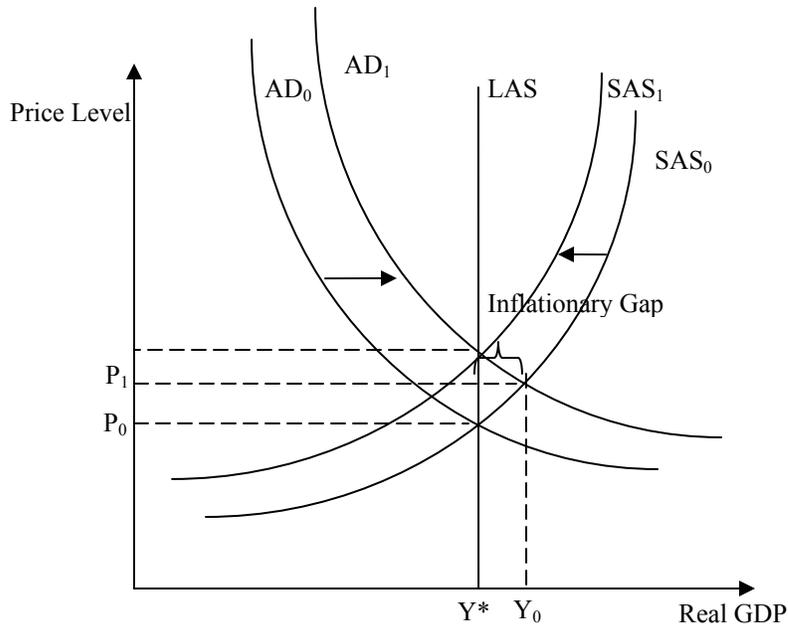
2. Long Run Equilibrium



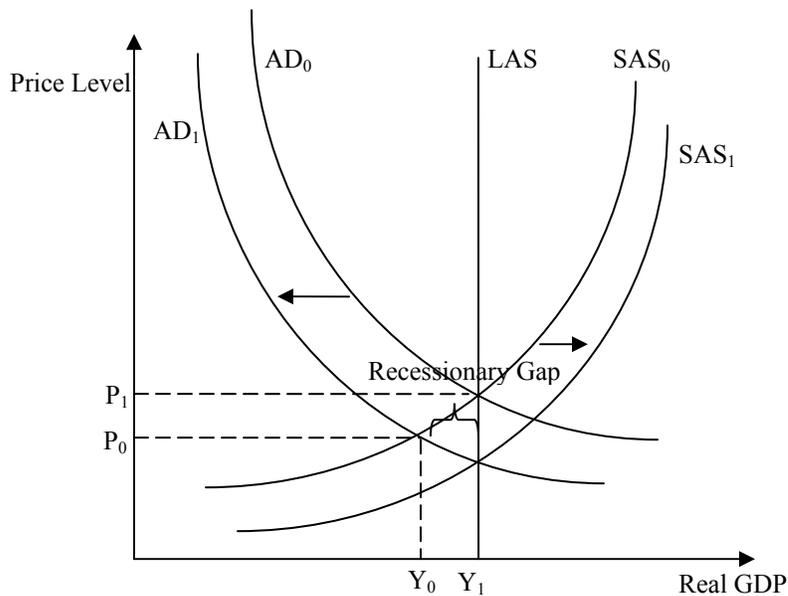
3. Short and Long Run Framework in Concert: Suppose the economy is concurrently in both Short and Long Run equilibrium. We will now discuss how the economy could adjust itself back into equilibrium when AD and AS shocks that shift either AD or AS out of its initial long run equilibrium, as least conceptually.



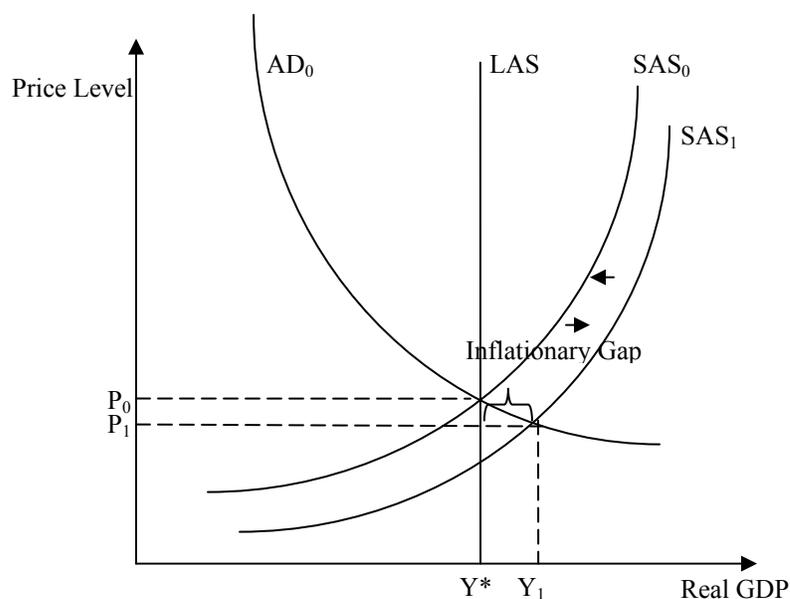
- a. Expansionary AD Shock: Such a shock could be from any of the shift factors of AD. This would lead to an upward shift in AD raising prices, and drives the real output above its potential output level, creating an inflationary gap. However, this increase in prices would drive wages up (assuming wages are flexible), thus raising cost of production across the economy, and reduces AS by shifting it backwards. The economy will achieve a new equilibrium back at the potential output, but at a higher price level.



- b. **Contractionary AD Shock:** A contractionary AD shock shifts AD backwards. This then creates a recessionary gap by driving the equilibrium level of real output below the potential level of output, creating a recessionary gap, at a lower price. At this short run equilibrium, due to lower prices, driving profits down, forcing firms to reduce wages (assuming wages are flexible). This in turn reduces the cost of production, allowing firms to reduce the cost of production, and expand production, shifting the SAS back eventually to the potential level of output.



- c. Expansionary AS Shock: SAS shocks work in a similar fashion as a AD shock with the exception that the initial movement away from the long run equilibrium is induced by SAS shifting. An expansionary AS shock drives the SAS outwards which creates an inflationary gap. Since the economy is operating above its potential output level, there is an excess demand for labor, driving wages up, consequently forcing eventually AS to contract back into the original equilibrium.



- d. Contractionary AS Shock: The arguments are exactly the same for contractionary AS shock. An example is the OPEC oil shock of 1973-1974 and 1979-1980. Note that instead of a inflationary gap, the SAS shift causes a recessionary gap. Convince yourself.

If the economy can cure itself, why hasn't it whenever recessionary or inflationary pressures arises. Note that in arguing that the economy can always readjust itself, we have based it on the assumption that wages are flexible. However, in general there are downward rigidities in wages, hence lengthening the amount of time required before the economy can reach a new equilibrium by itself. The simplistic solution from Classical Economist is that all the economy need to do is to eliminate the rigidities by eliminating unions, and policies that keep wages high, such as minimum wages. However, these institutions serve purposes that pricing mechanism sometimes cannot ensure, equitability in the distribution of income. The call to arms by Keynesian economist during the depression years was a result of downward rigidities.

Problems in Applying AD/AS framework to Policy Analysis.

1. Basically government intervention through shifting AD will work under certain situation only. Consider the following arguments:
 - a. Suppose the economy is indeed suffering from recession and output is indeed below potential output. Then by government intervention, and hence shifting the AD curve outward, the government can bring the economy back into equilibrium again.
 - b. But suppose the economy is already at potential equilibrium or above it. Just that we don't know. But embarking on an expansionary policy thereby shifting the AD outward, the government inadvertently creates an inflationary gap, which in force wages higher, leading to a fall in SAS. The economy is then left with the same level of real output, but at a higher price level.
2. The above discussion highlights the problems in intervention.
 - a. Suppose we know we are indeed in a recession, how do we know how much to intervene?
 - b. That is basically, how do we know what is the economy's potential output.
3. Well, we can try to work with what we know. In general policymakers divide the economy into three ranges within which it operates, and whether AD policies would have an effect on prices. See figure 9.9 on page 228 of your text.
 - a. When the output is substantially below potential level, we know that shift in AD will not affect price level much. (Keynesian Range)
 - b. When we near potential level of output, AD shifts will cause moderate changes in price level.
 - c. However, when we are at the potential level of output, all AD shifts will do is to drive prices up, creating a situation where the economy is always under inflationary pressure. (Classical Range)
4. How can we then estimate or approximate potential output?
 - a. Use the unemployment level below which inflation starts as an indication of potential output being reached. That is we try to find the target rate of unemployment. Problem with this approach is that the economy is constantly evolving and growing. As an economy evolves and cycles around its general trend, several types of unemployment are created, cyclical and structural unemployment. Cyclical unemployment is temporary in nature, whereas structural unemployment remains when the economy is at the potential level of output. Question is how should we define whether a particular worker is structurally unemployed or otherwise.
 - b. Forecast the potential level of output using data of previous levels of output factoring growth rate. However, technology does not alter growth rates at a constant rate, which means such methodologies may lead to errors.