Aggregate Supply & Business Cycles

6

Unit highlights:

⇒ **Short run and long run aggrerate supply curve**

⇒ **Business cycles**

Lesson 1: Short-Run & Long-Ran Aggregate Supply Curve

Lesson Objectives

After studying this lesson, you will be able to

- see what the aggregate supply curve shows
- understand why distinguishing between short-run and long-run aggregate supply is of crucial importance.
- realize why the short-run aggregate supply is positively sloped, while the long-run aggregate supply curve is vertical.
- appreciate why some macroeconomists claim that even the short-run supply curve is vertical.

Short Run and Long-Run Aggregate Supply Curves

The steepness of the aggregate supply curve is of crucial importance in modern macro economies

In our discussions so far, we concentrated most of our attention on the derivation of the aggregate demand curve. In lesson 4 of unit 5, we introduced the aggregate supply with a few brief comments. This should not give the impression that the aggregate supply is perhaps less important than aggregate demand in macroeconomic analysis. This is far from true. Over the last quarter century. i.e. economists have come round to the view that aggregate supply is critical to understanding how the macroeconomy evolves over time. In modern macroeconomics, the distinction between the short run and the long run aggregate supply is crucial.

In the short run, the aggregate supply together with aggregate demand can explain the ups and downs in output in the economy. But in the long run (a decade or more, perhaps), economic growth or rising living standard is unthinkable without increases in the aggregate supply. Therefore, the question "How steep is the aggregate supply curve" is the main controversy in modern macroeconomics. In the long run, as we will see, the aggregate supply curve is vertical, though economists may disagree on the time span which should be designated as the long run. The long run output is then determined by aggregate supply alone, while the price level depends both on aggregate demand and aggregate supply. By contrast, both the price level and the output level are determined in the shot-run by aggregate demand and aggregate supply, because the aggregate supply curve is positively sloped. Moreover, the magnitude of the slope of the aggregate supply

curve determines how a given expansion (or contraction) in aggregate demand is split into short-run price and output changes.

The Short-Run Aggregate Supply Curve

The aggregate supply curve shows how much is offered for sale at various price levels.

Generally speaking, the aggregate supply curve describes the behavior of the production side of the economy. The aggregate supply curve shows for each possible price the quantity of goods and services that the firms in the economy will be ready to produce, other things equal. In the shout-run, the higher the price level, the larger is the amount of output supplied (other thing being equal). In other words, the short-run aggregate supply curve is upward sloping for a considerable range of output.

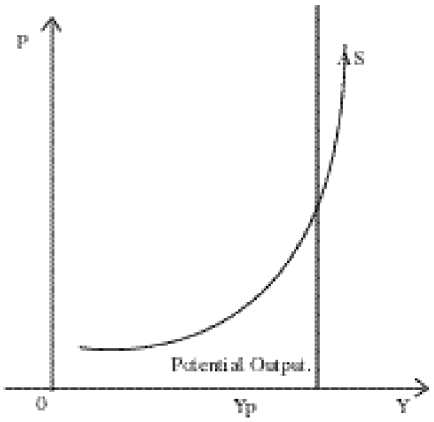

Figure 6.1: A short run Aggregate supply curve

A typical upward sloping short-run aggregate supply curve is shown in Figure 6.1. It is easy to see why the curve slopes upward. The firms are motivated to produce by the prospect of profits. But the profit to be had from a unit of output produced is given by the difference between the price at which it can be sold and its average cost of production. That is

per unit profit = price - unit cost.

Therefore, what happens to the unit profit as the price level rises depends on how the unit cost responds to output expansion.

Some costs are relatively fixed in the short-run which is why the short-run AS curve is positively sloped.

If the unit cost lags behind the price rise, firms will be encouraged to increase output. Are there reasons to suppose that this is what is likely to happen in the short-run? The answer is yes, because labour and some other inputs used by firms can be obtained at relatively fixed prices for some period of time (though not for ever). For instance, many firms employ workers on the basis of long term contracts (ranging from one to three years) which specify money wage rates for

the period (with partial adjustments for price changes in the mean time). Even where there are no labour unions and hence no such labour contracts, it is quite rare for wages to be raised more than once a year. This inflexibility of wage costs to changes in market conditions is of some importance for firms because labour costs constitute quite a significant proportion of total costs. What is true for labour costs is often true for some other inputs (such as raw materials and components) which are also purchased on the basis of long-term contracts. Moreover, some input prices fixed by the government are slow to change. Examples are the prices for electricity, gas, water and telephone services. Of course, none of these contracts or fixed prices last for ever; but many of them last long enough to allow unit costs to lag behind the price level.

Now if the selling prices rise (due to changes in market conditions, e.g. shifts in demand) while wages and other input costs remain relatively fixed, per unit profit goes up, and firms will be keen to step up production. The opposite happens when the price level falls: the profit margin is reduced and firms respond by cutting back on production. This type of behavioral response from firms makes the short-run aggregate supply curve upward sloping.

To summarize, the reason why the short run aggregate supply curve is positively sloped is that in the short run labour and other input costs are fixed (or, at any rate, do not rise as fast as the price level) so that higher prices mean higher profit margins and, therefore, higher production.

One more comment about the shape of the short run aggregate supply function is in order. Look at the particular curvature with which we have drawn the aggregate supply curve in Figure 6.1. It is flat at low levels of output and gets progressively steeper at higher output levels. We briefly mentioned the reasons for this in Lesson-4 of the previous unit. We have to add little to what we have stated there. At low levels of output capacity utilization is low and lots of resources are unutilized. In this situation, if there is an upsurge in demand, firms can increase output by raising prices modestly, because unit costs are expected to rise slowly. The aggregate supply curve is therefore, relatively flat. By contrast, when the economy is booming and demand is very strong, the economy has very little unutilized capacity or other resources. Here attempts to acquire more resources for additional production will cause the unit cost to rise more sharply than before. Therefore, prices have to rise in a commensurate fashion. On the demand side too, high prices are unlikely to be fiercely resisted by consumers because of the prevailing high wages. Therefore, the slope of the shot-run aggregate supply function (which reflects the response of costs to output expansion) generally rises as the degree of resource utilization increases.

The slope of the AS curve rises as the degree of resource utilization increases

Shifts in the aggregate Supply Curve

The short-run AS shifts when input prices change, productivity improves and stocks of labour and capital grow

The aggregate supply curve shifts whenever the factors (the "other things") that determine its position change. What are these factors? One set of factors is obviously the input prices (prices of raw materials, energy, labour and so on). If any of these prices goes up, the unit cost will rise, and therefore, the supply curve will shift upward, implying that the same level of output will be supplied at higher prices. Conversely, lower input prices will move the aggregate supply curve in the opposite dissection, allowing the firms to supply given amount of output at lower prices than before.

Another factor that impinges on the unit cost of production and, therefore, on the position of the aggregate supply curve, is the state of technology. For example, a technological breakthrough increases the productivity of labour (or of capital) and tends to reduce per unit cost. When this happens, the aggregate supply curve shifts downward.

Finally, the most obvious factor should not escape our notice; the availability of labour and capital. The larger the size of the labour force or of the stock of capital, the greater is the economy's capacity to produce, and the further out the aggregate supply curve will be from the origin. Therefore, as the labour force grows over time and the stock of capital increases through investment, the aggregate supply curve will shift outward, and the economy will be able to supply more output at any given price level than before.

The Long-Run Aggregate Supply curve

In the long-run all components of costs adjust to rising prices. Therefore the long run AS curve is vertical at the potential level of output.

The short-run inflexibility of some components of cost vanishes in the long run. Wage contracts, rent agreements, regulated prices-all become variable and subject to negotiation in the long-run. Labour unions, for example, see that their real wages have in the mean time been eorded by inflation; they will insist on compensation through higher money wages. If the general price level goes up say, by 10%, all elements of cost (wages, rents, regulated prices etc) will ultimately rise by 10%. That is, the unit costs rise in proportion to the rise in the price level.

In this scenario, firms will be unable to profit from higher levels of aggregate demand. In the long run, when all elements of costs have fully adjusted to higher prices, the equilibrium output will get back to the potential level (Yp). Therefore, in the long run, the aggregate supply curve is vertical at the level of potential output (corresponding to the natural rate of unemployment) as shown in Fig-6.2.

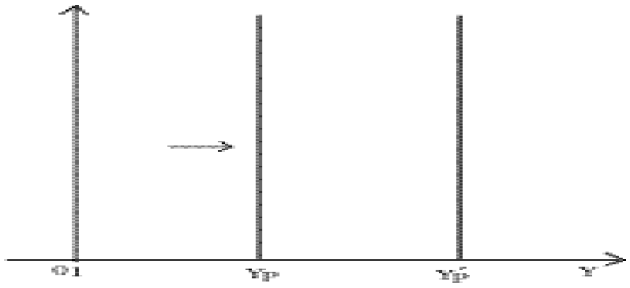

Fig.2 The Long-Run Aggregate Supply Curves

This curve can, of course, shift to the right as the potential output grows over time owing to accumulation of capital, growth of the labour force, or improvement in technology.

Some economists believe that the AS curve is vertical even in the short run

Incidentally, note that some macroeconomists claim that the aggregate supply curve is vertical even in the short run. Their agreement is that people anticipate inflation and do so correctly. Therefore, in negotiating long-term wage contracts they allow for price changes. As a result, the very basis for short run output response to higher prices disappears, and the aggregate supply curve becomes vertical. In this case, expansionary fiscal or monetary policy cannot reduce unemployment even in the short run. Most economists, however, disagree with this position and stick to the view that in the short run higher prices can bring forth higher output (i.e. the short run aggregate supply curve is positively sloped).

Review Questions

MCQ'S (Tick the correct Answer)

1. In the short run, the aggregate supply curve is positively sloped because
   A. input costs adjust immediately to changes in the price level
   B. input costs adjust to changes in price with a time lag
   C. the aggregate demand is high.
   D. the aggregate demand is weak.
2. When the increase in the price level lags behind the increase in unit costs, the profit per unit
   A. decreases
   B. increases
   C. remains unchanged
   D. has nothing to do with unit costs.
3. The short-run aggregate supply curve is relatively flat when the level of output is
   A. relatively small
   B. relatively large
   C. equal to the potential level
   D. above the potential level
4. A technological improvement is likely to shift the aggregate supply curve
   A. to the right
   B. to the left
   C. in either direction
   D. it will not shift
5. The long run aggregate supply curve is
   A. horizontal
   B. vertical
   C. positively sloped
   D. negatively sloped

Short Questions

1. Explain why a distinction between the short run and the long run aggregate supply curve is important in macroeconomic analysis.
2. What determines the slope of the short run aggregate supply curve? How is it related to the degree of resource utilization?
3. "According to some economists, even the short-run aggregate supply curve is likely to the vertical" How do they justify this position?

Broad Questions

1. What factors determine the position of the short-run aggregate supply function? Discuss each of them briefly.
2. Why is the long run aggregate supply function vertical at the potential output level? When and why will it shift to the right? What is the implication of a vertical AS for demand management policies?

Asnwers (MCQ'S)

1. B 2. B 3. A 4. A 5. B

Lesson 2: Business Cycles : Genesis and Features

Lesson Objectives

After studying this lesson, you will be able to

- know what the natural rate of unemployment is;
- know that real output does not grow smoothly along the trend path;
- understand why the real output fluctuates around the trend giving rise to business cycles;
- see what the different phases of the business cycles are and how they are related.

Business Cycles: Genesis and Features

Economic definition of full employment leaves room for the unemployment of those who are in between jobs

From our discussion in the previous lesson, we know that the aggregate supply in the long run equals the potential output. The potential output, it may be recalled, is the level of output which the fully employed labour force of a country can produce in a given period. The term full-employment is used here in the economic, not physical, sense. At any time, some people will be in-between jobs, quitting some and looking for others. When the members of the labour force other than these people find job at the existing rate of remuneration, they are treated as employed. In the economic sense, then, full employment exists when those who want to be employed at the going wage rate are employed. This definition of full employment allows for unemployment of those between jobs. These people make up the group known as the frictionally unemployed. The rate of unemployment corresponding to this situation is also call the natural rate of unemployment (or full employment rate of unemployment!). The actual rate, can of course, fall short of, or exceed, the natural rate, depending on circumstances in the market. When the economy is booming, demand is high and business expectation buoyant, the actual rate may be less than the natural rate of unemployment (and the actual output exceeds the potential level). On the other hand, when the demand is weak and business optimism is ebbing, the actual rate of unemployment may exceed the nature rate (and actual output is below the potential output).

The potential output can grow over time, as mentioned earlier, if a nation's labour force grows, capital stocks increase though investment and technological improvements take place.

In Fig 6.3 curve A shows the trend path of real (potential) output over-time.

Unfortunately, factors are not fully employed, and output is not at the potential level, all the time, no matter how much we long for stable, steady growth. Actual output fluctuates, instead, around the trend level.

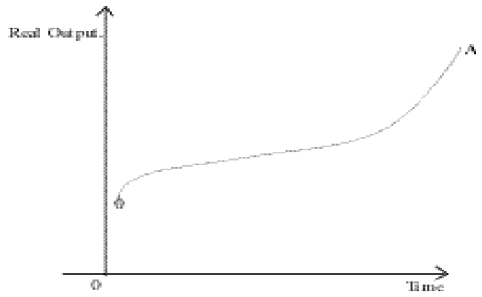

Figure –6.3: Trade output over Time

Fluctuations are due to shifts in aggregate demand and aggregate supply.

The reasons for these fluctuations are complex but the basic mechanism can be illustrated with the help of the tools of aggregate supply and aggregate demand. Consider Fig-6.4 which depicts how the equilibrium price-output combination is determined in the AD-AS framework. In panel (a), the levels of AD and AS are such that the equilibrium output is at the potential level, Y_p. Now suppose that for some reasons (say, a drop in real exports), AD_o falls to AD_1, causing the output level to fall from the potential level (Y_p) to Y_1 which corresponds to a rate of unemployment higher than the natural rate. On the other hand, if AD surges ahead (say, because of an exogenous growth in real exports), the aggregate demand curve shifts to AD_2, raising the real output to Y_2. As a result, unemployment falls below the natural rate.

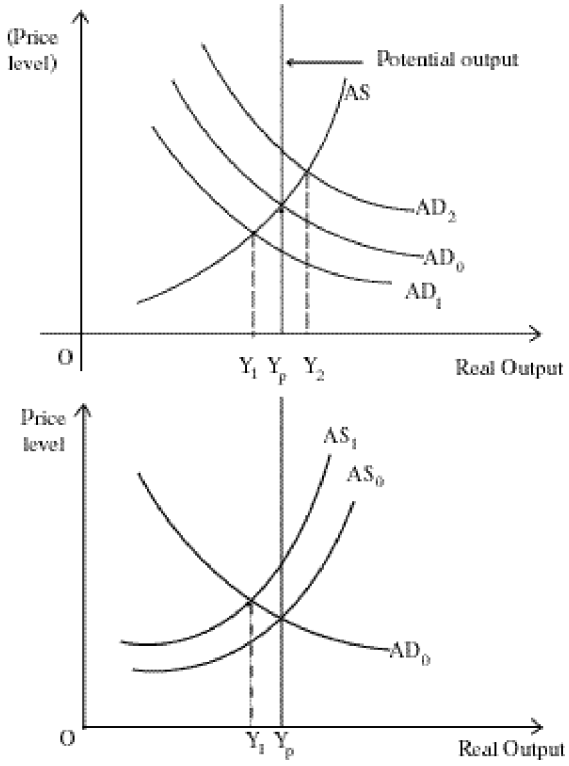

Figure 6.4: Shift in Real Output owing to demand & Supply shocks

Fluctuations in output and employment can equally come from the supply side, as illustrated in Fig. 6.4(b), where as a result of a leftward shift of the aggregate supply curve, the actual output goes down from the potential level Yp to Y_1, causing unemployment rate to go above the natural rate. This is a case of an unfavorable supply shock, arising from, say, a rise in the price of an important input like energy, or a crop failure. The supply shock may be favorable too, as in the case of a bumper crop, or a substantial fall in important input prices. In this latter case, the actual output will overshoot the potential level, and unemployment will fall below the natural rate.

Business cycles are irregular ups and downs of real output around the trend.

In short, actual output can fluctuate around the trend because of shifts in demand and supply conditions. These fluctuations generate what are known as business cycles, and through these cycles are tied together inflation, unemployment and growth experienced by an economy. More formally, business cycles are irregular, but readily identifiable, patterns of expansions and contractions in economic activity around the path of trend growth.

Features of the Business Cycle

The patterns of business cycles are irregular, and no two business cycles are quite the same. You may wonder why they are called 'cycles' at all. Irregular though they are, the business cycles have a family resemblance, exhibiting some identifiable phases, as shown in Figure-6.5.

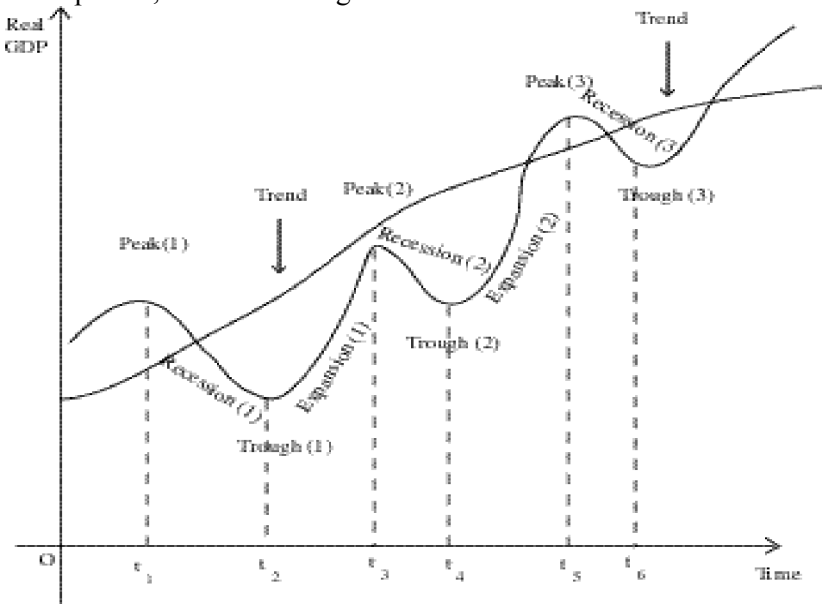

Figure 6.3: Business Cycles

During a recession economic activity declines and unemployment

Identifying a business cycle may conveniently begin with a definition of a recession. A recession refers to a situation in which the economic activity is declining. But how far must economic activity decline before we can recognize it and say that the economy is in recession? In the US, where quarterly data on GDP are available, the economy is said to be in recession, when the GDP declines for two or more consecutive quarters. In any case, persistent decline in economic activity cannot escape notice for long, and identification of a recession is not difficult.

A recession reaches its trough when the economic activity is at its

During a recession consumer purchases decline sharply. As a result, inventories accumulate unexpectedly, especially in those industries which produce consumer durables like automobiles, television sets and washing machines. If consumers face financial difficulties or, are pessimistic about their future incomes, they can easily postpone purchases of these goods. When a recession hits the economy, business profits drop, and as firms cut back on production in the face of accumulating inventories, real GDP falls. But with the fall in real GDP, incomes of workers fall which in run leads to further fall in consumer purchases. Businesses respond by reducing investment in plant and equipment. Unemployment mounts, and inflation slows down. The recession ends with the trough, which is the time when the economic activity is at its lowest.

The recovery phase of a business hits a peak when the output is at its highest.

The recessionary phase is followed by a period of expansion (also called recovery). Output increases, and profits, employment, wages, prices and interest rates tend to rise in general. The upswing or the expansionary phase ends in another peak when the real GDP is at its highest. This represents a turning point and the economy moves into recession again, reaches a trough, is followed by recovery (expansion) leading to another peak and so on.

Business Cycles are irregular with respect to time as well as size

In summary, business cycles show that actual output does not grow smoothly along the trend; it fluctuates irregularly around the trend. From the peak, the actual output falls to trough via recession, and then to another peak through recovery, only to nosedive into another recession and so on. Note carefully from Figure-6.5 that output movements are irregular with respect to both time and size. For instance, the duration of recession (1) in Figure-6.5 is larger than those of recession (2) and recession (3). Similarly, the periods of recovery during expansion are unequal. On the other hand, the depths of recessions are not the same, nor are the heights of expansion. It is also important to note that the recovery may be incomplete i.e. the recovery may hit a peak before it reaches the potential output (see Figure 6.5, peak 2 which is below the potential line).

Review Questions

MCQ'S (Tick the correct answer)

1. In the economic sense, full employment refers to a situation when
   A. the entire labour force is employed.
   B. those who are willing to work at the going wage rate are employed.
   C. 80% of the labour force is employed
   D. 95% of the labour force is employed

2. When the real output is above the potential level, the
   A. natural rate of unemployment is equal to the actual rate
   B. natural rate is lower than the actual rate
   C. natural rate is higher than the actual rate
   D. natural rate of unemployment is higher than the actual rate of inflation.
3. During a recession, the rate of unemployment
   A. declines
   B. rises
   C. remains unchanged
   D. real output rises

4. During an expansion, the rate of unemployment
   A. declines
   B. increases
   C. remains unchanged
   D. real output falls.

5. Business cycles are similar
   A. with respect to time only
   B. with respect to size only
   C. with respect to both time and size
   D. neither with respect to size, nor time

Short Questions

1. What is the natural rate of unemployment? How is it related to the potential level of output?
2. What are the business cycles? Try to guess why no two cycles are similar.
3. In what sense, a recovery can be incomplete? Can you guess why?

Broad Questions

1. Attempt a general explanation of why real output does not grow smoothly along the trend path.
2. What are the different phases of business cycles? Discuss their characteristics.

Answer to MCQ"S

1. B 2. B 3. B 4. A 5. D