Macroeconomics

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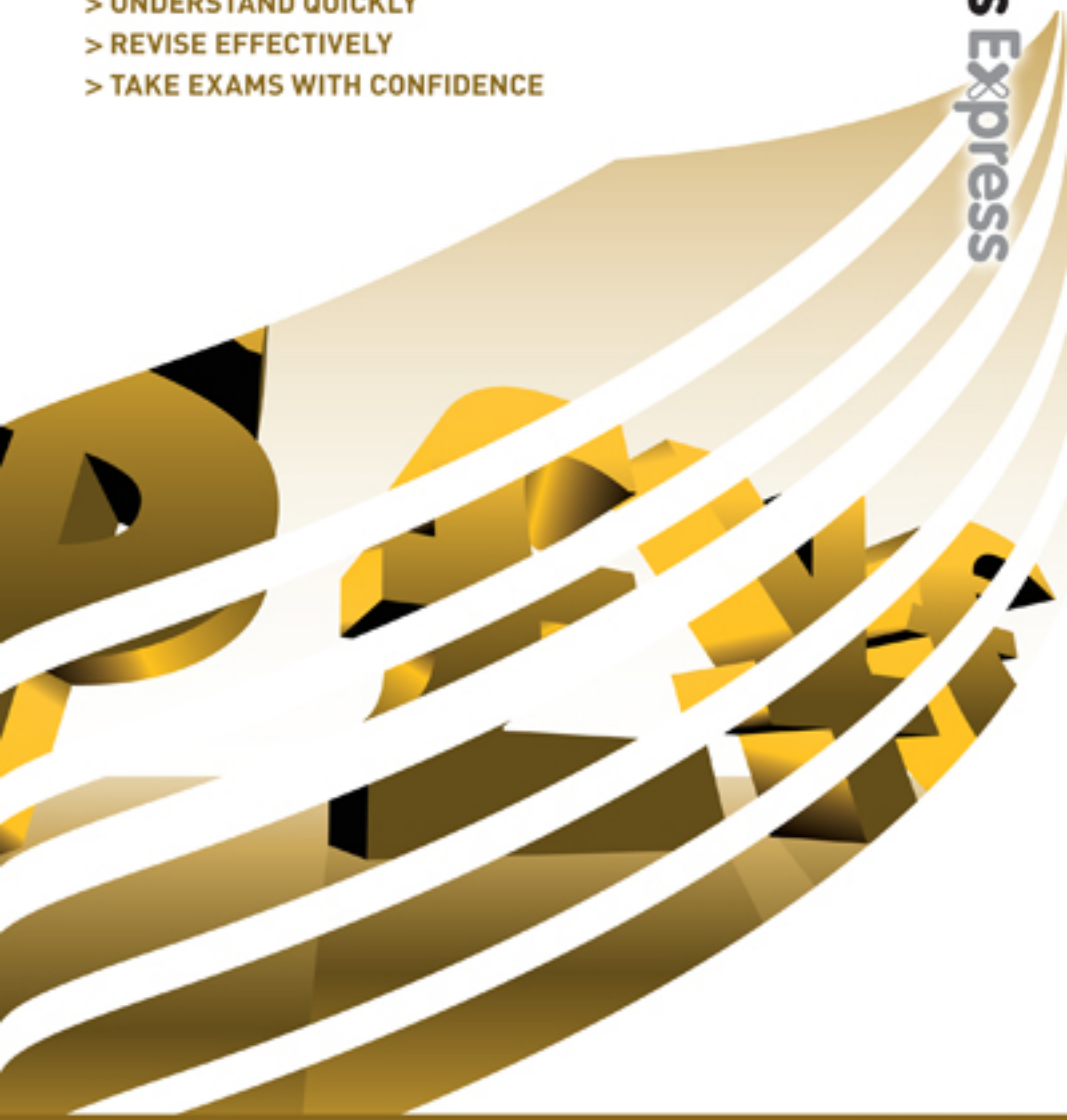
> UNDERSTAND QUICKLY
> REVISE EFFECTIVELY
> TAKE EXAMS WITH CONFIDENCE

Economics Express



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Macroeconomics

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Inputs, costs and the *SRAS* curve

A key consideration is the shape of the economy's short-run aggregate supply curve. This is dependent on the extent to which firms' costs change as they adjust their output levels. A simplifying assumption is to assume that in the short run the 'menu' of prices paid by firms for their inputs is fixed. In drawing the short-run aggregate supply curve we are therefore assuming a given set of input prices. In effect, we are assuming that input prices exhibit 'stickiness' in the short run. This is not entirely unreasonable, especially in the case of labour where wage rates are typically set for one or two years.

Intuitively, we might expect more domestically produced goods and services to be provided the higher the economy's average price level. This implies that the aggregate supply curve slopes upwards. But can we be more specific about the extent to which it *may* slope upwards?

At this point we need to consider the technical relationship between inputs and output, that is the adjustment firms need to make in their use of resources to bring about a given change in the volume of output. This relationship is known as a **production function**. In effect, this captures prevailing technologies and ways of doing things. In the short run we shall assume that these are fixed. Firms' production functions help to determine their costs in adjusting output. Consequently, they determine the shape of the aggregate supply curve too.

In the short run, firms looking to change their volume of output are constrained by the resources they can adjust. This reflects current technological know-how and the likelihood that some resources can be adjusted very little, if at all, in the short run. It is customary to model non-financial fixed assets used in production, such as the amount of office or factory space, as being 'fixed' in the short run. These inputs are known more simply as **physical capital**. Therefore, to adjust their volume of output, firms must, in the short run, adjust the levels of those inputs that are 'variable'. These inputs include labour, raw materials and consumables ('day-to-day' inputs).

Key definitions

Production function

A function that describes the relationship between inputs and output. A production function can be for either an individual firm or an economy as a whole.

Physical capital (non-financial fixed assets)

Inputs that can be used for a protracted period of time, usually more than one year, in the production of goods and services.

Now assume that firms are looking to increase the quantity of variable inputs so that they can raise output. The volume of additional resources needed may depend on existing levels of output. In the presence of fixed quantities of capital, firms are likely to reach a level of output when to keep raising output by a given amount will require increasingly larger amounts of additional variable inputs. This is the idea that variable inputs exhibit diminishing marginal returns. The important point here is that this has implications for the cost of increasing output: the additional cost of increasing output rises as output rises. Consequently, the average cost of production will rise too.

Therefore, the assumption of a fixed stock of capital in the economy helps to explain why the *SRAS* curve is typically drawn as becoming steeper as output rises. This effect is likely to be reinforced by the growing scarcity of variable inputs, like labour, at higher and higher levels of output. Workers, for instance, are typically paid higher rates for working overtime. Again, the result is that marginal costs will rise as output increases.

Key definition

Diminishing marginal returns

The decline in the additional amount of output that results from increasing an input while the quantity of other inputs remains constant.

Stylised *SRAS* curve

A stylised (or hypothetical) version of the *SRAS* curve is shown in Figure 3.1. At low levels of output up to Y_1, the curve shows that firms in aggregate are willing to increase output without an increase in output prices. This is consistent with the circular flow of income model. However, beyond Y_1 larger and larger increases in prices are needed to induce additional output. At Y_f, firms are unable to increase output further. This maximum level of output should not be confused with the economy's **potential output**. The economy's potential output occurs when its inputs are being employed at normal levels of utilisation. Therefore, it is the economy's sustainable output level. As output expands up to Y_f, inputs are being used increasingly intensively and a point is reached when firms are operating at above normal capacity. There is, of course, a limit to this and this is what Y_f shows. Potential output is therefore *below* Y_f.

Key definition

Potential output

The economy's output level when resources are being employed at normal levels of utilisation and which is sustainable over the longer term.

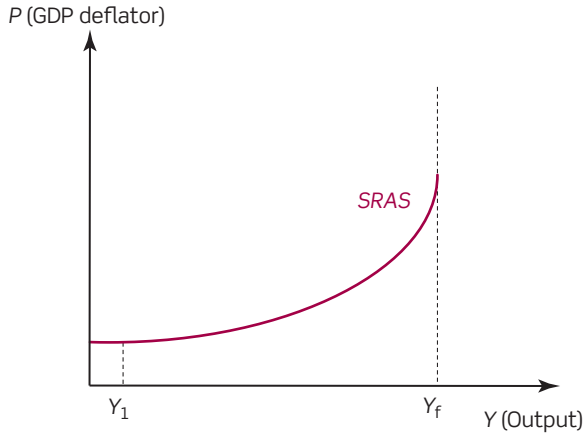


Figure 3.1 Stylised short-run aggregate supply curve.

Assessment advice

Take care with terminology. The economy's potential output is not the same as its full-capacity output. It is the economy's sustainable output level. The economy's output can exceed its potential output.

Examples & evidence

Output gaps

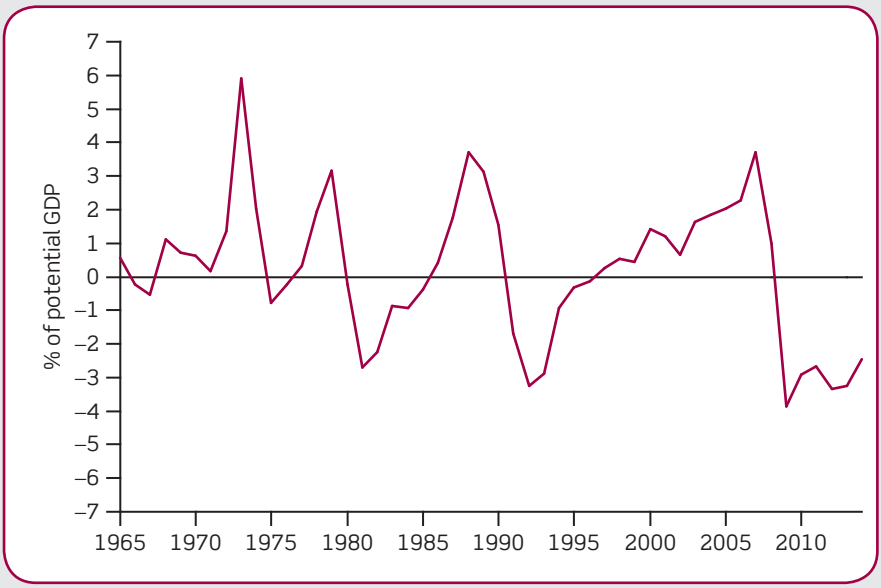
When the economy's *actual* output diverges from its *potential* output, the economy experiences an output gap. It is important to recognise that potential output is that level of output when the economy's resources, such as its workforce or firms' plant and equipment, are being used at normal levels of intensity. It is also known as the economy's 'sustainable' or 'natural' level of output. Full-capacity output is higher, but it, too, is constrained by the availability of resources and the extent to which these resources can be used ever more intensively.

A negative output gap occurs when the economy's output is *below* the economy's potential output. Negative output gaps tend to occur when economic growth is weak or even negative. A positive output gap occurs when the economy's output is *above* its potential output. Positive output gaps tend to occur during periods of strong economic growth (see Chapter 4).

While actual output is observable, potential output is estimated. Estimates can be generated by analysing the responses to surveys of business.

Potential output can also be estimated by using statistical techniques. There are two general statistical approaches. First, a trend growth path can be 'fitted' through actual output (real GDP) data. Second, a model of the economy's production function can be built. The model enables modellers to estimate the effectiveness of the economy's resources and therefore the level of output if these resources are being used at normal levels of intensity. Official estimates of the economy's output gaps, such as those issued by the European Union or the Organization for Economic Cooperation and Development (OECD), tend to use this production function approach.

The chart below shows the UK's output gap since 1965. The figures are expressed as a percentage of the economy's estimated potential output. The period between 2008 and 2013 is especially noteworthy, with the economy's output typically 3½ per cent below its potential.



UK output gap, 1965–2014.

Note: 2012 to 2014 are forecasts.
Source: Based on data from AMECO database (European Commission, DGECFIN), Table 6.5. http://ec.europAa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm.

Questions

1. Explain how actual output can exceed potential output.

2. Why might we expect price pressures to emerge if the economy is operating above its potential output level?

Assessment advice

Perhaps the way that your tutor has drawn the *SRAS* curve looks slightly different. This reflects differences among economists about the *precise* nature of this relationship. The mainstream view is that the *SRAS* curve becomes steeper as the level of output rises. The important point here is to understand the theoretical foundations in the construction of the curve.

Recap

The *SRAS* curve plots the aggregate amount of output that firms are willing and able to supply at different values of the GDP deflator. In constructing the curve, we assume a given level of technological know-how, a given stock of capital and that input prices are constant. The mainstream view is that the *SRAS* curve grows increasingly steeper as the economy's output level rises.

Test yourself

Q1. Explain the mainstream view as to why the *SRAS* becomes progressively steeper.

Q2. What sorts of items are included within the economy's stock of capital?

Shifts of the *SRAS* curve

The *SRAS* curve shows the impact of a change in output prices on the volume of output in the economy. The effect of a change in the GDP deflator on output represents a move *along* an *SRAS* curve. But there are other variables that affect the level of output (real GDP). Changes in these will lead to a *shift* of the *SRAS* curve.

In constructing the *SRAS* curve we hold certain variables constant. If these change then we have a new *SRAS* curve. Among these are input prices. Changes in wage rates or the price of raw materials affect firms' costs. This, in turn, affects the amount of goods and services that firms are willing to supply at each price level. A decrease in input costs will increase the amount that firms are willing to supply at each price level. This is consistent with a downward shift of the *SRAS* curve, such as that from $SRAS_1$ to $SRAS_2$ as shown in Figure 3.2. It is assumed that the economy's full capacity output, Y_f, is not affected.

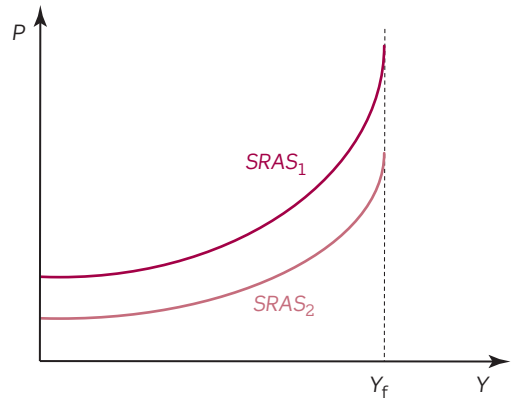


Figure 3.2 Increase in short-run aggregate supply curve (no change in full-capacity output).

We also hold the amount of physical capital constant in the short run. An increase in the amount of physical capital per worker is known as **capital deepening**. It raises the productivity of labour enabling more to be produced. Hence, an increase in physical capital is also consistent with an increase in aggregate supply. Similarly, an advancement in technology and know-how allows firms to produce more, even when other things, such as the quantity of inputs, remain constant.

Increasing amounts of capital and technological progress not only cause the *SRAS* curve to move rightwards, but also raise the economy's potential output and its full-capacity output. This is illustrated in Figure 3.3. A similar effect arises from an increase in the size of a country's labour force or an increase in a country's stock of **human capital**. Human capital is the term used to describe the skills, expertise and health of the population.

Key definitions

Capital deepening

An increase in the amount of capital per worker.

Human capital

The skills, expertise and health of the population.

In industrialised economies, we have observed over many years an accumulation of physical capital, capital deepening, technological advance and rising levels of human capital. This means that the *SRAS* curves are continually shifting rightwards in these countries. The speed of this movement is then