

# Chapter 10: How the macroeconomy works: the circular flow of income, aggregate demand/aggregate supply analysis and related concepts

## Application of economics in the real world

### Application of economics in the real world 10.1: Economic shock caused by the El Niño effect

1 The textbook defines an economic shock as a sudden unexpected event hitting the economy, disturbing either aggregate demand (a demand shock) or aggregate supply (a supply shock). In some cases, an outside shock may affect both aggregate demand and aggregate supply. The El Niño effect is an example of this. On the one hand, the effect creates uncertainty among consumers and firms, which is likely to reduce aggregate demand in the countries affected, while on the other hand, the supply-side effects include destruction of fishing stocks and a fall in farm production.

2 The El Niño effect increases the rate of global inflation. Inflation occurs when there is a sustained increase in the average price level. Economists measure inflation by tracking the prices of a selection (or basket) of goods and services in an index. The goods and services are weighted, and prices changes are measured monthly. The rate of inflation should reflect the changes in the cost of living for the average household in an economy.

According to the case study, commodity prices in an El Niño year will increase because the extreme weather conditions ‘can constrain the supply of rain-driven agricultural commodities’. Droughts in areas of the western Pacific, unusually heavy rains in South America, and strong storms and hurricanes disrupt economic activity. Crop yields in the affected years are normally lower than average and this puts upward pressure on prices. As the prices of the items measured in the inflation index increase globally, the rate of inflation increases.

3 In the UK, hot summers are beneficial for some sectors of the economy but have adverse effects for other sectors. The leisure and tourism industry benefits from hot summers because they result in a significant upturn in trade. Warm weather and sunny days draw consumers into seaside towns and tourist attractions. Businesses such as restaurants and ice cream parlours sell more goods and services and generate higher profits. Retail sales of barbecues, firelighters, outdoor recreational goods, summer clothing, sunglasses and sun cream all experience an increase in demand, especially if the weather before the heatwave has been poor.

However, hot weather has a negative effect on productivity, which harms the economy’s output. According to research by the Office of Scientific and Technical Information, extremely hot days can result in workplace productivity falling by 30% on any given day. Researchers believe that for every degree over 25°C, overall output can drop by as much as 2%.

The 2018 heatwave appears to have buoyed the UK economy, as ONS data show that in the second quarter of the year, the economy grew by 0.7%. This growth was led by the retail, food, drink production and building sectors. In contrast, the ONS noted that the service sector, which accounts for 80% of the UK economy, was subdued. The hot summer of 2022 is harder to judge as the ‘cost-of-living crisis’ was having a dampening effect on spending. Certainly the very hot days in July — when temperatures exceeded 40°C — may have led to a slowdown in spending.

4 Global warming and climate change in sub-Saharan Africa is more significant than El Niño, and the effect on world economic performance will be more damaging. El Niño is a weather

phenomenon that occurs on a reasonably predictable cycle. It has adverse effects but there are also benefits. It is part of the world's natural weather pattern and businesses can plan for its adverse effects and try to minimise the damage it causes. Global warming and climate change, in contrast, are long-term changes to the world's environment that scientists do not fully understand. There have been a range of different models about the effects and consequences of climate change and it is very difficult for governments and businesses to make long-term plans. There is a broad consensus that, as the globe warms, weather patterns will become increasingly extreme and agricultural markets will experience volatility as farmers struggle with droughts, fires and floods. Scientific models also predict that many economies near the equator will become too hot and there will be a large displacement of people and mass migration. When and how this may happen is unclear. It could be in the next 20 years or over the course of a century. However, climate change is going to result in serious economic harm to the economies of some countries, which will harm the world economy.

## Application of economics in the real world 10.2: The 'credit crunch' and the financial crisis

- 1 A **sub-prime borrower** is a low-income customer who is a bad credit risk.  
A **credit crunch** is defined as 'a severe shortage of money or credit'.  
**Negative equity** is a situation in which what a person owes is greater than what they own.
- 2 Although house prices continued to rise after 2019, uncertainty caused by Brexit and the Covid pandemic put a halt on house price increases in 2020. Prices accelerated in 2021 as house buyers and sellers wanted to take advantage of temporary cuts to stamp duty. In late 2022, however, house prices began to fall as interest rates were increased nine times over the year from the low of 0.1% to 3.5% by the end of 2022.
- 3 The main points in Ian Stewart's article are:
  - The proximate causes of recent financial crises varied — overvalued tech stocks getting their comeuppance in 2001, a reversal of inflows of foreign capital in Asia in 1997 and so on, but the underlying drivers are eerily similar.
  - Financial crises, far from being exceptional events, are recurring features of the market system. Three factors are especially conducive to bubbles.
  - First, long periods of economic stability tend to inflate asset prices by making people too confident, too willing to borrow and too oblivious to risk.
  - The 15 or so years before 2007 was just such a period, marked by good growth, falling inflation and low interest rates. Volatility and major economic crises were notable by their absence. This stability fostered the impression that credit would stay cheap for ever and that asset prices would keep on rising. There was a similar boom before the US crash of 1929, marked by soaring car production and highway construction, and the rapid introduction of electricity and telephones to households. In the late 1920s and early 2000s, what appeared to be a new era of technologically driven prosperity pushed asset prices ever higher.
  - Rapid growth in the supply of credit is the second enabler of asset bubbles.
  - This, too, is a very old story. The legendary South Sea investment bubble of the early eighteenth century was fuelled by credit from newly established banks. Almost 300 years later, in the early 2000s, a boom in the availability of mortgage credit for high-risk buyers in the USA sowed the seeds of the global financial crisis.
  - The third feature of a boom that is heading to bust is rapid financial innovation. It played a role in one of the first recorded bubbles, the Dutch tulip mania of 1636, where sellers of bulbs provided buyers with the necessary credit. The failure of innovative and opaque

financial structures, such as collateralised debt obligations, played a key role in the financial crisis of 2008. Financial innovation is important because it enables large numbers of less specialist investors to join in the boom. The legend goes that when shoe-shine boys started giving stock tips in the late 1920s, seasoned investors sold out. Today one might substitute taxi driver for shoe-shine boy.

- Of course, economic stability, a good supply of credit and financial innovation are highly desirable. Politicians, the public and policy-makers love strong and stable growth. Credit is the essential lubricant of a market economy. Innovations in finance, from the ATM to peer-to-peer lending and PayPal, make life easier. The judgement that regulators need to make is when we have had too much of a good thing. As William McChesney Martin, chairman of the US Federal Reserve in the 1950s and 1960s, said, it is the job of central bankers to ‘take away the punch bowl just when the party gets going’.
- 4 A financial crisis leads to a collapse in the supply of credit. When businesses find that they cannot get loans, in the subsequent credit crunch, some of them will go bust and output will begin to fall. Falling real output for 6 months or more constitutes a recession.

### Application of economics in the real world 10.3: Keynes on ‘Poverty in Plenty’

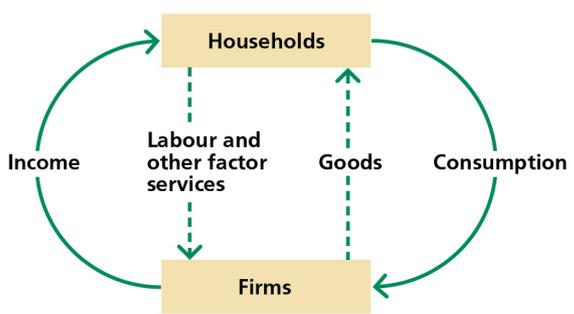
- 1 Effective aggregate demand is total planned spending by consumers, firms, the government and the overseas sector on real national output.
- 2 According to Keynes, the main reason why too little effective aggregate demand may occur in an economy stems from the way consumers behave. In what is known as the ‘paradox of thrift’, as household incomes rise, people save a growing proportion of their incomes. If these savings are hoarded rather than lent to firms to spend on investment goods, there will be too little effective aggregate demand in the economy.
- 3 Free-market or anti-Keynesian economists believe the economic system is self-adjusting because of the efficient functioning of the price mechanism in the economy. In the economy’s aggregate labour market, in the event of demand-deficient unemployment, the excess supply of labour causes real wages to fall to price the unemployed into jobs, while in financial markets, rates of interest fall to get rid of the excess supply of savings.
- 4 The first cause of the growth in economic output which started in 2009, at the end of the recession, was the Labour government of the time increasing aggregate demand through an expansionary fiscal policy. This policy, which involved increased government borrowing to finance the growth in government spending, was brought to an end in 2010 by the incoming Conservative-led government, which introduced austerity policies.

However, a slow rate of growth still continued because of the very lax monetary policy implemented by the Bank of England. Tight fiscal policy was therefore matched by loose monetary policy, in the form of very low interest rates and, for a short time, quantitative easing.

## End-of-chapter questions

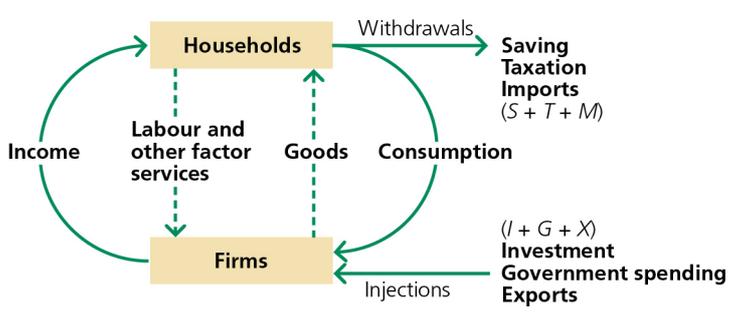
- 1 If we assume a closed economy with no government, money and goods in the economy move in a circular fashion, chasing each other around the economy.

In Figure A10.1, the dashed flow lines show the real flows occurring in the economy between households and firms. Households supply labour and other factor services in exchange for goods and services produced by the firms. But these *real flows* generate money flows of income and expenditure shown by the solid flow lines.



**Figure A10.1** A circular flow diagram of an economy comprising just households and firms

- 2 Referring back to question 1, in a simplified model of the economy there is just one component of aggregate demand: namely, consumption spending by households. When the model is extended as shown in Figure A10.2, investment by firms, government spending and spending on the country's exports are additional components of aggregate demand.

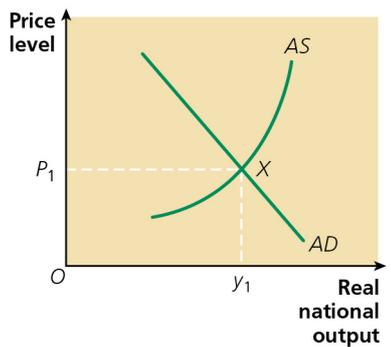


**Figure A10.2** Effect of introducing investment, government spending and export demand into the circular flow of income

Aggregate demand is represented by the following equation:

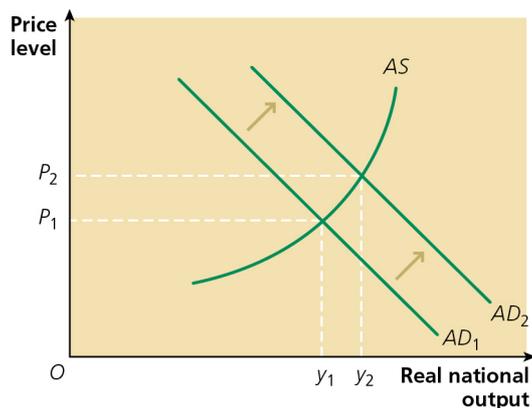
$$\text{aggregate demand} = \text{consumption} + \text{investment} + \text{government spending} + \text{exports (net of imports)}$$

Equilibrium national income occurs when aggregate demand = aggregate supply. This can be illustrated on an *AD/AS* diagram as shown in Figure A10.3.



**Figure A10.3** Macroeconomic equilibrium

Since the overseas demand for UK exports is one of the components of aggregate demand, an increase in exports shifts the *AD* curve in Figure A10.4 to the right and increases equilibrium national income from  $y_1$  to  $y_2$ .



**Figure A10.4** Effect of an increase in exports on macroeconomic equilibrium

- 3 The rate of interest affects both consumption and saving. If the rate of interest rises, households save more and consume less. If the rate of interest falls, the reverse is true — households save less and consume more.
- 4 The investment multiplier measures the effect on national income of a change in investment in the economy, in which the multiplier coefficient  $k$  is determined on the ‘demand side’ of the economy by leakages or withdrawals of spending from the circular flow of income. The multiplier equation is  $Y = k\Delta I$ , where  $k$  is the multiplier coefficient.

By contrast, the accelerator measures the effect on investment of a change in the level of national income, in which the accelerator coefficient  $v$  is determined on the ‘supply side’ of the economy by the capital–output ratio. The accelerator equation is  $\Delta I = v\Delta Y$ , where  $v$  is the accelerator coefficient.

- 5 The short-run aggregate supply (*SRAS*) curve assumes that the level of capital is fixed. While in the short run fixed capital cannot be changed, firms can increase the utilisation of existing factors of production: for example, by overtime working. Firms experience rising marginal costs and will only be prepared to supply more output if they can charge higher prices. Hence, the *SRAS* curve is upward sloping.

However, in the long run, the aggregate supply (*LRAS*) curve is not influenced by the price level. Long-run aggregate supply reflects the economy’s production potential. It is the maximum level of output the economy can produce when the economy is on its production possibility frontier. Hence, the *LRAS* curve is vertical or completely inelastic with respect to the price level.

- 6 Since the *SRAS* curve slopes upward with respect to the average price level, a rightward shift of the aggregate demand curve increases both output and the price level. Figure A10.4 in the answer to question 2 illustrates this.

## Test yourself answers

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### TEST YOURSELF 10.1

The first part of the question refers back to the answer to Test yourself 9.5. Real national income is the actual goods and services produced by an economy in a particular time period, say a year. By contrast, nominal national income shows national income at the current price level. But if, for example, the growth rate of real income is zero, but the inflation rate is 10%, the measure of nominal national income will falsely indicate that output has risen by 10%.

### TEST YOURSELF 10.2

Investment, government spending and demand for the country's exports are injections of spending into the circular flow of income. Saving, taxation and demand for imports are withdrawals or leakages of spending out of the circular flow.

### TEST YOURSELF 10.3

Besides equilibrium national income, two other contexts in which economists use the term 'equilibrium' are balance of payments equilibrium, and most commonly market equilibrium in a particular market for goods or a factor of production.

### TEST YOURSELF 10.4

When people save, they may lend to a bank or some other financial institution, the fraction of their income they have decided not to spend on goods or services. When this happens, financial institutions, such as banks, lend on the savings for other people, including firms, to spend. The income recirculates back into the economy. However, instead of doing this, people may hoard part of their income. An example would be stashing banknotes under floorboards, or even keeping money for a long time in a purse or wallet. The income or money is withdrawn from circulation, functioning as an unspent leakage or withdrawal of demand from the circular flow of income. Deficient aggregate demand may occur in the economy, leading possibly to a recession. Hoarding can also lead to criminal behaviour when burglars break into houses in the search for hoarded money.

### TEST YOURSELF 10.5

The official definition of a recession in the UK is 6 months or more of falling real GDP or negative economic growth. However, other countries have different definitions. The USA, for example, has a more general definition of recession as 'a period of falling economic activity spread across the economy, lasting more than a few months'.

### TEST YOURSELF 10.6

This question is testing your understanding of 'ex ante' and 'ex post'. Aggregate demand is ex ante, relating to what people *plan* to do, whereas national expenditure is ex post, relating to *what they end up doing*. The aggregate demand equation  $AD = C + I + G + (X - M)$  is telling us that total planned spending by households, firms etc. is made up of total planned spending on consumption by households plus total planned spending by firms on investment and so on. By contrast, the national expenditure equation  $E = C + I + G + (X - M)$ , though looking apparently similar, shows actual consumption in a particular year plus actual investment in that year, and so on.

## TEST YOURSELF 10.7

Aggregate demand is total *planned* spending on real output in the economy at different price levels. Aggregate supply is the level of real national output that producers *plan* to supply at different price levels.

## TEST YOURSELF 10.8

As stated in the previous answer, aggregate supply is the level of real national output that producers are prepared to supply at different price levels. When the price level changes, an adjustment or movement along the *AS* curve occurs in response to the change in the price level. The position of the aggregate supply curve is determined by the variables (other than the price level) which determine aggregate supply. Costs of production are such a variable. If costs of production increase, the short-run aggregate supply curve shifts leftward or upward. A fall in production costs causes the *SRAS* curve to shift downward or rightward.

## TEST YOURSELF 10.9

The answer to the previous question stated that the shape of the *SRAS* curve depends on the average price level in the economy. Other things remaining constant, firms are only prepared to supply more output if the price level rises. Firms are assumed to respond to higher prices by being prepared to sell more output. Hence the *SRAS* curve slopes upward to the right. However, in the long run, aggregate supply is not influenced by the price level. Long-run supply reflects the economy's production potential. It is the maximum level of output that the economy can produce when the economy is on its production possibility frontier. The *LRAS* curve is completely inelastic with respect to the price level, hence the curve is vertical.

## TEST YOURSELF 10.10

The macroeconomic concept of consumption relates to the aggregate level of consumption for all goods and services in the economy as a whole. By contrast, the microeconomic concept of market demand relates to demand by households for just one good or service in the economy. The former is aggregated; the latter is disaggregated.

## TEST YOURSELF 10.11

Current income is income received in the current time period, for example this year, whereas life-cycle income is the income a person expects to receive over the whole of their life.

## TEST YOURSELF 10.12

A stock is the total amount of a variable at a moment in time, whereas a flow is the rate of change of the variable over a given period of time. Wealth is a stock, but income is a flow.

## TEST YOURSELF 10.13

Consumption is the spending of income on consumer goods and services. Saving is keeping income and not spending it on consumer goods and services.

## TEST YOURSELF 10.14

A financial intermediary is typically an institution that enables the channelling of funds between lenders and borrowers. Savers lend funds to an intermediary institution such as a bank, which then passes on the funds to spenders or borrowers. The financial intermediary essentially acts as a 'middle-man' between lenders and borrowers.

### TEST YOURSELF 10.15

Firms or businesses, as well as households, sometimes save. Instead of investing in productive physical assets or capital goods in times of uncertainty, firms may decide to sit on a ‘cash mountain’, by depositing part of their sales revenue in a bank. However, the bank may lend the funds on to somebody else for them to spend.

### TEST YOURSELF 10.16

Statement A provides the correct answer, being a definition of the export multiplier. Statement B is a definition of the accelerator, a concept which is often confused with the multiplier.

### TEST YOURSELF 10.17

Developing the answer to the previous question, the investment multiplier can be expressed as the equation:

$$\Delta Y = k\Delta I$$

where  $k$  is the multiplier symbol.

The accelerator is the reverse relationship expressed as the equation:

$$\Delta I = v\Delta Y$$

where  $v$  is the accelerator symbol.

### TEST YOURSELF 10.18

At any level of income, the  $MPC$  and the  $MPS$  sum to unity ( $MPC + MPS = 1$ ). The multiplier is  $1/MPS$ .

Given this information,

the answer to (a) is:

$1/0.1$  which is 10;

the answer to (b) is:

$1/0.9$  which is 1.1 recurring;

the answer to (c) is:

$1/0.5$  which is 2.

### TEST YOURSELF 10.19

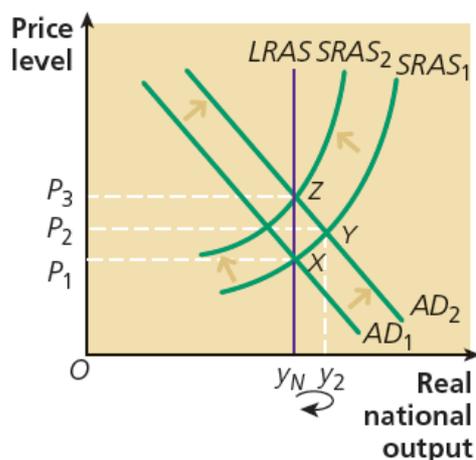
*Nominal* national income measures the flow of output at the current price level in the economy. In contrast, *real* national income is the flow of actual goods and services that are produced.

### TEST YOURSELF 10.20

The current AQA A-level Economics specification mentions the normal capacity level of national income. In the context of ‘The Determinants of Long-Run Aggregate Supply’, it mentions that ‘The position of the vertical long-run  $AS$  curve represents the normal capacity level of output of the economy.’ No mention is made of full capacity or the full capacity level of income.

The reason why the normal capacity level of income or output is now used by AQA is to allow for the possibility that the economy may temporarily produce above or below its normal capacity. However, while this is possible in the short run, it cannot be sustained in the long run when the economy reverts back to its normal capacity level of output.

In the textbook, the possibilities are illustrated in the following diagram:



‘Normal capacity’ is not quite the same as ‘full capacity’. Even when producing at ‘normal capacity’, the economy may still be capable of temporarily producing a higher level of ‘real output’.

We shall assume that the economy is initially in macroeconomic equilibrium at point  $X$  in the diagram, where curve  $AD_1$  intersects both the  $SRAS_1$  and the  $LRAS$  curves. Since the economy is producing on the  $LRAS$  curve, real output is at its ‘normal capacity’ level  $y_N$ . An increase in aggregate demand, caused perhaps by an expansionary monetary policy, shifts the  $AD$  curve rightward to  $AD_2$ , which brings about a new short-run macroeconomic equilibrium at point  $Y$ . In the new equilibrium, the level of real output has risen to  $y_2$ , which is above the ‘normal capacity’ level of output.

However, this level of output, in which the economy is producing above its production potential, cannot be sustained, unless of course the  $LRAS$  curve itself shifts rightward. To understand why this is the case, we must remember that one of the determinants of the position of an  $SRAS$  curve is the level of money wages in the economy. A higher level of money wages shifts the  $SRAS$  curve upward or leftward, whereas lower money wages would shift the curve rightward. At  $y_2$  there are shortages of labour and other factors of production, so excess demand in the labour market and other factor markets leads to rising factor prices. To persuade workers to supply the extra labour needed for  $y_2$  to be produced, given the fact that the price level has risen to  $P_2$ , money wages must also rise. As soon as this happens, the  $SRAS$  curve shifts to  $SRAS_2$ . As the backward-bending curved arrow lying along the horizontal axis shows, real output falls back from  $y_2$  to the ‘normal capacity’ level of real output at  $y_N$ , located below point  $Z$  on the diagram.

From the point of view of maximising your mark and grade in the A-level examination, you can treat the ‘normal capacity’ level of income or output as being the same thing as the ‘full capacity’ level of income or output.

## TEST YOURSELF 10.21

- No. Gross domestic product (GDP) is before depreciation of capital consumption has been deducted to calculate a net value. Secondly, national income differs from domestic product because it includes net income from abroad, whereas domestic product is after the deduction of net income from abroad.
- As previously explained, *nominal* national income measures the flow of output at the current price level in the economy. In contrast, *real* national income is the flow of actual goods and services that are produced.
- Saving is simply not consuming income (a leakage from the circular flow of income), whereas investment is the purchase of capital goods (an injection into the circular flow of income).

- d) Consumption, investment, government spending and net export demand ( $X - M$ ).
- e) Deficient aggregate demand refers to aggregate demand falling short of aggregate supply at the full employment level of output.
- f) In the long run, aggregate supply is not influenced by the price level. Long-run supply reflects the economy's production potential. It is the maximum level of output that the economy can produce when the economy is on its production possibility frontier. There is no spare capacity or idle resources in the economy. The vertical *LRAS* curve is located immediately above the maximum level of physical output that the economy can produce. Once the economy produces at full capacity, an increase in aggregate demand increases the price level but real output does not change.

### TEST YOURSELF 10.22

Statement B is correct because the positive increase in GDP shown in the first column of data is accompanied by a fall in the percentage unemployment rate shown in the final column. Statement A is incorrect because, although the rate of inflation fell, the price level did not; this also explains why statement C is incorrect. Statement D is also wrong as the rate of increase of earnings fell but total earnings still grew.