

## READING

# 16

## Monetary and Fiscal Policy

by Andrew Clare, PhD, and Stephen Thomas, PhD

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### LEARNING OUTCOMES

| <i>Mastery</i>           | <i>The candidate should be able to:</i>  |
|--------------------------|--|
| <input type="checkbox"/> | a. compare monetary and fiscal policy;   |
| <input type="checkbox"/> | b. describe functions and definitions of money;  |
| <input type="checkbox"/> | c. explain the money creation process;   |
| <input type="checkbox"/> | d. describe theories of the demand for and supply of money;  |
| <input type="checkbox"/> | e. describe the Fisher effect;   |
| <input type="checkbox"/> | f. describe roles and objectives of central banks;   |
| <input type="checkbox"/> | g. contrast the costs of expected and unexpected inflation;  |
| <input type="checkbox"/> | h. describe tools used to implement monetary policy;   |
| <input type="checkbox"/> | i. describe the monetary transmission mechanism;   |
| <input type="checkbox"/> | j. describe qualities of effective central banks;  |
| <input type="checkbox"/> | k. explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates; |
| <input type="checkbox"/> | l. contrast the use of inflation, interest rate, and exchange rate targeting by central banks;                     |
| <input type="checkbox"/> | m. determine whether a monetary policy is expansionary or contractionary;  |
| <input type="checkbox"/> | n. describe limitations of monetary policy;  |
| <input type="checkbox"/> | o. describe roles and objectives of fiscal policy;   |
| <input type="checkbox"/> | p. describe tools of fiscal policy, including their advantages and disadvantages;                                  |
| <input type="checkbox"/> | q. describe the arguments about whether the size of a national debt relative to GDP matters;                       |

*(continued)*

| LEARNING OUTCOMES        |  |
|--------------------------|--|
| Mastery                  | The candidate should be able to:   |
| <input type="checkbox"/> | r. explain the implementation of fiscal policy and difficulties of implementation; |
| <input type="checkbox"/> | s. determine whether a fiscal policy is expansionary or contractionary;            |
| <input type="checkbox"/> | t. explain the interaction of monetary and fiscal policy.                          |

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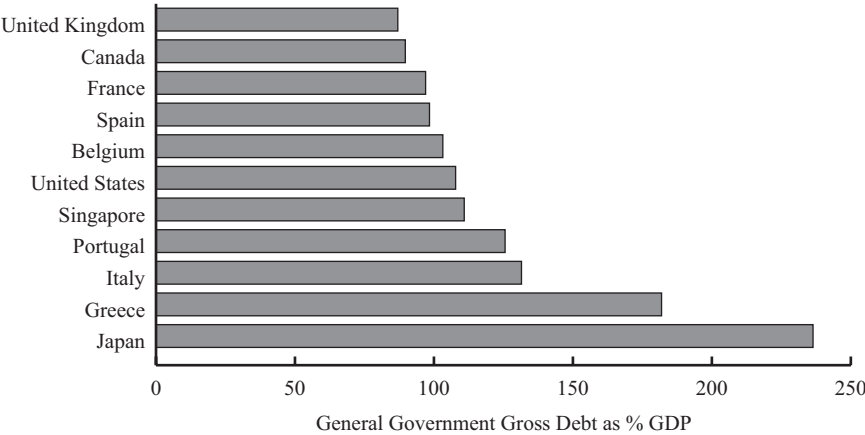
INTRODUCTION

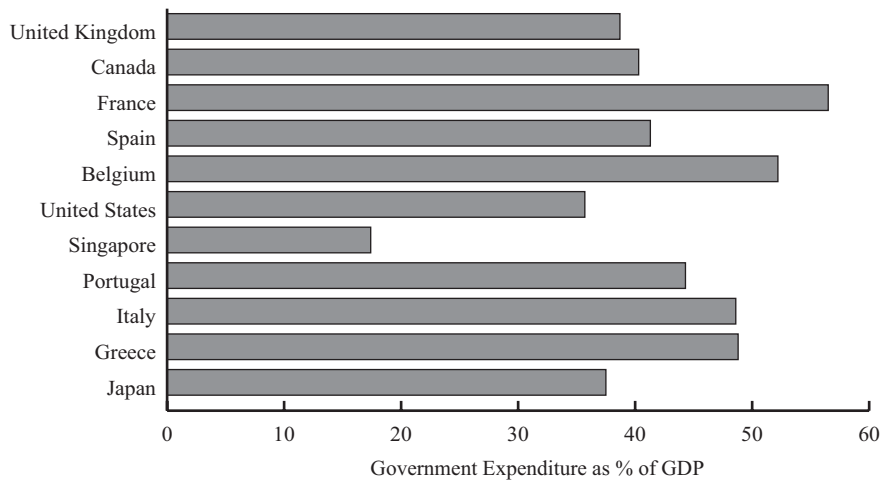
The economic decisions of households can have a significant impact on an economy. For example, a decision on the part of households to consume more and to save less can lead to an increase in employment, investment, and ultimately profits. Equally, the investment decisions made by corporations can have an important impact on the real economy and on corporate profits. But individual corporations can rarely affect large economies on their own; the decisions of a single household concerning consumption will have a negligible impact on the wider economy.

By contrast, the decisions made by governments can have an enormous impact on even the largest and most developed of economies for two main reasons. First, the public sectors of most developed economies normally employ a significant proportion of the population, and they are usually responsible for a significant proportion of spending in an economy. Second, governments are also the largest borrowers in world debt markets. Exhibit 1 gives some idea of the scale of government borrowing and spending.

Exhibit 1

Panel A. Central Government Debt to GDP, 2017



**Exhibit 1 (Continued)****Panel B. Public Sector Spending to GDP, 2017**

Source: IMF, World Economic Outlook Database, April 2018.

Government policy is ultimately expressed through its borrowing and spending activities. In this reading, we identify and discuss two types of government policy that can affect the macroeconomy and financial markets: monetary policy and fiscal policy.

**Monetary policy** refers to central bank activities that are directed toward influencing the quantity of money and credit in an economy.<sup>1</sup> By contrast, **fiscal policy** refers to the government's decisions about taxation and spending. Both monetary and fiscal policies are used to regulate economic activity over time. They can be used to accelerate growth when an economy starts to slow or to moderate growth and activity when an economy starts to overheat. In addition, fiscal policy can be used to redistribute income and wealth.

The overarching goal of both monetary and fiscal policy is normally the creation of an economic environment where growth is stable and positive and inflation is stable and low. Crucially, the aim is therefore to steer the underlying economy so that it does not experience economic booms that may be followed by extended periods of low or negative growth and high levels of unemployment. In such a stable economic environment, householders can feel secure in their consumption and saving decisions, while corporations can concentrate on their investment decisions, on making their regular coupon payments to their bond holders and on making profits for their shareholders.

The challenges to achieving this overarching goal are many. Not only are economies frequently buffeted by shocks (such as oil price jumps), but some economists believe that natural cycles in the economy also exist. Moreover, there are plenty of examples from history where government policies—either monetary, fiscal, or both—have exacerbated an economic expansion that eventually led to damaging consequences for the real economy, for financial markets, and for investors.

The balance of the reading is organized as follows. Section 2 provides an introduction to monetary policy and related topics. Section 3 presents fiscal policy. The interactions between monetary policy and fiscal policy are the subject of Section 4. A summary and practice problems conclude the reading.

<sup>1</sup> Central banks can implement monetary policy almost completely independent of government interference and influence at one end of the scale, or simply as the agent of the government at the other end of the scale.

## 2

## MONETARY POLICY

As stated above, monetary policy refers to government or central bank activities that are directed toward influencing the quantity of money and credit in an economy. Before we can begin to understand how monetary policy is implemented, we must examine the functions and role of **money**. We can then explore the special role that **central banks** play in today's economies.

## EXAMPLE 1

## Monetary and Fiscal Policy

- 1 Which of the following statements *best* describes monetary policy?  
Monetary policy:
  - A involves the setting of medium-term targets for broad money aggregates.
  - B involves the manipulation by a central bank of the government's budget deficit.
  - C seeks to influence the macro economy by influencing the quantity of money and credit in the economy.
- 2 Which of the following statements *best* describes fiscal policy? Fiscal policy:
  - A is used by governments to redistribute wealth and incomes.
  - B is the attempt by governments to balance their budgets from one year to the next.
  - C involves the use of government spending and taxation to influence economy activity.

## Solution to 1:

C is correct. Choice A is incorrect because, although the setting of targets for monetary aggregates is a possible *tool* of monetary policy, monetary policy itself is concerned with influencing the overall, or macro, economy.

## Solution to 2:

C is correct. Note that governments may wish to use fiscal policy to redistribute incomes and balance their budgets, but the overriding goal of fiscal policy is usually to influence a broader range of economic activity.

## 2.1 Money

To understand the nature, role, and development of money in modern economies, it is useful to think about a world without money—where to purchase any good or service, an individual would have to “pay” with another good or service. An economy where such economic agents as households, corporations, and even governments pay for goods and services in this way is known as a **barter economy**. There are many drawbacks to such an economy. First, the exchange of goods for other goods (or services) would require both economic agents in the transaction to want what the other is selling. This means that there has to be a **double coincidence of wants**. It might also be impossible to undertake transactions where the goods are indivisible—that is, where one agent wishes to buy a certain amount of another's goods, but that agent

only has one indivisible unit of another good that is worth more than the good that the agent is trying to buy. Another problem occurs if economic agents do not wish to exchange all of their goods on other goods and services. This may not be a problem, however, when the goods they have to sell can be stored safely so that they retain their value for the future. But if these goods are perishable, they will not be able to store value for their owner. Finally, in a barter economy, there are many measures of value: the price of oranges in terms of pears; of pears in terms of bread; of bread in terms of milk; or of milk in terms of oranges. A barter economy has no common measure of value that would make multiple transactions simple.

### 2.1.1 *The Functions of Money*

The most generic definition of money is that it is any generally accepted medium of exchange. A **medium of exchange** is any asset that can be used to purchase goods and services or to repay debts. Money can thus eliminate the debilitating double coincidence of the “wants” problem that exists in a barter economy. When this medium of exchange exists, a farmer wishing to sell wheat for wine does not need to identify a wine producer in search of wheat. Instead, he can sell wheat to those who want wheat in exchange for money. The farmer can then exchange this money for wine with a wine producer, who in turn can exchange that money for the goods or services that she wants.

However, for money to act as this liberating medium of exchange, it must possess certain qualities. It must:

- i. be readily acceptable,
- ii. have a known value,
- iii. be easily divisible,
- iv. have a high value relative to its weight, and
- v. be difficult to counterfeit.

Qualities (i) and (ii) are closely related; the medium of exchange will only be acceptable if it has a known value. If the medium of exchange has quality (iii), then it can be used to purchase items of relatively little value and of relatively large value with equal ease. Having a high value relative to its weight is a practical convenience, meaning that people can carry around sufficient wealth for their transaction needs. Finally, if the medium of exchange can be counterfeited easily, then it would soon cease to have a value and would not be readily acceptable as a means of effecting transactions; in other words, it would not satisfy qualities (i) and (ii).

Given the qualities that money needs to have, it is clear why precious metals (particularly gold and silver) often fulfilled the role of medium of exchange in early societies, and as recently as the early part of the twentieth century. Precious metals were acceptable as a medium of exchange because they had a known value, were easily divisible, had a high value relative to their weight, and could not be easily counterfeited.

Thus, precious metals were capable of acting as a medium of exchange. But they also fulfilled two other useful functions that are essential for the characteristics of money. In a barter economy, it is difficult to store wealth from one year to the next when one's produce is perishable, or indeed, if it requires large warehouses in which to store it. Because precious metals like gold had a high value relative to their bulk and were not perishable, they could act as a **store of wealth**. However, their ability to act as a store of wealth not only depended on the fact that they did not perish physically over time, but also on the belief that others would always value precious metals. The value from year to year of precious metals depended on people's continued demand for them in ornaments, jewellery, and so on. For example, people were willing to use gold as a store of wealth because they believed that it would remain highly valued.

However, if gold became less valuable to people relative to other goods and services year after year it would not be able to fulfill its role as a **store of value**, and as such might also lose its status as a medium of exchange.

Another important characteristic of money is that it can be used as a universal unit of account. As such, it can create a single unitary **measure of value** for all goods and services. In an economy where gold and silver are the accepted medium of exchange, all prices, debts, and wealth can be recorded in terms of their gold or silver coin exchange value. Money, in its role as a unit of account, drastically reduces the number of prices in an economy compared to barter, which requires that prices be established for a good in terms of all other goods for which it might be exchanged.

In summary, money fulfills three important functions, it:

- acts as a medium of exchange;
- provides individuals with a way of storing wealth; and
- provides society with a convenient measure of value and unit of account.

### 2.1.2 *Paper Money and the Money Creation Process*

Although precious metals like gold and silver fulfilled the required functions of money relatively well for many years, and although carrying gold coins around was easier than carrying around one's physical produce, it was not necessarily a safe way to conduct business.

A crucial development in the history of money was the **promissory note**. The process began when individuals began leaving their excess gold with goldsmiths, who would look after it for them. In turn the goldsmiths would give the depositors a receipt, stating how much gold they had deposited. Eventually these receipts were traded directly for goods and services, rather than there being a physical transfer of gold from the goods buyer to the goods seller. Of course, both the buyer and seller had to trust the goldsmith because the goldsmith had all the gold and the goldsmith's customers had only pieces of paper. These depository receipts represented a promise to pay a certain amount of gold on demand. This paper money therefore became a proxy for the precious metals on which they were based, that is, they were directly related to a physical commodity. Many of these early goldsmiths evolved into banks, taking in excess wealth and in turn issuing promissory notes that could be used in commerce.

In taking in other people's gold and issuing depository receipts and later promissory notes, it became clear to the goldsmiths and early banks that not all the gold that they held in their vaults would be withdrawn at any one time. Individuals were willing to buy and sell goods and services with the promissory notes, but the majority of the gold that backed the notes just sat in the vaults—although its ownership would change with the flow of commerce over time. A certain proportion of the gold that was not being withdrawn and used directly for commerce could therefore be lent to others at a rate of interest. By doing this, the early banks created money.

The process of **money creation** is a crucial concept for understanding the role that money plays in an economy. Its potency depends on the amount of money that banks keep in reserve to meet the withdrawals of its customers. This practice of lending customers' money to others on the assumption that not all customers will want all of their money back at any one time is known as **fractional reserve banking**.

We can illustrate how it works through a simple example. Suppose that the bankers in an economy come to the view that they need to retain only 10 percent of any money deposited with them. This is known as the **reserve requirement**.<sup>2</sup> Now consider what happens when a customer deposits €100 in the First Bank of Nations. This deposit changes the balance sheet of First Bank of Nations, as shown in Exhibit 2,

<sup>2</sup> This is an example of a *voluntary* reserve requirement because it is self-imposed.

and it represents a liability to the bank because it is effectively loaned to the bank by the customer. By lending 90 percent of this deposit to another customer the bank has two types of assets: (1) the bank's reserves of €10, and (2) the loan equivalent to €90. Notice that the balance sheet still balances; €100 worth of assets and €100 worth of liabilities are on the balance sheet.

Now suppose that the recipient of the loan of €90 uses this money to purchase some goods of this value and the seller of the goods deposits this €90 in another bank, the Second Bank of Nations. The Second Bank of Nations goes through the same process; it retains €9 in reserve and loans 90 percent of the deposit (€81) to another customer. This customer in turn spends €81 on some goods or services. The recipient of this money deposits it at the Third Bank of Nations, and so on. This example shows how money is created when a bank makes a loan.

### Exhibit 2 Money Creation via Fractional Reserve Banking

#### First Bank of Nations

| Assets   |     | Liabilities |      |
|----------|-----|-------------|------|
| Reserves | €10 | Deposits    | €100 |
| Loans    | €90 |             |      |

#### Second Bank of Nations

| Assets   |     | Liabilities |     |
|----------|-----|-------------|-----|
| Reserves | €9  | Deposits    | €90 |
| Loans    | €81 |             |     |

#### Third Bank of Nations

| Assets   |       | Liabilities |     |
|----------|-------|-------------|-----|
| Reserves | €8.1  | Deposits    | €81 |
| Loans    | €72.9 |             |     |

This process continues until there is no more money left to be deposited and loaned out. The total amount of money 'created' from this one deposit of €100 can be calculated as:

$$\text{New deposit/Reserve requirement} = €100/0.10 = €1,000 \quad (1)$$

It is the sum of all the deposits now in the banking system. You should also note that the original deposit of €100, via the practice of reserve banking, was the catalyst for €1,000 worth of economic transactions. That is not to say that economic growth would be zero without this process, but instead that it can be an important component in economic activity.

The amount of money that the banking system creates through the practice of fractional reserve banking is a function of 1 divided by the reserve requirement, a quantity known as the **money multiplier**.<sup>3</sup> In the case just examined, the money multiplier is  $1/0.10 = 10$ . Equation 1 implies that the smaller the reserve requirement, the greater the money multiplier effect.

<sup>3</sup> This quantity, known as the simple money multiplier, represents a maximum expansion. To the extent that banks hold excess reserves or that money loaned out is not re-deposited, the money expansion would be less. More complex multipliers incorporating such factors are developed in more advanced texts.

In our simplistic example, we assumed that the banks themselves set their own reserve requirements. However, in some economies, the central bank sets the reserve requirement, which is a potential means of affecting money growth. In any case, a prudent bank would be wise to have sufficient reserves such that the withdrawal demands of their depositors can be met in stressful economic and credit market conditions.

Later, when we discuss central banks and central bank policy, we will see how central banks can use the mechanism just described to affect the money supply. Specifically, the central bank could, by purchasing €100 in government securities credited to the bank account of the seller, seek to initiate an increase in the money supply. The central bank may also lend reserves directly to banks, creating excess reserves (relative to any imposed or self-imposed reserve requirement) that can support new loans and money expansion.

## EXAMPLE 2

### Money and Money Creation

- 1 To fulfill its role as a medium of exchange, money should:
  - A be a conservative investment.
  - B have a low value relative to its weight.
  - C be easily divisible and a good store of value.
- 2 If the reserve requirement for banks in an economy is 5 percent, how much money could be created with the deposit of an additional £100 into a deposit account?
  - A £500
  - B £1,900
  - C £2,000
- 3 Which of the following functions does money normally fulfill for a society? It:
  - A acts as a medium of exchange only.
  - B provides economic agents with a means of storing wealth only.
  - C provides society with a unit of account, acts as a medium of exchange, and acts as a store of wealth.

#### Solution to 1:

C is correct. Money needs to have a known value and be easily divisible. It should also be readily acceptable, difficult to counterfeit, and have a high value relative to its weight.

#### Solution to 2:

C is correct. To calculate the increase in money from an additional deposit in the banking system, use the following expression: new deposit/reserve requirement.

#### Solution to 3:

C is correct. Money needs to be able to fulfill the functions of acting as a unit of account, a medium of exchange, and a means of storing wealth.



### 2.1.3 Definitions of Money

The process of money creation raises a fundamental issue: What is money? In an economy with money but without promissory notes and fractional reserve banking, money is relatively easy to define: Money is the total amount of gold and silver coins in circulation, or their equivalent. The money creation process above, however, indicates that a broader definition of money might encompass all the notes and coins in circulation *plus* all bank deposits.

More generally, we might define money as any medium that can be used to purchase goods and services. Notes and coins can be used to fulfill this purpose, and yet such currency is not the only means of purchasing goods and services. Personal cheques can be written based on a bank chequing account, while debit cards can be used for the same purpose. But what about time deposits or savings accounts? Nowadays transfers can be made relatively easily from a savings account to a current account; therefore, these savings accounts might also be considered as part of the stock of money. Credit cards are also used to pay for goods and services; however, there is an important difference between credit card payments and those made by cheques and debit cards. Unlike a cheque or debit card payment, a credit card payment involves a deferred payment. Basically, the greater the complexity of any financial system, the harder it is to define money.

The monetary authorities in most modern economies produce a range of measures of money (see Exhibit 3). But generally speaking, the money stock consists of notes and coins in circulation, plus the deposits in banks and other financial institutions that can be readily used to make purchases of goods and services in the economy. In this regard, economists often speak of the rate of growth of **narrow money** and/or **broad money**. By narrow money, they generally mean the notes and coins in circulation in an economy, plus other very highly liquid deposits. Broad money encompasses narrow money but also includes the entire range of liquid assets that can be used to make purchases.

Because financial systems, practice, and institutions vary from economy to economy, so do definitions of money; thus, it is difficult to make international comparisons. Still, most central banks produce both a narrow and broad measure of money, plus some intermediate ones too. Exhibit 3 shows the money definitions in four economies.

#### Exhibit 3 Definitions of Money

##### Money Measures in the United States

The US Federal Reserve produces two measures of money. The first is M1, which comprises notes and coins in circulation, travelers' cheques of non-bank issuers, demand deposits at commercial banks, plus other deposits on which cheques can be written. M2 is the broadest measure of money currently produced by the Federal Reserve and includes M1, plus savings and money market deposits, time deposit accounts of less than \$100,000, plus other balances in retail money market and mutual funds.

##### Money Measures in the Eurozone

The European Central Bank (ECB) produces three measures of euro area money supply. The narrowest is M1. M1 comprises notes and coins in circulation, plus all overnight deposits. M2 is a broader definition of euro area money that includes M1, plus deposits redeemable with notice up to three months and deposits with maturity up to two years. Finally, the euro area's broadest definition of money is **M3**, which includes M2, plus repurchase agreements, money market fund units, and debt securities with up to two years maturity.

(continued)

**Exhibit 3 (Continued)****Money Measures in Japan**

The Bank of Japan calculates three measures of money. M1 is the narrowest measure and consists of cash currency in circulation. M2 incorporates M1 but also includes certificates of deposit (CDs). The broadest measure, M3, incorporates M2, plus deposits held at post offices, plus other savings and deposits with financial institutions. There is also a “broad measure of liquidity” that encompasses M3 as well as a range of other liquid assets, such as government bonds and commercial paper.

**Money Measures in the United Kingdom**

The United Kingdom produces a set of four measures of the money stock. **M0** is the narrowest measure and comprises notes and coins held outside the Bank of England, plus Bankers’ deposits at the Bank of England. **M2** includes M0, plus (effectively) all retail bank deposits. **M4** includes M2, plus wholesale bank and building society deposits and also certificates of deposit. Finally, the Bank of England produces another measure called **M3H**, which is a measure created to be comparable with money definitions in the EU (see above). M3H includes M4, plus UK residents’ and corporations’ foreign currency deposits in banks and building societies.

**2.1.4 The Quantity Theory of Money**

The previous section of this reading shows that there are many definitions of money. In this section, we explore the important relationship between money and the price level. This relationship is best expressed in the **quantity theory of money**, which asserts that total spending (in money terms) is proportional to the quantity of money. The theory can be explained in terms of Equation 2, known as the **quantity equation of exchange**:

$$M \times V = P \times Y \quad (2)$$

where  $M$  is the quantity of money,  $V$  is the velocity of circulation of money (the average number of times in a given period that a unit of currency changes hands),  $P$  is the average price level, and  $Y$  is real output. The expression is really just an accounting identity. Effectively, it says that over a given period, the amount of money used to purchase all goods and services in an economy,  $M \times V$ , is equal to monetary value of this output,  $P \times Y$ . If the velocity of money is approximately constant—which is an assumption of quantity theory—then spending  $P \times Y$  is approximately proportional to  $M$ . The quantity equation can also be used to explain a consequence of **money neutrality**. If money neutrality holds, then an increase in the money supply,  $M$ , will not affect  $Y$ , real output, or the speed with which money changed hands,  $V$ , because if real output is unaffected, there would be no need for money to change hands more rapidly.<sup>4</sup> However, it will cause the aggregate price level,  $P$ , to rise.

The simple quantity theory gave rise to the equally simple idea that the price level, or at least the rate of inflation, could be controlled by manipulating the rate of growth of the money supply. Economists who believe this are referred to as **monetarists**. They argue that there is a causal relationship running from money growth to inflation. In the past, some governments have tried to apply this logic in their efforts to control inflation, most notably and unsuccessfully the United Kingdom’s government in 1979

<sup>4</sup> Note that the full version of the quantity theory of money uses the symbol  $T$  rather than  $Y$  to indicate transactions because money is used not just for buying goods and services but also for financial transactions. We will return to this point in the discussion of quantitative easing.

(see Example 5). However, it is possible that causality runs the other way—that is, from real activity to the money supply. This means that the quantity of money in circulation is determined by the level of economic activity, rather than vice versa.

### 2.1.5 The Demand for Money

The amount of wealth that the citizens of an economy choose to hold in the form of money—as opposed to bonds or equities—is known as the demand for money. There are three basic motives for holding money:

- transactions-related;
- precautionary; and
- speculative.

Money balances that are held to finance transactions are referred to as **transactions money balances**. The size of the transactions balances will tend to increase with the average value of transactions in an economy. Generally speaking, as gross domestic product (GDP) grows over time, transactions balances will also tend to grow; however, the ratio of transactions balances to GDP remains fairly stable over time.

As the name suggests, **precautionary money balances** are held to provide a buffer against unforeseen events that might require money. These balances will tend to be larger for individuals or organizations that enter into a high level of transactions over time. In other words, a precautionary buffer of \$100 for a company that regularly enters into transactions worth millions of dollars might be considered rather small. When we extend this logic to the overall economy, we can see that these precautionary balances will also tend to rise with the volume and value of transactions in the economy, and therefore, GDP as well.

Finally, the **speculative demand for money** (sometimes called the **portfolio demand for money**) relates to the demand to hold speculative money balances based on the potential opportunities or risks that are inherent in other financial instruments (e.g., bonds). **Speculative money balances** consist of monies held in anticipation that other assets will decline in value. But in choosing to hold speculative money balances rather than bonds, investors give up the return that could be earned from the bond or other financial assets. Therefore, the speculative demand for money will tend to fall as the returns available on other financial assets rises. However, it will tend to rise as the perceived risk in other financial instruments rises. In equilibrium, individuals will tend to increase their holdings of money relative to riskier assets until the marginal benefit of having a lower risk portfolio of wealth is equal to the marginal cost of giving up a unit of expected return on these riskier assets. In aggregate then, speculative balances will tend to be inversely related to the expected return on other financial assets and directly related to the perceived risk of other financial assets.

#### EXAMPLE 3

##### Money

- 1 The transactions demand for money refers to the demand to hold money:
  - A as a buffer against unforeseen events.
  - B to use in the purchase of goods and services.
  - C based on the opportunity or risks available on other financial instruments.
- 2 The speculative demand for money will tend to:
  - A fall as the perceived risk on other assets rises.

- B** rise as the expected returns on other assets fall.
  - C** be inversely related to the transactions demand for money.
- 3** What is the difference between narrow and broad money? Broad money:
- A** is limited to those liquid assets most commonly used to make purchases.
  - B** can be used to purchase a wider range of goods and services than narrow money.
  - C** encompasses narrow money and refers to the stock of the entire range of liquid assets that can be used to make purchases.

**Solution to 1:**

B is correct. The transactions demand for money refers to the amount of money that economic agents wish to hold to pay for goods and services.

**Solution to 2:**

B is correct. If the expected return on other assets falls, then the opportunity cost of holding money also falls and can, in turn, lead to an increase in the speculative demand for money.

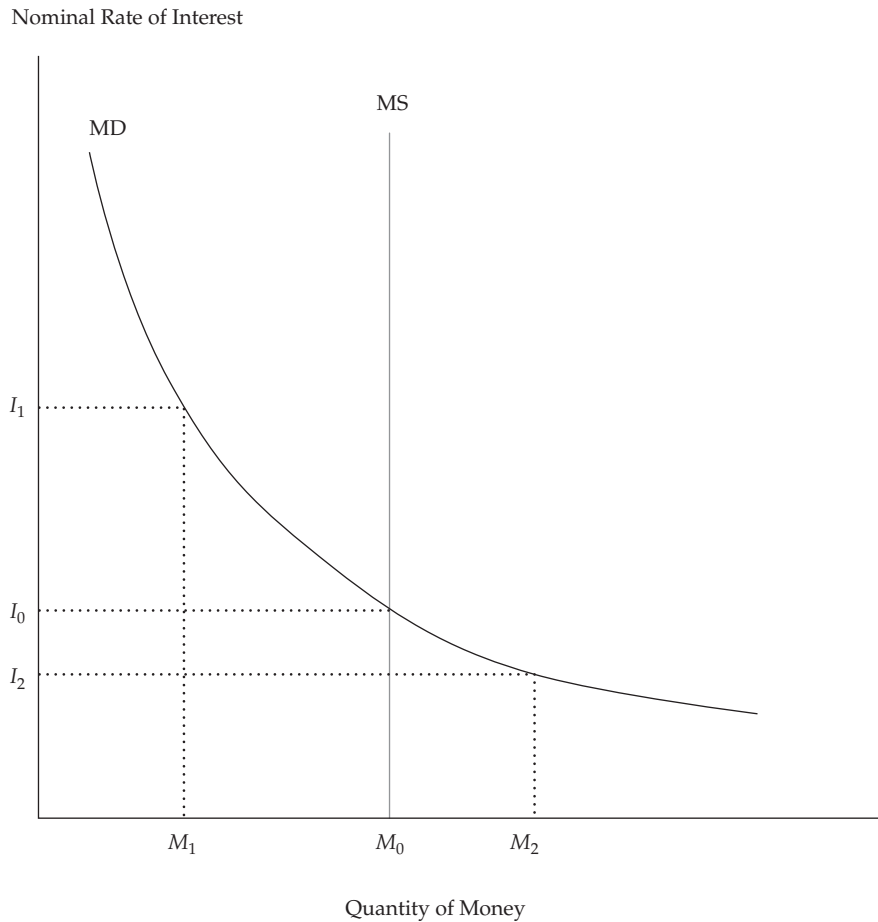
**Solution to 3:**

C is correct. This is the definition of broad money. Broad money encompasses narrow money.

### 2.1.6 The Supply and Demand for Money

We have now discussed definitions of money, its relationship with the aggregate price level, and the demand for it. We now discuss the interaction between the supply of and demand for money.

As with most other markets, the supply of money and the demand to hold it will interact to produce an equilibrium price for money. In this market, the price of money is the nominal interest rate that could be earned by lending it to others. Exhibit 4 shows the supply and demand curves for money. The vertical scale represents the rate of interest; the horizontal scale plots the quantity of nominal money in the economy. The supply curve (MS) is vertical because we assume that there is a fixed nominal amount of money circulating at any one time. The demand curve (MD) is downward sloping because as interest rates rise, the speculative demand for money falls. The supply and demand for money are both satisfied at an equilibrium interest rate of  $I_0$ .  $I_0$  is the rate of interest at which no excess money balances exist.

**Exhibit 4 The Supply and Demand for Money**

To see why  $I_0$  is the equilibrium rate of interest where there are no excess money balances, consider the following. If the interest rate on bonds were  $I_1$  instead of  $I_0$ , there would be excess supply of money ( $M_0 - M_1$ ). Economic agents would seek to buy bonds with their excess money balances, which would force the price of bonds up and the interest rate back down to  $I_0$ . Similarly, if bonds offered a rate of interest,  $I_2$ , there would be an excess demand for money ( $M_2 - M_0$ ). Corporations and individuals would seek to sell bonds so that individuals could increase their money holdings, but in doing so, the price of bonds would fall and the interest rate offered on them would rise until it reached  $I_0$ . Interest rates effectively adjust to bring the market into equilibrium (“clear the market”). In this simple example, we have also assumed that the supply of money and bonds is fixed as economic agents readjust their holdings. In practice, this may not be true, but the dynamics of the adjustment process described here essentially still hold.

Exhibit 4 also reemphasises the relationship between the supply of money and the aggregate price level, which we first encountered when discussing the quantity theory of money. Suppose that the central bank increases the supply of money from  $M_0$  to  $M_2$ , so that the vertical supply curve shifts to the right. Because the increase in the supply of money makes it more plentiful and hence less valuable, its price (the interest rate) falls as the price level rises.

This all sounds very simple, but in practice the effects of an increase in the money supply are more complex. The initial increase in the money supply will create excess supply of cash. People and companies could get rid of the excess by loaning the money

to others by buying bonds, as implied above, but they might also deposit it in a bank or simply use it to buy goods and services. But an economy's capacity to produce goods and services depends on the availability of real things: notably, natural resources, capital, and labour—that is, factors of production supplied either directly or indirectly by households. Increasing the money supply does not change the availability of these real things. Thus, some economists believe that the long-run impact of an exogenous increase in the supply of money is an increase in the aggregate price level.

This phenomenon—whereby an increase in the money supply is thought in the long run simply to lead to an increase in the price level while leaving real variables like output and employment unaffected—is known as **money neutrality**. To see why in the long run money should have a neutral effect on real things, consider the following simple example.

Suppose the government declared today that 1kg would henceforth be referred to as 2kg and that 1.5kg would be referred to as 3kg. In other words, suppose that they halved the “value” of a kilogram. Would anything real have changed? A 1kg bag of sugar would not have changed physically, although it would be relabelled as a 2kg bag of sugar. However, there might be some short-run effects; confused people might buy too little sugar, and some people might go on crash diets! But ultimately people would adjust. In the long run, the change wouldn't matter. There is a clear parallel here with the theory of money neutrality. Doubling the prices of everything—halving the value of a currency—does not change anything real. This is because, like kilograms, money is a unit of account. However, halving the value of a currency could affect real things in the short run.

There are two points worth making with regard to money neutrality. First, although the simple kilogram analogy above does suggest that money should not affect real things in the long run, as the British economist Keynes said: “*In the long run we are all dead!*” In practice, it is very difficult for economists to be sure that money neutrality holds in the long run. And second, we must assume that monetary authorities do believe that the money supply can affect real things in the short run. If they did not, then there would be almost no point to monetary policy.

### 2.1.7 The Fisher Effect

The **Fisher effect** is directly related to the concept of money neutrality. Named after the economist Irving Fisher, the Fisher effect states that the real rate of interest in an economy is stable over time so that changes in nominal interest rates are the result of changes in expected inflation. Thus, the nominal interest rate ( $R_{\text{nom}}$ ) in an economy is the sum of the required real rate of interest ( $R_{\text{real}}$ ) and the expected rate of inflation ( $\pi^e$ ) over any given time horizon:

$$R_{\text{nom}} = R_{\text{real}} + \pi^e \quad (3)$$

According to money neutrality, over the long term the money supply and/or the growth rate in money should not affect  $R_{\text{real}}$  but will affect inflation and inflation expectations.

The Fisher effect also demonstrates that embedded in every nominal interest rate is an expectation of future inflation. Suppose that 12-month US government T-bills offered a yield equal to 4 percent over the year. Suppose also that T-bill investors wished to earn a real rate of interest of 2 percent and expected inflation to be 2 percent over the next year. In this case, the return of 4 percent would be sufficient to deliver the investors' desired real return of 2 percent (so long as inflation did not exceed 2 percent). Now suppose that investors changed their view about future inflation and instead expected it to equal 3 percent over the next 12 months. To compensate them for the higher expected inflation, the T-bill rate would have to rise to 5 percent, thereby preserving the required 2 percent real return.

There is one caveat to this example. Investors can never be sure about future values of such economic variables as inflation and real growth. To compensate them for this uncertainty, they require a **risk premium**. The greater the uncertainty, the greater the required risk premium. So, all nominal interest rates are comprised of three components:

- a required real return;
- a component compensating investors for expected inflation; and
- a risk premium to compensate them for uncertainty.

#### EXAMPLE 4

### Interest Rates and the Supply of Money

- 1 According to the quantity equation of exchange, an increase in the money supply can lead to an:
  - A increase in the aggregate price level, regardless of changes in the velocity of circulation of money.
  - B increase in the aggregate price level as long as the velocity of circulation of money rises sufficiently to offset the increase in the money supply.
  - C increase in the aggregate price level as long as the velocity of circulation of money does not fall sufficiently to offset the increase in the money supply and real output is unchanged.
- 2 The nominal interest rate comprises a real rate of interest:
  - A plus a risk premium only.
  - B plus a premium for expected inflation only.
  - C compensation for both expected inflation and risk.
- 3 An expansion in the money supply would *most likely*:
  - A lead to a decline in nominal interest rates.
  - B lead to an increase in nominal interest rates.
  - C reduce the equilibrium amount of money that economic agents would wish to hold.

#### Solution to 1:

C is correct. If the velocity of circulation of money does not change with an increase in the money supply and real output is fixed, then the aggregate price level should increase. If the velocity of circulation of money falls sufficiently, or if real output rises sufficiently, then the increase in money may have no impact on prices.

#### Solution to 2:

C is correct. Investors demand a real rate of interest and compensation for expected inflation and a risk premium to compensate them for uncertainty.

#### Solution to 3:

A is correct. Increasing the supply of money, all other things being equal, will reduce its “price,” that is, the interest rate on money balances.



**EXAMPLE 5****Mrs. Thatcher's Monetary Experiment****The Background**

Over the 1970s, the United Kingdom had one of the worst inflation records of any developed economy. Retail price inflation averaged 12.6 percent over that decade and peaked at 26.9 percent in August 1975. Over this period, then-Prime Minister Margaret Thatcher and her advisers had become convinced that inflation could not be controlled by the income and price policies used in the United Kingdom in the past. Instead, they believed that inflation could be tamed by controlling the rate of growth of the money supply. Mrs. Thatcher's first administration took power in May 1979 with the intention of pursuing a monetarist agenda—that is, a macroeconomic policy that would be underpinned by targets for money supply growth.

**The Medium-Term Financial Strategy**

Targets for monetary growth were set for a definition of the money supply known as Sterling M3 (£M3), which was to be kept in the range of 7–11 percent for the period 1980–1981 and then gradually reduced to within 4–8 percent by 1983–1984. This set of targets was known as the Medium Term Financial Strategy (MTFS). The idea was simple: Control the rate of growth of the money supply, and the rate of growth of prices (i.e., inflation) would remain under control too. The instrument of control was the Bank of England's policy interest rate that would be set to achieve the desired rate of growth of the money supply. This was a macroeconomic policy built, however imperfectly, on an interpretation of the quantity theory of money.

The theory was simple, but the practice proved to be less so. Over the first two and a half years of the MTFS, £M3 overshot its target by 100 percent. The inability of the monetary authorities to control the rate of growth of the broad money supply was largely caused by Thatcher's abolition of exchange controls in 1979. By abolishing these controls, there was a significant increase in foreign exchange business that came into the British banking system, which changed the velocity of money and therefore meant that the relationship between broad money and nominal incomes had changed fundamentally.<sup>5</sup>

Despite the inability to control the money supply, in 1983 the Thatcher administration reasserted its confidence in the policy and published a further set of monetary targets for several years ahead. However, the persistent failure to meet these targets, too, eventually led to the abandonment of any type of monetary targeting by the summer of 1985.

The experience of the UK monetary authorities over this period emphasizes how unstable the relationship between money and the policy interest rate could be along with the relationship between money and aggregate demand—particularly in an economy that is experiencing rapid financial innovation, as the UK economy was following the abolition of exchange controls and the introduction of greater competition within the banking industry.

Today the Bank of England is responsible for the operation and implementation of monetary policy in the United Kingdom. The trends in money supply are watched very carefully, but they are not the subject of targets, per se.

<sup>5</sup> See Goodhart (1989) for a discussion.



## 2.2 The Roles of Central Banks

Central banks play several key roles in modern economies. Generally, a central bank is the monopoly supplier of the currency, the banker to the government and the bankers' bank, the lender of last resort, the regulator and supervisor of the payments system, the conductor of monetary policy, and the supervisor of the banking system. Let us examine these roles in turn.

In its earliest form, money could be exchanged for a pre-specified precious commodity, usually gold, and promissory notes were issued by many private banks. Today, however, state-owned institutions—usually central banks—are designated in law as being the monopoly suppliers of a currency. Initially, these monopolists supplied money that could be converted into a pre-specified amount of gold; they adhered to a **gold standard**. For example, up until 1931, bank notes issued by Britain's central bank, the Bank of England, could be redeemed at the bank for a pre-specified amount of gold. But Britain, like most other major economies, abandoned this convertibility principle in the first half of the twentieth century. Money in all major economies today is not convertible by law into anything else, but it is, in law, **legal tender**. This means that it must be accepted when offered in exchange for goods and services. Money that is not convertible into any other commodity is known as **fiat money**. Fiat money derives its value via government decree and because people accept it for payment of goods and services and for debt repayment.

As long as fiat money is acceptable to everyone as a medium of exchange, and it holds its value over time, then it will also be able to serve as a unit of account. However, once an economy has moved to a system of fiat money, the role of the supplier of that money becomes even more crucial because they could, for example, expand the supply of this money indefinitely should they wish to do so. Central banks therefore play a crucial role in modern economies as the suppliers and guardians of the value of their fiat currencies and as institutions charged with the role of maintaining confidence in their currencies. As the monopoly suppliers of an economy's currency, central banks are at the centre of economic life. As such, they assume other roles in addition to being the suppliers and guardians of the value of their currencies.

Most central banks act as the banker to the government and to other banks. They also act as a **lender of last resort** to banks. Because the central bank effectively has the capacity to print money, it is in the position to be able to supply the funds to banks that are facing a damaging shortage. The facts that economic agents know that the central bank stands ready to provide the liquidity required by any of the banks under its jurisdiction and that they trust government bank deposit insurance help to prevent bank runs in the first place. However, the recent financial crisis has shown that this knowledge is not always sufficient to deter a bank run.

### EXAMPLE 6

#### The Northern Rock Bank Run

In the latter part of the summer of 2007, the fall in US house prices and the related implosion of the US sub-prime mortgage market became the catalyst for a global liquidity crisis. Banks began to hoard cash and refused to lend to other banks at anything other than extremely punitive interest rates through the interbank market. This caused severe difficulties for a UK mortgage bank, Northern Rock. Northern Rock's mortgage book had expanded rapidly in the preceding years as it borrowed aggressively from the money markets. It is now clear that this expansion was at the expense of loan quality. The then UK regulatory authority,

the Financial Services Authority (FSA),<sup>6</sup> later reported in 2008 that Northern Rock’s lending practices did not pay due regard to either the credit quality of the mortgagees or the values of the properties on which the mortgages were secured. Being at the worst end of banking practice, and relying heavily on international capital markets for its funding, Northern Rock was therefore very susceptible to a global reduction in liquidity. As the liquidity crisis took hold, Northern Rock found that it could not replace its maturing money market borrowings. On 12 September 2007, in desperate need of liquidity, Northern Rock’s board approached the UK central bank to ask for the necessary funds.

However, the news of Northern Rock’s perilous liquidity position became known by the public and, more pertinently, by Northern Rock’s retail depositors. On 14 September, having heard the news, queues began to form outside Northern Rock branches as depositors tried to withdraw their savings. On that day, it was estimated that Northern Rock depositors withdrew around £1bn, representing 5 percent of Northern Rock’s deposits. Further panic ensued as investors in “internet only” Northern Rock accounts could not withdraw their money because of the collapse of Northern Rock’s website. A further £1bn was withdrawn over the next two days.

Northern Rock’s share price dropped rapidly, as did the share prices of other similar UK banks. The crisis therefore threatened to engulf more than one bank. To prevent contagion, the Chancellor of the Exchequer announced on 17 September that the UK government would guarantee all Northern Rock deposits. This announcement was enough to stabilize the situation, and given that lending to Northern Rock was now just like lending to the government, deposits actually started to rise again.

Eventually Northern Rock was nationalized by the UK government, with the hope that at some time in the future it could be privatized once its balance sheet had been repaired.

Central banks are also often charged by the government to supervise the banking system, or at least to supervise those banks that they license to accept deposits. However, in some countries, this role is undertaken by a separate authority. In other countries, the central bank can be jointly responsible with another body for the supervision of its banks.

Exhibit 5 lists the banking supervisors in the G-10 countries; central banks are underlined. As the exhibit shows, most but not all bank systems have a single supervisor, which is not necessarily a central bank. A few countries, such as Germany and the United States, have more than one supervisor.

| Exhibit 5 Banking Supervision in the G10 |  |
|--|--|
| Country                                  | Institution(s)   |
| Belgium                                  | Banking and Finance Commission                                 |
| Canada                                   | Office of the Superintendent of Financial Institutions         |
| France                                   | Commission Bancaire  |
| Germany                                  | Federal Banking Supervisory Office; <u>Deutsche Bundesbank</u> |
| Italy                                    | <u>Bank of Italy</u>   |

<sup>6</sup> In 2013, the Financial Services Authority was replaced by two new regulatory authorities, the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA).

**Exhibit 5 (Continued)**

| <b>Country</b> | <b>Institution(s)</b>  |
|----------------|--|
| Japan          | <u>Financial Services Agency</u>   |
| Netherlands    | <u>Bank of Netherlands</u>   |
| Sweden         | Swedish Financial Supervisory Authority  |
| Switzerland    | Federal Commission   |
| United Kingdom | <u>Bank of England</u>   |
| United States  | Office of the Comptroller of the Currency; <u>Federal Reserve</u> ;<br>Federal Deposit Insurance Corporation |

The United Kingdom is an interesting case study in this regard. Until May 1997, the Bank of England had statutory responsibility for banking supervision in the United Kingdom. In May 1997, banking supervision was removed from the Bank of England and assigned to a new agency, the Financial Services Authority (FSA). However, the removal of responsibility for banking supervision from the central bank was seen by some as being a contributory factor in the run on the mortgage bank Northern Rock, and generally as a contributory factor in the recent banking crisis. Because of this perceived weakness in the separation of the central bank from banking supervision, the Bank of England regained responsibility for banking supervision and regulation in 2013.

Perhaps the least appreciated role of a central bank is its role in the **payments system**. Central banks are usually asked to oversee, regulate, and set standards for a country's payments system. Every day millions of financial transactions take place in a modern economy. For the system to work properly, procedures must be robust and standardized. The central bank will usually oversee the payments system and will also be responsible for the successful introduction of any new processes. Given the international nature of finance, the central bank will also be responsible for coordinating payments systems internationally with other central banks.

Most central banks will also be responsible for managing their country's **foreign currency reserves** and also its gold reserves. With regard to the latter, even though countries abandoned the gold standard in the early part of the twentieth century, the world's central bankers still hold large quantities of gold. As such, if central banks were to decide to sell significant proportions of their gold reserves, it could potentially depress gold prices.

Finally, central banks are usually responsible for the operation of a country's **monetary policy**. This is arguably the highest profile role that these important organizations assume. Recall that monetary policy refers to central bank activities that are directed toward influencing the quantity of money and credit in an economy. As the monopoly supplier of a country's currency, central banks are in the ideal position to implement and/or determine monetary policy.

To summarise, central banks assume a range of roles and responsibilities. They do not all assume responsibility for the supervision of the banks, but all of the other roles listed below are normally assumed by the central bank:

- Monopoly supplier of the currency;
- Banker to the government and the bankers' bank;
- Lender of last resort;
- Regulator and supervisor of the payments system;

- Conductor of monetary policy; and
- Supervisor of the banking system.

### 2.3 The Objectives of Monetary Policy

Central banks fulfill a variety of important roles, but for what overarching purpose? A brief perusal of the websites of the world's central banks will reveal a wide range of explanations of their objectives. Their objectives are clearly related to their roles, and so there is frequent mention of objectives related to the stability of the financial system and to the payments systems. Some central banks are charged with doing all they can to maintain full employment and output. But some also have related but less tangible roles, like “maintaining confidence in the financial system,” or even to “promote understanding of the financial sector.” But there is one overarching objective that most seem to acknowledge explicitly, and that is the objective of maintaining **price stability**.

So, although central banks usually have to perform many roles, most specify an overarching objective. Exhibit 6 lists what we might call the primary objective(s) of a number of central banks, from both developed and developing economies.

#### Exhibit 6 The Objectives of Central Banks

##### The Central Bank of Brazil

Its “institutional mission” is to “ensure the stability of the currency’s purchasing power and a solid and efficient financial system.”

##### The European Central Bank

“[T]o maintain price stability is the primary objective of the Euro system and of the single monetary policy for which it is responsible. This is laid down in the Treaty on the Functioning of the European Union, Article 127 (1).”

“Without prejudice to the objective of price stability”, the euro system will also “support the general economic policies in the Community with a view to contributing to the achievement of the objectives of the Community.” These include a “high level of employment” and “sustainable and non-inflationary growth.”

##### The US Federal Reserve

“The Federal Reserve sets the nation’s monetary policy to promote the objectives of maximum employment, stable prices, and moderate long-term interest rates.”

##### The Reserve Bank of Australia

“It is the duty of the Reserve Bank Board, within the limits of its powers, to ensure that the monetary and banking policy of the Bank is directed to the greatest advantage of the people of Australia and that the powers of the Bank ... are exercised in such a manner as, in the opinion of the Reserve Bank Board, will best contribute to:

- a the stability of the currency of Australia;
- b the maintenance of full employment in Australia; and
- c the economic prosperity and welfare of the people of Australia.”

**Exhibit 6 (Continued)****The Bank of Korea**

“The primary purpose of the Bank, as prescribed by the Bank of Korea Act of 1962, is the pursuit of price stability.”

Source: Central bank websites found at <http://www.bis.org/cbanks.htm>.

**EXAMPLE 7****Central Banks**

- 1 A central bank is normally *not* the:
  - A lender of last resort.
  - B banker to the government and banks.
  - C body that sets tax rates on interest on savings.
- 2 Which of the following *best* describes the overarching, long-run objective of most central banks?
  - A Price stability
  - B Fast economic growth
  - C Current account surplus

**Solution to 1:**

C is correct. A central bank is normally the lender of last resort and the banker to the banks and government, but the determination of all tax rates is normally the preserve of the government and is a fiscal policy issue.

**Solution to 2:**

A is correct. Central banks normally have a variety of objectives, but the overriding one is nearly always price stability.

As we have already discussed, one of the essential features of a monetary system is that the medium of exchange should have a relatively stable value from one period to the next. Arguably then, the overarching goal of most central banks in maintaining price stability is the associated goal of controlling inflation. But before we explore the tools central banks use to control inflation, we should first consider the potential costs of inflation. In other words, we should ask why it is that central bankers believe that it is so important to control a nominal variable.

**2.3.1 The Costs of Inflation**

Huge efforts have been put into controlling inflation since the major economies experienced such high levels of inflation in the 1970s. From the early 1970s then, inflation has been seen as a very bad thing. But why? What are the costs of inflation? The debate around the “costs” of inflation really centers on the distinction between **expected inflation** and **unexpected inflation**. Expected inflation is clearly the level of inflation that economic agents expect in the future. Unexpected inflation can be defined as the level of inflation that we experience that is either below or above that which we expected; it is the component of inflation that is a surprise.

At a micro level, high inflation means that businesses constantly have to change the advertised prices of their goods and services. These are known as **menu costs**. There also exists what economists refer to as “shoe leather” costs of inflation. In times of high inflation, people would naturally tend to hold less cash and would therefore wear out their shoe leather (or more likely the engines of their cars) in making frequent trips to the bank to withdraw cash. But these are relatively old arguments, used to demonstrate that inflation is bad. In a modern economy, with the internet and with transactions becoming increasingly cashless, these costs associated with inflation will be lower today than they may have been in the past.

To demonstrate the potentially more significant costs of inflation, consider the following. Imagine a world where inflation is high but where all prices (including asset prices) in an economy are perfectly indexed to inflation, and that technology has eliminated the issues surrounding the menu and shoe leather costs of inflation. In such a world, would economic agents care about inflation? Probably not. If the average price of goods and services rose by 10 percent, people’s salaries (and all other prices) would rise by the same amount, which would therefore make economic agents indifferent to the rise in prices.

In practice, however, all prices, wages, salaries, rents, and so forth are not indexed, in which case economic agents would certainly need to think about inflation more carefully. But what if inflation in this world where prices are no longer perfectly indexed is high, but perfectly predictable? In this alternative, imaginary world, economic agents would have to think about inflation, but not too hard as long as they were capable of calculating the impact of the known inflation rate on all future prices. So, if everyone knew that inflation was going to be 10 percent over the next year, then everyone could bargain for a 10 percent increase in their salaries to accommodate this, and companies could plan to put up the prices of their goods and services by 10 percent. In this world, an expectation of 10 percent inflation would become a self-fulfilling prophecy.

However, economic agents would worry about inflation in a world where all prices were not indexed and, crucially, where inflation was high and unpredictable. In fact, this is a crude description the inflationary backdrop in many developed economies over the 1970s and 1980s, including the United States, France, the United Kingdom, Italy, and Canada.

Arguably it is **unexpected inflation** that is most costly. Inflation that is fully anticipated can be factored into wage negotiations and priced into business and financial contracts. But when inflation turns out to be higher than is anticipated, then borrowers benefit at the expense of lenders because the real value of their borrowing declines. Conversely, when inflation is lower than is anticipated, lenders benefit at the expense of borrowers because the real value of the payment on debts rises. Furthermore, if inflation is very uncertain or very volatile, then lenders will ask for a premium to compensate them for this uncertainty. As a result, the costs of borrowing will be higher than would otherwise have been the case. Higher borrowing costs could in turn reduce economic activity, for example, by discouraging investment.

It is also possible that **inflation uncertainty** can exacerbate the economic cycle. Inflation uncertainty is the degree to which economic agents view future rates of inflation as hard to forecast. Take for example the case of an imaginary television manufacturer. Suppose one day that the manufacturer looks out at the market for televisions and sees that the market price of televisions has risen by 10 percent. Armed with this information, the manufacturer assumes that there has been an increase in demand for televisions or maybe a reduction in supply. So, to take advantage of the new, higher prices, the manufacturer extends the factory, employs more workers, and begins to produce more televisions.

Having now increased the output of the factory, the manufacturer then attempts to sell the extra televisions that the factory has produced. But to its horror, the manufacturer finds out that there is no extra demand for televisions. Instead, the



10 percent rise in television prices was caused by a generalized 10 percent increase in all consumer prices across the economy. The manufacturer realizes that it has surplus stock, surplus factory capacity, and too many workers. So, it cuts back on production, lays off some of the workforce, and realizes that it won't need to invest in new plant or machinery for a long time.

This example emphasizes the potentially destabilizing impact of unexpected inflation. It demonstrates how unanticipated inflation can reduce the information content of market prices for economic agents. If we scale this example up, it should not be too difficult to imagine how unanticipated increases or decreases in the general price level could help to exacerbate—and in some extreme cases cause—economic booms and busts.

Over the last two to three decades the consensus among economists has been that unanticipated and high levels of inflation can have an impact on real things like employment, investment and profits, and therefore that controlling inflation should be one of the main goals of macroeconomic policy. In summary:

**Expected inflation** can give rise to:

- menu costs and
- shoe leather costs.

**Unanticipated (unexpected) inflation** can in addition:

- lead to inequitable transfers of wealth between borrowers and lenders (including losses to savings);
- give rise to risk premia in borrowing rates and the prices of other assets; and
- reduce the information content of market prices.

### 2.3.2 Monetary Policy Tools<sup>7</sup>

Central banks have three primary tools available to them: open market operations, the refinancing rate, and reserve requirements.

**2.3.2.1 Open Market Operations** One of the most direct ways for a central bank to increase or reduce the amount of money in circulation is via **open market operations**. Open market operations involve the purchase and sale of government bonds from and to commercial banks and/or designated market makers. For example, when the central bank buys government bonds from commercial banks, this increases the reserves of private sector banks on the asset side of their balance sheets. If banks then use these surplus reserves by increasing lending to corporations and households, then via the money multiplier process explained in Section 2.1.2, broad money growth expands. Similarly, the central bank can sell government bonds to commercial banks. By doing this, the reserves of commercial banks decline, reducing their capacity to make loans (i.e., create credit) to households and corporations and thus causing broad money growth to decline through the money multiplier mechanism. In using open market operations, the central bank may target a desired level of commercial bank reserves or a desired interest rate for these reserves.

<sup>7</sup> Monetary policy tools and operations often vary considerably from economy to economy. We have tried to describe the generics of the process here. For a more-detailed review of monetary operations across the world, see Gray and Talbot (2006).

**2.3.2.2 The Central Bank's Policy Rate** The most obvious expression of a central bank's intentions and views comes via the interest rate it sets. The name of the **official interest rate** (or **official policy rate** or just **policy rate**) varies from central bank to central bank, but its purpose is to influence short- and long-term interest rates and ultimately real economic activity.

The interest rate that a central bank sets and that it announces publicly is normally the rate at which it is willing to lend money to the commercial banks (although practices do vary from country to country). This policy rate can be achieved by using short-term collateralized lending rates, known as repo rates. For example, if the central bank wishes to increase the supply of money, it might buy bonds (usually government bonds) from the banks, with an agreement to sell them back at some time in the future. This transaction is known as a **repurchase agreement**. Normally, the maturity of repo agreements ranges from overnight to two weeks. In effect, this represents a secured loan to the banks, and the lender (in this case the central bank) earns the repo rate.

Suppose that a central bank announces an increase in its official interest rate. Commercial banks would normally increase their **base rates** at the same time. A commercial bank's base rate is the reference rate on which it bases lending rates to all other customers. For example, large corporate clients might pay the base rate plus 1 percent on their borrowing from a bank, while the same bank might lend money to a small corporate client at the base rate plus 3 percent. But why would commercial banks immediately increase their base or reference rates just because the central bank's refinancing rate had increased?

The answer is that commercial banks would not want to have lent at a rate of interest that would be lower than they might be charged by the central bank. Effectively, the central bank can force commercial banks to borrow from it at this rate because it can conduct open market operations that create a shortage of money, forcing the banks to sell bonds to it with a pre-agreed repurchase price (i.e., do a repurchase agreement). The repo rate would be such that the central bank earned the official refinancing rate on the transactions.

The name of each central bank's official refinancing rate varies. The Bank of England's refinancing rate is the **two-week repo rate**. In other words, the Bank of England fixes the rate at which it is willing to lend two-week money to the banking sector. The ECB's official policy rate is known as the **refinancing rate** and defines the rate at which it is willing to lend short-term money to the euro area banking sector.

The corresponding rate in the United States is the discount rate, which is the rate for member banks borrowing directly from the Federal Reserve System. But the most important interest rate used in US monetary policy is the **federal funds rate**. The federal funds rate (or **fed funds rate**) is the interbank lending rate on overnight borrowings of reserves. The Federal Open Market Committee (FOMC) seeks to move this rate to a target level by reducing or adding reserves to the banking system by means of open market operations. The level of the rate is reviewed by the FOMC at its meetings held every six weeks (although the target can be changed between meetings, if necessary).

Through the setting of a policy rate, a central bank can manipulate the amount of money in the money markets. Generally speaking, the higher the policy rate, the higher the potential penalty that banks will have to pay to the central bank if they run short of liquidity, the greater will be their willingness to reduce lending, and the more likely that broad money growth will shrink.

**2.3.2.3 Reserve Requirements** The third primary way in which central banks can limit or increase the supply of money in an economy is via their **reserve requirements**. We have already seen that the money creation process is more powerful the lower the percentage reserve requirement of banks. So, a central bank could restrict money creation by raising the reserve requirements of banks. However, this policy tool is not



used much nowadays in developed economies. Indeed, some central banks, such as the Bank of England, do not even set minimum reserve requirements for the banks under their jurisdiction anymore. Changing reserve requirements frequently is disruptive for banks. For example, if a central bank increased the reserve requirements, a bank that was short on reserves might have to cease its lending activities until it had built up the necessary reserves, because deposits would be unlikely to rise quickly enough for the bank to build its reserves in this way. However, reserve requirements are still actively used in many developing countries to control lending and remain a potential policy tool for those central banks that do not currently use it.

To summarize, central banks can manipulate the money supply in one of three ways:

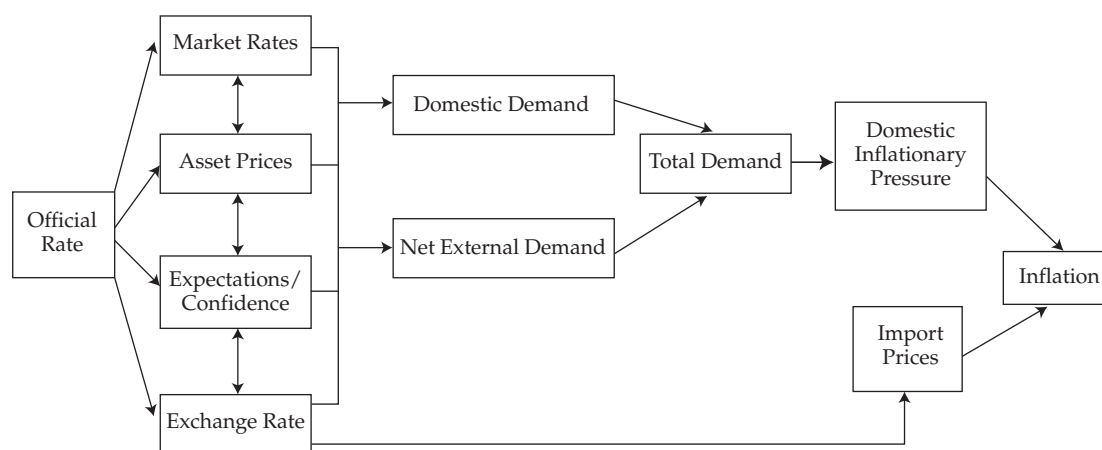
- open market operations;
- its official policy rate and associated actions in the repo market; and
- manipulation of official reserve requirements.

### 2.3.3 The Transmission Mechanism

The overarching goal of a central bank is to maintain price stability. We demonstrated above how a central bank can manipulate the money supply and growth of the money supply. We also indicated how policy rates set and targeted by the central banks are usually very short term in nature; often they target overnight interest rates. However, most businesses and individuals in the real economy borrow and lend over much longer time frames than this. It may not be obvious, then, how changing short-term interest rates can influence the real economy, particularly if money neutrality holds in the long run. The fact that central bankers believe that they can affect real economic variables, in particular economic growth, by influencing broad money growth suggests that they believe that money is not neutral—at least not in the short run.

Exhibit 7 presents a stylized representation of the **monetary transmission mechanism**. This is the process whereby a central bank's interest rate gets transmitted through the economy and ultimately affects the rate of increase of prices—that is, inflation.

**Exhibit 7 A Stylized Representation of the Monetary Transmission Mechanism**



Source: Bank of England.

Suppose that a central bank announces an increase in its official interest rate. The implementation of the policy may begin to work through the economy via four interrelated channels. Those channels include bank lending rates, asset prices, agents' expectations, and exchange rates. First, as described above, the base rates of commercial

banks and interbank rates should rise in response to the increase in the official rate. Banks would, in turn, increase the cost of borrowing for individuals and companies over both short- and long-term horizons. Businesses and consumers would then tend to borrow less as interest rates rise. An increase in short-term interest rates could also cause the price of such assets as bonds or the value of capital projects to fall as the discount rate for future cash flows rises.

Market participants would then come to the view that higher interest rates will lead to slower economic growth, reduced profits, and reduced borrowing to finance asset purchases. Exporters' profits might decline if the rise in interest rates causes the country's exchange rate to appreciate, because this would make domestic exports more expensive to overseas buyers and dampen demand to purchase them. The fall in asset prices as well as an increase in prices would reduce household financial wealth and therefore lead to a reduction in consumption growth. Expectations regarding interest rates can play a significant role in the economy. Often companies and individuals will make investment and purchasing decisions based on their interest rate expectations, extrapolated from recent events. If the central bank's interest rate move is widely expected to be followed by other interest rate increases, investors and companies will act accordingly. Consumption, borrowing, and asset prices may all decline as a result of the revision in expectations.

There is a whole range of interconnected ways in which a rise in the central bank's policy rate can reduce real domestic demand and net external demand (that is, the difference between export and import consumption). Weaker total demand would tend to put downward pressure on the rate of domestic inflation—as would a stronger currency, which would reduce the prices of imports. Taken together, these might begin to put downward pressure on the overall measure of inflation.

To summarize, the central bank's policy rate works through the economy via any one, and often all, of the following interconnected channels:

- Short-term interest rates;
- Changes in the values of key asset prices;
- The exchange rate; and
- The expectations of economic agents.

#### EXAMPLE 8

##### Central Bank Tools

- 1 Which of the following variables are *most likely* to be affected by a change in a central bank's policy rate?
  - A Asset prices only
  - B Expectations about future interest rates only
  - C Both asset prices and expectations about future interest rates
- 2 Which of the following does a central bank seek to influence directly via the setting of its official interest rate?
  - A Inflation expectations
  - B Import prices
  - C Domestic inflation

**Solution to 1:**

C is correct. The price of equities, for example, might be affected by the expectation of future policy interest rate changes. In other words, a rate change may be taken as a signal of the future stance of monetary policy—contractionary or expansionary.

**Solution to 2:**

A is correct. By setting its official interest rate, a central bank could expect to have a direct influence on inflation expectations—as well as on other market interest rates, asset prices, and the exchange rate (where this is freely floating). If it can influence these factors, it might ultimately hope to influence import prices (via changes in the exchange rate) and also domestically generated inflation (via its impact on domestic and/or external demand). The problem is that the workings of the transmission mechanism—from the official interest rate to inflation—are complex and can change over time.

**2.3.4 Inflation Targeting**

Over the 1990s, a consensus began to build among both central bankers and politicians that the best way to control inflation and thereby maintain price stability was to target a certain level of inflation and to ensure that this target was met by monitoring a wide range of monetary, financial, and real economic variables. Nowadays, inflation-targeting frameworks are the cornerstone of monetary policy and macroeconomic policy in many economies. Exhibit 8 shows the growth in the number of inflation-targeting monetary policy regimes over time.

The inflation-targeting framework that is now commonly practiced was pioneered in New Zealand. In 1988, the New Zealand Minister of Finance, Roger Douglas, announced that economic policy would focus on bringing inflation down from the prevailing level of around 6.0 percent to a target range of 0 to 2 percent. This goal was given legal status by the Reserve Bank of New Zealand Act 1989. As part of the Act, the Reserve Bank of New Zealand (RBNZ) was given the role of pursuing this target. The bank was given **operational independence**; it was free to set interest rates in the way that it thought would best meet the inflation target. Although the RBNZ had independent control of monetary policy, it was still accountable to the government and was charged with communicating its decisions in a clear and transparent way. As Exhibit 8 shows, the New Zealand model was widely copied.

**Exhibit 8 The Progressive Adoption of Inflation Targeting by Central Banks**

|      |                |                |           |      |             |
|------|----------------|----------------|-----------|------|-------------|
| 1989 | New Zealand    |                |           |      |             |
| 1990 | Chile          | Canada         |           |      |             |
| 1991 | Israel         | United Kingdom |           |      |             |
| 1992 | Sweden         | Finland        | Australia |      |             |
| 1995 | Spain          |                |           |      |             |
| 1998 | Czech Republic | South Korea    | Poland    |      |             |
| 1999 | Mexico         | Brazil         | Colombia  | ECB  |             |
| 2000 | South Africa   | Thailand       |           |      |             |
| 2001 | Iceland        | Norway         | Hungary   | Peru | Philippines |
| 2005 | Guatemala      | Indonesia      | Romania   |      |             |
| 2006 | Turkey         | Serbia         |           |      |             |
| 2007 | Ghana          |                |           |      |             |

*Note:* Spain and Finland later joined the EMU.

*(continued)*

**Exhibit 8 (Continued)**

*Sources:* For 2001 and earlier, Truman (2003). For 2002 to 2007, Roger (2010).

Although these inflation-targeting regimes vary a little from economy to economy, their success is thought to depend on three key concepts: central bank independence, credibility, and transparency.

**Central Bank Independence**<sup>8</sup> In most cases, the central bank that is charged with targeting inflation has a degree of independence from its government. This independence is thought to be important. It is conceivable that politicians could announce an inflation target and direct the central bank to set interest rates accordingly. Indeed, this was the process adopted in the United Kingdom between 1994 and 1997. But politicians have a constant eye on re-election and might be tempted, for example, to keep rates “too low” in the lead up to an election in the hope that this might help their re-election prospects. As a consequence, this might lead to higher inflation. Thus, it is now widely believed that monetary policy decisions should rest in the hands of an organization that is remote from the electoral process. The central bank is the natural candidate to be the monopoly supplier of a currency.

However, there are degrees of independence. For example, the head of the central bank is nearly always chosen by government officials. The Chairman of the US Federal Reserve’s Board of Governors is appointed by the President of the United States of America; the Head of the ECB is chosen by the committee of Euro area finance ministers; while the Governor of the Bank of England is chosen by the Chancellor of the Exchequer. So, in practice, separating control from political influence completely is probably an impossible (although a desirable) goal.

There are further degrees of independence. Some central banks are both operationally and **target independent**. This means that they not only decide the level of interest rates, but they also determine the definition of inflation that they target, the rate of inflation that they target, and the horizon over which the target is to be achieved. The ECB has independence of this kind. By contrast, other central banks—including those in New Zealand, Sweden, and the United Kingdom—are tasked to hit a definition and level of inflation determined by the government. These central banks are therefore only operationally independent.

**Credibility** The independence of the central bank and public confidence in it are key in the design of an inflation-targeting regime.

To illustrate the role of credibility, suppose that instead of the central bank, the government assumes the role of targeting inflation but the government is heavily indebted. Given that higher inflation reduces the real value of debt, the government would have an incentive to avoid reaching the inflation target or to set a high inflation target such that price stability and confidence in the currency could be endangered. As a result, few would believe the government was really intent on controlling inflation; thus, the government would lack credibility. Many governments have very large levels of debt, especially since the 2008–2009 global financial crisis. In such a situation, economic agents might expect a high level of inflation, regardless of the actual, stated target. The target might have little credibility if the organization’s likelihood of sticking to it is in doubt.

<sup>8</sup> For information about the degree of independence of any central bank, the roles that it assumes in an economy, and the framework in which it operates, analysts should go to a central bank’s website. A list of central bank websites can be found at <http://www.bis.org/cbanks.htm>.

If a respected central bank assumes the inflation-targeting role and if economic agents believe that the central bank will hit its target, the belief itself could become self-fulfilling. If everyone believes that the central bank will hit an inflation target of 2 percent next year, this expectation might be built into wage claims and other nominal contracts that would make it hit the 2 percent target. It is for this reason that central bankers pay a great deal of attention to inflation expectations. If these expectations were to rise rapidly, perhaps following a rapid increase in oil prices, unchecked expectations could get embedded into wage claims and eventually cause inflation to rise.

**Transparency** One way of establishing credibility is for a central bank to be transparent in its decision making. Many, if not all, independent inflation-targeting central banks produce a quarterly assessment of their economies. These **Inflation Reports**, as they are usually known, give central banks' views on the range of indicators that they watch when they come to their (usually) monthly interest rate decision. They will consider and outline their views on the following subjects, usually in this order:

- Broad money aggregates and credit conditions;
- Conditions in financial markets;
- Developments in the real economy (e.g., the labour market); and
- Evolution of prices.

Consideration of all of these important components of an economy is then usually followed by a forecast of growth and inflation over a medium-term horizon, usually two years.

By explaining their views on the economy and by being transparent in decision making, the independent, inflation-targeting central banks seek to gain reputation and credibility, making it easier to influence inflation expectations and hence ultimately easier to meet the inflation target.

**The Target** Whether the target is set by the central bank or by the government for the central bank to hit, the level of the target and the horizon over which the target is to be hit is a crucial consideration in all inflation-targeting frameworks.

#### Exhibit 9 A Range of Inflation Targets

##### Country/Region

|                |   |
|----------------|---|
| Australia      | Australian Federal Reserve's target is inflation between 2.0% and 3.0%.   |
| Canada         | Bank of Canada's target is CPI inflation within the 1.0% and 3.0% range.  |
| Euro-area      | ECB's target is CPI inflation close to, but below, a ceiling of 2%.   |
| South Korea    | Bank of Korea's target for 2010–2012 is CPI inflation within $\pm 1.0$ percentage of 2.0%.  |
| New Zealand    | Reserve Bank of New Zealand's target is to keep future inflation between 1.0% and 3.0% with a focus on the average future inflation rate near 2.0%. |
| Sweden         | Riksbank's target is CPI inflation within $\pm 1.0$ percentage point of 2.0%.   |
| United Kingdom | Bank of England's target is CPI inflation within $\pm 1.0$ percentage point of 2.0%.  |

Source: Central bank websites (<http://www.bis.org/cbanks.htm>).

Exhibit 9 shows that many central banks in developed economies target an inflation rate of 2 percent based on a consumer price index. Given that the operation of monetary policy is both art and science, the banks are normally allowed a range around the central target of +1 percent or –1 percent. For example, with a 2 percent target, they would be tasked to keep inflation between 1 percent and 3 percent. But why target 2 percent and not 0 percent?

The answer is that aiming to hit 0 percent could result in negative inflation, known as **deflation**. One of the limitations of monetary policy that we discuss below is its ability or inability to deal with periods of deflation. If deflation is something to be avoided, why not target 10 percent? The answer to this question is that levels of inflation that high would not be consistent with price stability; such a high inflation rate would further tend to be associated with high inflation volatility and uncertainty. Central bankers seem to agree that 2 percent is far enough away from the risks of deflation and low enough not to lead to destabilizing inflation shocks.

Finally, we should keep in mind that the headline inflation rate that is announced in most economies every month, and which is the central bank's target, is a measure of how much a basket of goods and services has risen over the previous twelve months. It is history. Furthermore, interest rate changes made today will take some time to have their full effect on the real economy as they make their way through the monetary transmission mechanism. It is for these two reasons that inflation targeters do not target current inflation but instead usually focus on inflation two years ahead.

Although inflation-targeting mandates may vary from country to country, they have common elements: the specification of an explicit inflation target, with permissible bounds, and a requirement that the central bank should be transparent in its objectives and policy actions. This is all usually laid out in legislation that imposes statutory obligations on the central bank. As mentioned earlier, New Zealand pioneered the inflation-targeting approach to monetary policy that has since been copied widely. Below is New Zealand's Policy Targets Agreement, which specifies the inflation-targeting mandate of its central bank, the Reserve Bank of New Zealand.

#### **Exhibit 10 New Zealand's Policy Targets Agreement**

"This agreement between the Minister of Finance and the Governor of the Reserve Bank of New Zealand (the Bank) is made under section 9 of the Reserve Bank of New Zealand Act 1989 (the Act). The Minister and the Governor agree as follows:

##### **1 Price stability**

- a** Under Section 8 of the Act the Reserve Bank is required to conduct monetary policy with the goal of maintaining a stable general level of prices.
- b** The Government's economic objective is to promote a growing, open and competitive economy as the best means of delivering permanently higher incomes and living standards for New Zealanders. Price stability plays an important part in supporting this objective.

##### **2 Policy target**

- a** In pursuing the objective of a stable general level of prices, the Bank shall monitor prices as measured by a range of price indexes. The price stability target will be defined in terms of the All Groups Consumers Price Index (CPI), as published by Statistics New Zealand.
- b** For the purpose of this agreement, the policy target shall be to keep future CPI inflation outcomes between 1 per cent and 3 per cent on average over the medium term.

##### **3 Inflation variations around target**

**Exhibit 10 (Continued)**

- a For a variety of reasons, the actual annual rate of CPI inflation will vary around the medium-term trend of inflation, which is the focus of the policy target. Amongst these reasons, there is a range of events whose impact would normally be temporary. Such events include, for example, shifts in the aggregate price level as a result of exceptional movements in the prices of commodities traded in world markets, changes in indirect taxes,<sup>9</sup> significant government policy changes that directly affect prices, or a natural disaster affecting a major part of the economy.
- b When disturbances of the kind described in clause 3(a) arise, the Bank will respond consistent with meeting its medium-term target.

**4 Communication, implementation and accountability**

- a On occasions when the annual rate of inflation is outside the medium-term target range, or when such occasions are projected, the Bank shall explain in Policy Statements made under section 15 of the Act why such outcomes have occurred, or are projected to occur, and what measures it has taken, or proposes to take, to ensure that inflation outcomes remain consistent with the medium-term target.
- b In pursuing its price stability objective, the Bank shall implement monetary policy in a sustainable, consistent and transparent manner and shall seek to avoid unnecessary instability in output, interest rates and the exchange rate.
- c The Bank shall be fully accountable for its judgments and actions in implementing monetary policy.”

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Source: <http://www.rbnz.govt.nz/>.

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To summarize, an inflation-targeting framework normally has the following set of features:

- An independent and credible central bank;
- A commitment to transparency;
- A decision-making framework that considers a wide range of economic and financial market indicators; and
- A clear, symmetric and forward-looking medium-term inflation target, sufficiently above 0 percent to avoid the risk of deflation but low enough to ensure a significant degree of price stability.

Indeed, independence, credibility, and transparency are arguably the crucial ingredients for an effective central bank, whether they target inflation or not.

**The Main Exceptions to the Inflation-Targeting Rule** Although the practice of inflation targeting is widespread, there are two prominent central banks that have not adopted a formal inflation target along the lines of the New Zealand model: the Bank of Japan and the US Federal Reserve System.

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<sup>9</sup> “Indirect taxes” refer to such taxes as sales taxes and value-added taxes that are levied on goods and services rather than directly on individuals and companies.



### The Bank of Japan

Japan's central bank, the Bank of Japan (BoJ), does not target an explicit measure of inflation. Japan's government and its monetary authorities have been trying to combat deflation for much of the last two decades. However, despite their efforts—including the outright printing of money—inflation has remained very weak. Inflation targeting is seen very much as a way of combating and controlling inflation; as such, it would seem to have no place in an economy that suffers from persistent deflation.

Some economists have argued, however, that an inflation target is exactly what the Japanese economy needs. By announcing that positive inflation of say 3 percent is desired by the central bank, this might become a self-fulfilling prophecy if Japanese consumers and companies factor this target into nominal wage and price contracts. But for economic agents to believe that the target will be achieved, they have to believe that the central bank is capable of achieving it. Given that the BoJ has failed to engineer persistent, positive inflation, it is debatable how much credibility Japanese households and corporations would afford such an inflation-targeting policy.

### The US Federal Reserve System

It is perhaps rather ironic that the world's most influential central bank, the US Federal Reserve, which controls the supply of the world's de facto reserve currency, the US dollar, does not have an explicit inflation target. However, it is felt that the single-minded pursuit of inflation might not be compatible with the Fed's statutory goal as laid out in the Federal Reserve Act, which charges the Fed's board to:

“promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”

In other words, it has been argued that inflation targeting might compromise the goal of “maximum employment.” In practice, however, the Fed has indicated that it sees core inflation measured by the personal consumption expenditure (PCE) deflator of about, or just below, 2 percent as being compatible with “stable prices.” Financial markets therefore watch this US inflation gauge very carefully in order to try and anticipate the rate actions of the Fed.

**Monetary Policy in Developing Countries** Developing economies often face significant impediments to the successful operation of any monetary policy—that is, the achievement of price stability. These include:

- the absence of a sufficiently liquid government bond market and developed interbank market through which monetary policy can be conducted;
- a rapidly changing economy, making it difficult to understand what the neutral rate might be and what the equilibrium relationship between monetary aggregates and the real economy might be;
- rapid financial innovation that frequently changes the definition of the money supply;
- a poor track record in controlling inflation in the past, making monetary policy intentions less credible; and
- an unwillingness of governments to grant genuine independence to the central bank.



Taken together, any or all of these impediments might call into question the effectiveness of any developing economy's monetary policy framework, making any related monetary policy goals difficult to achieve.

### EXAMPLE 9

#### Central Bank Effectiveness

- 1 The reason some inflation-targeting banks may target low inflation and not 0 percent inflation is *best* described by which of the following statements?
  - A Some inflation is viewed as being good for an economy.
  - B Targeting zero percent inflation runs a higher risk of a deflationary outcome.
  - C It is very difficult to eliminate all inflation from a modern economy.
- 2 The degree of credibility that a central bank is afforded by economic agents is important because:
  - A they are the lender of last resort.
  - B their targets can become self-fulfilling prophecies.
  - C they are the monopolistic suppliers of the currency.

#### Solution to 1:

B is correct. Inflation targeting is art, not science. Sometimes inflation will be above target and sometimes below. Were central banks to target zero percent, then inflation would almost certainly be negative on some occasions. If a deflationary mindset then sets in among economic agents, it might be difficult for the central bank to respond to this because they cannot cut interest rates much below zero.

#### Solution to 2:

B is correct. If a central bank operates within an inflation-targeting regime and if economic agents believe that it will achieve its target, this expectation will become embedded into wage negotiations, for example, and become a self-fulfilling prophecy. Also, banks need to be confident that the central bank will lend them money when all other sources are closed to them; otherwise, they might curtail their lending drastically, leading to a commensurate reduction in money and economic activity.

### 2.3.5 Exchange Rate Targeting

Many developing economies choose to operate monetary policy by targeting their currency's exchange rate, rather than an explicit level of domestic inflation. Such targeting involves setting a fixed level or band of values for the exchange rate against a major currency, with the central bank supporting the target by buying and selling the national currency in foreign exchange markets. There are recent examples of developed economies using such an approach. In the 1980s, following the failure of its policy of trying to control UK inflation by setting medium-term goals for money supply growth (see Example 5), the UK government decided to operate monetary policy such that the sterling's exchange rate equalled a pre-determined value in terms of German deutschemarks. The basic idea is that by tying a domestic economy's currency to that of an economy with a good track record on inflation, the domestic economy would effectively "import" the inflation experience of the low inflation economy.

Suppose that a developing country wished to maintain the value of its currency against the US dollar. The government and/or central bank would announce the currency exchange rate that they wished to target. To simplify matters, let us assume that the domestic inflation rates are very similar in both countries and that the monetary authorities of the developing economy have set an exchange rate target that is consistent with relative price levels in the two economies. Under these (admittedly unlikely) circumstances, in the absence of shocks, there would be no reason for the exchange rate to deviate significantly from this target level. So as long as domestic inflation closely mirrors US inflation, the exchange rate should remain close to its target (or within a target band). It is in this sense that a successful exchange rate policy imports the inflation of the foreign economy.

Now suppose that economic activity in the developing economy starts to rise rapidly and that domestic inflation in the developing economy rises above the level in the United States. With a freely floating exchange rate regime, the currency of the developing economy would start to fall against the dollar. To arrest this fall, and to protect the exchange rate target, the developing economy's monetary authority sells foreign currency reserves and buys its own currency. This has the effect of reducing the domestic money supply and increasing short-term interest rates. The developing economy experiences a monetary policy tightening which, if expected to bring down inflation, will cause its exchange rate to rise against the dollar.

By contrast, in a scenario in which inflation in the developing country fell relative to the United States, the central bank would need to sell the domestic currency to support the target, tending to increase the domestic money supply and reduce the rate of interest.

In practice, the interventions of the developing economy central bank will simply stabilize the value of its currency, with many frequent adjustments. But this simplistic example should demonstrate one very important fact: *When the central bank or monetary authority chooses to target an exchange rate, interest rates and conditions in the domestic economy must adapt to accommodate this target and domestic interest rates and money supply can become more volatile.*

The monetary authority's commitment to and ability to support the exchange rate target must be credible for exchange rate targeting to be successful. If that is not the case, then speculators may trade against the monetary authority. Speculative attacks forced sterling out of the European Exchange Rate Mechanism in 1992. The fixed exchange rate regime was abandoned and the United Kingdom allowed its currency to float freely. Eventually, the UK government adopted a formal inflation target in 1997. Similarly, in the Asian financial crisis of 1997–1998, Thailand's central bank tried to defend the Thai baht against speculative attacks for much of the first half of 1997 but then revealed at the beginning of July that it had no reserves left. The subsequent devaluation triggered a debt crisis for banks and companies that had borrowed in foreign currency, and contagion spread throughout Asia.

Despite these risks, many currencies are pegged to other currencies, most notably the US dollar. Exhibit 11 shows a list of some of the currencies that were pegged to (fixed against) the US dollar at the end of 2018. Other currencies operate under a "managed exchange rate policy," where they are allowed to fluctuate within a range that is maintained by a monetary authority via market intervention. Dollarization occurs when a country adopts the US dollar as their functional currency. This is stronger than pegging to the dollar because under dollarization the US dollar replaces the previous national currency. Exhibit 11 breaks out countries that peg their currency to the dollar and those that have adopted the US dollar as their currency.

**Exhibit 11 Select Currencies Pegged to the US Dollar, as of December 2018****Pegged to USD**

- |                 |                        |
|-----------------|------------------------|
| • Bermuda       | • Saudi Arabia         |
| • Bahamas       | • Qatar                |
| • Lebanon       | • United Arab Emirates |
| • Hong Kong SAR |                        |

**Dollarized**

- |                     |                                |
|---------------------|--------------------------------|
| • Panama (1904)     | • El Salvador (2000)           |
| • Ecuador (2000)    | • Caribbean Netherlands (2011) |
| • East Timor (2001) |                                |

**EXAMPLE 10****Exchange Rate Targeting**

- 1 When the central bank chooses to target a specific value for its exchange rate:
  - A it must also target domestic inflation.
  - B it must also set targets for broad money growth.
  - C conditions in the domestic economy must adapt to accommodate this target.
- 2 With regard to monetary policy, what is the hoped for benefit of adopting an exchange rate target?
  - A Freedom to pursue redistributive fiscal policy
  - B Freedom to set interest rates according to domestic conditions
  - C To “import” the inflation experience of the economy whose currency is being targeted
- 3 Which of the following is *least* likely to be an impediment to the successful implementation of monetary policy in developing economies?
  - A Fiscal deficits
  - B Rapid financial innovation
  - C Absence of a liquid government bond market

**Solution to 1:**

C is correct. The adoption of an exchange rate target requires that the central bank set interest rates to achieve this target. If the target comes under pressure, domestic interest rates may have to rise, regardless of domestic conditions. It may have a “target” level of inflation in mind as well as “targets” for broad money growth, but as long as it targets the exchange rate, domestic inflation and broad money trends must simply be allowed to evolve.

**Solution to 2:**

C is correct. Note that interest rates have to be set to achieve this target and are therefore subordinate to the exchange rate target and partially dependent on economic conditions in the foreign economy.

**Solution to 3:**

A is correct. Note that the absence of a liquid government bond market through which a central bank can enact open market operations and/or repo transactions will inhibit the implementation of monetary policy—as would rapid financial innovation because such innovation can change the relationship between money and economic activity. Fiscal deficits, on the other hand, are not normally an impediment to the implementation of monetary policy, although they could be if they were perceived to be unsustainable.

## 2.4 Contractionary and Expansionary Monetary Policies and the Neutral Rate

Most central banks will adjust liquidity conditions by adjusting their official policy rate.<sup>10</sup> When they believe that economic activity is likely to lead to an increase in inflation, they might increase interest rates, thereby reducing liquidity. In these cases, market analysts describe such actions as **contractionary** because the policy is designed to cause the rate of growth of the money supply and the real economy to contract (see Exhibit 7 for the possible transmission mechanism here). Conversely, when the economy is slowing and inflation and monetary trends are weakening, central banks may increase liquidity by cutting their target rate. In these circumstances, monetary policy is said to be **expansionary**.

Thus, when policy rates are high, monetary policy may be described as contractionary; when low, they may be described as expansionary. But what are they “high” and “low” in comparison to?

The **neutral rate of interest** is often taken as the point of comparison. One way of characterizing the neutral rate is to say that it is that rate of interest that neither spurs on nor slows down the underlying economy. As such, when policy rates are above the neutral rate, monetary policy is contractionary; when they are below the neutral rate, monetary policy is expansionary. The neutral rate should correspond to the average policy rate over a business cycle.

However, economists’ views of the neutral rate for any given economy might differ, and therefore, their view of whether monetary policy is contractionary, neutral, or expansionary might differ too. What economists do agree on is that the neutral policy rate for any economy comprises two components:

- Real trend rate of growth of the underlying economy, and
- Long-run expected inflation.

The real trend rate of growth of an economy is also difficult to discern, but it corresponds to that rate of economic growth that is achievable in the long run that gives rise to stable inflation. If we are thinking about an economy with a credible inflation-targeting regime, where the inflation target is say 2 percent per year and where an analyst believes that the economy can grow sustainably over the long term at a rate of 2.5 percent per year, then they might also estimate the neutral rate to be:

$$\text{Neutral rate} = \text{Trend growth} + \text{Inflation target} = 2.5\% + 2\% = 4.5\% \quad (4)$$

<sup>10</sup> Although, if they have reduced their policy rate to 0 percent, to increase liquidity further they have to resort to less-conventional monetary policy measures.

The analyst would therefore describe the central bank's monetary policy as being contractionary when its policy rate is above 4.5 percent and expansionary when it is below this level.

In practice, central banks often indicate what they believe to be the neutral rate of interest for their economy too. But determining this "neutral rate" is more art than science. For example, many analysts have recently revised down their estimates of trend growth for many western countries following the collapse of the credit bubble, because in many cases, the governments and private individuals of these economies are now being forced to reduce consumption levels and pay down their debts.

### *What's the Source of the Shock to the Inflation Rate?*

An important aspect of monetary policy for those charged with its conduct is the determination of the source of any shock to the inflation rate. Suppose that the monetary authority sees that inflation is rising beyond its target, or simply in a way that threatens price stability. If this rise was caused by an increase in the confidence of consumers and business leaders, which in turn has led to increases in consumption and investment growth rates, then we could think of it as being a **demand shock**. In this instance, it might be appropriate to tighten monetary policy in order to bring the inflationary pressures generated by these domestic demand pressures under control.

However, suppose instead that the rise in inflation was caused by a rise in the price of oil (for the sake of argument). In this case, the economy is facing a **supply shock**, and raising interest rates might make a bad situation worse. Consumers are already facing an increase in the cost of fuel prices that might cause profits and consumption to fall and eventually unemployment to rise. Putting up interest rates in this instance might simply exacerbate the oil price-induced downturn, which might ultimately cause inflation to fall sharply.

It is important, then, for the monetary authority to try to identify the source of the shock before engineering a contractionary or expansionary monetary policy phase.

## **2.5 Limitations of Monetary Policy**

The limitations of monetary policy include problems in the transmission mechanism and the relative ineffectiveness of interest rate adjustment as a policy tool in deflationary environments.

### **2.5.1 Problems in the Monetary Transmission Mechanism**

In Exhibit 7, we presented a stylized representation of the monetary policy transmission mechanism, including the channels of bank lending rates, asset prices, expectations, and exchange rates. The implication of the diagram is that there are channels through which the actions of the central bank or monetary authority are transmitted to both the nominal and real economy. However, there may be some occasions when the will of the monetary authority is not transmitted seamlessly through the economy.

Suppose that a central bank raises interest rates because it is concerned about the strength of underlying inflationary pressures. Long-term interest rates are influenced by the path of expected short-term interest rates, so the outcome of the rate hike will depend on market expectations. Suppose that bond market participants think that short-term rates are already too high, that the monetary authorities are risking a recession, and that the central bank will likely undershoot its inflation target. This fall in inflation expectations could cause long-term interest rates to fall. That would make long-term borrowing cheaper for companies and households, which could in turn stimulate economic activity rather than cause it to contract.

Arguably, the more credible the monetary authority, the more stable the long end of the yield curve; moreover, the monetary authority will be more confident that its “policy message” will be transmitted throughout the economy. A term recently used in the marketplace is **bond market vigilantes**. These “vigilantes” are bond market participants who might reduce their demand for long-term bonds, thus pushing up their yields, if they believe that the monetary authority is losing its grip on inflation. That yield increase could act as a brake on any loose monetary policy stance. Conversely, the vigilantes may push long-term rates down by increasing their demand for long-dated government bonds if they expect that tight monetary policy is likely to cause a sharp slowdown in the economy, thereby loosening monetary conditions for long-term borrowers in the economy.

A credible monetary policy framework and authority will tend not to require the vigilantes to do the work for it.

In very extreme instances, there may be occasions where the demand for money becomes infinitely elastic—that is, where the demand curve is horizontal and individuals are willing to hold additional money balances without any change in the interest rate—so that further injections of money into the economy will not serve to further lower interest rates or affect real activity. This is known as a **liquidity trap**. In this extreme circumstance, monetary policy can become completely ineffective. The economic conditions for a liquidity trap are associated with the phenomenon of **deflation**.

### 2.5.2 Interest Rate Adjustment in a Deflationary Environment and Quantitative Easing as a Response

Deflation is a pervasive and persistent fall in a general price index and is more difficult for conventional monetary policy to deal with than inflation. This is because cutting nominal interest rates much below zero to stimulate the economy is difficult.<sup>11</sup> It is at this point that the economic conditions for a liquidity trap arise.

Deflation raises the real value of debt, while the persistent fall in prices can encourage consumers to put off consumption today, leading to a fall in demand that leads to further deflationary pressure. Thus a deflationary “trap” can develop, which is characterized by weak consumption growth, falling prices, and increases in real debt levels. Japan eventually found itself in such a position following the collapse of its property bubble in the early 1990s.

If conventional monetary policy—the adjustment of short-term interest rates—is no longer capable of stimulating the economy once the zero or even negative nominal interest rate bound has been reached, is monetary policy useless?

In the aftermath of the collapse of the high-tech bubble in November 2002, Federal Reserve Governor (now Chairman) Ben Bernanke gave a speech entitled “Deflation: Making Sure ‘It’ Doesn’t Happen Here.” In this speech, Bernanke stated that inflation was always and everywhere a monetary phenomenon, and he expressed great confidence that by expanding the money supply by various means (including dropping it out of a helicopter on the population below), the Federal Reserve as the monopoly supplier of money could always engineer positive inflation in the US economy. He said:

I am confident that the Fed would take whatever means necessary to prevent significant deflation in the United States and, moreover, that the US central bank, in cooperation with other parts of the government as needed, has sufficient policy instruments to ensure that any deflation that might occur would be both mild and brief.

<sup>11</sup> Interest rates were cut to below zero in several European countries in 2014 and subsequently in Japan in 2016.



Following the collapse of the credit bubble in 2008, a number of governments along with their central banks cut rates to (near) zero, including those in the United States and the United Kingdom. However, there was concern that the underlying economies might not respond to this drastic monetary medicine, mainly because the related banking crisis had caused banks to reduce their lending drastically. In order to kick start the process, both the Federal Reserve and the Bank of England effectively printed money and pumped it in to their respective economies. This “unconventional” approach to monetary policy, known as **quantitative easing** (QE), is operationally similar to open market purchase operations but conducted on a much larger scale.

The additional reserves created by central banks in a policy of quantitative easing can be used to buy any assets. The Bank of England chose to buy **gilts** (bonds issued by the UK government), where the focus was on gilts with three to five years maturity. The idea was that this additional reserve would kick-start lending, causing broad money growth to expand, which would eventually lead to an increase in real economic activity. But there is no guarantee that banks will respond in this way. In a difficult economic climate, it may be better to hold excess reserves rather than to lend to households and businesses that may default.

In the United States, the formal plan for QE mainly involved the purchase of mortgage bonds issued or guaranteed by Freddie Mac and Fannie Mae. Part of the intention was to push down mortgage rates to support the US housing market, as well as to increase the growth rate of broad money. Before implementing this formal program, the Federal Reserve intervened in several other markets that were failing for lack of liquidity, including interbank markets and the commercial paper market. These interventions had a similar effect on the Federal Reserve’s balance sheet and the money supply as the later QE program.

This first round of QE by the Federal Reserve was then followed by a further round of QE, known as QE2. In November 2010, the Federal Reserve judged that the US economy had not responded sufficiently to the first round of QE (QE1). The Fed announced that it would create \$600 billion and use this money to purchase long-dated US Treasuries in equal tranches over the following eight months. The purpose of QE2 was to ensure that long bond yields remained low in order to encourage businesses and households to borrow for investment and consumption purposes, respectively.

The final round of QE, known as QE3, was implemented in September 2012 to provide \$40 billion per month to purchase agency mortgage-backed securities “until the labor market improved substantially.” QE3 lasted until December 2013, when the Federal Reserve announced it was tapering back on these purchases. These purchases, and quantitative easing, ended 10 months later in October 2014.

As long as central banks have the appropriate authority from the government, they can purchase any assets in a quantitative easing program. But the risks involved in purchasing assets with credit risk should be clear. In the end, the central bank is just a special bank. If it accumulates bad assets that then turn out to create losses, it could face a fatal loss of confidence in its main product: fiat money.

### 2.5.3 Limitations of Monetary Policy: Summary

The ultimate problem for monetary authorities as they try to manipulate the supply of money in order to influence the real economy is that they cannot control the amount of money that households and corporations put in banks on deposit, nor can they easily control the willingness of banks to create money by expanding credit. Taken together, this also means that they cannot always control the money supply. Therefore, there are definite limits to the power of monetary policy.

**EXAMPLE 11****The Limits of Monetary Policy: The Case of Japan****The Background**

Between the 1950s and 1980s, Japan's economy achieved faster real growth than any other G7 economy. But the terrific success of the economy sowed the seeds of the problems that were to follow. The very high real growth rates achieved by Japan over four decades became built in to asset prices, particularly equity and commercial property prices. Toward the end of the 1980s, asset prices rose to even higher levels when the Bank of Japan followed a very easy monetary policy as it tried to prevent the Japanese yen from appreciating too much against the US dollar. However, when interest rates went up in 1989–1990 and the economy slowed, investors eventually came to believe that the growth assumptions that were built in to asset prices and other aspects of the Japanese economy were unrealistic. This realization caused Japanese asset prices to collapse. For example, the Nikkei 225 stock market index reached 38,915 in 1989; by the end of March 2003, it had fallen by 80 percent to 7,972. The collapse in asset prices caused wealth to decline dramatically. Consumer confidence understandably fell sharply too, and consumption growth slowed. Corporate spending also fell, while bank lending contracted sharply in the weak economic climate. Although many of these phenomena are apparent in all recessions, the situation was made worse when deflation set in. In an environment when prices are falling, consumers may put off discretionary spending today until tomorrow; by doing this, however, they exacerbate the deflationary environment. Deflation also raises the real value of debts; as deflation takes hold, borrowers find the real value of their debts rising and may try to increase their savings accordingly. Once again, such actions exacerbate the recessionary conditions.

**The Monetary Policy Response**

Faced with such a downturn, the conventional monetary policy response is to cut interest rates to try to stimulate real economic activity. The Japanese central bank, the Bank of Japan, cut rates from 8 percent in 1990 to 1 percent by 1996. By February 2001, the Japanese policy rate was cut to zero where it stayed.

Once rates are at or near zero, there are two broad approaches suggested by theory, though the two are usually complementary. First, the central bank can try to convince markets that interest rates will remain low for a long time, even after the economy and inflation pick up. This will tend to lower interest rates along the yield curve. Second, the central bank can try to increase the money supply by purchasing assets from the private sector, so-called quantitative easing. The Bank of Japan (BoJ) did both in 2001. It embarked on a program of quantitative easing supplemented by an explicit promise not to raise short-term interest rates until deflation had given way to inflation.

Quantitative easing simply involves the printing of money by the central bank. In practice, this involved the BoJ using open market operations to add reserves to the banking system through the direct purchase of government securities in the open market.

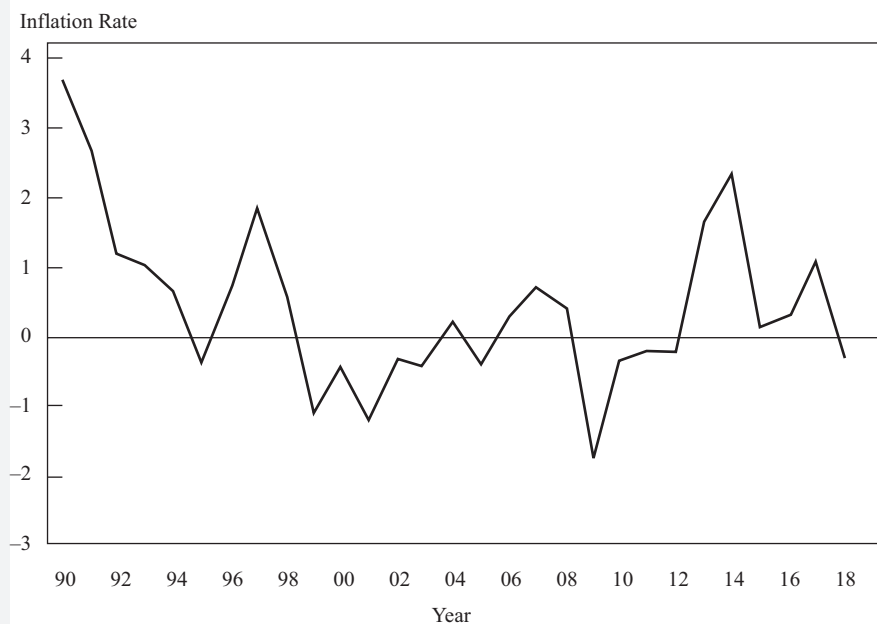
The reserve levels became the new target. The BoJ's monetary policy committee determined the level of reserves and the quantity of bond purchases that should be undertaken, rather than voting on the policy rate.



The success of this policy is difficult to judge. As the chart below shows, although deflation turned to inflation for a while, it returned to deflation in 2008–2009 when the Japanese economy suffered a sharp recession along with much of the rest of the world. At that time, having reversed its QE policy during 2004–2008 by reducing its bond holdings, the Bank of Japan began to buy again.

The Bank of Japan ramped up its asset purchases starting in 2013, when other central banks began to unwind their QE programs. At the beginning of 2013, BoJ Assets to Japanese GDP were approximately 30%. By mid-2018, BoJ assets to Japanese GDP were almost 100%! Economists debate the point, but arguably, even the Bank of Japan's much larger program of QE has not been able to eliminate deflation. The Japanese experience suggests that there may be limits to the power of monetary policy.

### Exhibit 12 Inflation and Deflation in Japan



Source: [www.statbureau.org/en/japan/inflation-tables](http://www.statbureau.org/en/japan/inflation-tables).

### EXAMPLE 12

#### Evaluating Monetary Policy

- 1 If an economy's trend GDP growth rate is 3 percent and its central bank has a 2 percent inflation target, which policy rate is *most consistent* with an expansionary monetary policy?
  - A 4 percent
  - B 5 percent
  - C 6 percent

- 2 An increase in a central bank's policy rate might be expected to reduce inflationary pressures by:
- A reducing consumer demand.
  - B reducing the foreign exchange value of the currency.
  - C driving up asset prices leading to an increase in personal sector wealth.
- 3 Which of the following statements *best* describes a fundamental limitation of monetary policy? Monetary policy is limited because central bankers:
- A cannot control the inflation rate perfectly.
  - B are appointed by politicians and are therefore never truly independent.
  - C cannot control the amount of money that economic agents put in banks, nor the willingness of banks to make loans.

**Solution to 1:**

A is correct. The neutral rate of interest, which in this example is 5 percent, is considered to be that rate of interest that neither spurs on nor slows down the underlying economy. As such, when policy rates are above the neutral rate, monetary policy is contractionary; when they are below the neutral rate, monetary policy is expansionary. It comprises two components: the real trend rate of growth of the underlying economy (in this example, 3 percent) and long-run expected inflation (in this example, 2 percent).

**Solution to 2:**

A is correct. If an increase in the central bank's policy rate is successfully transmitted via the money markets to other parts of the financial sector, consumer demand might decline as the rate of interest on mortgages and other credit rises. This decline in consumer demand should, all other things being equal and amongst other affects, lead to a reduction in upward pressure on consumer prices.

**Solution to 3:**

C is correct. Central bankers do not control the decisions of individuals and banks that can influence the money creation process.

## 3

### FISCAL POLICY

The second set of tools used for influencing economic activity consists of the tools associated with fiscal policy. These involve the use of government spending and changing tax revenue to affect a number of aspects of the economy:

- Overall level of aggregate demand in an economy and hence the level of economic activity.
- Distribution of income and wealth among different segments of the population.
- Allocation of resources between different sectors and economic agents.

Often, a discussion of fiscal policy focuses on the impact of changes in the difference between government spending and revenue on the aggregate economy, rather than on the actual levels of spending and revenue themselves.

### 3.1 Roles and Objectives of Fiscal Policy

A primary aim for fiscal policy is to help manage the economy through its influence on aggregate national output, that is, real GDP.

#### 3.1.1 *Fiscal Policy and Aggregate Demand*

Aggregate demand is the amount companies and households plan to spend. We can consider a number of ways that fiscal policy can influence aggregate demand. For example, an **expansionary** policy could take one or more of the following forms:

- Cuts in personal income tax raise disposable income with the objective of boosting aggregate demand.
- Cuts in sales (indirect) taxes to lower prices which raises real incomes with the objective of raising consumer demand.
- Cuts in corporation (company) taxes to boost business profits, which may raise capital spending.
- Cuts in tax rates on personal savings to raise disposable income for those with savings, with the objective of raising consumer demand.
- New public spending on social goods and infrastructure, such as hospitals and schools, boosting personal incomes with the objective of raising aggregate demand.

We must stress, however, that the reliability and magnitude of these relationships will vary over time and from country to country. For example, in a recession with rising unemployment, it is not always the case that cuts in income taxes will raise consumer spending because consumers may wish to raise their precautionary (rainy day) saving in anticipation of further deterioration in the economy. Indeed, in very general terms economists are often divided into two camps regarding the workings of fiscal policy: **Keynesians** believe that fiscal policy can have powerful effects on aggregate demand, output, and employment when there is substantial spare capacity in an economy. **Monetarists** believe that fiscal changes only have a temporary effect on aggregate demand and that monetary policy is a more effective tool for restraining or boosting inflationary pressures. Monetarists tend not to advocate using monetary policy for countercyclical adjustment of aggregate demand. This intellectual division will naturally be reflected in economists' divergent views on the efficacy of the large fiscal expansions observed in many countries following the credit crisis of 2008, along with differing views on the possible impact of quantitative easing.

#### 3.1.2 *Government Receipts and Expenditure in Major Economies*

In Exhibit 13, we present the total government revenues as a percentage of GDP for some major economies. This is the share of a country's output that is gathered by the government through taxes and such related items as fees, charges, fines, and capital transfers. It is often considered as a summary measure of the extent to which a government is involved both directly and indirectly in the economic activity of a country.

Taxes are formally defined as compulsory, unrequited payments to the general government (they are unrequited in the sense that benefits provided by a government to taxpayers are usually not related to payments). Exhibit 13 contains taxes on incomes and profits, social security contributions, indirect taxes on goods and services, employment taxes, and taxes on the ownership and transfer of property.

**Exhibit 13 General Government Revenues as Percent of GDP**

|                | 1995 | 2000 | 2005 | 2008 | 2010 | 2015 |
|----------------|------|------|------|------|------|------|
| Australia      | 34.5 | 36.1 | 36.5 | 35.3 | 32.4 | 34.9 |
| Germany        | 45.1 | 46.4 | 43.6 | 43.8 | 43.0 | 44.5 |
| Japan          | 31.2 | 31.4 | 31.7 | 34.4 | 30.6 | 35.7 |
| United Kingdom | 38.2 | 40.3 | 40.8 | 42.2 | 38.2 | 38.0 |
| United States  | 33.8 | 35.4 | 33.0 | 32.3 | 30.9 | 33.4 |
| OECD           | 37.9 | 39.0 | 37.7 | 37.9 | 39.8 | 40.9 |

Source: Organisation for Economic Co-Operation and Development (OECD).

Taxes on income and profits have been fairly constant for the Organisation for Economic Co-Operation and Development (OECD) countries overall at around 12.5–13 percent of GDP since the mid-1990s, while taxes on goods and services have been steady at about 11 percent of GDP for that period. Variations between countries can be substantial; taxes on goods and services are around 5 percent of GDP for the United States and Japan but over 16 percent for Denmark.

Exhibit 14 shows the percentage of GDP represented by government expenditure in a variety of major economies over time. Generally, these have been fairly constant since 1995, though Germany had a particularly high number at the start of the period because of reunification costs. The impacts of governments' fiscal stimulus programs in the face of the 2008–2009 financial crisis show up as significant increases in government expenditures in Exhibit 14 and increases in government deficits in Exhibit 15 between 2008 and 2010.

**Exhibit 14 General Government Expenditures as Percent of GDP**

|                | 1995 | 2000 | 2005 | 2008 | 2010 | 2015 |
|----------------|------|------|------|------|------|------|
| Australia      | 38.2 | 35.2 | 34.8 | 34.3 | 34.4 | 36.2 |
| Germany        | 54.8 | 45.1 | 46.9 | 43.8 | 47.3 | 43.9 |
| Japan          | 36.0 | 39.0 | 38.4 | 37.1 | 39.6 | 39.4 |
| United Kingdom | 44.1 | 36.6 | 44.0 | 47.5 | 47.6 | 42.2 |
| United States  | 37.1 | 33.9 | 36.2 | 38.8 | 42.9 | 37.6 |
| OECD           | 42.7 | 38.7 | 40.5 | 41.4 | 45.2 | 41.8 |

Source: OECD.

Clearly, the possibility that fiscal policy can influence output means that it may be an important tool for **economic stabilization**. In a recession, governments can raise spending (**expansionary fiscal policy**) in an attempt to raise employment and output. In boom times—when an economy has full employment and wages and prices are rising too fast—then government spending may be reduced and taxes raised (**contractionary fiscal policy**).

Hence, a key concept is the **budget surplus/deficit**, which is the difference between government revenue and expenditure for a fixed period of time, such as a fiscal or calendar year. Government revenue includes tax revenues net of transfer payments; government spending includes interest payments on the government debt. Analysts often focus on changes in the budget surplus or deficit from year to year as indicators of whether the fiscal policy is getting tighter or looser. An increase in a budget

surplus would be associated with contractionary fiscal policy, while a rise in a deficit is an expansionary fiscal policy. Of course, over the course of a business cycle the budget surplus will vary automatically in a countercyclical way. For example, as an economy slows and unemployment rises, government spending on social insurance and unemployment benefits will also rise and add to aggregate demand. This is known as an **automatic stabilizer**. Similarly, if boom conditions ensue and employment and incomes are high, then progressive income and profit taxes are rising and also act as automatic stabilizers increasing budget surplus or reducing budget deficit. The great advantage of automatic stabilizers is that they are indeed automatic, not requiring the identification of shocks to which policymakers must consider a response. By reducing the responsiveness of the economy to shocks, these automatic stabilizers reduce output fluctuations. Automatic stabilizers should be distinguished from discretionary fiscal policies, such as changes in government spending or tax rates, which are actively used to stabilize aggregate demand. If government spending and revenues are equal, then the budget is **balanced**.

**Exhibit 15 General Government Net Borrowing or Lending as Percent of GDP**

|                | 1995 | 2000 | 2005 | 2008 | 2010  | 2015 |
|----------------|------|------|------|------|-------|------|
| Australia      | -3.7 | 0.9  | 1.7  | -3.8 | -4.4  | -2.2 |
| Germany        | -9.7 | 1.3  | -3.3 | -0.2 | -4.2  | 0.8  |
| Japan          | -4.7 | -7.6 | -6.7 | -4.1 | -9.1  | -3.6 |
| United Kingdom | -5.8 | 3.7  | -3.3 | -5.1 | -9.4  | -4.2 |
| United States  | -3.3 | 1.5  | -3.3 | -7.0 | -12.0 | -4.2 |
| OECD           | -4.8 | 0.2  | -2.7 | -1.5 | -5.1  | -1.9 |

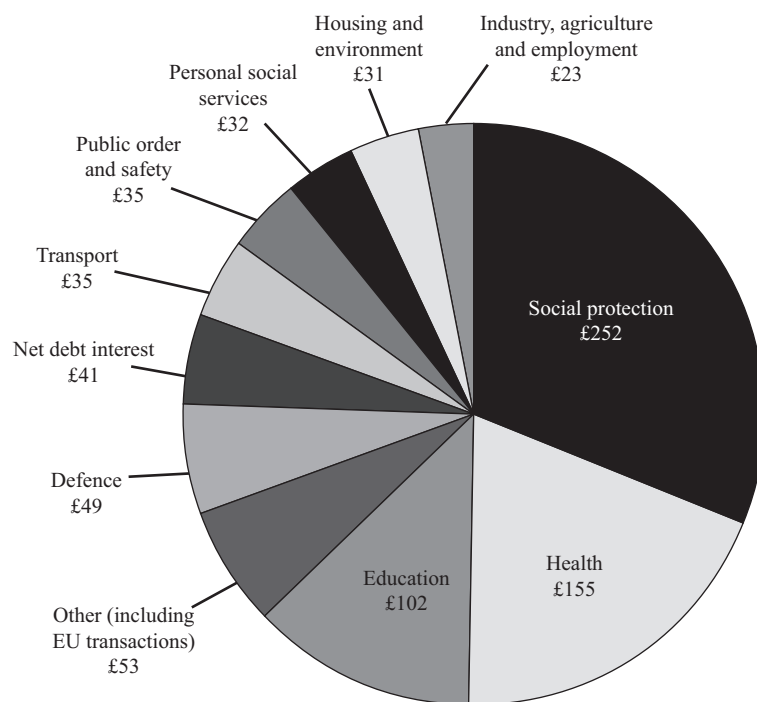
Source: OECD.

### EXAMPLE 13

#### Sources and Uses of Government Cash Flows: The Case of the United Kingdom

The precise components of revenue and expenditure will of course vary over time and between countries. But, as an example of the breakdown of expenditure and revenue, in Exhibits 16 and 17 we have presented the budget projections of the United Kingdom for 2018/2019. The budget projected that total spending would come to £808bn, while total revenue would only be £769bn. The government was therefore forecasting a budget shortfall of £39bn for the fiscal year, meaning that it had an associated need to borrow £39bn from the private sector in the United Kingdom or the private and public sectors of other economies.

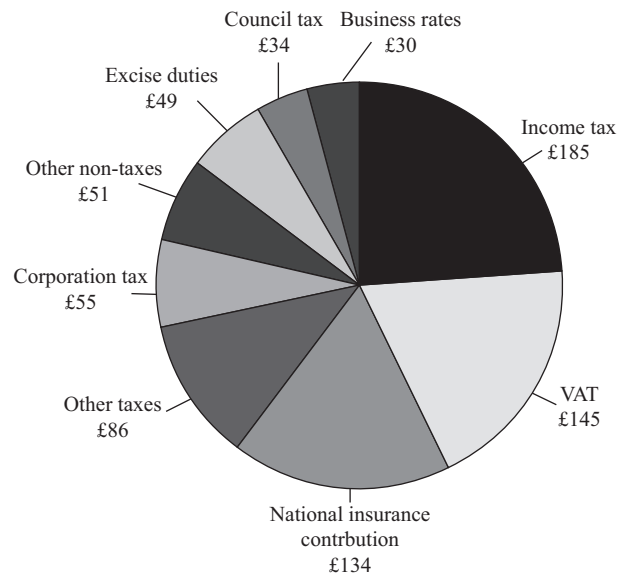
**Exhibit 16** Where Does the Money Go? The United Kingdom, 2018–2019



*Note:* All values are in billions of pounds.

*Source:* HM Treasury, United Kingdom.

**Exhibit 17 Where Does the Money Come From? The United Kingdom, 2018–2019**



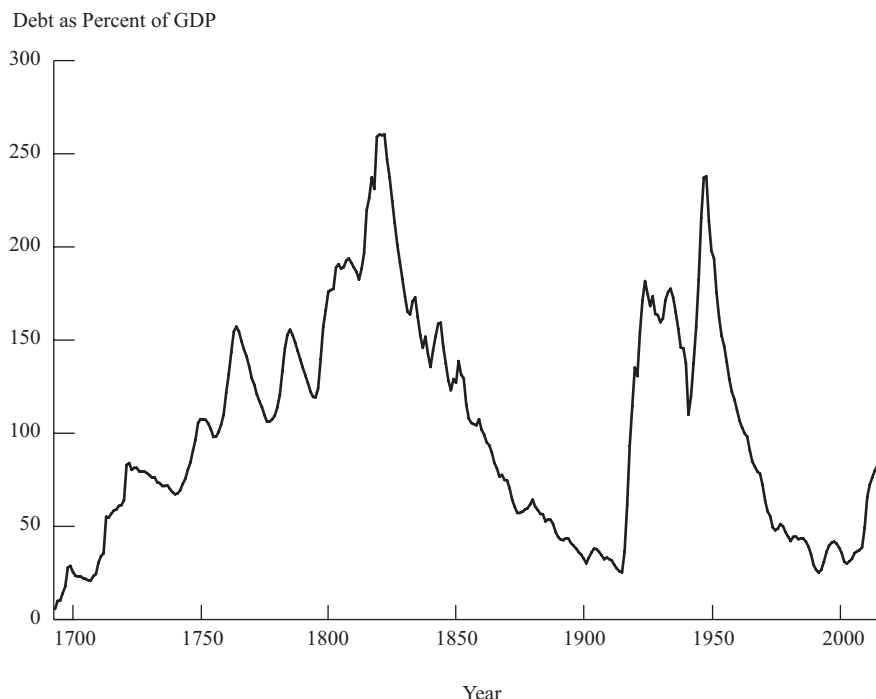
*Note:* All values are in billions of pounds.

*Source:* HM Treasury, United Kingdom.

### 3.1.3 Deficits and the National Debt

Government deficits are the difference between government revenues and expenditures over a period of calendar time, usually a year. Government (or national) debt is the accumulation over time of these deficits. Government deficits are financed by borrowing from the private sector, often via private pension and insurance fund portfolio investments. We saw above that governments are more likely to have deficits than surpluses over long periods of time. As a result, there may exist a large stock of outstanding government debt owned by the private sector. This will vary as the business cycle ebbs and flows. Exhibit 18 shows the time path of the ratio of public debt to GDP for the United Kingdom over several hundred years. It can be clearly seen that the major cause of fluctuations in that ratio through history has been the financing of wars, in particular the Napoleonic Wars of 1799–1815 and the First and Second World Wars of 1914–1918 and 1939–1945.



**Exhibit 18 UK National Debt as Percent of GDP (1692–2018)**

Source: <http://ukpublicspending.co.uk>.

With the onset of the credit crisis of 2008, governments actively sought to stimulate their economies through increased expenditures without raising taxes and revenues. This led to increased borrowing, shown in Exhibits 15 and 19, which has become a concern in the financial markets in 2010 for such countries as Greece. Indeed, between 2008 and 2009, central government debt rose from \$1.2 trillion to \$1.6 trillion in the United Kingdom and from \$5.8 trillion to \$7.5 trillion for the United States.<sup>12</sup> The fiscal expansion by governments in the face of the financial crisis seems to have significantly raised the General Government Debt to GDP ratio over the long term for many countries, as illustrated in Exhibit 19.

**Exhibit 19 General Government Debt as Percent of GDP**

|                | 1995 | 2000  | 2005  | 2008  | 2010  | 2015  |
|----------------|------|-------|-------|-------|-------|-------|
| Australia      | 57.3 | 41.1  | 30.0  | 30.0  | 41.9  | 64.1  |
| Germany        | 54.1 | 59.5  | 70.1  | 68.1  | 84.5  | 78.9  |
| Japan          | 94.7 | 142.6 | 176.2 | 181.6 | 207.5 | 237.4 |
| United Kingdom | 51.4 | 48.7  | 51.3  | 63.3  | 88.8  | 111.7 |
| United States  | 83.2 | 61.7  | 79.0  | 93.2  | 117.0 | 125.3 |
| OECD           | 65.8 | 59.9  | 59.5  | 60.8  | 73.0  | 85.3  |

Source: [www.oecd.org](http://www.oecd.org).

<sup>12</sup> [www.oecd.org](http://www.oecd.org).

Ultimately, if the ratio of debt to GDP rises beyond a certain unknown point, then the solvency of the country comes into question. An additional indicator for potential insolvency is the ratio of interest rate payments to GDP, which is shown for some major economies in Exhibit 20. These represent payments required of governments to service their debts as a percentage of national output and as such reflect both the size of debts and the interest charged on them. Such ratios could rise rapidly with the growing debt ratios of 2009 and 2010, particularly if the interest rates on the debt were to rise from the historically low levels.

**Exhibit 20 General Government Net Debt Interest Payments as Percent of GDP**

|                | 1995 | 2000 | 2005 | 2008 | 2010 | 2015 |
|----------------|------|------|------|------|------|------|
| Australia      | 3.5  | 1.7  | 1.0  | −0.5 | 0.0  | 0.3  |
| Germany        | 2.9  | 2.7  | 2.4  | 2.3  | 2.1  | 0.9  |
| Japan          | 1.3  | 1.5  | 0.8  | 0.3  | 0.6  | 0.4  |
| United Kingdom | 3.1  | 2.4  | 1.8  | 1.7  | 2.6  | 2.0  |
| United States  | 3.5  | 2.5  | 1.8  | 2.6  | 2.9  | 2.8  |
| OECD           | 3.6  | 2.5  | 1.8  | 1.9  | 2.1  | 1.9  |

Source: OECD.

Governments' spending was far in excess of revenues following the credit crisis of 2007–2010 as governments tried to stimulate their economies; this level of spending raised concerns in some quarters about the scale of governmental debt accumulation. Exhibit 19 shows that government debt relative to GDP for the OECD countries overall rose from 59.5 percent in 2005 to 85.3 percent in 2015. In Japan, where fiscal spending has been used to stimulate the economy from the early 1990s, the ratio has risen from 94.7 percent in 1995 to 237.4 percent in 2015. If an economy grows in real terms, so do the real tax revenues and hence the ability to service a growing real debt at constant tax rate levels. However, if the real growth in the economy is lower than the real interest rate on the debt, then the debt ratio will worsen even though the economy is growing because the debt burden (i.e., the real interest rate times the debt) grows faster than the economy. Hence, an important issue for governments and their creditors is whether their additional spending leads to sufficiently higher tax revenues to pay the interest on the debt used to finance the extra spending.

However, within a national economy, the real value of the outstanding debt will fall if the overall price level rises (i.e., inflation, and hence a rise in nominal GDP even if real GDP is static) and thus the ratio of debt to GDP may not be rising. But if the general price level falls (i.e., deflation), then the ratio may stay elevated for longer. If net interest payments rise rapidly and investors lose confidence in a government's ability to honour its debts, then financing costs may escalate even more quickly and make the situation unstable.

Should we be concerned about the size of a national debt (relative to GDP)? There are strong arguments both for and against:

The arguments against being concerned about national debt (relative to GDP) are as follows:

- The scale of the problem may be overstated because the debt is owed internally to fellow citizens. This is certainly the case in Japan and South Korea, where 93 percent is owned by local residents. Canada is similar with 90 percent owned by residents. However, other countries have a much lower

percentage owned internally. In the United States and United Kingdom, the figures are 53 percent and 73 percent, respectively, while Italy has only 46 percent owned by local residents.<sup>13</sup>

- A proportion of the money borrowed may have been used for capital investment projects or enhancing human capital (e.g., training, education); these should lead to raised future output and tax revenues.
- Large fiscal deficits require tax changes which may actually reduce distortions caused by existing tax structures.
- Deficits may have no net impact because the private sector may act to offset fiscal deficits by increasing saving in anticipation of future increased taxes. This argument is known as “Ricardian equivalence” and is discussed in more detail later.
- If there is unemployment in an economy, then the debt is not diverting activity away from productive uses (and indeed the debt could be associated with an increase in employment).

The arguments in favour of being concerned are:

- High levels of debt to GDP may lead to higher tax rates in the search for higher tax revenues. This may lead to disincentives to economic activity as the higher marginal tax rates reduce labour effort and entrepreneurial activity, leading to lower growth in the long run.
- If markets lose confidence in a government, then the central bank may have to print money to finance a government deficit. This may lead ultimately to high inflation, as evidenced by the economic history of Germany in the 1920s and more recently in Zimbabwe.
- Government borrowing may divert private sector investment from taking place (an effect known as **crowding out**); if there is a limited amount of savings to be spent on investment, then larger government demands will lead to higher interest rates and lower private sector investing.

An important distinction to make is between long- and short-run effects. Over short periods of time (say, a few years), crowding out may have little effect. If it lasts for a longer time, however, then capital accumulation in an economy may be damaged. Similarly, tax distortions may not be too serious over the short-term but will have a more substantial impact over many years.

#### EXAMPLE 14

##### Types of Fiscal Policies

- 1 Which of the following is *not* associated with an expansionary fiscal policy?
  - A A rise in capital gains taxes
  - B Cuts in personal income taxes
  - C New capital spending by the government on road building
- 2 Fiscal expansions will *most likely* have the most impact on aggregate output when the economy is in which of the following states?
  - A Full employment

<sup>13</sup> These data come from the Bank for International Settlements (BIS), IMF, and central bank websites. All figures are as of 2018.

- B Near full employment
  - C Considerable unemployment
- 3 Which one of the following is *most likely* a reason to *not* use fiscal deficits as an expansionary tool?
- A They may crowd out private investment.
  - B They may facilitate tax changes to reduce distortions in an economy.
  - C They may stimulate employment when there is substantial unemployment in an economy.

#### Solution to 1:

A is correct. A rise in capital gains taxes reduces income available for spending and hence reduces aggregate demand, other things being equal. Cutting income tax raises disposable income, while new road building raises employment and incomes; in both cases, aggregate demand rises and hence policy is expansionary.

#### Solution to 2:

C is correct. When an economy is close to full employment a fiscal expansion raising aggregate demand can have little impact on output because there are few spare unused resources (e.g., labour or idle factories); instead, there will be upward pressure on prices (i.e., inflation).

#### Solution to 3:

A is correct. A frequent argument against raises in fiscal deficits is that the additional borrowing to fund the deficit in financial markets will displace private sector borrowing for investment (i.e., “crowd it out”).

## 3.2 Fiscal Policy Tools and the Macroeconomy

We now look at the nature of the fiscal tools available to a government. Government spending can take a variety of forms:

- **Transfer payments** are welfare payments made through the social security system and, depending on the country, comprise payments for state pensions, housing benefits, tax credits and income support for poorer families, child benefits, unemployment benefits, and job search allowances. Transfer payments exist to provide a basic minimum level of income for low-income households, and they also provide a means by which a government can change the overall income distribution in a society. Note that these payments are not included in the definition of GDP because they do not reflect a reward to a factor of production for economic activity. Also, they are not considered to be part of general government spending on goods and services.
- **Current government spending** involves spending on goods and services that are provided on a regular, recurring basis—including health, education, and defense. Clearly, such spending will have a big impact on a country’s skill level and overall labour productivity.
- **Capital expenditure** includes infrastructure spending on roads, hospitals, prisons, and schools. This investment spending will add to a nation’s capital stock and affect productive potential for an economy.

Government spending can be justified on both economic and social grounds:

- To provide such services as defense that benefit all citizens equally.

- For infrastructure capital spending (e.g., roads) to help a country's economic growth.
- To guarantee a minimum level of income for poorer people and hence redistribute income and wealth (e.g., welfare and related benefits).
- To influence a government's economic objectives of low inflation and high employment and growth (e.g., management of aggregate demand).
- To subsidize the development of innovative and high-risk new products or markets (e.g., alternative energy sources).

Government revenues can take several forms:

- **Direct taxes** are levied on income, wealth, and corporate profits and include capital gains taxes, national insurance (or labour) taxes, and corporate taxes. They may also include a local income or property tax for both individuals and businesses. Inheritance tax on a deceased's estate will have both revenue-raising and wealth-redistribution aspects.
- **Indirect taxes** are taxes on spending on a variety of goods and services in an economy—such as the excise duties on fuel, alcohol, and tobacco as well as sales (or value-added tax)—and often exclude health and education products on social grounds. In addition, taxes on gambling may also be considered to have a social aspect in deterring such activity, while fuel duties will have an environmental purpose in making fuel consumption and hence travel more expensive.

Taxes can be justified both in terms of raising revenues to finance expenditures and in terms of income and wealth redistribution policies. Economists typically consider four desirable attributes of a tax policy:

- **Simplicity:** This refers to ease of compliance by the taxpayer and enforcement by the revenue authorities. The final liability should be certain and not easily manipulated.
- **Efficiency:** Taxation should interfere as little as possible in the choices individuals make in the market place. Taxes affect behaviour and should, in general, discourage work and investment as little as possible. A major philosophical issue among economists is whether tax policy should deliberately deviate from efficiency to promote “good” economic activities, such as savings, and discourage harmful ones, such as tobacco consumption. Although most would accept a limited role in guiding consumer choices, some will question if policymakers are equipped to decide on such objectives and whether there will be unwanted ancillary effects, such as giving tax breaks for saving among people who already save and whose behaviour does not change.
- **Fairness:** This refers to the fact that people in similar situations should pay the same taxes (“horizontal equity”) and that richer people should pay more taxes (“vertical equity”). Of course, the concept of fairness is really subjective. Still, most would agree that income tax rates should be progressive—that is, that households and corporations should pay proportionately more as their incomes rise. However, some people advocate “flat” tax rates, whereby all should pay the same proportion of taxable income.
- **Revenue sufficiency:** Although revenue sufficiency may seem obvious as a criterion for tax policy, there may be a conflict with fairness and efficiency. For example, one may believe that increasing income tax rates to reduce fiscal deficits reduces labour effort and that tax rate increases are thus an inefficient policy tool.

**EXAMPLE 15****Some Issues with Tax Policy**

- 1 *Incentives.* Some economists believe that income taxes reduce the incentive to work, save, and invest and that the overall tax burden has become excessive. These ideas are often associated with supply-side economics and the US economist Arthur Laffer. A variety of income tax cuts and simplifications have taken place in the United States since 1981, and although there is substantial controversy, some claim that work effort did rise (although tax cuts had little impact on savings). Similarly, some found that business investment did rise, while others claimed it was independent of such cuts.
- 2 *Fairness.* How do we judge the fairness of the tax system? One way is to calibrate the tax burden falling on different groups of people ranked by their income and to assess how changes in taxes affect these groups. Of course, this imposes huge data demands on investigators and must be considered incomplete. In the United States, it has been found that the federal system is indeed highly progressive. Many countries use such methods to analyze the impact of tax changes on different income groups when they announce their annual fiscal policy plans.
- 3 *Tax reform.* There is continuous debate on reforming tax policy. Should there be a flat-rate tax on labour income? Should all investment be immediately deducted for corporate taxes? Should more revenue be sourced from consumption taxes? Should taxes be indexed to inflation? Should dividends be taxed when profits have already been subject to tax? Should estates be taxed at all? Many of these issues are raised in the context of their impact on economic growth.

**EXAMPLE 16****Fiscal Tools**

- 1 Which of the following is *not* a tool of fiscal policy?
  - A A rise in social transfer payments
  - B The purchase of new equipment for the armed forces
  - C An increase in deposit requirements for the buying of houses
- 2 Which of the following is not an indirect tax?
  - A Excise duty
  - B Value-added Tax
  - C Employment taxes
- 3 Which of the following statements is *most* accurate?
  - A Direct taxes are useful for discouraging alcohol consumption.
  - B Because indirect taxes cannot be changed quickly, they are of no use in fiscal policy.
  - C Government capital spending decisions are slow to plan, implement, and execute and hence are of little use for short-term economic stabilization.

**Solution to 1:**

C is correct. Rises in deposit requirements for house purchases are intended to reduce the demand for credit for house purchases and hence would be considered a tool of monetary policy. This is a policy used actively in several countries, and is under consideration by regulators in other countries to constrain house price inflation.

**Solution to 2:**

C is correct. Both excise duty and VAT are applied to prices, whereas taxes on employment apply to labour income and hence are not indirect taxes.

**Solution to 3:**

C is correct. Capital spending is much slower to implement than changes in indirect taxes; and indirect taxes affect alcohol consumption more directly than direct taxes.

**3.2.1 The Advantages and Disadvantages of Using the Different Tools of Fiscal Policy**

The different tools used to expedite fiscal policy as a means to try to put or keep an economy on a path of positive, stable growth with low inflation have both advantages and disadvantages:

**Advantages:**

- Indirect taxes can be adjusted almost immediately after they are announced and can influence spending behaviour instantly and generate revenue for the government at little or no cost to the government.
- Social policies, such as discouraging alcohol or tobacco use, can be adjusted almost instantly by raising such taxes.

**Disadvantages:**

- Direct taxes are more difficult to change without considerable notice, often many months, because payroll computer systems will have to be adjusted (although the announcement itself may well have a powerful effect on spending behaviour more immediately). The same may be said for welfare and other social transfers.
- Capital spending plans take longer to formulate and implement, typically over a period of years. For example, building a road or hospital requires detailed planning, legal permissions, and implementation. This is often a valid criticism of an active fiscal policy and was widely heard during the US fiscal stimulus in 2009–2010. On the other hand, such policies add to the productive potential of an economy, unlike a change in personal or indirect taxes. Of course, the slower the impact of a fiscal change, the more likely other exogenous changes will already be influencing the economy before the fiscal change kicks in.

The above-mentioned tools may also have expectational effects at least as powerful as the direct effects. The announcement of future income tax rises a year ahead could potentially lead to reduced consumption immediately. Such delayed tax rises were a feature of UK fiscal policy of 2009–2010; however, the evidence is anecdotal because spending behaviour changed little until the delayed tax changes actually came into force.

We may also consider the relative potency of the different fiscal tools. Direct government spending has a far bigger impact on aggregate spending and output than income tax cuts or transfer increases; however, if the latter are directed at the poorest



in society (basically, those who spend all their income), then this will give a relatively strong boost. Further discussion and examples of these comparisons are given in section 4 below on the interaction between monetary and fiscal policy.

### 3.2.2 Modeling the Impact of Taxes and Government Spending: The Fiscal Multiplier

The conventional macroeconomic model has government spending,  $G$ , adding directly to aggregate demand,  $AD$ , and reducing it via taxes,  $T$ ; these comprise both indirect taxes on expenditures and direct taxes on factor incomes. Further government spending is increased via the payment of transfer benefits,  $B$ , such as social security payments. Hence, the net impact of the government sector on aggregate demand is:

$$G - T + B = \text{Budget surplus OR deficit} \quad (5)$$

Net taxes ( $NT$ ; taxes less transfers) reduce disposable income ( $YD$ ) available to individuals relative to national income or output ( $Y$ ) as follows:

$$YD = Y - NT = (1 - t) Y \quad (6)$$

where  $t$  is the **net tax rate**. Net taxes are often assumed to be proportional to national income,  $Y$ , and hence total tax revenue from net taxes is  $tY$ . If  $t = 20\%$  or  $0.2$ , then for every \$1 rise in national income, net tax revenue will rise by 20 cents and household disposable income will rise by 80 cents.

The **fiscal multiplier** is important in macroeconomics because it tells us how much output changes as exogenous changes occur in government spending or taxation. The recipients of the increase in government spending will typically save a proportion  $1 - c$  of each additional dollar of disposable income, where  $c$  is the **marginal propensity to consume** (MPC) this additional income. Ignoring income taxes, we can see that \$ $c$  will, in turn, be spent by these recipients on more goods and services. The recipients of this \$ $c$  will themselves spend a proportion  $c$  of this additional income (i.e., \$ $c \times c$ , or  $c$ -squared). This process continues with income and spending growing at a constant rate of  $c$  as it passes from hand to hand through the economy. This is the familiar geometric progression with constant factor  $c$ , where  $0 < c < 1$ . The sum of this geometric series is  $1/(1 - c)$ .

We define  $s$  as the **marginal propensity to save** (MPS), the amount saved out of an additional dollar of disposable income. Because  $c + s = 1$ , hence  $s = 1 - c$ .

**Exhibit 21 Disposable Income, Saving, and the MPC**

| Income | Income tax | Disposable income | Consumption | Saving |
|--------|------------|-------------------|-------------|--------|
| \$100  | \$20       | \$80              | \$72        | \$8    |

In Exhibit 21, the MPC out of disposable income is 90% or 0.9 (72/80). The MPS is therefore  $1 - 0.9$  or 0.1

For every dollar of new (additional) spending, total incomes and spending rises by  $\$1/(1 - c)$ . And because  $0 < c < 1$ , this must be  $> 1$ ; this is the multiplier. If  $c = 0.9$  (or individuals spend 90 percent of additions to income), then the multiplier =  $1/(1 - 0.9) = 10$ .

A formal definition of the multiplier would be the ratio of the change in equilibrium output to the change in autonomous spending that caused the change. This is a monetary measure, but because prices are assumed to be constant in this analysis, real and monetary amounts are identical. Given that fiscal policy is about changes in government spending,  $G$ , net taxes,  $NT$ , and tax rates,  $t$ , we can see that the multiplier is an important tool for calibrating the possible impact of policy changes on

output. How can we introduce tax changes into the multiplier concept? We do this by introducing the idea of disposable income,  $YD$ , defined as income less income taxes net of transfers,  $Y - NT$ .

**Households** spend a proportion  $c$  of disposable income,  $YD$ , that is,  $cYD$  or  $c(Y - NT)$  or  $c(1 - t)Y$ . The **marginal propensity to consume** in the presence of taxes is then  $c(1 - t)$ . If the government increases spending, say on road building, by an amount,  $G$ , then disposable income rises by  $(1 - t)G$  and consumer spending by  $c(1 - t)G$ . Provided there are unused sources of capital and labour in the economy, this leads to a rise in aggregate demand and output; the recipients of this extra consumption spending will have  $(1 - t)c(1 - t)G$  extra disposable income available and will spend  $c$  of it. This cumulative extra spending and income will continue to spread through the economy at a decreasing rate as  $0 < c(1 - t) < 1$ . The overall final impact on aggregate demand and output will effectively be the sum of this decreasing geometric series with common ratio  $c(1 - t)$ , and this sums to  $1/[1 - c(1 - t)]$ . This is known as the **fiscal multiplier** and is very relevant to studies of fiscal policy as changes in  $G$  or tax rates will affect output in an economy through the value of the multiplier.

For example, if the tax rate is 20 percent, or 0.2, and the marginal propensity to spend is 90 percent, or 0.9, then the fiscal multiplier will be:  $1/[1 - 0.9(1 - 0.2)]$  or  $1/0.28 = 3.57$ . In other words, if the government raises  $G$  by \$1 billion, total incomes and spending rise by \$3.57 billion.

Discretionary fiscal policy (see below) will involve changes in these variables with a view to influencing  $Y$ .

### 3.2.3 The Balanced Budget Multiplier

If a government increases  $G$  by the same amount as it raises taxes, the aggregate output actually rises. Why is this?

It is because the marginal propensity to spend out of disposable income is less than 1, and hence for every dollar less in  $YD$ , spending only falls \$ $c$ . Hence, aggregate spending falls less than the tax rise by a factor of  $c$ . A balanced budget leads to a rise in output, which in turn leads to further rises in output and incomes via the multiplier effect.

Suppose an economy has an equilibrium output or income level of \$1,000 consisting of \$900 of consumption and \$100 of investment spending, which is fixed and not related to income. If government spending is set at \$200, financed by a tax rate of 20 percent (giving tax revenue of \$200), what will happen to output? First, additional government spending of \$200 will raise output by that amount; but will taxes of \$200 reduce output by a similar amount? Not if the MPC is less than 1; suppose it is 0.9, and hence spending will only fall by 90 percent of \$200, or \$180. The initial impact of the balanced fiscal package on aggregate demand will be to raise it by  $\$200 - \$180 = \$20$ . This additional output will, in turn, lead to further increases in income and output through the multiplier effect.

Even though the above policy involved a combination of government spending and tax increases that initially left the government's budget deficit/surplus unchanged, the induced rise in output will lead to further tax revenue increases and a further change in the budget position. Could the government adjust the initial change in spending to offset exactly the eventual total change in tax revenues? The answer is "yes," and we can ask what will be the effect on output of this genuinely balanced budget change? This balanced budget multiplier always takes the value unity.

**EXAMPLE 17****Government Debt, Deficits, and Ricardo**

The total stock of government debt is the outstanding stock of IOUs issued by a government and not yet repaid. They are issued when the government has insufficient tax revenues to meet expenditures and has to borrow from the public. The size of the outstanding debt equals the cumulative quantity of net borrowing it has done, and the fiscal or budget deficit is added in the current period to the outstanding stock of debt. If the outstanding stock of debt falls, we have a negative deficit or a surplus.

If a government reduces taxation by \$10 billion one year and replaces that revenue with borrowing of \$10 billion from the public, will it have any real impact on the economy? The important issue here is how people perceive that action: Do they recognize what will happen over time as interest and bond principal have to be repaid out of future taxes? If so, they may think of the bond finance as equivalent to delayed taxation finance; thus, the reduction in current taxation will have no impact on spending because individuals save more in anticipation of higher future taxes to repay the bond. This is called **Ricardian equivalence** after the economist David Ricardo. If people do not correctly anticipate all the future taxes required to repay the additional government debt, then they feel wealthier when the debt is issued and may increase their spending, adding to aggregate demand.

Whether Ricardian equivalence holds in practice is ultimately an empirical issue and is difficult to calibrate conclusively given the number of things that are changing at any time in a modern economy.

### 3.3 Fiscal Policy Implementation: Active and Discretionary Fiscal Policy

In the following, we discuss major issues in fiscal policy implementation.

#### 3.3.1 Deficits and the Fiscal Stance

An important question is the extent to which the budget is a useful measure of the government's fiscal stance. Does the size of the deficit actually indicate whether fiscal policy is **expansionary** or **contractionary**? Clearly, such a question is important for economic policymakers insofar as the deficit can change for reasons unrelated to actual fiscal policy changes. For example, the **automatic stabilizers** mentioned earlier will lead to changes in the budget deficit unrelated to fiscal policy changes; a recession will cause tax revenues to fall and the budget deficit to rise. An observer may conclude that fiscal policy has been loosened and is expansionary and that no further government action is required.

To this end, economists often look at the **structural (or cyclically adjusted) budget deficit** as an indicator of the fiscal stance. This is defined as the deficit that would exist *if the economy was at full employment (or full potential output)*. Hence, if we consider a period of relatively high unemployment, such as 2009–2010 with around 9–10 percent of the workforce out of work in the United States and Europe, then the budget deficits in those countries would be expected to be reduced substantially if the economies returned to full employment. At this level, tax revenues would be higher and social transfers lower. Recent data for major countries are given in Exhibit 22, where negative numbers refer to deficits and positive numbers are surpluses.

**Exhibit 22 General Government Cyclically Adjusted Balances as Percent of GDP**

|                | 1995 | 2000 | 2005 | 2008 | 2010  | 2015 |
|----------------|------|------|------|------|-------|------|
| Australia      | −3.1 | 0.9  | 2.0  | −0.4 | −3.8  | −0.1 |
| Germany        | −9.5 | 0.9  | −2.6 | −0.8 | −3.3  | 0.7  |
| Japan          | −4.6 | −6.4 | −4.1 | −4.0 | −8.2  | −3.6 |
| United Kingdom | −5.6 | 0.8  | −4.5 | −5.6 | −7.6  | −4.3 |
| United States  | −2.9 | −0.4 | −5.4 | −7.1 | −10.0 | −3.5 |
| OECD           | −4.6 | −1.2 | −3.6 | −4.5 | −6.9  | −2.0 |

Source: OECD Economic Outlook, Volume 2018 Issue 1.

A further reason why actual government deficits may *not* be a good measure of fiscal stance is the distinction between real and nominal interest rates and the role of inflation adjustment when applied to budget deficits. Although national economic statistics treat the cash interest payments on debt as government expenditure it makes more sense to consider only the inflation-adjusted (or real) interest payments because the real value of the outstanding debt is being eroded by inflation. Automatic stabilizers—such as income tax, VAT, and social benefits—are important because as output and employment fall and reduce tax revenues, so *net* tax revenues also fall as unemployment benefits rise. This acts as a fiscal stimulus and serves to reduce the size of the multiplier, dampening the output response of whatever caused the fall in output in the first place. By their very nature, automatic stabilizers do not require policy changes; no policymaker has to decide that an economic shock has occurred and how to respond. Hence, the responsiveness of the economy to shocks is automatically reduced, as are movements in employment and output.

In addition to these automatic adjustments, governments also use discretionary fiscal adjustments to influence aggregate demand. These will involve tax changes and/or spending cuts or increases usually with the aim of stabilizing the economy. A natural question is why fiscal policy cannot stabilize aggregate demand completely, hence ensuring full employment at all times.

### 3.3.2 Difficulties in Executing Fiscal Policy

Fiscal policy cannot stabilize aggregate demand completely because the difficulties in executing fiscal policy cannot be completely overcome.

First, the policymaker does not have complete information on how the economy functions. It may take several months for policymakers to realize that an economy is slowing, because data appear with a considerable time lag and even then are subject to substantial revision. This is often called the **recognition lag** and has been likened to the problem of driving with the rear view mirror. Then, when policy changes are finally decided on, they may take many months to implement. This is the **action lag**. If a government decides to raise spending on capital projects to increase employment and incomes, for example, these may take many months to plan and put into action. Finally, the result of these actions on the economy will take additional time to become evident; this is the **impact lag**. These types of policy lags also occur in the case of discretionary monetary policy.

A second aspect of time in this process is the uncertainty of where the economy is heading independently of these policy changes. For example, a stimulus may occur simultaneously with a surprise rise in investment spending or in the demand for a country's exports just as discretionary government spending starts to rise. Macroeconomic forecasting models do not generally have a good track record for accuracy and hence

cannot be relied on to aid the policy-making process in this context. In addition, when discretionary fiscal adjustments are announced (or are already underway), private sector behaviour may well change leading to rises in consumption or investment, both of which will reinforce the effects of a rise in government expenditure. Again, this will make it difficult to calibrate the required fiscal adjustment to secure full employment.

There are wider macroeconomic issues also involved here.

- If the government is concerned with both unemployment *and* inflation in an economy, then raising aggregate demand toward the full employment level may also lead to a tightening labour market and rising wages and prices. The policy-maker may be reluctant to further fine tune fiscal policy in an uncertain world because it might induce inflation.
- If the budget deficit is already large relative to GDP and further fiscal stimulus is required, then the necessary increase in the deficit may be considered unacceptable by the financial markets when government funding is raised, leading to higher interest rates on government debt and political pressure to tackle the deficit.
- Of course, all this presupposes that we know the level of full employment, which is difficult to measure accurately. Fiscal expansion raises demand, but what if we are already at full employment, which will be changing as productive capacity changes and workers' willingness to work at various wage levels changes?
- If unused resources reflect a low supply of labour or other factors rather than a shortage of demand, then discretionary fiscal policy will not add to demand and will be ineffective, raising the risk of inflationary pressures in the economy.
- The issue of crowding out may occur: If the government borrows from a limited pool of savings, the competition for funds with the private sector may crowd out private firms with subsequent less investing and economic growth. In addition, the cost of borrowing may rise, leading to the cancellation of potentially profitable opportunities. This concept is the subject of continuing empirical debate and investigation.

#### EXAMPLE 18

### Evaluating Fiscal Policy

- 1 Which of the following statements is *least* accurate?
  - A The economic data available to policymakers have a considerable time lag.
  - B Economic models always offer an unambiguous guide to the future path of the economy.
  - C Surprise changes in exogenous economic variables make it difficult to use fiscal policy as a stabilization tool.
- 2 Which of the following statements is *least* accurate?
  - A Discretionary fiscal changes are aimed at stabilizing an economy.
  - B In the context of implementing fiscal policy, the recognition lag is often referred to as “driving in the rear view mirror.”
  - C Automatic fiscal stabilizers include new plans for additional road building by the government.
- 3 Which of the following statements regarding a fiscal stimulus is *most* accurate?

- A Accommodative monetary policy reduces the impact of a fiscal stimulus.
  - B Different statistical models will predict different impacts for a fiscal stimulus.
  - C It is always possible to predict precisely the impact of a fiscal stimulus on employment.
- 4 Which of the following statements is *most* accurate?
- A An increase in the budget deficit is always expansionary.
  - B An increase in government spending is always expansionary.
  - C The structural deficit is always larger than the deficit below full employment.
- 5 Crowding out refers to a:
- A fall in interest rates that reduces private investment.
  - B rise in private investment that reduces private consumption.
  - C rise in government borrowing that reduces the ability of the private sector to access investment funds.
- 6 A contractionary fiscal policy will always involve which of the following?
- A A balanced budget
  - B A reduction in government spending
  - C A fall in the budget deficit or rise in the surplus
- 7 Which one of the following statements is *most* accurate?
- A Ricardian equivalence refers to individuals having no idea of future tax liabilities.
  - B If there is high unemployment in an economy, then easy monetary and fiscal policies should lead to an expansion in aggregate demand.
  - C Governments do not allow political pressures to influence fiscal policies but do allow voters to affect monetary policies.

#### Solution to 1:

B is correct. Economic forecasts from models will always have an element of uncertainty attached to them and thus are not unambiguous or precise in their prescriptions. Once a fiscal policy decision has been made and implemented, unforeseen changes in other variables may affect the economy in ways that would lead to changes in the fiscal policy if we had perfect foresight. Note that it is true that official economic data may be available with substantial time lags, making fiscal judgements more difficult.

#### Solution to 2:

C is correct. New plans for road building are discretionary and not automatic.

#### Solution to 3:

B is correct. Different models embrace differing views on how the economy works, including differing views on the impact of fiscal stimuli.

#### Solution to 4:

A is correct. Note that increases in government spending may be accompanied by even bigger rises in tax receipts and hence may not be expansionary.



**Solution to 5:**

C is correct. A fall in interest rates is likely to lead to a rise in investment. Crowding out refers to government borrowing that reduces the ability of the private sector to invest.

**Solution to 6:**

C is correct. Note that a reduction in government spending could be accompanied by an even bigger fall in taxation, making it be expansionary.

**Solution to 7:**

B is correct. Note that governments often allow pressure groups to affect fiscal policy and that Ricardian equivalence involves individuals correctly anticipating future taxes, so A and C are not correct choices.

## THE RELATIONSHIP BETWEEN MONETARY AND FISCAL POLICY

# 4

Both monetary and fiscal policies can be used to try and influence the macroeconomy. But the impact of monetary policy on aggregate demand may differ depending on the fiscal policy stance. Conversely, the impact of fiscal policy might vary under various alternative monetary policy conditions. Clearly, policymakers need to understand this interaction. For example, they need to consider the impact of changes to the budget when monetary policy is accommodative as opposed to when it is restrictive: Can we expect the same impact on aggregate demand in both situations?

Although both fiscal and monetary policy can alter aggregate demand, they do so through differing channels with differing impact on the composition of aggregate demand. The two policies are not interchangeable. Consider the following cases in which the assumption is made that *wages and prices are rigid*:

- *Easy fiscal policy/tight monetary policy*: If taxes are cut or government spending rises, the expansionary fiscal policy will lead to a rise in aggregate output. If this is accompanied by a reduction in money supply to offset the fiscal expansion, then interest rates will rise and have a negative effect on private sector demand. We have higher output and higher interest rates, and government spending will be a larger proportion of overall national income.
- *Tight fiscal policy/easy monetary policy*: If a fiscal contraction is accompanied by expansionary monetary policy and low interest rates, then the private sector will be stimulated and will rise as a share of GDP, while the public sector will shrink.
- *Easy monetary policy/easy fiscal policy*: If both fiscal and monetary policy are easy, then the joint impact will be highly expansionary—leading to a rise in aggregate demand, lower interest rates (at least if the monetary impact is larger), and growing private and public sectors.
- *Tight monetary policy/tight fiscal policy*: Interest rates rise (at least if the monetary impact on interest rates is larger) and reduce private demand. At the same time, higher taxes and falling government spending lead to a drop in aggregate demand from both public and private sectors.



## 4.1 Factors Influencing the Mix of Fiscal and Monetary Policy

Although governments are concerned about stabilizing the level of aggregate demand at close to the full employment level, they are also concerned with the growth of potential output. To this end, encouraging private investment will be important. It may best be achieved by accommodative monetary policy with low interest rates and a tight fiscal policy to ensure free resources for a growing private sector.

At other times, the lack of a good quality, trained workforce—or perhaps a modern capital infrastructure—will be seen as an impediment to growth; thus, an expansion in government spending in these areas may be seen as a high priority. If taxes are not raised to pay for this, then the fiscal stance will be expansionary. If a loose monetary policy is chosen to accompany this expansionary spending, then it is *possible* that inflation may be induced. Of course, it is an open question as to whether policymakers can judge the appropriate levels of interest rates or fiscal spending levels.

Clearly, the mix of policies will be heavily influenced by the political context. A weak government may raise spending to accommodate the demands of competing vested interests (e.g., subsidies to particular sectors, such as agriculture in the EC), and thus a restrictive monetary policy may be needed to hold back the possibly inflationary growth in aggregate demand through raised interest rates and less credit availability.

Both fiscal and monetary policies suffer from lack of precise knowledge of where the economy is today, because data appear initially subject to revision and with a time lag. However, fiscal policy suffers from two further issues with regard to its use in the short run.

As we saw earlier, it is difficult to implement quickly because spending on capital projects takes time to plan, procure, and put into practice. In addition, it is politically easier to loosen fiscal policy than to tighten it; in many cases, automatic stabilizers are the source of fiscal tightening, because tax rates are not changing and political opposition is muted. Similarly, the independence of many central banks means that decisions on raising interest rates are outside the hands of politicians and thus can be taken more easily.

The interaction between monetary and fiscal policies was also implicitly evident in our discussion of Ricardian equivalence because if tax cuts have no impact on private spending as individuals anticipate future higher taxes, then clearly this may lead policymakers to favour monetary tools.

Ultimately, the interaction of monetary and fiscal policies in practice is an empirical question, which we touched on earlier. In their detailed research paper using the IMF'S Global Integrated Monetary and Fiscal Model (IMF 2009), IMF researchers examined four forms of coordinated global fiscal loosening over a two-year period, which will be reversed gradually after the two years are completed. These are:

- an increase in social transfers to all households,
- a decrease in tax on labour income,
- a rise in government investment expenditure, and
- a rise in transfers to the poorest in society.

The two types of monetary policy responses considered are:

- no monetary accommodation, so rising aggregate demand leads to higher interest rates immediately; or
- interest rates are kept unchanged (accommodative policy) for the two years.

The following important policy conclusions from this study emphasize the role of policy interactions:

- *No monetary accommodation:* Government spending increases have a much bigger effect (six times bigger) on GDP than similar size social transfers because the latter are not considered permanent, although real interest rates rise as monetary authorities react to rises in aggregate demand and inflation. Targeted social transfers to the poorest citizens have double the effect of the non-targeted transfers, while labour tax reductions have a slightly bigger impact than the latter.
- *Monetary accommodation:* Except for the case of the cut in labour taxes, fiscal multipliers are now much larger than when there is no monetary accommodation. The cumulative multiplier (i.e., the cumulative effect on real GDP over the two years divided by the percentage of GDP, which is a fiscal stimulus) is now 3.9 for government expenditure compared to 1.6 with no monetary accommodation. The corresponding numbers for targeted social transfer payments are 0.5 without monetary accommodation and 1.7 with it. The larger multiplier effects with monetary accommodation result from rises in aggregate demand and inflation, leading to falls in real interest rates and additional private sector spending (e.g., on investment goods). Labour tax cuts are less positive.

## 4.2 Quantitative Easing and Policy Interaction

What about the scenario of zero interest rates and deflation? Fiscal stimulus should still raise demand and inflation, lowering real interest rates and stimulating private sector demand. We saw earlier that quantitative easing has been a feature of major economies during 2009–2010. This involves the purchase of government or private securities by the central bank from individuals, institutions, or banks and substituting central bank balances for those securities. The ultimate aim is that recipients will subsequently increase expenditures, lending or borrowing in the face of raised cash balances and lower interest rates.

If the central bank purchases government securities on a large scale, it is effectively funding the budget deficit and the independence of monetary policy is an illusion. This so-called “printing of money” is feared by many economists as the monetization of the government deficit. Note that it is unrelated to the conventional inflation target of central banks, such as the Bank of England. Some economists question whether an independent central bank should engage in such activity.

## 4.3 The Importance of Credibility and Commitment

The IMF model implies that if governments run persistently high budget deficits, real interest rates rise and crowd out private investment, reducing each country’s productive potential. As individuals realize that deficits will persist, inflation expectations and longer-term interest rates rise: This reduces the effect of the stimulus by half.

Further, if there is a real lack of commitment to fiscal discipline over the longer term, (e.g., because of aging populations) and the ratio of government debt to GDP rose by 10 percentage points permanently in the United States alone, then world real interest rates would rise by 0.14 percent—leading to a 0.6 percent permanent fall in world GDP.

**EXAMPLE 19****Interactions of Monetary and Fiscal Policy**

- 1 In a world where Ricardian equivalence holds, governments would *most likely* prefer to use monetary rather than fiscal policy because under Ricardian equivalence:
  - A real interest rates have a more powerful effect on the real economy.
  - B the transmission mechanism of monetary policy is better understood.
  - C the future impact of fiscal policy changes are fully discounted by economic agents.
- 2 If fiscal policy is easy and monetary policy tight, then:
  - A interest rates would tend to fall, reinforcing the fiscal policy stance.
  - B the government sector would tend to shrink as a proportion of total GDP.
  - C the government sector would tend to expand as a proportion of total GDP.
- 3 Which of the following has the greatest impact on aggregate demand according to an IMF study? A 1 percent of GDP stimulus in:
  - A government spending.
  - B rise in transfer benefits.
  - C cut in labour income tax across all income levels.

**Solution to 1:**

C is correct. If Ricardian equivalence holds, then economic agents anticipate that the consequence of any current tax cut will be future tax rises, which leads them to increase their saving in anticipation of this so that the tax cut has little effect on consumption and investment decisions. Governments would be forced to use monetary policy to affect the real economy on the assumption that money neutrality did not hold in the short term.

**Solution to 2:**

C is correct. With a tight monetary policy, real interest rates should rise and reduce private sector activity, which could be at least partially offset by an expansion in government activity via the loosening of fiscal policy. The net effect, however, would be an expansion in the size of the public sector relative to the private sector.

**Solution to 3:**

A is correct. The study clearly showed that direct spending by the government leads to a larger impact on GDP than changes in taxes or benefits.

## SUMMARY

In this reading, we have sought to explain the practices of both monetary and fiscal policy. Both can have a significant impact on economic activity, and it is for this reason that financial analysts need to be aware of the tools of both monetary and fiscal policy, the goals of the monetary and fiscal authorities, and most important the monetary and fiscal policy transmission mechanisms.

- Governments can influence the performance of their economies by using combinations of monetary and fiscal policy. Monetary policy refers to central bank activities that are directed toward influencing the quantity of money and credit in an economy. By contrast, fiscal policy refers to the government's decisions about taxation and spending. The two sets of policies affect the economy via different mechanisms.
- Money fulfills three important functions: It acts as a medium of exchange, provides individuals with a way of storing wealth, and provides society with a convenient unit of account. Via the process of fractional reserve banking, the banking system can create money.
- The amount of wealth that the citizens of an economy choose to hold in the form of money—as opposed to, for example, bonds or equities—is known as the demand for money. There are three basic motives for holding money: transactions-related, precautionary, and speculative.
- The addition of 1 unit of additional reserves to a fractional reserve banking system can support an expansion of the money supply by an amount equal to the money multiplier, defined as  $1/\text{reserve requirement}$  (stated as a decimal).
- The nominal rate of interest is comprised of three components: a real required rate of return, a component to compensate lenders for future inflation, and a risk premium to compensate lenders for uncertainty (e.g., about the future rate of inflation).
- Central banks take on multiple roles in modern economies. They are usually the monopoly supplier of their currency, the lender of last resort to the banking sector, the government's bank and bank of the banks, and they often supervise banks. Although they may express their objectives in different ways, the overarching objective of most central banks is price stability.
- For a central bank to be able to implement monetary policy objectively, it should have a degree of independence from government, be credible, and be transparent in its goals and objectives.
- The ultimate challenge for central banks as they try to manipulate the supply of money to influence the economy is that they cannot control the amount of money that households and corporations put in banks on deposit, nor can they easily control the willingness of banks to create money by expanding credit. Taken together, this also means that they cannot always control the money supply. Therefore, there are definite limits to the power of monetary policy.
- The concept of money neutrality is usually interpreted as meaning that money cannot influence the real economy in the long run. However, by the setting of its policy rate, a central bank hopes to influence the real economy via the policy rate's impact on other market interest rates, asset prices, the exchange rate, and the expectations of economic agents.

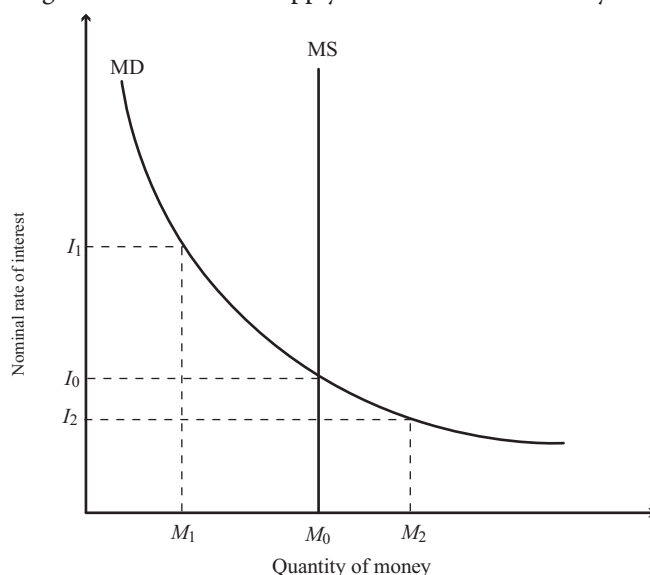
- Inflation targeting is the most common monetary policy—although exchange rate targeting is also used, particularly in developing economies. Quantitative easing attempts to spur aggregate demand by drastically increasing the money supply.
- Fiscal policy involves the use of government spending and revenue raising (taxation) to impact a number of aspects of the economy: the overall level of aggregate demand in an economy and hence the level of economic activity; the distribution of income and wealth among different segments of the population; and hence ultimately the allocation of resources between different sectors and economic agents.
- The tools that governments use in implementing fiscal policy are related to the way in which they raise revenue and the different forms of expenditure. Governments usually raise money via a combination of direct and indirect taxes. Government expenditure can be current on goods and services or can take the form of capital expenditure, for example, on infrastructure projects.
- As economic growth weakens, or when it is in recession, a government can enact an expansionary fiscal policy—for example, by raising expenditure without an offsetting increase in taxation. Conversely, by reducing expenditure and maintaining tax revenues, a contractionary policy might reduce economic activity. Fiscal policy can therefore play an important role in stabilizing an economy.
- Although both fiscal and monetary policy can alter aggregate demand, they work through different channels, the policies are therefore not interchangeable, and they conceivably can work against one another unless the government and central bank coordinate their objectives.

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## PRACTICE PROBLEMS

- As the reserve requirement increases, the money multiplier:
  - increases.
  - decreases.
  - remains the same.
- Which is the *most* accurate statement regarding the demand for money?
  - Precautionary money demand is directly related to GDP.
  - Transactions money demand is inversely related to returns on bonds.
  - Speculative demand is inversely related to the perceived risk of other assets.
- The following exhibit shows the supply and demand for money:



There is an excess supply of money when the nominal rate of interest is:

- $I_0$ .
  - $I_1$ .
  - $I_2$ .
- According to the theory of money neutrality, money supply growth does *not* affect variables such as real output and employment in:
    - the long run.
    - the short run.
    - the long and short run.
  - Which of the following *best* describes a fundamental assumption when monetary policy is used to influence the economy?
    - Financial markets are efficient.
    - Money is not neutral in the short run.
    - Official rates do not affect exchange rates.
  - Monetarists are *most likely* to believe:
    - there is a causal relationship running from inflation to money.
    - inflation can be affected by changing the money supply growth rate.

- C rapid financial innovation in the market increases the effectiveness of monetary policy.
- 7 The proposition that the real interest rate is relatively stable is *most* closely associated with:
- A the Fisher effect.
  - B money neutrality.
  - C the quantity theory of money.
- 8 Which of the following equations is a consequence of the Fisher effect?
- A Nominal interest rate = Real interest rate + Expected rate of inflation.
  - B Real interest rate = Nominal interest rate + Expected rate of inflation.
  - C Nominal interest rate = Real interest rate + Market risk premium.
- 9 Central banks would typically be *most* concerned with costs of:
- A low levels of inflation that are anticipated.
  - B moderate levels of inflation that are anticipated.
  - C moderate levels of inflation that are not anticipated.
- 10 Monetary policy is *least likely* to include:
- A setting an inflation rate target.
  - B changing an official interest rate.
  - C enacting a transfer payment program.
- 11 Which role is a central bank *least likely* to assume?
- A Lender of last resort.
  - B Sole supervisor of banks.
  - C Supplier of the currency.
- 12 Which is the *most* accurate statement regarding central banks and monetary policy?
- A Central bank activities are typically intended to maintain price stability.
  - B Monetary policies work through the economy via four independent channels.
  - C Commercial and interbank interest rates move inversely to official interest rates.
- 13 When a central bank announces a decrease in its official policy rate, the desired impact is an increase in:
- A investment.
  - B interbank borrowing rates.
  - C the national currency's value in exchange for other currencies.
- 14 Which action is a central bank *least likely* to take if it wants to encourage businesses and households to borrow for investment and consumption purposes?
- A Sell long-dated government securities.
  - B Purchase long-dated government treasuries.
  - C Purchase mortgage bonds or other securities.
- 15 A central bank that decides the desired levels of interest rates and inflation and the horizon over which the inflation objective is to be achieved is *most* accurately described as being:
- A target independent and operationally independent.
  - B target independent but not operationally independent.



- C operationally independent but not target independent.
- 16 A country that maintains a target exchange rate is *most likely* to have which outcome when its inflation rate rises above the level of the inflation rate in the target country?
- A An increase in short-term interest rates.
  - B An increase in the domestic money supply.
  - C An increase in its foreign currency reserves.
- 17 A central bank's repeated open market purchases of government bonds:
- A decreases the money supply.
  - B is prohibited in most countries.
  - C is consistent with an expansionary monetary policy.
- 18 In theory, setting the policy rate equal to the neutral interest rate should promote:
- A stable inflation.
  - B balanced budgets.
  - C greater employment.
- 19 A prolonged period of an official interest rate very close to zero without an increase in economic growth *most likely* suggests:
- A quantitative easing must be limited to be successful.
  - B there may be limits to the effectiveness of monetary policy.
  - C targeting reserve levels is more important than targeting interest rates.
- 20 Raising the reserve requirement is *most likely* an example of which type of monetary policy?
- A Neutral.
  - B Expansionary.
  - C Contractionary.
- 21 Which of the following is a limitation on the ability of central banks to stimulate growth in periods of deflation?
- A Ricardian equivalence.
  - B The interaction of monetary and fiscal policy.
  - C The fact that interest rates cannot fall significantly below zero.
- 22 The *least likely* limitation to the effectiveness of monetary policy is that central banks cannot:
- A accurately determine the neutral rate of interest.
  - B regulate the willingness of financial institutions to lend.
  - C control amounts that economic agents deposit into banks.
- 23 Which of the following is the *most likely* example of a tool of fiscal policy?
- A Public financing of a power plant.
  - B Regulation of the payment system.
  - C Central bank's purchase of government bonds.
- 24 The *least likely* goal of a government's fiscal policy is to:
- A redistribute income and wealth.
  - B influence aggregate national output.
  - C ensure the stability of the purchasing power of its currency.

- 25 Given an independent central bank, monetary policy actions are *more likely* than fiscal policy actions to be:
- A implementable quickly.
  - B effective when a specific group is targeted.
  - C effective when combating a deflationary economy.
- 26 Which statement regarding fiscal policy is *most* accurate?
- A To raise business capital spending, personal income taxes should be reduced.
  - B Cyclically adjusted budget deficits are appropriate indicators of fiscal policy.
  - C An increase in the budget surplus is associated with expansionary fiscal policy.
- 27 The *least likely* explanation for why fiscal policy cannot stabilize aggregate demand completely is that:
- A private sector behavior changes over time.
  - B policy changes are implemented very quickly.
  - C fiscal policy focuses more on inflation than on unemployment.
- 28 Which of the following *best* represents a contractionary fiscal policy?
- A Public spending on a high-speed railway.
  - B A temporary suspension of payroll taxes.
  - C A freeze in discretionary government spending.
- 29 A “pay-as-you-go” rule, which requires that any tax cut or increase in entitlement spending be offset by an increase in other taxes or reduction in other entitlement spending, is an example of which fiscal policy stance?
- A Neutral.
  - B Expansionary.
  - C Contractionary.
- 30 Quantitative easing, the purchase of government or private securities by the central banks from individuals and/or institutions, is an example of which monetary policy stance?
- A Neutral.
  - B Expansionary.
  - C Contractionary.
- 31 The *most likely* argument against high national debt levels is that:
- A the debt is owed internally to fellow citizens.
  - B they create disincentives for economic activity.
  - C they may finance investment in physical and human capital.
- 32 Which statement regarding fiscal deficits is *most* accurate?
- A Higher government spending may lead to higher interest rates and lower private sector investing.
  - B Central bank actions that grow the money supply to address deflationary conditions decrease fiscal deficits.
  - C According to the Ricardian equivalence, deficits have a multiplicative effect on consumer spending.
- 33 Which policy alternative is *most likely* to be effective for growing both the public and private sectors?
- A Easy fiscal/easy monetary policy.

- B** Easy fiscal/tight monetary policy.
- C** Tight fiscal/tight monetary policy.

## SOLUTIONS

- 1 B is correct. There is an inverse relationship between the money multiplier and the reserve requirement. The money multiplier is equal to 1 divided by the reserve requirement.
- 2 A is correct. Precautionary money demand is directly related to GDP. Precautionary money balances are held to provide a buffer against unforeseen events that might require money. Precautionary balances tend to rise with the volume and value of transactions in the economy, and therefore rise with GDP.
- 3 B is correct. When the interest rate on bonds is  $I_1$  there is an excess supply of money (equal to  $M_0 - M_1 > 0$ ). Economic agents would seek to buy bonds with their excess money balances, which would force the price of bonds up and the interest rate down to  $I_0$ .
- 4 A is correct. According to the theory of money neutrality, an increase in the money supply ultimately leads to an increase in the price level and leaves real variables unaffected in the long run.
- 5 B is correct. If money were neutral in the short run, monetary policy would not be effective in influencing the economy.
- 6 B is correct. By definition, monetarists believe prices may be controlled by manipulating the money supply.
- 7 A is correct. The Fisher effect is based on the idea that the real interest rate is relatively stable. Changes in the nominal interest rate result from changes in expected inflation.
- 8 A is correct. The Fisher effect implies that changes in the nominal interest rate reflect changes in expected inflation, which is consistent with Nominal interest rate = Real interest rate + Expected rate of inflation.
- 9 C is correct. Low levels of inflation has higher economic costs than moderate levels, all else equal; unanticipated inflation has greater costs than anticipated inflation.
- 10 C is correct. Transfer payment programs represent fiscal, not monetary policy.
- 11 B is correct. The supervision of banks is not a role that all central banks assume. When it is a central bank's role, responsibility may be shared with one or more entities.
- 12 A is correct. Central bank activities are typically intended to maintain price stability. Concerning choice B, note that the transmission channels of monetary policy are not independent.
- 13 A is correct. Investment is expected to move inversely with the official policy rate.
- 14 A is correct. Such action would tend to constrict the money supply and increase interest rates, all else equal.
- 15 A is correct. The central bank described is target independent because it set its own targets (e.g., the target inflation rate) and operationally independent because it decides how to achieve its targets (e.g., the time horizon).
- 16 A is correct. Interest rates are expected to rise to protect the exchange rate target.
- 17 C is correct. The purchase of government bonds via open market operations increases banking reserves and the money supply; it is consistent with an expansionary monetary policy.

- 18 A is correct. The neutral rate of interest is that rate of interest that neither stimulates nor slows down the underlying economy. The neutral rate should be consistent with stable long-run inflation.
- 19 B is correct. A central bank would decrease an official interest rate to stimulate the economy. The setting in which an official interest rate is lowered to zero (or even slightly below zero) without stimulating economic growth suggests that there are limits to monetary policy.
- 20 C is correct. Raising reserve requirements should slow money supply growth.
- 21 C is correct. Deflation poses a challenge to conventional monetary policy because once the central bank has cut nominal interest rates to zero (or slightly less than zero) to stimulate the economy, they cannot cut them further.
- 22 A is correct. The inability to determine exactly the neutral rate of interest does not necessarily limit the power of monetary policy.
- 23 A is correct. Public financing of a power plant could be described as a fiscal policy tool to stimulate investment.
- 24 C is correct. Ensuring stable purchasing power is a goal of monetary rather than fiscal policy. Fiscal policy involves the use of government spending and tax revenue to affect the overall level of aggregate demand in an economy and hence the level of economic activity.
- 25 A is correct. Monetary actions may face fewer delays to taking action than fiscal policy, especially when the central bank is independent.
- 26 B is correct. Cyclically adjusted budget deficits are appropriate indicators of fiscal policy. These are defined as the deficit that would exist if the economy was at full employment (or full potential output).
- 27 B is correct. Fiscal policy is subject to recognition, action, and impact lags.
- 28 C is correct. A freeze in discretionary government spending is an example of a contractionary fiscal policy.
- 29 A is correct. A “pay-as-you-go” rule is a neutral policy because any increases in spending or reductions in revenues would be offset. Accordingly, there would be no net impact on the budget deficit/surplus.
- 30 B is correct. Quantitative easing is an example of an expansionary monetary policy stance. It attempts to spur aggregate demand by drastically increasing the money supply.
- 31 B is correct. The belief is that high levels of debt to GDP may lead to higher future tax rates which may lead to disincentives to economic activity.
- 32 A is correct. Government borrowing may compete with private sector borrowing for investment purposes.
- 33 A is correct. If both fiscal and monetary policies are “easy,” then the joint impact will be highly expansionary, leading to a rise in aggregate demand, low interest rates, and growing private and public sectors.