Macroeconomic Policy and Financial Markets

Unit 1 Macroeconomics and the World of Finance

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Unit Overview

Unit 1 will introduce you to the main topics you will study in the whole module. It will discuss the distinction between macroeconomic analysis that focuses on long-run growth of the economy and the macroeconomics of short-run fluctuations, and outline the distinction between aggregate demand factors and aggregate supply factors affecting macroeconomic outcomes. In studying the unit, you will consider key questions concerning the link between macroeconomics and financial markets, and learn to distinguish the financial markets approach to macroeconomics from other windows upon the macroeconomy.

Learning outcomes

When you have completed your study of this unit, you will be able to:

- discuss the role of national income accounts
- interpret central banks' analyses of short-term macroeconomic changes
- explain the difference between 'price effects' and 'quantity effects' in the relation between finance and aggregate expenditure.

Reading for Unit 1

David Miles, Andrew Scott and Francis Breedon (2012) Chapters 1 'What is macroeconomics?' and 2 'The language of macroeconomics: The national income accounts'. *Macroeconomics: Understanding the Global Economy*. 3rd Edition. New York: Wiley.

Chairman Alan Greenspan (2002) 'Federal Reserve Board's semiannual monetary policy report to the Congress' before the Committee on Banking, Housing, and Urban Affairs, US Senate, July 16.

Board of Governors of the Federal Reserve System (2002) *Monetary Policy Report to the Congress*, July 16 2002, pp. 1–38.

1.1 Introduction

All people concerned with finance quickly find that they have to keep a watch on three types of events and try to understand them. One is the movements of financial markets – especially equity markets, bond markets, money markets and foreign exchange markets. Another is news about individual companies and borrowers. The third is macroeconomic news about the economy as a whole, especially the growth of total output and income (GDP), inflation and, in most economies, the balance of payments.

This module is designed to enable you to understand the key elements of macroeconomics and their connection with financial markets – the third type of event and its relation to the first.

The module is designed to increase the depth of your understanding whether or not you have studied economics or macroeconomics previously. Although it does not require previous study of macroeconomics, if you have studied macroeconomics at undergraduate level this module adds to your knowledge because, unlike other courses, we focus on the relation financial markets have to macroeconomics.

Macroeconomics became fully established as an important field of economics after the Second World War ended in 1945. Fifty to sixty years ago many economists, especially in Britain and the US, regarded it as more important than microeconomics. They believed that the focus it had then on explaining medium-term fluctuations in gross domestic product and employment provided analytical foundations for policies that would eliminate severe business cycles and the mass unemployment that accompanied them.

The broad consensus on the potential of macroeconomic policy was not universal, but many agreed that judicious macroeconomic policies could overcome the scourges of recession, general unemployment, foreign trade interruptions and inflation. The most active debate was over which type of macroeconomic policy was more useful and how different types should be combined.

The main macroeconomic policies in contention were:

- *monetary policy*, focusing on either interest rates or a monetary aggregate (the stock of money, or the amount of credit)
- *fiscal policy*, focusing on the budget balance between tax revenues and government expenditure.

For open economies, policy on the *exchange rate* also entered the debate in countries where exchange rates were not allowed to float freely in response to market forces. And, for a period in the 1960s and 1970s some argued that *incomes policies* involving direct control of wage rate increases should be an important macroeconomic policy.

Macroeconomics in the last decades of the 20th century was marked by apparently strong divisions between writers identifying themselves as belonging to one of two camps: *Keynesian* or *Monetarist*. The distinctions are blurred, but in terms of policy Keynesians broadly favoured use of fiscal

policy and, at times, exchange rate policy and incomes policy, to maintain high employment, while Monetarists broadly favoured the use of monetary policy and focused on the control of inflation.

We still have controversies over the appropriateness of different policy mixes, especially as the US and European economies have, since the 2008 financial crisis faced recession and high unemployment. And the fragility of the banking system has added a third policy element to complicate fiscal and monetary policy – financial stability policy.

In the new environment, fiscal policy has focused on debates over the size of a 'fiscal stimulus' and how rapidly it should be withdrawn through an 'austerity budget'. Monetary policy has focused on the merits and problems of using 'quantitative easing' designed to increase liquidity in the economy. And the balance between fiscal and monetary policy has been debated in terms of the relative merits of fiscal stimulus and quantitative easing.

But the disagreements are more nuanced and multifaceted than the old confrontation between a simplified Keynesian and a simplified Monetarist school. Therefore, this module does not make reference to that historic division, or, indeed, to its predecessors (the debates from the 1930s between Keynesians and writers styled as 'Classical' or as 'Austrian School').

1.2 Getting Macroeconomics in Perspective

Financial markets and investors receive a large quantity of macroeconomic information every week. But to understand macroeconomics we need to step back from those data. To see what lies behind the numbers we need to create some distance, and in order to do that we need a framework for organising our thoughts.

The macroeconomic news that regularly confronts finance people is both high frequency and dense. News appears daily about the economy's macro-economic indicators, and continuous updates are viewed at all hours on phones and tablets.

Official measures of a country's output and expenditure appear every three months in developed countries. Official figures for employment, inflation and the balance of payments appear monthly in many countries. Indicators giving clues about the direction of those measures appear frequently, as do reports measuring businesses' and economists' expectations about their future direction. And, equally as prominently as such high-frequency data about the 'home' economy, the computer screens and newspapers give immediate information about the macroeconomic indicators of other large economies that has to be absorbed – for example, the most recent GDP growth of the USA, Euro-zone, and Japan; China's rate of growth of imports and exports; or shipping prices (a change in which might give advance notice of an increase or decrease in countries' foreign trade volumes).

The density and high frequency of that macroeconomic information makes it difficult to see the macroeconomic picture as a whole. It is difficult to know whether your country is entering a period of sustained growth in GDP, for example, by examining recent months' data on all the available indicators. That is partly because the indicators might provide contradictory signals – because the last few quarters' GDP growth figures, for example, might reflect temporary factors that boost them or push them down.

Another reason why recent data fail to give a clear picture of the macroeconomic position is that the data themselves are inaccurate. Even in countries that have well-established, well-resourced, and expert statistical services there are two sources of inaccuracy.

- The first, which affects data over a long period, is that it is difficult to be certain that the measure we have is defined in a way that accurately represents the category we are trying to measure.
- The second is that, even if we are sure that the definition used – for example, for GDP statistics – does match the idea of gross domestic product, the collection and processing of data in a short period creates inaccuracies. Therefore, the announced GDP statistics often have to be revised later.

A famous example concerned the macroeconomic position of the US in 2001, a year when there was great uncertainty. The data published for 2001 showed that GDP had declined, output had fallen, in one quarter but had grown, albeit modestly, in the three other quarters. But in July 2002 the US statisticians revised their estimates of GDP for 2001. The new, more reliable, data showed that, in fact, GDP had declined in three quarters of 2001. Anyone who, at the end of 2001 or beginning of 2002, had used the published data to judge the US economy would have been misled into thinking it had been stronger than it actually was.

 **Optional Reading 1.1 and 1.2**

You might find it interesting to investigate further the reasons why published macroeconomic economic data can be misleading. Here are two readings that will help you do that.

Optional Reading 1.1

To consider the problem that the things measured by the statistics might not correspond to the categories we are trying to measure, we suggest you read the arguments of William Nordhaus, Professor of Economics at Yale University. He put them to the United States Congress Joint Economic Committee in 2002, for changing the methods the US Department of Commerce, Bureau of Economic Analysis (BEA) uses for calculating National Income and Product Accounts (NIPA). It's an interesting and readable paper:

> William D Nordhaus (2002) 'Prepared statement of Dr. William D Nordhaus, sterling professor of economics, Yale University; Chairman, Bureau of Economic Analysis Advisory Committee'. *Hearing before the Joint Economic Committee Congress of the United States, Second Session*, July 24. Washington, US Government Printing Office. pp. 55–70.

Optional Reading 1.2

To consider the problem that the published data on macroeconomic aggregates, the National Income and Product Accounts, are initially inaccurate and regularly have to be revised, we suggest you read a paper published by the US Department of Commerce, Bureau of Economic Analysis (BEA). The paper examines the extent to which these revisions make the initial published data unreliable (and concludes that reliability remains high):

Dennis J Fixler and Bruce T Grimm (2002) 'Reliability of GDP and related NIPA estimates'. *Bureau of Economic Analysis*, January.

Those are some of the reasons why, to understand macroeconomics, we need to step back from that high-frequency and dense data. To see what lies behind the immediate news, we need to create some distance.

Another reason for standing back from the high-density information is that we need a framework for organising our thoughts. Essentially, that is the role of a theory. Theoretical models in macroeconomics are frameworks for organising our thoughts in a way that enables us to make sense of the macroeconomic phenomena of actual economies. They are models that attempt to identify the systematic relationships that exist between economic variables.

Let us illustrate with an example. An important idea concerning the interaction between macroeconomics and the financial markets is the notion that firms' investment in physical assets is negatively related to the interest rates on corporate bonds and credit. But if we look at the most recent data on firms' investment and on interest rates we would not be able to identify a systematic relationship even if the data were accurate. The accepted approach is to develop a theoretical model that identifies the relationships between investment, interest rates and other variables (or 'explains' the relationships). That theoretical model can then be evaluated against data by using statistical techniques (econometrics) and large data series.

In this unit, we will set out some key elements of a macroeconomic framework. In the rest of the module we will study some specific systematic relationships in macroeconomics.

1.3 Long-Run and Short-Run Macroeconomics

A country's macroeconomic position in the short run is often different from its long-run outcome. Economies experience cycles in which booms are followed by recessions. In a short period of a few boom years the data show high positive rates of growth followed by a few years of recession when the data show negative growth (declines) in GDP. The long term, however, is marked by a trend that averages those booms and recessions. In the long run, developed economies experience a positive growth trend. That long-run rate of growth is lower than the high growth experienced in short-run booms and is above the low (negative) growth experienced in recessions.

People often experience myopia. They are able focus only on the short-term economic position and do not see the long-term trend. In financial markets, there is a well-known phenomenon of investors believing that a current boom is all that matters; in a boom, they ignore the fact that the long-run trend rate of growth is lower than in the recent period.

As analysts, we need to be able to distinguish the long term from the short term. Your objective is to be able to do more than observe macroeconomic changes. It is to be able to analyse what underlies them or, in other words, what systematic cause–effect relations produce macroeconomic changes. To do that we need to distinguish between the key factors that determine both:

- long-run macroeconomic trends, and
- short-run changes (often called medium-term changes in policy analyses).

An important principle, which is often missed in popular discussion of economic policy, is this: the factors that are important for long-run trends are not necessarily the same as those that determine short-run (medium-term) changes. Therefore, policies to induce faster growth in the medium term might be the opposite of those needed for long-term growth.

Box 1.1 Short-run and long-run GDP changes: a US illustration

The graph in this Box illustrate the ideas introduced at the beginning of Section 1.3. The data represented in Figure 1.1 show the rate of growth of the United States' GDP in each year from 1998 through 2011. They illustrate short-term changes in GDP.

Measuring the annual rate of growth on the right hand vertical axis, they show that a high rate of 4.8 per cent was recorded for 1999 (during the 'dot com boom' characterised by financial speculation) while in 2009, following the financial crash of 2008, the economy shrank, recording negative GDP growth of –3.5 per cent.

The graph illustrates a major economic cycle – the one that has marked our recent experience and had wide effects on economies, politics, and societies. It was characterised by an upswing with increasing rates of growth of GDP from 2002 to 2004 followed by slower but still positive rates of growth until the end of 2007. The downswing began in 2008 when no growth was recorded and continued into 2009 when GDP shrank by 3.5 per cent.

The authoritative National Bureau of Economic Research (NBER) measures US economic cycles.

Figure 1.1 United States Real GDP Growth (annual per cent change)

Source: IMF (2011)

1.3.1 Aggregate supply

Economists regard an economy's aggregate performance in the long run, its long-run macroeconomic growth rate, as determined by supply phenomena. The *aggregate supply* of goods and services, and the things that determine aggregate supply, are regarded as the fundamental determinants of long-run growth of GDP.

The macroeconomic analysis of those relationships is known as *growth theory* and, for many, its importance eclipses the study of short-term macroeconomic fluctuations. A small increase in the average rate of growth of a country's GDP sustained over decades – its long-run macroeconomic growth rate – has a much greater effect on the standard of living than a higher rate of growth over the few years of a short-term boom or the temporary decline in a recession. As one leading macroeconomist, David Romer, puts it, 'the welfare consequences of long-run growth swamp any possible effects of […] short-run fluctuations' (Romer, 1996: p. 5).

The main elements that determine aggregate supply in the long term are changes in the supply of labour and capital, and changes in their productivity. In an efficient economy, the rate of growth of productivity is the result of technical change, and modern growth theory examines several ways in which technical change occurs.

Optional Reading 1.3

Modern growth theory is not part of this module, but if you wish to study it in the future there are many good articles and books you could read to give you an overview. One, which we suggest as a useful starting point, is written by Robert Solow, one of the fathers of 20th century growth theory. Solow outlines and comments upon the theories of endogenous growth that developed after the mid-1980s, almost 30 years after his own path-breaking writing:

Robert M Solow (1994) 'Perspectives on growth theory'. *The Journal of Economic Perspectives*, 8 (1), 45–54.

The key idea we would like you to remember about modern growth theory is that it treats the economy's long-run growth rate as being determined by aggregate supply alone. It assumes that *aggregate demand* is adequate to ensure that the growing output is sold. It is assumed that the long-run rate of growth is not affected by aggregate demand growing slower or faster.

In the *short run*, GDP may grow faster (in booms) or slower (in recessions) than the long-run rate of growth.

That may result from supply shocks causing aggregate supply to deviate from its long-run growth path. A famous example is the policy-induced quadrupling of the price of oil, a major input into production of goods and services, in 1973. It pushed the growth of output of goods and services in the US (and worldwide) below the previous growth rate of GDP. However, macroeconomic analysis of short-term fluctuations starts with the influence *aggregate demand* has on output.

1.3.2 Aggregate demand

Aggregate demand influences the amount of goods and services actually produced. If, at some time during a recession, aggregate demand is below the economy's capacity output, production will be below the capacity output denoted by the long-run growth path. With aggregate demand being below capacity output, capital and labour are underutilised or unemployed.

We analyse aggregate demand influences on the economy's output and income while initially assuming that the supply factors underlying long-run growth – changes in technology, growth of the capital stock, and growth of the labour force – are absent.

In the most basic, simple macroeconomic models, a position where actual output is below the level that the available labour force and capital stock could produce with existing technology is described as *output below full-capacity output*. In such models, it is assumed that the discrepancy arises because aggregate demand is too low. Most importantly, in the most simplified models it is assumed that an increase in output towards its full capacity level can be created by an increase in aggregate demand in a direct sense: an increase in the quantity of goods and services demanded leads to an increase in the quantity of output with no change in prices.

In the more developed macroeconomic models that are the accepted framework today, the full capacity level of output is defined in terms of market equilibrium and increases in aggregate demand have effects on prices as well as raising the quantity of output.

Since aggregate demand has a key role in short-run fluctuations, macroeconomics gives attention to analysing the determinants of aggregate demand. In this module, we concentrate mainly upon short-run fluctuations. To lay

firm foundations, the next section enables you to review some of the basic concepts of aggregate demand analysis.

1.4 Aggregate Demand and National Income Accounts

Aggregate demand includes demand for goods and services of many different types, therefore we have to analyse the different factors that influence demands for different things: it would be unreasonable to assume that the demand for food responds to the same variables as the demand for machinery in the short term. Similarly, different types of agents buy goods and services – it would be unreasonable to assume that government demand for goods and services is determined by the same factors that influence firms' demand.

To take account of the main different types of goods and services that are demanded, and the main categories of agents, macroeconomists divide the aggregate demand for goods and services into four broad categories (Consumer demand by the private sector, Investment demand by the private sector, Government demand and Net foreign demand) and their sub categories:

Consumer demand by the private sector C

Investment demand by the private sector I

comprising two sub-categories:

Investment in fixed capital I^k

Investment in inventories I^i

Government demand G

Net foreign demand $(X-Z)$

Exports (X) minus Imports (Z) of goods and services.

Thus, total aggregate demand in an economy is the sum of those broad categories of demand:

$$\begin{aligned}\text{Aggregate Demand } (AD) &= C + I + G + (X - Z) \\ &= C + (I^k + I^i) + (G) + (X - Z)\end{aligned}$$

If the value that consumers, firms, government, and other countries' residents demand is the same as they actually do spend, that aggregate expenditure exactly equals aggregate supply, the value of goods and services that are actually sold. That means that a measure of a nation's output (its aggregate supply) such as Gross Domestic Product equals aggregate demand measured on similar principles:

- Gross Domestic Product equals Gross Domestic Expenditure (aggregate demand).

And, since aggregate supply generates income to producers in the form of profits and wages (before tax, interest, and rent):

- Gross Domestic Product also equals Gross Domestic Income.

Those equalities have an interesting implication, which is a useful keystone for all macroeconomic analysis, so let us pause briefly and reflect on them. Let us use AD for aggregate demand or gross domestic expenditure, AS for aggregate supply or gross domestic product, and Y for gross domestic income. Then the equalities described in the previous paragraph can be written as:

$$AD = AS = Y \tag{1.1}$$

Since

$$AD = C + I + G + \left(X - Z\right) \tag{1.2}$$

$$Y = C + I + G + \left(X - Z\right) \tag{1.3}$$

That statement of the equality between gross domestic income and the sum of the components of aggregate demand enables us to identify quite easily a simple relationship that is a key for macroeconomic analysis. It is the fact that in any economy the amount saved always equals investment demand, plus government expenditure, plus net exports. We can demonstrate that using equations 1.4 through 1.6.

Saving (S) can be defined as the difference between total income and consumption expenditure:

$$S = Y - C \tag{1.4}$$

If we subtract C from both sides of Equation 1.4, it follows that

$$Y - C = I + G + \left(X - Z\right) \tag{1.5}$$

Or, in other words

$$S = I + G + \left(X - Z\right) \tag{1.6}$$

The ideas outlined in this section are the most basic ideas in macroeconomics. But even simple ideas are puzzling and create questions. In fact, some would say that the simpler the idea the more questions it raises since it tries to reduce a hugely complex world to a thin form. It is rather like trying to create an image of a person using only a sketch or a line drawing; the lines might enable us to highlight key features, but they fail to capture all the person's dimensions.

Therefore, before you proceed to the next section, please take the time to study some of the complexities we have omitted so far in our discussion of aggregate demand, aggregate supply and gross domestic income. They are explained in the following readings.

Reading 1.1

Please study Chapters 1 and 2 of *Macroeconomics: Understanding the Global Economy* by David Miles, Andrew Scott and Francis Breedon.

David Miles, Andrew Scott and Francis Breedon (2012) *Macroeconomics: Understanding the Global Economy*, Chapters 1 'What is Macroeconomics?' and 2 'The Language of Macroeconomics: The

We recommend that you ensure that you fully understand Section 2.4 of Chapter 2 ('Three measures of output: output, income and expenditure'), which gives a thorough explanation of the principles outlined in Section 1.4 of this unit. But it is valuable to read Chapter 1 and preceding sections of Chapter 2 carefully too, in order to understand the broader context and the foundations of Section 2.4.

When you have read Miles *et al*'s explanation of concepts related to aggregate demand and national income accounts, please take a minute to consolidate your understanding. Write a few sentences for yourself explaining the difference between *nominal* gross domestic product and *real* gross domestic product, and explain the meaning of the *GDP deflator*.

1.5 Alternative Windows on Macroeconomics

The evolution of modern macroeconomics since 1945 has occurred in a changing world environment. In its early days, economists were concerned to avoid a repeat of the mass unemployment the industrial economies experienced in the 1930s. Subsequent experience of inflation led to attempts to develop policies to reduce price and wage increases. In the 1980s and 1990s the connection between macroeconomics and booms in asset markets (especially real estate and stock markets) gained importance, and in recent years macroeconomic analysts have been concerned with resisting deflation, increasing GDP growth in advanced economies, and dealing with global imbalances marked by China's external surplus and the external deficit of the US. Partly as a result of such changing circumstances and the policy demands they have placed on economic analysis, macroeconomics can be viewed from a number of different perspectives. The window through which macroeconomics is viewed depends partly on the times and partly on the position of the person studying it.

This module looks at macroeconomics from the point of view of modern financial markets. That gives it a different emphasis from courses that approach macroeconomics from the point of view of the labour market or from the point of view of technological change and long-run economic growth.

Although the core of our knowledge of macroeconomic behaviour is the same irrespective of whether we view it through the financial market window, the labour market window or through technical change, the problems and ideas that are given centre-stage differ. Macroeconomics courses that have the labour market at the fore illuminate the key problem of whether policy makers can achieve a trade-off between unemployment and inflation. A course with financial markets at the fore gives greater emphasis to the interaction between finance and aggregate demand.

Because this module is designed to enable you to learn about macroeconomics from the perspective of modern financial markets it deals with:

- how macroeconomic shocks and macroeconomic policy affect financial markets and financial institutions, and
- how financial markets and institutions themselves affect macroeconomics.

1.6 Macroeconomics and Financial Markets

How do macroeconomic shocks and macroeconomic policy affect financial markets and financial institutions?

How do financial markets and institutions affect macroeconomics?

By the end of this module you will be able to provide some answers to those questions. You will also find that trying to answer those questions leads you into other, more detailed questions. But it is not only you, as a graduate student, who is grappling with these questions, for they are the questions that grip the mind of financial decision makers and leading policy makers every day.

Let us see how those academic questions are paralleled by the real world concerns of a leading policymaker, Alan Greenspan.

1.6.1 A central banker's macroeconomic view of the USA

Alan Greenspan became the Chairman of the Federal Reserve Board, the US central bank that determines monetary policy, in mid-1987. During his tenure, he was sometimes called the second most powerful man in the world, second only to the US President. While the American economy boomed he was widely praised, but his reign is now widely regarded as disastrously creating the conditions that led to the 2007–08 crash of the US financial system and subsequent recession.

The power of the Federal Reserve Chairman stems from the responsibility the Federal Reserve has for determining monetary policy in the United States. A successful Chairman also has great influence over fiscal policy – the Federal budget – which is the other key element of the country's macroeconomic policy. And the Chairman's influence goes well beyond the US, for what happens to the US economy affects economies around the globe. The Chairman of the Federal Reserve Board gives a written report to the US Congress, the legislators, every six months and gives testimony about it in person.

We would like you to read the testimony Mr Greenspan gave to Congress on 16 July 2002 regarding his six-monthly report. There Mr Greenspan gives several examples of his thinking on how macroeconomics affects finance and how finance affects macroeconomics. Before reading it, please remember the context. The US economy had experienced an unprecedented boom with remarkable growth of GDP during the 1990s. The boom had ended in 2001, but in the first half of 2002 there were signs that the economy was pulling out of recession and into another period of sustained growth.

However, no one could be certain and there were grounds for pessimism. Mr Greenspan discusses the main factors the Federal Reserve identified at that time as influencing the economy's prospects.

Reading 1.2

We would like you to read Alan Greenspan's testimony now.

Alan Greenspan (2002) 'Federal Reserve Board's semiannual monetary policy report to the Congress' before the Committee on Banking, Housing, and Urban Affairs, US Senate, July 16.

Exercise 1.1

While reading Alan Greenspan's testimony, please make a note of the different types of influences this Chairman considers. In particular, we would like you to identify statements:

- where he discusses the influence of financial markets on macroeconomic prospects
- where he discusses the influence of macroeconomic changes on financial markets
- where he considers important macroeconomic influences, but does not directly link them to financial markets.

Reading 1.3

Board of Governors of the Federal Reserve System (2002) 'Monetary Policy Report to the Congress', July 16.

Greenspan's testimony is underpinned by the more technical six-monthly 'Monetary Policy Report' the Federal Reserve Board makes to Congress. Now please read the Report submitted at the same time as the Chairman's testimony of July 2002, also available online (Board of Governors of the Federal Reserve System, 2002).

The Testimony of the Chairman of the Federal Reserve Board, and the Board's Monetary Policy Report gives a strong insight into how the Federal Reserve thinks about the relation between macroeconomics and financial markets. They deal with four broad categories:

1. Aggregate demand for goods and services
   - demand for inventories
   - demand for consumer goods and services
   - demand for physical investment goods
2. Supply of goods and services
   - productivity of labour
   - labour market conditions
3. Financial markets
   - price of finance
   - amount of finance
4. Foreign transactions.

Please make a note of those elements in the Federal Reserve's macroeconomic assessment. They include some categories that we have already considered above, but the lists are not identical; in these reports, the Federal Reserve gives emphasis only to some of the categories of aggregate demand we have listed earlier in this unit (see Section 1.4 'Aggregate Demand and National Income Accounts') and it includes several economic indicators that are not included in our aggregate demand categories.

Exercise 1.2

Please write lists of each of the:

- categories of aggregate demand that are not emphasised in the federal Reserve reports
- indicators the Federal Reserve emphasises that are not components of aggregate demand.

A comparison of the lists draws attention to a number of their elements. We would like to consider more fully three elements that are important for the main subject of this module – the interaction between macroeconomics and financial markets. The three are:

- the price of finance
- the amount of finance
- inventory investment.

1.6.2 The price of finance

In 2002 the Federal Reserve's influence over the economy was exercised through one main policy instrument, the rate of interest on Federal Funds, the price of finance in the short-term credit market for Federal Funds. The relation between that interest rate and the price of finance to households and firms is complex, but you can see from the Report that the Federal Reserve believes that the expenditure of households and firms is sensitive to the price they have to pay for finance and the factors that influence it.

Here are some of the effects of the price of finance that the Report mentions:

- The Report argues that low interest rates for mortgage credit help to explain the fact that household expenditure on real estate and consumer goods was strong in 2002 and had remained relatively high while other parts of the economy experienced a slowdown in previous years.
- Higher interest rates to compensate lenders for risk affected some companies as risk perceptions worsened. The crash of the dot com boom and revelations of poor corporate governance and controversial accounting, which made the reported profits of some companies unreliable, made borrowers judge many companies to be more risky. Companies that, as a result, faced higher finance costs had an incentive to reduce their spending on investment in fixed assets and inventories.
- Another element in the price of finance that companies face is the cost of equity finance. In general, a fall in the price of a company's equity implies a rise in the cost of capital, the rate of return investors expect as an inducement to hold shares. The Report identifies the depressing effect on firms of the decline in share prices experienced after the long equity boom ended in 2001.

If you have studied macroeconomics at undergraduate level you are familiar with simplified models, such as the IS-LM model, which give the interest rate a central role in linking monetary policy to aggregate demand. As the Report suggests, in the more complex real world that the Federal Reserve

faces, the price of finance cannot be reduced to a single interest rate ('the' interest rate). And the factors influencing the price of finance are complex.

1.6.3 The quantity of finance

The amount of finance can have an effect on aggregate demand quite separate from the price of finance. A major financial crisis is often characterised by a 'credit crunch' under which firms find that they simply cannot borrow new or replacement funds; the market can become so illiquid that credit is not available to meet borrowers' demand. The nadir of the 2007-08 financial crisis was marked by one of the most severe credit crunches ever seen: at times wholesale credit markets effectively ceased to operate.

If the quantity of finance of various types falls short of the amounts that firms desire, the shortage can affect firms' expenditure on investment goods. Such a credit crunch can be seen as a quantity effect rather than a price effect – it is not simply a matter of having to pay higher interest rates (price of credit), for in such circumstances the amount of finance available would be below firms' demand for finance even at higher rates.

Similarly, in less disturbed times the amount of finance available can have a quantity effect distinct from a price effect.

In the section 'Corporate Profits and Business Finance', the authors of the Monetary Policy Report to the Congress describe the factors affecting the quantity of different types of finance available to firms. Their comments relate to the quantity effect of finance. That is illustrated by two comments in particular:

- 'The rise in profits […] helped keep nonfinancial corporations' need for external funds below the average of last year.'
- 'Although many businesses have apparently substituted bond debt for shorter term financing by choice, others […] have done so by necessity: They were pushed out of the commercial paper market'

To fully understand the quantity effect of both financial phenomena we need to use a model of firms' behaviour that is well established in the literature of corporate finance and studied in corporate finance courses – 'the pecking order theory' or 'financing hierarchy theory'.

The 'pecking order theory' set out by Myers and Majluf (1984: pp. 187–221) says that, because information is not equally available to all, firms have preferences between different sources of finance. Firms prefer to finance their investment spending first by using their own internal funds. If the quantity of that finance is inadequate they turn to their second preference, credit of various types (bank debt, issue of commercial paper, issue of corporate bonds). Only as a last resort do they choose to obtain finance by issuing new equities.

Because of those preferences, the rise in profits identified in the Report can be interpreted as an improvement in the quantity of preferred finance available for firms' investment.

On the other hand, the Report suggests a quantity effect in relation to short-term debt – firms' commercial paper. Firms were unable to obtain as much credit as they wished in the market for commercial paper and had to find other sources. If alternative sources had not been available they would have had to reduce their investment spending.

1.6.4 Inventory investment

Inventory investment (I^i) is one component of aggregate demand that receives attention in the Federal Reserve's macroeconomic assessment as an indicator of economic conditions.

At this point we would like to discuss inventory investment, instead of other components such as consumer demand (C) or investment demand for physical investment goods, fixed capital investment (I^k). Inventory investment measures firms' increases in inventories of raw materials, intermediate goods or finished products; when negative it shows a net decrease in inventories. The largest component of the private sector's aggregate demand in the US is consumer demand, accounting for approximately 70 per cent of aggregate demand, and the second largest component is investment in fixed capital. Changes in those 'final demand' components of aggregate demand have a large influence on total conditions; Alan Greenspan's view of a possible economic expansion was that it would depend on the strength of such final demand: 'the strength of final demand will play its usual central role in determining the vigour of the expansion'. Changes in inventory levels in any period (the rate of inventory investment or disinvestment) account for a small proportion of gross domestic product, but they sometimes play an important role, tipping changes in total aggregate demand in one direction or another.

The reason we would like you to think about inventory investment here, despite its low relative size in the US economy, is that it highlights an important aspect of macroeconomic analysis and policy – the distinction between agents' aggregate demand and their *actual* expenditure. That distinction is closely related to discrepancies between demand and supply and consequent changes in agents' asset holdings.

Consider, again, the following passage from Alan Greenspan's testimony in July 2002:

> the fundamentals are in place for a return to sustained healthy growth: imbalances in inventories and capital goods appear largely to have been worked off; inflation is quite low and is expected to remain so; and productivity growth has been remarkably strong […] As has often been the case in the past, the behavior of inventories provided substantial impetus for the initial strengthening of the economy. Manufacturers, wholesalers, and retailers took vigorous steps throughout 2001 to eliminate an unwanted buildup of stocks that emerged when final demand slowed late in 2000. By early this year, with inventory levels having apparently come into better alignment with expected sales, the pace of inventory reduction began to ebb, and efforts to limit further drawdowns provided a considerable boost to production. The available

> evidence suggests that, in some sectors, liquidation may be giving way to a rebuilding of inventories. However, as inventories start to grow more in line with sales in coming quarters, the contribution of inventory investment to real GDP growth should lessen. As a result, the strength of final demand will play its usual central role in determining the vigor of the expansion.

In his analysis of how firms' demand for inventory goods to increase their inventories (inventory investment), or their negative demand (inventory disinvestment), affects total aggregate demand, Greenspan introduces a concept we have not considered yet. He noted that there had previously been an 'unwanted buildup of stocks' at the end of year 2000 because the 'final demand' components of aggregate demand had been low at that time.

The phenomenon of an 'unwanted buildup of stocks' compels us to re-examine the meaning of aggregate demand. We have to distinguish between agents' *desired* aggregate demand and *actual* aggregate demand. In previous sections we have implicitly assumed that the two are identical, but the inventory changes of late 2000 that Greenspan describes makes clear that a difference can exist, and the difference has real effects.

The level of investment in inventories – the increase in stocks – that firms desire is to be denoted by I^i, but the investment that they actually carry out is $\hat{I}^i$. An 'unwanted buildup of stocks' occurs when $\hat{I}^i$ is higher than I^i. In those circumstances firms find themselves owning an increase in inventories they did not intend to own. Their 'unwanted buildup' is an increase in their assets just as much as their planned inventory accumulation is; therefore, it counts as 'actual investment in inventories'.

The distinction between desired and actual inventory investment carries through to aggregate demand as a whole. Previously we defined aggregate demand as:

$$\begin{aligned} AD &= C + I + G + (X - Z) \\ &= C + (I^k + I^i) + (G) + (X - Z) \end{aligned}$$

Now we can define actual aggregate demand by replacing desired inventory investment with actual inventory investment:

$$\text{Actual } AD = C + \left(I^k + \hat{I}^i\right) + \left(G\right) + \left(X - Z\right)$$

In the case we are considering, actual aggregate demand (Actual *AD*) differs from desired aggregate demand (*AD*) to the extent that firms' actual inventory investment is different from their desired inventory investment.

We have been considering the case described by Greenspan where actual inventory investment is greater than firms' desired investment in stocks. It is worth reflecting on two puzzles:

- Could actual inventory investment be lower than desired inventory investment?

- Could other elements of aggregate demand, such as consumer demand or investment in fixed capital, also show a difference between agents' desired and actual levels?

In any period an economy's Actual Aggregate Demand can differ from Aggregate Demand. That leads us to reflect again on the connection between aggregate demand, gross domestic product, and gross domestic income. In Section 1.4, you considered the fundamental national income equalities between aggregate demand, gross domestic product, and gross domestic income:

$$AD = AS = Y$$

Now that we know there can be a difference between AD and Actual AD, which is the appropriate measure of aggregate demand in the national income equalities? In fact, the equalities are only valid if we use actual aggregate demand:

$$\text{Actual } AD = AS = Y$$

The intuition behind that idea is this. The value of new goods and services produced (AS) must yield an income for their producers (Y). That income is the value added in producing them and has two basic components – the rewards to labour, wages, and the rewards to capital, profits. The value of new goods and services produced must equal the value of expenditure on them *on condition that* we include all expenditure, including spending that was unintended.

In our example, that means we must include actual inventory investment, including the unintended component. If output in any period is greater than desired aggregate demand, producers cannot sell all the output they thought they could to willing customers. Therefore, they find they have unsold finished goods, or part-finished goods, or raw materials. In other words, they have actual growth of inventories higher than their desired inventory investment. Because that actual inventory investment is itself a component of actual aggregate demand, actual aggregate demand automatically equals aggregate supply.

Now, let us think about Alan Greenspan's discussion of the prospects for the US economy in 2002. Our detour to look at 'unintended inventory investment' was a long trip. But now it enables us to get a view of what effects, according to Alan Greenspan, resulted from the late 2000 'unwanted build-up of stocks'. In 2002 the Federal Reserve judged that the rise in unintended inventory investment ($\hat{I}^i - I^i$) in late 2000 led firms to take action in 2001; they cut back on desired inventory investment in 2001, reducing I^i to negative levels in order to cut stocks back to a level that matched the desired ratio of inventories to expected sales. By mid-2002, it seemed that adjustment had occurred.

The overall picture painted by Greenspan is that at certain times a slowdown in aggregate demand can cause a rise in unintended inventory investment, which has a temporary effect on gross domestic product. Firms' subsequent efforts to reduce the unwanted stocks amplifies the reduction in aggregate

demand by making desired inventory investment negative (a drawdown of inventories). But once that has been worked through, the basic determinants of aggregate demand – demand for consumer goods, investment fixed assets, and net exports – 'final demand' again comes to 'play its usual central role'.

1.7 Macroeconomics and Finance in Subsequent Units

Macroeconomic developments in any country – such as the level and rate of change of GDP, the rate of unemployment, the balance of trade with other countries – depend to a large extent on the behaviour of two large economic aggregates, *saving* and *investment*.

Recall from Section 1.4 of this unit that the difference between GDP and aggregate saving is aggregate consumption expenditure. Therefore, saying that saving and investment are the major determinants of macroeconomic developments implies also that aggregate demand in the form of consumption and investment expenditure are crucial.

Now let us consider financial markets, including the markets for bonds, bank credit, and equities. In financial economics we see those markets and their institutions – the financial system – as located between savers and investors. Ultimately, the role of the financial system is to intermediate between savers and investors or, in other words, to act as a channel that enables savings to finance investment.

Since saving and investment are fundamental to both macroeconomics and financial markets they are fundamental to the links and interaction between macroeconomics and financial markets. In Unit 2 you will study saving, followed, in Unit 3, by studying investment.

The interaction of aggregate saving and investment generates macroeconomic fluctuations. Economies experience booms and slumps with associated fluctuations in inflation (or deflation), unemployment, and foreign trade and capital flows, and those movements interact with changes on financial markets. Monetary policy and fiscal policy attempt to moderate those macroeconomic fluctuations partly by influencing the aggregate saving (consumption) and investment of the private sector. Therefore in Unit 4 you will study monetary policy, building on the material in Units 2 and 3. In the following unit, Unit 5, we discuss fiscal policy.

Both monetary and fiscal policies have effects that work through financial markets. For example, central banks' use of their main instrument, an interest rate, requires them to operate in financial markets to influence rates. Similarly, fiscal policy affects the balance between government expenditure and tax receipts, and deficits have to be financed by government borrowing of various types. Consequently, fiscal policy, too, has a systematic influence on financial markets. The connections that monetary and fiscal policies have with financial markets are studied in Units 4 and 5.

A driving force behind financial markets in the real world and in theory is the expectations of dealers and of the firms and households that hold assets and issue securities. The effectiveness of macroeconomic policy, whether monetary policy or fiscal policy, depends on the private sector's expectations both in financial markets and in the markets where wages and goods prices are determined. In Unit 6 we consider the macroeconomic role of expectations, concentrating particularly on expectations of future inflation and interest rates.

In Units 7 and 8, we discuss the links between macroeconomics and international financial markets. The previous units have mainly dealt with macroeconomic relations within a country. We have abstracted from the international dimension although international financial phenomena dominate macroeconomic events in many economies, and at particular times. In the final quarter of the module we introduce the international dimension. Unit 7 enables you to study the interaction between exchange rates, determined in currency markets, and a country's international trade (exports and imports). In Unit 8 we focus on some principal aspects of the links between macroeconomics and international capital flows, cross-border investment by financial institutions and firms.

Your study of international aspects in Units 7 and 8 conclude this module. We hope that by the end of the module you will feel that you have studied some challenging ideas, that you have a deeper understanding of macroeconomic policy's interaction with financial markets, and that your new understanding also raises new and interesting questions in your mind.

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