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Money and Inflation at the Time of Covid

To the memory of the life and work of Peter Jay

Money and Inflation at the Time of Covid

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Contents

List of figures vii
List of tables ix
List of boxes x
Preface xi
Acknowledgements xx

Introduction to *Money and Inflation at the Time of Covid* 1

PART I SOME BACKGROUND THEORY

1 The quantity theory of money: a new restatement 26

2 How this restatement differs from Friedman's 88

3 Can central banks run out of ammunition? The money–equities interaction channel in monetary policy 100

4 Why were economists' forecasts in the Covid pandemic so badly wrong? 123

PART II APPLICATIONS OF THE THEORY IN THE EARLY 2020s

5 The money explosion of spring 2020, as it happened 153

6 Was it right in 2020 to forecast that the then money explosion would increase inflation? An analysis of the US situation 168

7 Applying the theory to the USA in the early 2020s 193

8 Applying the theory to the UK in the early 2020s 209

9 Does cost accountancy provide a good framework for analysing inflation? 225

10 Money in the Covid-related business cycle: an analytical narrative and key evidence 240

Index 263

Figures

1.1	Corporate profits as a share of US GDP	49
1.2	Money growth and inflation in the G20, 1980–2022	58
1.3	The house price boom in the USA during the Covid pandemic	62
1.4	Household and non-household money early in the USA's Covid-related business cycle	63
1.5	Expectations of inflation % over the next ten years, as implied by relative yields in the US bond market, in the early 2020s	70
3.1	Liquid assets as % of total assets for all mutual funds in the USA, 1999–2019	109
3.2	The contrasting volatility in the USA of aggregate money and money held by the financial sector	114
4.1	UK nominal GDP and broad money, 1964–2024	131
4.2	Income velocity of circulation of UK broad money, 1964–2024	131
4.3	Change in income velocity of broad money in the UK, 1965–2024	132
4.4	Frequency of changes in UK broad money velocity within certain bands, 1965–2019	134
4.5	Frequency of changes in UK broad money velocity within certain bands, 1980–2019	135
5.1	Annual % growth rate of deposits at US commercial banks, implied by the increase in the last four weeks	157
5.2	A histogram of changes in the velocity of broad money in the USA since end-1951	161
6.1	Money growth in the OECD area, 1981–2022	170
6.2	Covid and the sharp jump in US unemployment in spring 2020	171
6.3	Money and nominal GNP/GDP in the USA in the century from 1918	174
6.4	Ratio of broad money to national income in the USA in six decades from 1959: Friedman's financialization hypothesis	176

6.5 Income velocity of circulation of broad money in the USA in the century before the Covid-19 pandemic 177
6.6 Changes in broad money velocity in the USA in the century to Covid 178
6.7 A histogram of changes in the velocity of broad money in the USA, in the century to 2019 179
6.8 A histogram of changes in the velocity of broad money in the USA since end-1951 180
6.A1 Crash in US money growth in the two years to spring 2023 187
7.1 Three-month annualized growth rate % of M3 broad money in the USA, 2009 to mid-2020 197
7.2 Fiscal policy vs. monetary policy: fiscal deficit, money growth and nominal GDP, by decade from 1960 206
8.1 Labour shortages, as seen by UK businesses, 1961–2022 217
9.1 The UK's import costs from the mid-1950s 232
9.2 Real cost of import price shocks – comparing the mid-1970s with Covid 233
9.3 Output gap in the UK as a % of potential output 235
10.1 Income velocity of M3 broad money in the USA, 2010–20 242
10.2 Income velocity of M3 broad money in the USA, 2010–24 243
10.3 Check to money growth in the USA from spring 2022 244
10.4 Nominal GDP and broad money in the USA since mid-2020 245
10.5 Income velocity of M3 broad money in the Eurozone before Covid-19 248
10.6 Income velocity of Eurozone M3 broad money, showing the 2020 anomaly 249
10.7 Income velocity of Eurozone M3 broad money, in the 2010s and the Covid-affected early 2020s 251
10.8 Nominal GDP and broad money in the Eurozone since mid-2020 252
10.9 Income velocity of M4x broad money in the UK, 2010–20 253
10.10 Income velocity of M4x broad money in the UK, 2010–24 254
10.11 Nominal GDP and broad money in the UK from mid-2020 254
10.12 The behaviour of broad money velocity in the four years from mid-2020 256

Tables

1.1	Transactions through major US noncash payments systems in 2021	31
1.2	Value and composition of US household wealth at end-2021	38
1.3	Money, income and the value of variable-income assets in the USA, 1946–2021	50
1.4	Capital gains and losses on major asset classes in the USA's Covid-related business cycle	53
1.5	Changes in US household sector balance sheet, 1946–2021	56
3.1	Constituents of household wealth in the USA at end-2019	106
3.2	Holders of US corporate equities at end-2019	108
5.1	Medium-term relationship between changes in money and changes in nominal GDP	163
6.1	Money growth in leading nations, G7 group and Switzerland, before and during Covid pandemic	169
7.1	The stability of the growth rates of money and nominal GDP in the USA in the 20th and 21st centuries	194
7.2	US budget deficit and inflation at the time of Covid	204
9.1	Inflation, and changes in inflation, in leading nations at the time of Covid	228
9.2	House price inflation in England and Wales, 2018–2024	230

Boxes

0.1	Main propositions of the restated quantity theory of money	4
1.1	Guide to sections in Chapter 1	28
7.1	The arithmetic of the USA's 2020 money explosion	196

Preface

This book is the culmination of my career as an economist which began, in a sense, in my teens. With Britain in the mid-1960s beset by economic problems, I decided as a teenager that I would become an economist. The problems were reported in the newspapers, including *The Times*, which for some years had a semi-autonomous *Times Business News* supplement. The charismatic and clever Peter Jay was its economics editor. In one of his articles Jay claimed to have found a surprising and counter-intuitive "deflation paradox". As a sixth-former at Colchester Royal Grammar School, I was underwhelmed by the idea and wrote to Jay to explain why. An extensive exchange of letters followed, without Jay knowing my age. Somehow the fact that I was only in my teens leaked out.[1] Jay was then kind enough to invite me to lunch at the Mermaid Restaurant, attached to the then Mermaid Theatre and not far from the offices of *The Times* at New Printing House Square.[2]

We stayed in touch. When I was chairman of the undergraduate Politics and Economics Society at Oxford University, Jay accepted my invitation to talk to us. He took the opportunity to present the case for an economic policy select committee of the House of Commons. The meeting was in the Trinity (that is, summer) term in 1970, with perhaps four other people turning up to listen.[3] Jay was completely unfazed by the small audience, and spoke with his usual clarity and eloquence. A memorandum by Samuel Brittan and Peter Jay, with the date of preparation given as 17 February 1970, was submitted by its two authors to the House of Commons Select Committee on Procedure in 1974. The memorandum recommended that Parliament establish an economic policy select committee.[4]

In my 1972 final Oxford examinations for a degree in History and Economics, I gained a first class degree, with the equal highest marks in economics in my year. I was awarded a so-called "Studentship" at Nuffield College, to begin post-graduate work. I felt that I should improve my mathematical and statistical skills, and had a year at Nuffield supervised by Jim Mirrlees (1936–2018). Mirrlees was a doyen of mathematical economics who won the Nobel Prize in 1996. He was a nice man, but our attitudes towards politics and economics were quite different. Jay rescued me from Nuffield by offering me a job on the economics staff of *The Times* in summer 1973. I was delighted and of course

accepted. It was a fantastic break for a young man interested in real-world policy-making. In those days *The Times* was regarded as "the top people's newspaper", and anything in it had a disproportionate esteem and influence. I was on the economics staff of *The Times* for the three years from autumn 1973. They were a period of almost unremitting crisis, which served as a perfect melting pot for new macroeconomic thinking not far from actual policy-making. Some of my reporting was of sessions of the Expenditure Committee of the House of Commons, which could be seen as a precursor of the Treasury select committee. (The Treasury select committee is now well-established; it is, in effect, the economic affairs select committee recommended by Brittan and Jay.)

I was very lucky to start my career in such a prominent and fascinating position. Indeed, the rest of that career could be interpreted as an attempt to catch up with the break which Jay gave me in the early 1970s. The current volume is therefore dedicated to the memory of Peter Jay. He died on 22 September 2024, just a few weeks before the typescript was sent to the publishers.

The Brittan–Jay 1974 memorandum noticed "the resurrection of monetary policy" in the United Kingdom in the late 1960s and contained a brief reference to Milton Friedman.[5] Indeed, for a time and within a select circle, Brittan and Jay were known as "the monetarist twins" or even "the terrible monetarist twins".[6] Jay had in fact spent much of the late 1960s working in Washington, partly because the editor of *The Times* suggested it to him, and also partly because Jay loved the United States of America.[7] While on the other side of the Atlantic Jay met Friedman, and was undoubtedly stimulated by the discussions between them.[8] Friedman's views must have had an impact on Jay's reaction to the money supply explosion during the Conservative government (1970–74) under prime minister Edward Heath.[9] In the two years to autumn 1973 the M3 measure of broad money surged by just above 60 per cent, at a compound annual per cent rate of increase of 26.7 per cent.[10] Jay forecast that the accompanying boom would end in bust, in association with sharply higher inflation.[11]

Jay was something of a maverick in his views about the inflationary consequences of the so-called "Heath–Barber boom", and in my first few months at *The Times* I was puzzled by his pessimism.[12] But he was right. In the year to August 1975 the retail price index soared by 26.9 per cent. This was the context in which I became a monetarist, where a monetarist is to be understood as someone who believes that large movements in the price level are always preceded or accompanied by large movements in the quantity of money. Admittedly, I was finding my way. My education at Oxford had not prepared me to specialize in money and banking, although I had attended valuable evening seminars (probably in 1971) at All Souls College presided over by Sir John Hicks. Two of the guest speakers at the Hicks' seminar were Charles Goodhart and David Laidler, whom I later came to know well. (As a lowly undergraduate,

I did not meet them on these occasions at All Souls. In the early 1980s I had lunch and exchanged letters with Hicks, but we were not close.[13])

Over time my views evolved. Initially, as should be obvious from this account, the dominant influences were Friedman, whom I met through the Institute of Economic Affairs, and other journalists, particularly – but not only – Brittan and Jay. In 1976 I left *The Times* and went to work in the City of London. Large budget deficits entailed rapidly growing public debt, and the surge in public debt stimulated demand for macroeconomic advice on inflation and government bond yields. I was provoked by often insightful analyses from Gordon Pepper, an analyst (and eventual senior partner) at W. Greenwell & Co., the stockbroking firm, but thought I could do better.[14] I became a partner in another firm of stockbrokers, L. Messel & Co. In the mid-1980s I made a small fortune from the Big Bang (which led to the acquisition at high prices of London broking firms, to the benefit of these firms' partners) as well as my own trading in financial markets at the time.

Much of my research at L. Messel & Co. used data from a government publication, *Financial Statistics*, which had started life in the early 1960s. I understand that its contents reflected advice from Treasury civil servants, including Jay, who had worked at the Treasury before being recruited to *The Times*. In particular, good-quality monetary data were a regular feature of *Financial Statistics*, before the modern era in which long-run statistical series can easily be downloaded online from official sources. My education in money and banking came to a significant extent from looking at, and trying to make sense of, information in *Financial Statistics*.

The late 1970s and 1980s were an exciting time to be an economist active in London financial markets and commentary. The Thatcher government (1979–90) was at first committed to policies in which money growth targets were central. These policies passed under the label of "monetarism" and were routinely believed to have their intellectual roots in Milton Friedman's Chicago School. As inflation did come down in the early 1980s, the policies were successful in that respect. (UK annual inflation in the 1970s was routinely in the double digits per cent; in the mid-1980s it fell to an annual rate of about 5 per cent.)

In my view, both at the time and now, the policy framework adopted in those years made no sense unless the theory set out in the first half of the present work was correct. I call the theory "broad-money monetarism". As the years have gone by, I have come to realize that broad-money monetarism is a distinct body of thought, very different in key respects from Chicago School monetarism. The second chapter of *Money and Inflation at the Time of Covid* elaborates these differences, while a section of the Introduction distances me from (what I call) monetary-base and narrow-money monetarism.[15]

Broad-money monetarism may have provided the rationale for a policy framework focussed on broad money targets and these targets may have led

to the intended reduction in inflation, but money-based policy-making was unpopular. The overwhelming majority of British economists were hostile to monetarism, whether it took the Chicago School form or the somewhat different approach actually applied in the UK. In October 1985 broad money targets were downgraded by Nigel Lawson, the Chancellor of the Exchequer. Their demise in 1986 was accompanied by an acceleration in the growth of bank credit and broad money, similar in kind to that in the Heath–Barber boom of the early 1970s. After asset price buoyancy in 1986, 1987 and 1988, the Lawson boom terminated in an upturn of consumer inflation which again reached a double-digit annual per cent rate in 1990. (It is not an accident that Thatcher was obliged to leave 10 Downing Street not long afterwards.)

From an early stage of the Lawson boom, it seemed to me to resemble the Heath–Barber boom of 15 years earlier. I criticized the betrayal of the monetarist policy framework in several places, including a series of articles in *The Times*. I warned in late 1986 that – unless money growth were restrained – the result would be the return of double-digit inflation which eventually happened. My writings in this period were brought together in a 1992 collection called *Reflections on Monetarism*, with that book containing some semi-theoretical remarks on my favoured version of the monetary theory of national income determination. Samuel Brittan, who had lost interest in (what he termed) "monetarist mumbo-jumbo", mocked these remarks in his influential column in the *Financial Times*.[16]

Anyhow, many of my clients in the stockbroking world appreciated the value of my forecasts and the implied advice for their asset allocation decisions. With their support I set up in 1989 a new consultancy business, Lombard Street Research Ltd. For me, one purpose of Lombard Street Research was to maintain a forecasting tradition based on broad-money monetarism.[17] In late 1992 I was appointed to the newly created Treasury Panel of Independent Forecasters (or "wise persons"), in recognition of the success of my forecasts in the late 1980s. The Panel, which might be understood as a forerunner of the Bank of England's Monetary Policy Committee, was intended to advise officialdom on decisions relating to newly announced "inflation targets".[18]

Some observers might argue – given the events recounted in the last few paragraphs – that economists in Britain, and perhaps elsewhere, should pay attention to Congdon and broad-money monetarism. But that was not at all how they reacted. At its first meeting in early 1993 the Treasury Panel's agenda had not one item which so much as noticed the quantity of money and the banking system. I registered a protest by writing an Open Letter to the Panel's other members, but most of them were still not in the slightest interested in what I was saying.[19] Although I remained on the Panel until it was scrapped by the New Labour Chancellor of the Exchequer, Gordon Brown, in 1997, I was well aware that my input to the Panel's work came from a theoretical perspective

disliked, or even despised, by most other British economists. That was so, even as my forecasts continued to be relatively successful.[20] The Introduction to this book has a reference to me by Keynes' biographer, Robert Skidelsky, where he correctly described me in his 2019 book *Money and Government* as "lonely" and "an outlier" in British economics.

In the early twenty-first century economists' neglect of traditional monetary economics – in the sense of economics in which the quantity of money mattered to the economy's behaviour – went even further. An important influence here was a 2003 book by Michael Woodford, a professor at Columbia University, entitled *Interest and Prices*. To summarize one of its key themes, *Interest and Prices* says that a satisfactory analysis of inflation can be conducted without noticing or discussing money quantities at all. The claim apparently extends to the understanding of "galloping inflation" (roughly speaking, when the price level rise by between 10 per cent and 99 per cent a year) and hyperinflation (when it goes up by over 50 per cent a month). I recommend that readers have a look at section VI of Chapter 1 below, which provides some evidence relevant to the plausibility (or implausibility) of the Woodford notion. Woodford's work is highly esteemed in English-speaking universities and central banks, and has resulted in (what I term) "interest-rate-only macroeconomics". I see one task of *Money and Inflation at the Time of Covid* as being to debunk interest-rate-only macroeconomics.

In 2014 I created a new research institute, the Institute of International Monetary Research, in association with the University of Buckingham. For most of my career I have concentrated on the UK, which is – after all – where I live, and where I have my interests and worries. But much of the Institute's work is to examine money growth trends in all the major nations, not just the UK. In particular, money growth in the USA matters to its macroeconomic trajectory, and the USA's macroeconomic trajectory matters to the world's.

Money and Inflation at the Time of Covid is about my correct call in spring and summer 2020 that policy decisions taken in response to the Covid pandemic would lead to more inflation. This was the most important call of my career, since the dominant view among practically all of my professional colleagues and rivals – that Covid would lead to a long period of deflation – proved wrong. The book is very much about decisions and events in the USA and the UK, but does cover other nations to some extent.

I hope this Preface has helped the reader to situate me in the wider contemporary debates among economists and so to understand my intellectual debts. Plainly, an implication of the last few pages is that most of these debts are *not* to economists living today. This may reflects the ancientness of the quantity theory of money, combined with the unfortunate tendency of some modern economists to regard any ideas from the distant (or even recent) past with contempt. Instead my debts are mostly to economists who are no longer alive. In

the following chapters Friedman and Keynes have the lion's share of mentions (see p. 88). Skidelsky was correct in *Money and Government* to label me "a Keynesian monetarist", however odd that might seem to many people.

This is not to say I avoid contacts and discussions with other economists, or that my work has been entirely dismissed by the mainstream profession. I first met David Laidler in 1975, and we have been in contact off and on for all of the next 50 years. Of living economists, he is the most important to me and I owe him special thanks. (We exchanged emails in late March and early April 2020, when he immediately appreciated the significance of what I was saying, and fully supported my view.) I came to know Charles Goodhart, at the time a senior economist at the Bank of England, in the late 1970s, and my gratitude to him again goes back nearly 50 years. (And, again, we exchanged emails in late March and early April 2020, and Goodhart even went public with a rough-and-ready inflation forecast much the same as mine.)

I first met Robert Skidelsky – completely by chance – when we shared the same compartment in a train journey perhaps 30 or so years ago. We started talking, but unfortunately had to stop when the train reached its final destination. We still talk, although whether the conversations will ever reach a final destination is (I fear) uncertain and unlikely. His thoughts and provocations have been invaluable.

Sir Alan Walters, personal economic adviser to Margaret Thatcher when she was prime minister, recommended to Steve Hanke – at Baltimore's Johns Hopkins University – that he contact me if he wanted to see what monetarism meant on this side of the Atlantic.[21] Professor Hanke did so, and nowadays we are in more or less constant touch by email, usually agreeing and sometimes disagreeing. He has become an outstanding proponent of broad-money monetarism, and I admire and thank him for battling with the reprobates who dominate the American profession. Hanke has led the monetarist argument in the USA in the last few years.[22]

Samuel Demeulemeester and John Greenwood (of International Monetary Monitor Ltd) read an early draft of Chapter 1, and offered very detailed and helpful comments. Tom Clougherty and his colleagues at the Institute of Economic Affair were instrumental in converting that draft into my 2024 short IEA book, *The Quantity Theory of Money: A New Restatement*. I am most grateful to all of them.

Many other people have helped me in my career. A full list would be too long for the space available, but I must particularly thank those who have worked with me – and tolerated my foibles – at L. Messel & Co., Lombard Street Research and the Institute of International Monetary Research. Juan Castañeda was the Institute's second director, and we both wrote in spring and summer 2020 – sometimes working together and sometimes apart – about the inflationary risks from the then pervasive monetary and fiscal expansionism.

I owe a special debt to him; Gail Grimston, my PA at the Institute at the time and now; and John Petley, who helps me with the Institute's emails.

(None of the above are responsible for the many mistakes and misunderstandings which mar the current work. I must take the blame for these, as the book is very distinctively that of its author and no one else. A small style point concludes this Preface. The first person singular is used in the Preface and Introduction, but in the following chapters I refer to myself in the third person as "the author". The point may seem pedantic, but something has to be done for consistency and this is my usual practice.)

NOTES

1. In 1986, as Chancellor of the Exchequer, Nigel Lawson said, "I would not take too much notice of teenage scribblers in the City who jump up and down in an effort to get press attention." Lawson and Jay were friends, and Jay may have told Lawson about my sixth-form exploits. Almost certainly, I was "the teenage scribbler" to whom Lawson was referring, although at that point I was in my mid-thirties.
2. Both the Mermaid Theatre and the office building which constituted New Printing House Square in the 1960s have been demolished.
3. The meeting coincided with televised football matches in the 1970 World Cup.
4. Samuel Brittan and Peter Jay, 'A case for a Select Committee on Economic Affairs', pp. 93–124, in Peter Jay, *The Crisis for Western Political Economy* (London: André Deutsch, 1984).
5. Peter Jay, *The Crisis for Western Political Economy*, pp. 100, 106.
6. Robert Skidelsky, 'Economics as part of the human condition', review of *Capitalism with a Human Face* by Samuel Brittan, 12 January 1995, on Skidelsky's website as, https://robertskidelsky.com/1995/01/12/book-review-economics-as-part-of-the-human-condition/
7. See footnote 14 to 'Peter Jay – Powerbase', https://powerbase.info/index.php/Peter_Jay, accessed March 2025.
8. See footnote 15 to 'Peter Jay – Powerbase'.
9. Jay may also have been influenced by his father, Douglas Jay (1907–1996), who – as a young man in the late 1930s and 1940s – had moved in circles close to Keynes. My surmise is that, as father and son played chess together, they would often have talked about the economy in the early 1970s.
10. *Economic Trends: Annual Supplement* (London: Her Majesty's Stationery Office, 1989), p. 161.
11. Peter Jay, 'The boom that must go bust', *The Times*, 7 May 1973.
12. The reference to Barber is to Anthony Barber, who was Chancellor of the Exchequer from 1970 to 1974.
13. Hicks wrote to me out of the blue, to say how much he liked some articles I had written for *The Banker* magazine. Two of these endorsed the central

bank's role as lender of last resort, that is, its role of extending overdrafts to commercial banks when they ran short of cash. (See Tim Congdon, 'Should Britain adopt monetary base control?', pp. 31–7, *The Banker* [London: Financial Times Publications], February 1980 issue, and 'The first principles of central banking', *The Banker* [London: Financial Times Publications], April 1981 issue.) Hicks was concerned that the Chicago monetarist approach to the subject, with its focus on the quantity of the monetary base, overlooked the importance of overdrafts in money creation. We agreed about this, as will be clear in Chapter 2 below.

14. Jay asked me to write the news stories in *The Times* about Greenwell's *Monetary Bulletin*. He was probably right that – although I was a stripling in my early twenties – I was the only journalist on the staff who understood Pepper's often quite complex arguments. Pepper was consulted by Margaret Thatcher about monetary policy. His later collection, *Money, Credit and Asset Prices* (London: Macmillan Press, 1994), includes much material from various issues of Greenwell's *Monetary Bulletin*.
15. The reader may wonder about my relationship with Milton Friedman. He liked a 1978 pamphlet I wrote – called *Monetarism: An Essay in Definition* – for the Centre for Policy Studies, the think tank founded by Margaret Thatcher and Keith Joseph. But in 1980 and 1981 I made clear to him that I was opposed to a system (of "monetary base control") in which the quantity of money would be controlled by operations affecting the quantity of monetary base assets and banks' cash reserves. After a sharp exchange at the Mont Pelerin Society meeting in Chile in 1981, he cut off diplomatic relations. We met again many years later, not face to face, but by email. Our common friend, John Greenwood, sent him some of my work on different types of open market operation, including those which became known as "quantitative easing". For more on these email exchanges, see footnotes 13 and 17 to essay 4 in my collection, *Money in a Free Society* (New York: Encounter Books, 2011), pp. 416–17. When Friedman realized that we were essentially on the same side, the emails became friendly. But it will be clear from this book that I do not today hold Friedman in the esteem which at first I had for him. As I explain in Chapter 2, it staggers me that an advocate of the free market could not see that the Chicago School's 100 per cent cash reserve idea is an egregious intervention in the commercial freedom of the banking industry. See also my comments on his forecasting "blooper", on pp. 93–4.
16. Tim Congdon, *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publications, 1992), p. 167.
17. See the final chapter – Chapter 15, 'Some aspects of the transmission mechanism' – in Tim Congdon, *Keynes, the Keynesians and Monetarism* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2007) for my work at Lombard Street Research Ltd.
18. See David Smith, 'How Peter Jay, in these pages, transformed the economic policy debate', *The Times* Business Section, 25 September, 2024, for a tribute to Peter Jay just after his death, which mentions his influence on my

conversion to monetarism. The announcement of inflation targets was followed by about 15 years of markedly improved macroeconomic outcomes.

19. See Alan Budd, *Black Wednesday: A Re-examination of Britain's Experience in the Exchange Rate Mechanism* (London: Institute of Economic Affairs, 2005), based on 34th Wincott Lecture given by Budd on 5 October 2004, for a sample of the debates in this period.
20. Trevor Merriden, 'The good survey guide', *Management Today* (September 1996 issue), conducted a survey of macroeconomic forecasts in 1994 and 1995. His verdict was, "Top of the pile comes Lombard Street Research by Tim Congdon of the Chancellor's independent panel of forecasters."
21. Walters recommended to Thatcher in 1982 that I be appointed his successor as her personal economic adviser, but she did not take up the suggestion. I knew nothing about this at the time and learned about it only 40 years later.
22. Hanke is mentioned for his role in the US debate on monetary policy in Jennifer Burns, *Milton Friedman: The Last Conservative* (New York: Farrar, Straus and Giroux, 2023), p. 471.

Acknowledgements

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Chapter 3 largely reproduces an academic article, 'Can central banks run out of ammunition? The role of the money–equities interaction channel in monetary policy', which appeared in *The Journal of Economic Affairs* (John Willey & Sons, Inc.), vol. 41, no. 1, in January 2021. The author is again grateful to the editor of *The Journal of Economic Affairs* for his interest in my work and permission to re-use.

Introduction to *Money and Inflation at the Time of Covid*

Economists in the mass – as a profession, no less – did not cover themselves in glory in the early 2020s. Like everyone, they were caught off guard by the Covid pandemic. But, unlike other professions, they botched their reaction to it. Nearly all economists involved in macro-forecasting said that Covid-19 would lead to years of disinflation and perhaps even of deflation. Instead, in 2022, inflation reached the highest levels for 40 years in the United States of America, the Eurozone, the United Kingdom, and other leading nations. Economists in the USA had a conspicuously bad record in their mis-forecasting of inflation. An influential figure in American policy-making, Professor Jason Furman of Harvard University, in January 2022 contributed a column to the Project Syndicate website, under the title, 'Why did almost nobody see inflation coming?'. As he pointed out, in 2020 none of the Federal Open Market Committee's 18 members expected inflation above 2.5 per cent in 2021. In fact, consumer prices rose by 7 per cent in the year to December 2021. Furman lamented economists' "dismal performance" and "collective failure".[1]

I.

But in the UK at least, there were exceptions to Furman's "collective failure". I am pleased to say that they included me, the author of this book.[2] Right from the start, in late March and April 2020, I could see that the astonishing money explosion then under way would have inflationary consequences. The first result would be too much money chasing too few assets, so that the prices of shares and houses would be buoyant in late 2020 and 2021; the second would be too much money chasing too few goods and services. Consumer inflation might reach double digits at an annual rate in 2022 or 2023. I was particularly concerned about the inflation prospect in the USA, although I did not neglect the UK and worried about the Eurozone as well.[3] (In the following two years, I looked at Japan and Switzerland, and Canada and Australia, more sporadically.) On 30 March 2020, I sent out a special email to subscribers of the Institute of International Monetary Research monthly note. It related to the

USA and ended with the sentence, "Assuming that money growth does reach the 15 per cent to 20 per cent band for a few months, the message from history is that the annual increase in consumer prices will climb towards the 5 per cent–10 per cent area and could go higher." (The peak rate of annual money growth in fact came in June 2020, at over 25 per cent.)[4] On 23 April 2020, the *Wall Street Journal* published an article by me with the headline warning 'Get ready for the return of inflation'.

These two pieces were only a modest fraction of my output at the time. I wrote a somewhat more highbrow paper, entitled 'Will the current money growth acceleration increase inflation?: an analysis of the US situation', for the summer issue of the *World Economics* journal. It is reproduced, with some changes, as Chapter 6 below.[5] The argument of the paper was that the money explosion of 2020 would not immediately be matched by increases in prices and nominal gross domestic product (GDP). Instead, in the immediate future, the ratio of money to GDP would rise and the velocity of circulation would fall. But, over the next two to three years, I expected velocity to return towards the trend value implied by its past behaviour. Mean-reverting behaviour of this kind implied a significant rise in inflation, and I said so. Chapter 7 has more detail on people and events in the USA, and the patterns between different economic variables, in the Covid period. Chapter 8 is on the same lines, but is about the UK. Chapter 10 discusses the extent to which mean-reverting behaviour has been observed in practice since 2020.

In summer 2020, I collaborated closely with my colleague, Juan Castañeda, in the preparation of a pamphlet for the London-based think tank, the Institute of Economic Affairs (IEA), called *Inflation: the Next Threat?*.[6] To quote from the synopsis, "The extremely high growth rates of money [now being observed] will instigate an inflationary boom … Central banks seem heedless of the inflation risks inherent in monetary financing of the growing government deficits."[7] The IEA is to be thanked for publishing our work very quickly, in June 2020. The then Editorial Director, Syed Kamall (now Lord Kamall), knew that we represented a minority view, but he backed us to the hilt. We are most grateful to him for his support.

In late 2023, I circulated, for discussion purposes, Chapter 1 of a planned book on *Money and Inflation at the Time of Covid*. The chapter was noticed by Tom Clougherty, the IEA's current director, and he wondered whether it might form the basis of another IEA publication. I welcomed the idea. One result was the publication last summer of a short book, *The Quantity Theory of Money: A New Restatement*. Another was that the appearance of the longer work, *Money and Inflation at the Time of Covid*, was delayed. Anyhow, here is

that longer work, which incorporates much in *The Quantity Theory of Money: A New Restatement*, as well as other papers and articles written by me in the early 2020s, and some new material.

II.

The purpose of the current work is mostly to offer an analytical framework – a theory, if you wish – which explains why I was right in spring 2020 to predict a significant upturn in inflation. Another part of the agenda is to identify (what I regard as) serious misperceptions in the majority thinking which led to economists' "dismal performance". Chapter 1 recalls Milton Friedman's 1956 restatement of the quantity theory of money. It is now almost seven decades later. I suggest that – given the often tumultuous flow of monetary events in this period, the multiple associated disputes about these events between economists, and the new data generated in many countries – another restatement is needed. My focus is, however, rather different from Friedman's. It is on the theory of the transmission mechanism from money to the economy, which in applied contexts usually means from changes in the rate of money growth to a range of macroeconomic outcomes. The outcomes include – crucially – the inflation rate. By contrast, in 1956 Friedman concentrated on the properties of the money demand function. In explaining how money and the economy interact, I highlight the importance of an all-inclusive, broadly defined measure of money. Friedman would have sympathized with my approach, but he was never as fully committed to broad money as I am in this publication and have been throughout my career. Chapter 2 contains more detail on the differences between the current restatement of the quantity theory and Friedman's position, including that of the Chicago School to which he belonged. The middle sections of Chapter 1 are the vital ones in setting out the transmission mechanism; they should help in understanding how easy it was in spring 2020 to forecast the inflation flare-up which ensued in the next two to three years. My theoretical framework can be summarized in a box, as on p. 4.

BOX 0.1 MAIN PROPOSITIONS OF THE RESTATED QUANTITY THEORY OF MONEY

1. Monetary equilibrium is established when the non-bank private sector agents' demand to hold *all* money balances (i.e. broad money) is equal to the quantity of money created by the banking system and its customers.
2. When monetary equilibrium holds, the nominal levels of national income and wealth are at the levels desired by money-holding agents, and in that sense, national income and wealth are determined.
3. Transactions are many times higher in value in a modern economy than national output. But – no matter how enormous their value – transactions between non-bank, money-holding agents cannot change an all-inclusive measure of the quantity of money. If monetary equilibrium does not hold and the quantity of money is given, national income and wealth must adjust to restore equilibrium.
4. Changes in the value of variable-income assets (equities, real estate) – often due to changes in the quantity of money – are a central feature of the transmission mechanism. The Keynesian claim that the transmission mechanism involves only changes in the value of bonds (i.e., in "the rate of interest"), as in "the IS function" of the textbooks, is a serious misunderstanding.
5. If certain assumptions are met, changes in the quantity of money and nominal national income are equi-proportionate in equilibrium ("the proportionality postulate"). In practice, the required assumptions are rarely met in full and "monetary disequilibrium" often prevails. However, enough stability is found in agents' money-holding behaviour, particularly that of households, that changes in velocity (the inverse of the ratio of money to national income) are small over periods of several years compared with changes in either broad money or national income.
6. In equilibrium, the proportionality postulate applies to variable-income assets, as well as to the goods and services which constitute national output.
7. The quantity of money is determined by the extension of credit to the state and the non-bank private sector by the banking system; it is not usefully interpreted as a simple multiple of cash issued by the central bank or of capital invested in banks. The banking system consists of both profit-motivated commercial banks and a central bank. The central bank has the unique prerogative of issuing legal tender; its objectives are set out in legislation, which usually include the aim of price stability (or, at any rate, low inflation).

When shown this box, many economists may wonder what the fuss is all about. Don't the propositions amount to little more than organized common sense? Why has there been so much squabbling and rhetoric about these matters? Further, to the handful of economists who have bothered to read Keynes – as opposed to the hordes who call themselves "Keynesians" – the contents of the box may be more than a little ironic. Monetarists and Keynesians are usually stereotyped as opposites or even antagonists. But the few authentic Keynesians, those who have read all his principal works and not just *The General Theory*, might contend that the box does no more than recall key themes in the 1930 *Treatise on Money*.

I would not resist this interpretation; Keynes – particularly the Keynes of the *Treatise*, and of the 1923 *Tract on Monetary Reform* and the vast body of still readable journalism – is one of my intellectual heroes. In his 2018 book on *Money and Government*, Keynes' biographer, Robert Skidelsky, labelled me a "Keynesian monetarist".[8] This may have bewildered people, as it seemed to be an oxymoron. I took it as a compliment. It does in fact locate me well in the much-disputed territories of macroeconomics and monetary theory. But I dislike intensely one salient theme in *The General Theory*, for reasons which will become apparent later in this Introduction. (Note that the phrase "Keynesian monetarist" has subsequently been used by Tim Lankester in his 2024 book *Inside Thatcher's Monetarist Experiment*. Apparently, it was how Sir James Meade, a Nobel economics laureate, characterized himself in his attitude towards demand management and inflation in the 1970s. Lankester describes Meade as "a paid-up member of the Keynesian establishment". He believed in using monetary *and fiscal* policy to manage aggregate demand in order to meet targets for nominal GDP. He was opposed to organizing policy around money growth targets.[9] As I explain at the end of Chapter 7, I repudiate fiscal policy as a means of managing aggregate demand and economic activity, and hence I am not at all a paid-up member of the Keynesian establishment.)

Skidelsky was kind enough to say in his book that my work was "important", although he qualified this by saying that I was "lonely" and "an outlier". I regard my analytical framework as banal and straightforward, and do not believe it should be controversial. Nevertheless, the events of 2020 showed that Skidelsky was correct to suggest that I was an outlier. The framework implies – it very clearly and obviously implies – that a marked acceleration in the growth of broad money will result in a marked acceleration in inflation. But, to repeat, in spring 2020 – if close colleagues are excluded – I was almost in a minority of one in arguing that money growth in the teens or above per cent risked inflation in the teens per cent. Some attention was paid to my warnings, but – in the early months of the Covid emergency – not much.[10] (Subsequently, as the warnings were vindicated by events, the monetarist argument became

an important strand in the UK public debate. But it was overlooked in the public debate on inflation in most countries.)

Frankly, the economics profession was hopeless in its initial assessment of the Covid-19 shock and the appropriate policy answers. The mistake was so bad that almost all economists were wrong about a major shift in the direction of change in the aggregate price level, less than 18 months before that shift occurred. In my view, the trouble stemmed, above all, from

- Neglect of money growth trends in contemporary macroeconomic analysis, particularly in the supposed powerhouses of such analysis in the research departments of central banks, and
- Imprecision, ambiguity, and confusion in past statements of the quantity theory of money.

This book argues that the behaviour of money growth must be restored to a central position in policy-oriented macroeconomic analysis; it also tries to provide a statement of the quantity theory that is precise and rigorous, and therefore lends itself to successful forecasts of inflation.

When I use the phrase "contemporary macroeconomic analysis", to which of its aspects am I most unsympathetic? This Introduction may serve as an appetiser to the main course of the book's argument by emphasizing three areas of particular disagreement and tension. One of these – which may come as a surprise – is with other economists who sometimes (or even always) say they are monetarists, adherents of the quantity theory or whatever; another is with the centrality of the well-known "IS function" in textbook Keynesianism and a modish extension of textbook Keynesianism known as New Keynesianism; and the third is with a line of thought ("credit-ism") which emphasizes bank credit and debt incurrence *by themselves* as determinants of national income and wealth.[11]

III.

The main claims of this book rest on the ability of a broadly defined money aggregate to determine other macroeconomic variables. If this is monetarism, it is very much "broad-money monetarism". I am unenthusiastic about two alternative approaches, which might be called "monetary-base monetarism" and "narrow-money monetarism". Concision risks misrepresentation, but the essence of these alternatives seems to me captured in the following descriptions:

- *Monetary-base monetarism.* This line of thought has two main versions. The first is that the monetary base *by itself* – without invoking any other money balances – is the key measure of money in the determination of national expenditure and income; the second and more significant is that the link between the monetary base and a deposit-dominated money aggregate is so mechanical and certain that their rates of change are similar (or even identical), and – via the influences of the base on the wider money aggregate and of the wider aggregate on the economy – the base is again the ultimate determinant of national expenditure and income.[12] (The monetary base is defined below in Chapter 1; it consists of the monetary liabilities of the central bank.)
- *Narrow-money monetarism.* Here the idea is that a narrowly defined measure of money – again *by itself* – determines national expenditure and income. By implication, the tracking of a narrow aggregate such as M1 is sufficient for the analyst to forecast inflation. Further, if exponents of the quantity theory are asked for evidence of stable money-holding preferences, they think M1 is the appropriate aggregate in econometric investigation.[13] (Narrow money is also defined in Chapter 1.)

These two kinds of monetarism were associated with the University of Chicago in the late twentieth century. I accept that for decades they were very influential, but I am antipathetic to much of what they say. They have done a lot of damage. When adopted by widely quoted and well-regarded economists, they have often led to forecasting mistakes and embarrassment.

When Friedman made his "blooper" on inflation in the 1980s, by forecasting a significant rise which did not occur, the blooper arose from his selection of M1 as the most important aggregate in assessing inflation trends;[14] when Patrick Minford in the late 1980s wrongly quarreled with me about whether the UK's Lawson boom would prove inflationary, it was his attachment to the M0 notion of the monetary base which was responsible;[15] when four fellows of the Hoover Institution signed an Open Letter to Ben Bernanke in 2010, with its misjudged warning that the Fed's asset purchases would cause "currency debasement", they were anxious about the very rapid growth of the monetary base consequent on those asset purchases;[16] when Liam Halligan, the newspaper columnist, used the pages of *The Sunday Telegraph* incorrectly to criticize me for my post-2009 view that the then central bank asset purchases would not lead to rapid inflation, his misguided focus was on the UK monetary base.[17]

To reiterate, I do not care for either monetary-base monetarism or narrow-money monetarism. Moreover, I have no truck with appeals to "the aggregates" in the plural, since these, in my view are confessions of muddle or even ignorance. Analysis in this area of economics should relate to a broadly defined measure of money, full stop. Admittedly, there is a so-called

"boundary problem" in defining it.[18] (See pp. 29–30 in Chapter 1 for more on this problem.)

IV.

What is my objection to the IS function? Non-economist readers may be puzzled by the phrase. The IS function originates in a 1937 review article of Keynes' *General Theory*. It was written by Sir John Hicks, later awarded the Nobel Prize and undoubtedly one of Britain's greatest economists. (He is given a starring role in Chapter 1 below.) The *General Theory* may have been a revolutionary work, but perhaps for this very reason it was difficult to follow and understand. Not the least of its perplexities was that "the rate of interest" (meaning a bond yield) was active in two ostensibly separate processes of national income determination. The rate of interest *both* equilibrated the demand to hold money with the supply, where the demand to hold money was related to national income, *and* it determined investment, where national income was a multiple of investment.

Were there two distinct theories of national income determination in the one purported masterwork? Hicks' trick was to propose one function (which became "the LM function") for the monetary component of Keynes' *magnum opus*, and another function ("the IS function") to represent the multiplier story. The two functions could be translated into equations, thereby becoming a neat simultaneous-equations model of the economy; they could also be assembled in an IS/LM diagram with two beautifully intersecting curves. Keynes sent Hicks a postcard blessing the IS/LM construction. It has subsequently adorned hundreds of macroeconomics textbooks, with one of its attractions being that it is easy to mark in examinations.

But the IS/LM "thing" (Hicks' later characterization) depended on the structure of Keynes' argument in *The General Theory*, and in one important respect, that structure was unrealistic to the point of crankiness.[19] In much of *The General Theory*, Keynes restricted the choice between money and assets to a choice between money and bonds.[20] Hence an increase in the quantity of money raised the price of bonds, which lowered bond yields and his "rate of interest", which stimulated investment, and further spurred a gain in national expenditure and income that was a multiple of the extra investment. Here was the IS function at work.

The last paragraph summarizes a key strand in the *General Theory*; its sentences also respect syntax and the recognized meaning of words. Chapter 18 of his *General Theory* was pivotal, in that it was the place where he "gathered together the threads of [the] argument". It was also where he said that "the rate of interest" was one of the crucial independent variables in his system and – to repeat – he meant a representative bond yield as his "rate of interest".[21] But is

this really the right way to organize the interpretation of business and financial reality? In the hypothetical world of *The General Theory*, only two assets figure in the analysis – that is, money and bonds; in the real world, agents are balancing money both against goods and services, and an assortment of assets of which equities and real estate are far more important than bonds. As I discuss in Chapters 1 and 3, bonds are a relatively unimportant asset class in a modern economy. Fluctuations in the value of equities and real estate (which I call "variable-income assets") have far greater effects on changes in aggregate demand than fluctuations in the value of bonds (fixed-income assets).

The IS function may have helped Hicks to summarize the complex argument of *The General Theory* for the purposes of university instruction. But this part of Keynes' larger thesis was – and remains – about a minor feature of the economy and has little traction in understanding modern business life. Given the trivial position of bonds in the household sector balance sheet, the IS function misses at least 90 per cent of the interaction between money and the economy. Indeed, in the extreme conditions of late 2020 and early 2021, particularly in the USA, when excess money drove large gains in the stock market and house prices, it was probably picking up less than 2 per cent of that interaction. (See pp. 48–55 below for more justification of this statement.)

The analytical logic behind the LM curve may be more elusive than that behind the IS curve, as it involves reasoning in sometimes abstruse areas of monetary economics. Further, if money has to be retained in macroeconomics, that means banks have to be brought into the analysis as well.[22] Banks have balance sheets, while some Keynesian economists seem to find balance sheets difficult to read and understand.[23] Over time, the IS/LM approach has therefore been truncated and simplified into an approach with the IS function only.[24] A high proportion of today's macroeconomists have come to think in terms of an IS function – *and only an IS function* – when they want to determine aggregate demand and national income. They forget about money, in the sense of "the quantity of money", altogether. In 2020, the year which in the USA saw the fastest growth of broadly defined M3 money since the Second World War, the minutes of the Federal Open Market Committee contained not one reference to any money aggregate.[25]

V.

The elimination of money from macroeconomic analysis is most evident in the three-equation distillation of New Keynesianism, a body of thought often deemed to be the "workhorse" of today's central bank research.[26] In this body of thought, only one equation determines national expenditure and income, and it is indeed an IS function.[27] In qualification, the rate of interest in the three-equation model is not Keynes' bond yield but the central bank rate.[28]

The substitution is intended to enable the three-equation approach to inform real-world decision-taking by central banks, since it is widely agreed that "the rate of interest" – not the quantity of money – is their main policy instrument. (The monetarists have advocated following the quantity of money as an intermediate target; they have not said that the quantity of money is a policy instrument. However, operations such as asset purchases from or sales to *non-banks* have a fairly direct, measurable impact on the quantity of money.[29])

Despite the exclusion of money and banking from the three-equation framework, Huw Pill, the current chief economist at the Bank of England, has said that this kind of New Keynesianism is "canonical".[30] A similar commendation, using the same word, appeared in a speech from Isobel Schnabel of the European Central Bank in a major speech on 24 November 2020. In her view, "the canonical New Keynesian model" is one that "most central banks use to inform their decisions" and which therefore "goes to the very heart of monetary policy-making".[31]

One contention of the current work is, on the contrary, that three-equation New Keynesianism is worthless if it is intended to shed light on reality. In particular, the omission of money makes it difficult for central banks to gauge the appropriate size of purchases or sales of long-dated assets (i.e. "quantitative easing" or "quantitative tightening") when they want to influence the economy by this method. The asset purchases conducted in 2020 and 2021 were much too large in most of the world's leading economies. However, as central banks did not consider the numerical consequences of their asset purchases on the quantity of money, they did not appreciate that a major rise in inflation became inevitable because of their actions.

Pill's apparent canonization of the three-equation model is picked up and criticized in Chapters 1 and 8. As it happens, the evidential basis for the IS function is underwhelming. Early in the twenty-first century, Edward Nelson, one of the Federal Reserve's top economists and an assiduous reader of academic journals, was well aware of the rise of three-equation New Keynesianism. But he had had a few brushes with the data and proposed that there was an "IS puzzle". New Keynesians might say an IS function was one of their crucial three equations, but in the real world, the IS function was a bit of a sphinx; it did not have the form or the properties it was supposed to have. A notable contribution was made by Charles Goodhart and Boris Hofmann in a February 2005 article, 'The IS curve and the transmission of monetary policy: is there a puzzle?' in the *Applied Economics* journal. Like so many others, they found that work on reduced-form IS functions was unrewarding. Their best-fitting relationships usually had no explanatory power, but when they did, all too often the coefficients on the interest rate term were wrongly signed or insignificant. To find better relationships, they added explanatory variables such as property prices and, intriguingly, a monetary aggregate.

One of the most active researchers on the IS function was Livio Stracca, an economist at the European Central Bank. In a 2010 paper for the ECB's *Working Paper* series (no. 1236), he wondered whether the travails of the IS function arose because too much attention had been paid to possibly perverse and misleading results for a limited number of countries. (He may have been thinking of the USA and the UK in particular, as these tend to attract most attention from English-speaking economists, for obvious reasons.) He therefore assessed "data from 22 OECD countries over 40 years". His verdict was damning. To quote,

> I find little evidence in favour of the traditional specification [of the IS curve] where the real interest rate enters with a negative sign due to intertemporal substitution: on the contrary, it is typically either insignificant or wrongly signed. Overall, I conclude that the New Keynesian IS curve, at least in its most common formulations, is not structural and is overwhelmingly rejected by the data.

The empirical literature testing the IS function is small, but enough work has been done to establish a definite conclusion: convincing relationships between the *levels* of interest rates and nominal GDP are hard to find, while those between *changes* in the two variables are even more elusive. If the IS function is a vital element in a model viewed as fundamental, even canonical, in central bank research, something has gone wrong.

Moreover, the elusiveness of the relationship between interest rates and aggregate demand is hardly new. Friedman's long-time collaborator, Anna Schwartz, once offered a generalization from her many years of research and data mining. Speaking at an academic conference in the UK in 1969, she said,

> The correlations between the level or rates of change in interest rates, on the one hand, and rates of change in nominal income, prices and output, on the other, are considerably worse than those between rates of change in the quantity of money and these magnitudes.[32]

Of course, the structure of economies does change over the decades, but – when I tried to disprove Schwartz's generalization by looking at the US data about 50 years later – the data refused to comply. The Schwartz generalization remains valid.[33]

This is not to dispute the potential value of the three-equation approach – like IS/LM – as a classroom gadget.[34] But, when economists leave the classroom and assume positions of significant policy-making power, such gadgets may not be much help. If non-economists want to understand why the economics profession made a hash of the early 2020s, it is – in my view – the veneration of the IS function and the canonization of three-equation New Keynesianism that deserve much of the blame. Interest-rate-only macroeconomics has become

dominant in central bank practice, and it has expelled the quantity of money from research and analysis. Here is perhaps the main source of the intellectual failure behind, in Furman's words, the "dismal performance" of economists in the early 2020s.

I admire the bulk of Keynes' contribution to macroeconomic theory but, in my view, he used several chapters of *The General Theory* – specifically, chapters 13 to 18 – to puff the overrated liquidity preference theory of the rate of interest. The IS curve, a by-product of that theory, was later given more prominence in Keynesian textbooks than it merited. This was a mistake, which was all the more disappointing in view of the stronger analysis in the *Treatise on Money*. One ambition of the *Treatise* was to develop a theory of the determination of the value of *all* non-liquid assets, including securities other than bonds (and even perhaps assets other than financial securities). By contrast, a big chunk of the *General Theory* was preoccupied with an unimportant issue, the balance in portfolios between money and bonds. Curiously, and paradoxically, the *Treatise* in this respect – as in others – had greater generality than the more famous *General Theory*.[35] A central claim throughout *Money and Inflation at the Time of Covid* is that the value of all non-liquid assets – the value, in particular, of corporate equity and residential real estate – is far more important to macroeconomic outcomes than the value of bonds.

VI.

What was Keynes' motive in highlighting his liquidity preference theory of bond yields? Whether by design or not, part of the answer is that his apparently technical economic theorizing was laced with politics. Keynes was a lifelong member of the Liberal Party and not particularly left-wing. But in the 1930s his university town, Cambridge, had many left-leaning figures and was indeed a breeding ground for people who later became communist spies loyal to the Soviet Union. It may come as a surprise, but key arguments in *The General Theory* gave comfort to the left in Britain and other countries.

According to Keynes' liquidity preference theory, an increase in the quantity of money would normally raise bond prices and reduce bond yields. But in *The General Theory* he wondered whether circumstances could be imagined (of "virtually absolute liquidity preference", in his words) where bond prices were already so high that investors had to expect the next major move in prices would be downwards.[36] An increase in the quantity of money could therefore not raise bond prices, lower the rate of interest, and stimulate the economy. Monetary policy would become ineffective, justifying Keynes' advocacy of public works as a valid means of combating depression. In a 1939 lecture, Dennis Robertson, who had earlier been one of Keynes' collaborators,

characterized this pathology of monetary policy ineffectiveness as a "liquidity trap".[37]

The liquidity trap came to be seen as a failure of free-market capitalism, a system in which – at least allegedly – financial markets unguided by the state could not prevent mass unemployment. The claim of monetary policy ineffectiveness therefore appealed to many left-leaning economists in the 1940s, 1950s and 1960s, when Soviet communism seemed to offer an alternative to market capitalism. They wanted monetary policy sidelined, so that government decision-making in the economic sphere could become dominated by fiscal policy (and higher government spending) and planning (with consequent intervention in private-sector business and finance). The wider ramifications of Keynes' musings on "absolute liquidity preference" were not value-free but full of ideological baggage.[38]

The political element latent in the argument of *The General Theory* may have contributed to its rapid spread in American and British universities in the 1940s and 1950s. In this period, an upsurge of interest in macroeconomics would have been likely in any event, because of the improvements in national income accounting pioneered, particularly in the UK, to help in calibrating the direction of national resources towards military ends in the Second World War. But the boom in economics was given further impetus by the allegedly revolutionary new thinking in *The General Theory*. The American economist, Paul Samuelson, was only 30 years old at the end of the Second World War. He saw the need for a textbook which would meet the prospective growth in demand for economic knowledge. In 1948 – after three years of intensive effort – he brought out his *Economics: An Introductory Analysis*. *The General Theory* was avowedly a major inspiration for its chapters about national income determination.[39]

The Samuelson textbook went through 19 editions and was massively influential in the post-war decades. As *The General Theory* acquired the status of the Bible of modern macroeconomics, Samuelson's synthesis of key themes became its Book of Common Prayer. *Economics: An Introductory Analysis* picked up Keynes' point about the potential ineffectiveness of monetary policy at very low interest rates; it also urged the continuing usefulness of fiscal policy to macroeconomic stimulus in such conditions. Although the phrase "the liquidity trap" did not appear in the first edition of the textbook, it became a settled feature of Samuelsonian economics in later editions.

The first edition was quite rough towards the quantity theory of money; it was said to be a "special, simplified doctrine", which most economists would not accept "except with copious grains of salt".[40] The hostility to the quantity theory was accompanied, in the first edition of the textbook, by some unfriendliness towards planning on the lines of Soviet five-year plans. But the unfriendliness faded in the 1950s. A recurrent assertion in the editions of

the 1960s was that, because of its superior growth performance, the planned, communist economy of the Soviet Union would ultimately overtake the free market, capitalist economy of the USA in size.[41] Samuelson's name – like that of Keynes and Friedman – crops up several times in the rest of this book.

VII.

As explained in section II of Chapter 1, in the early twenty-first century, virtually all money balances are created by the extension of bank credit and are a liability of the banking system. But this was not always so. Until the early twentieth century, a significant proportion of money took the form of metallic coin. Metallic coin had value in its own right, as it could be melted down for alternative non-monetary uses. It made sense to differentiate between commodity money (properly called "money" as such, as contemporaries saw it) and "money" in its modern form, as a deposit entry on a bank balance sheet, which arose from credit extension and might be labelled "credit". Over time the role of commodity money diminished. People in a hurry might then use the words "credit" and "money" interchangeably as if they were synonyms, even though bank loans appear on the asset side of bank balance sheets, and deposits on the liabilities side. Of course, loans and deposits were – and are – quite distinct.[42]

In the 1920s, Lauchlin Currie, as a doctoral student at Harvard, became irritated by the tendency of his economist contemporaries to muddle up the two words. For example, in a 1933 article, he said that Keynes' 1923 *Tract on Monetary Reform* contained references to bank deposits as credit. The article showed that different authors were imprecise and careless in their choice of words. Currie complained that too much ambiguity made a word "unsuitable for scientific purposes". His conclusion was that, "The continued use of the term 'credit' appears to be an obstacle both to the advancement of monetary science and its application to current problems."[43] Keynes may have noticed the injunction, as in *The General Theory* he clarified in a footnote that by the word "money" he meant, mostly, bank deposits.[44] This historical background to the vocabulary may explain why, for the next few decades, "credit" was not a popular word in macroeconomics. Further, during and immediately after the Second World War, changes in banks' assets were dominated by operations in government securities, not by developments in their loan portfolios.

However, the position had changed radically by the 1980s. The decades of peace enabled banks to reduce claims on the state as a proportion of total assets. Increasingly, the growth of banks' assets was similar in size to the growth of banks' loans to the private sector or "bank credit". Meanwhile, the growth of broad money (that is, more or less all of banks' deposits) came to much the same thing as the growth of banks' assets. So, for extended periods,

the growth rates of bank credit and broad money were similar, and so were the growth rates of bank credit, broad money, and nominal GDP. This was the position, even as – in accordance with standard theory – the pivotal relationship was actually between the growth rates of broad money and nominal GDP.

Benjamin Friedman, a Harvard economist, was persuaded that credit *by itself* might have a causal role in the determination of national income, since the facts hinted that in some periods national income was better correlated with bank lending than with the quantity of money.[45] The proposition was taken up by Ben Bernanke and Alan Blinder, two economists at Princeton, in a 1988 article in the *American Economic Review*.[46] In its final section, they summarized their discussion as suggesting that "the case for credit [as opposed to money] turns on whether credit demand is, or is becoming, relatively more stable than money demand. We conclude with some evidence that this is true, at least since 1979." Another joint article in 1995, this time with Bernanke accompanied by Mark Gertler of New York University, expanded the ideas by proposing "a credit channel". The idea was that economic activity could be affected in various ways by the availability and terms of bank loans.[47] These writings from Bernanke, Blinder, Benjamin Friedman, and Gertler were seminal in that they stimulated a large and still growing literature on the relationship between bank lending *by itself*, on the one hand, and national expenditure and income, on the other.

Credit-ism and the credit channel are mentioned in Chapter 1 (see pp. 46–8), and heavily criticized there as untenable. A clear message of the key creditist articles was that its leading exponents wanted to replace money-based accounts of national income determination with credit-based accounts. Let it be conceded straightaway that bank loans are indeed a special kind of credit because their extension normally leads to the creation of new money balances. Bank loans are therefore different from credit due to capital market transactions (that is, the issuance of bonds) and credit arising from transactions between companies (that is, the "debtors" and "creditors" in company accounts, or "trade credit"). But a relationship between the rates of growth of bank credit and nominal GDP is an accidental by-product of the more traditional and meaningful relationship between the rates of growth of money and nominal GDP.[48] No one has ever advanced a theory in which the other forms of non-bank credit – credit from capital markets and trade credit – *by themselves* are relevant to the determination of national expenditure and income. By extension, it is unclear why bank credit *by itself* should be any different.

Anyhow, credit-ism has gained considerable academic prestige since its main votaries work in acknowledged Ivy League universities. Like three-equation New Keynesianism, its influence has spread to central banks. For example, the May 2020 issue of the Bank of England's *Monetary Policy Report* included

in its Chapter 2, on 'Current economic conditions', a four-page discussion of 'Credit conditions'. But it did not mention the quantity of money at all.

The exclusion of money from the Bank's analytical purview may have been only implicit, but – to anyone (such as myself) who believed in a money-based view of national income determination – it was glaring. On 6 April 2020, Andrew Bailey, the Governor of the Bank of England, wrote an article in the *Financial Times* denying that its planned programme of asset purchases was equivalent to monetary financing of the budget deficit. On the same day, the Institute of International Monetary Research sent out a special email written by me, with the following warning:

> In my career as an economic analyst, I have commented on a succession of Bank governors. Bailey needs to be told – like his predecessors – that the rate of increase in the UK price level depends on the rate of increase in the quantity of money relative to the rate of increase in goods and services. I will be surprised if the current mix of policies is not accompanied, over the next few months, by an annual increase in M4x into the double digits; I will also be surprised if that does not lead to an inflation rate closer to 10 per cent than we have seen for many years.

I also wrote a letter – with much the same content – to the *Financial Times* to protest about Bailey's article, but it was not used.[49] Chapter 8 below has more on Bailey's less-than-reassuring grasp of basic monetary theory, although he does seem to have been open to the possibility that money mattered. In evidence to the House of Lords' Economic Affairs Committee on 23 June 2023, he said that the Monetary Policy Committee (MPC) had been aware of rapid money growth in 2021.[50] To quote,

> … if we look back to 2021, say—as a number of people have said—you saw rapid growth in the M4 aggregate. What was not said is that the other aggregate measure of M4, which is M4 lending, was not growing rapidly at all. In fact, it was doing the opposite. It was almost unprecedented that there was this gap opening up between the two … In the committee, we discuss this a lot, and the rationalisation of this we arrived at, but it then posed a question, which I think is still with us, that what we were seeing was quite a strong build-up of saving in the economy. That helps explain the gap between the two measures. It was useful that the monetary aggregates were giving us that picture quite starkly. We then had to form a view. We had this unexpected build-up of saving that we could rationalise in a Covid context …

Bailey's remarks are open to various interpretations, but they might be seen as an example of creditist thinking.[51] Apparently, in 2021 the MPC worried about rapid money growth only if it were accompanied by strong bank lending to the private sector. In other words, money mattered as a proxy for future bank lending, but not otherwise. The discussion of the transmission mechanism in Chapter 1 of this book explains that – if this is the Bank of England's

considered view – it betrays a comprehensive misunderstanding of the relationship between money and the economy.[52] Bailey's evidence to the House of Lords illustrated the sort of muddles for which credit-ism is responsible.

VIII.

This book has two parts of roughly equal length. The first sets out the theory on which my 2020 forecasts of rising inflation were based; the second applies that theory to the events and statistical series of the early 2020s. Readers may object that the first part is only loosely theoretical, not least because every chapter is crammed with data and institutional material. But I regard the blend of theory and fact as a strength, not a weakness. Let me explain.

Macroeconomic models cannot contain everything in the actual world of business and finance; they are – unavoidably – distillations of reality. They select certain categories found in real-world economies and often denote them with symbols with a view to their manipulation in suggestive geometric or algebraic arguments. As a result, they exclude other categories. The process of exclusion may reduce the representativeness of models and – crucially – the reliability and usefulness of the policy prescriptions they draw.

Warnings about the necessarily selective nature of macroeconomic models are surely unobjectionable. By implication, economists must take great care – when they select the categories or "aggregates" in their models – that the importance attached to these aggregates accords with relative magnitudes in the real world. As Axel Leijonhufvud understood in his 1968 classic *On Keynesian Economics and the Economics of Keynes*, the "aggregative structure" of models matters to what they say.[53] To quote,

> Aggregation is based on judgements about what is of primary and what of secondary importance – about what to include and what to leave out. It poses statistical decision problems that should in principle be settled by empirical test. Analytically, the benefits lie in simplification …; the costs lie in the potentially significant causal relationships which vanish from sight. Empirically, the benefits lie in the reduced data and computation requirements; the cost in lessened predictive power.

Leijonhufvud credited the American Keynesian economist and Nobel laureate, James Tobin, with this insight on the importance of models' aggregative structure.[54] According to Leijonhufvud, a 1961 paper from Tobin was

> of particular interest … since it [sought] to demonstrate how even apparently minor differences in the aggregative structure of alternative models may embody quite different 'visions' of the way in which the economy works.

As "vision" is Schumpeter's word for the overall representation of an economy developed by particular economists, the warnings from Tobin and Leijonhufvud should be taken seriously.

Earlier in this introduction, interest-rate-only macroeconomics was criticized as "perhaps the main source of the intellectual failure" behind – according to Furman – economists' "dismal performance" in inflation forecasting in the early 2020s. Interest-rate-only macroeconomics was, and remains, an extreme illustration of the exclusion of a category – that is, the quantity of money – essential to preserve the accuracy and representativeness of any plausible "vision" of how the economy works. Similarly, the over-emphasis on the bond market – the market in fixed-interest securities – in Keynes' *General Theory* and then in influential textbooks such as Samuelson's led to a distorted "vision", with not enough attention paid to markets in the far more important variable-income assets. In the twenty-first century, the weight given to different concepts and aggregates in textbook models came to diverge markedly from the weight of the corresponding entities in practical reality. Should anyone be surprised that forecasts based on those models were sometimes poor?

So, to repeat, I regard the blend of theory and fact in the book's first half as a strength, not a weakness.

IX.

Talking of repetition, there is a lot of it in this book, perhaps too much. The book is to a large extent an exercise in "I told you so". My task has been to remind readers of what I said at the start of the 2020s, explain why I said it, check whether what I said was right over the next three or four years as the news and data came in, and then to explain when and why I was right. My apologies if this is sometimes tedious, but the repetition is difficult to avoid.

NOTES

1. Few American economists are closer to economic policy-making than Furman, who was chairman of President Obama's Council of Economic Advisers from August 2013 to January 2017. At the time of writing, he is the Aetna Professor of the Practice of Economic Policy jointly at Harvard Kennedy School and the Department of Economics at Harvard University.
2. In the USA, the first notable economist to forecast more inflation was Steve Hanke at Johns Hopkins University. His close colleague, John Greenwood of International Monetary Monitor, contributed to a joint effort on this front. Greenwood and Hanke are kindred spirits and we often work together, but their inflation warnings in this episode were a bit later than those from Castañeda and myself.

3. My pamphlet *Inflation: Why has it come back? And what can be done?* (London: Politeia, 2023) covered the UK and included sections – written by me in April 2020 – warning about double-digit inflation. The Eurozone is one of the six jurisdictions that have money trends monitored by the Institute of International Monetary Research in its regular monthly emails to subscribers.
4. The full email was reproduced in an appendix to *The Quantity Theory of Money: A New Restatement* (London: Institute of Economic Affairs, 2024). See also Chapter 5 in this volume.
5. Tim Congdon, 'Will the current money growth acceleration increase inflation?: an analysis of the US situation', pp. 1–24, *World Economics* (London: World Economics), vol. 21, no. 2, 2020.
6. I set up the Institute of International Monetary Research in 2014 and was its first Director. It is located at the University of Buckingham in England, where it has helped in the post-graduate teaching of economics. Castañeda was appointed as the second Director in 2016, when I became the Institute's Chair.
7. Juan Castañeda and Tim Congdon, *Inflation: The Next Threat?* (London: Institute of Economic Affairs, 2020).
8. Robert Skidelsky, *Money and Government* (London and New York: Penguin Random House, 2018), pp. 279–81.
9. Tim Lankester, *Inside Thatcher's Monetarist Experiment* (Bristol: Policy Press, for Bristol University Press, 2024), pp. 42–6.
10. For example, Martin Wolf, in his column in the *Financial Times* on 20 May 2020, headed 'Why inflation might follow the pandemic', referred to me, although keeping his distance. In his words, "If one is a monetarist, like Tim Congdon, the combination of constrained output with rapid monetary growth forecasts a jump in inflation. But it is possible that the pandemic has lowered the velocity of circulation: people may hold this money, not spend it. But one cannot be certain. I will not forget the almost universally unexpected surge in inflation in the 1970s. This could happen again." David Smith in *The Sunday Times* had already mentioned my concerns about inflation in his column on 12 April. In Canada, Terence Corcoran, a columnist in the *Financial Post*, noticed my warnings as early as March 2020 and referred to them approvingly in 2022. To quote from his piece, "One … money supply theorist is Tim Congdon at the Institute for International Monetary Research at the University of Buckingham. Congdon is a lone ranger of monetary policy who tracked money supply data, especially the mass expansion of key measures of money supply as central banks printed money to buy government and corporate bonds. As early as April 2020, Congdon called the Fed's monetary expansion at that time 'blistering' and warned of inevitable inflation" (Terence Corcoran, 'Modern monetary failure', *Financial Post*, 6 May 2022).
11. What about my views on the New Classical School and "real business cycle" models? I have little time for them and indeed regard some real business cycle (RBC) papers as wacky. I am enough of a Keynesian to believe that aggregate demand is a meaningful notion and that it can be separated, in a conceptually

useful way, from aggregate supply; I am also enough of a New Keynesian to accept that developments in the labour market are relevant to inflation dynamics.

12. I have written a critique of the claim that the monetary base *by itself* determines spending and inflation. See 'If "money matters", what about the monetary base?', pp. 185–200, *Journal of Economic Affairs* (Buckingham: Wiley for University of Buckingham), vol. 43, no. 2, 2023.
13. Robert Lucas, the 1995 Nobel economics laureate, and of the University of Chicago and hence in the Chicago tradition, tended to use M1 in empirical work. In his 1995 Nobel lecture he referred to other empirical work using M2, but remarked, "… nothing important depends on this choice" (see Robert Lucas, 'Monetary neutrality', in Torsten Persson [ed.], *Nobel Lectures, Economics, 1991–95* [Singapore: World Scientific Publishing, 1997], p. 249).
14. For Friedman's mistake on inflation, see pp. 107–11 of William Barnett's *Getting It Wrong* (Cambridge, MA: MIT Press, 2012). "Blooper" is Friedman's own word. (He had used it in a letter to his former student, David Laidler.) According to Jennifer Burns in her Friedman biography, Friedman said to a journalist about his mistake, "I was wrong, absolutely wrong. And I have no good explanation as to why I was wrong" (Burns, *Friedman: Last Conservative*, p. 441). If he did say this, it was disturbing, to say the least. See the discussion below, on pp. 93–4 in Chapter 2.
15. The disagreement between Minford and myself was discussed in my 1992 collection, Tim Congdon, *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1992). See particularly pp. 126–8 and pp. 226–7. Minford had been influenced by Eugene Fama (1939–), a Nobel laureate who has taught at the University of Chicago for virtually all of his academic career. My views on Fama's monetary economics are given in footnote 52 to Chapter 1 below.
16. For the Open Letter to Ben Bernanke, see https://www.hoover.org/research/open-letter-ben-bernanke. The forecast of rising inflation was completely wrong. In a 2014 column in *The New York Times,* Paul Krugman called the Open Letter "infamous". See 'Knaves, fools and quantitative easing', *The New York Times*, 2 October 2014.
17. See Liam Halligan, 'Why I believe Tim Congdon is on the losing side in the monetary easing argument', *The Telegraph*, 2 January 2011. The ensuing exchanges culminated in 'The debate: is there an inflation bubble?', between Halligan and the author, in *The Telegraph*, 15 February 2014.
18. Should broad money include only bank liabilities or liquid assets issued by non-banks? What about foreign currency deposits? For these issues in monetary economics, see Charles Goodhart's 'The boundary problem in financial regulation', *National Institute Economic Review* (Cambridge: Cambridge University Press), no. 206, 2008, pp. 48–55.
19. Hicks used the word "thing" in the first sentence of a 1980 paper on 'IS-LM: an explanation'. The paper was reprinted as chapter 23 of John Hicks' *Money,*

Interest and Prices, vol. II of *Collected Essays on Economic Theory* (Oxford: Basil Blackwell, 1982).

20. In fact, Keynes did not refer at all to the so-called "direct effects" of a change in the quantity of money on the economy. See footnote 68 to Chapter 1 below for the distinction between direct and indirect effects of changes in the quantity of money, as developed in Blaug's *Economic Theory in Retrospect*. A better sentence than the one in the text might be, "In influential chapters of *The General Theory,* Keynes implied that the only category in the economy with an important reaction to a change in the quantity of money was the value of a bond." Rather obviously, that was not – and is not – right.
21. See p. 245 of Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. VII, *The General Theory of Employment, Interest and Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1973, originally published 1936).
22. Bank deposits are the dominant kind of money nowadays.
23. See David Romer, 'Keynesian macroeconomics without the LM curve', *Journal of Economic Perspectives*, vol. 14, no. 2, spring 2000, pp. 149–69. Romer complained on p. 162 about "the confusing and painful analysis of how the banking system 'creates' money".
24. Romer's 2000 article mentioned in the last footnote illustrates the point.
25. In the USA, the Federal Reserve stopped publishing the M3 series in 2006. However, an independent consultancy, Shadow Government Statistics, continues to estimate M3 numbers from publicly available information, much of it from the Fed. I am grateful to Shadow Government Statistics for the data.
26. The word "workhorse" – to describe the position of three-equation New Keynesianism in central bank research – is used on the cover of Jordi Galí's *Monetary Policy, Inflation, and the Business Cycle* (Princeton and Oxford: Princeton University Press, 2008).
27. The ostracizing of money – in the sense of the quantity of money – from macroeconomics has occurred particularly in the twenty-first century, with a key influence being the version of the three-equation New Keynesian model set out in the much-cited article by Richard Clarida, Jordi Galí and Mark Gertler. 'The science of monetary policy: a new Keynesian perspective', *Journal of Economic Literature*, vol. 37, no. 4, 1999, pp. 1661–707.
28. The use of the central bank rate in the IS function raises many questions. In my view, the central bank rate equilibrates the demand for central bank credit with its supply, and it is set by transactions between the central bank and commercial banks. This is very different from the bond yield in Keynes' liquidity preference theory, which is set mostly by non-bank investors in the bond market and brings together their demand to hold money with the quantity of money in existence. See Tim Congdon, 'On some principles to fix the quantity of bank money', pp. 98–115, chapter 8, in Sheila Dow, Jesper Jespersen and Geoff Tily (eds), *The General Theory and Keynes for the 21st Century* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2018).

29. The topic is covered in essay 4, pp. 57–103, of my 2011 collection, *Money in a Free Society* (New York: Encounter Books). See, particularly, pp. 80–81 on different types of open market operations.
30. Huw Pill, in his speech 'What did the monetarists ever do for us?' given at Walter Eucken Institut/Stiftung Geld und Währung Conference, 'Inflation and Debt: Challenges for Monetary Policy after Covid-19', published on 24 June 2022 on the Bank of England website (www.bankofengland.co.uk), used the word "canonical" more than once in his approval of three-equation New Keynesianism.
31. 'COVID-19 and monetary policy: reinforcing prevailing challenges', speech by Isabel Schnabel, member of the Executive Board of the ECB, at The Bank of Finland Monetary Policy webinar, 24 November 2020.
32. Anna Schwartz, *Money in Historical Perspective* (Chicago and London: University of Chicago Press, 1987), p. 175.
33. 'Interest rates or quantity of money? Edward Nelson on Milton Friedman', pp. 320–35, *Journal of Economic Affairs* (London: Institute of Economic Affairs), vol. 41, no. 3, 2021.
34. The phrase "classroom gadget" to describe the IS/LM "thing" appears in the concluding section of Hicks' 1980 paper 'IS-LM: an explanation'.
35. Another illustration is that the *Treatise* has both a central bank and a commercial banking system, with the central bank issuing base money and the commercial banks issuing bank deposits. By contrast, the *General Theory* has a consolidated banking system which issues money. One result of the simplification is that the *General Theory* has no well-developed account of the determination of the quantity of money.
36. See p. 207 of Johnson and Moggridge (eds), *Collected Writings of John Maynard Keynes*, vol. VII, *General Theory.*
37. The phrase was first used by Dennis Robertson in 1939 in a lecture at the London School of Economics. It appeared in a 1940 book (Dennis Robertson, *Essays in Monetary Theory* [London: P.S. King], p. 34). A case has been made that the first written reference to the trap in Robertson's work was not in the context of the liquidity preference theory of the rate of interest, but in Robertson's discontent with the "parable of the bananas" in Keynes' *Treatise*. See Ingo Barens, 'Robertson's "liquidity trap" as an answer to Keynes's "banana parable"', paper given at the 22nd ESHET conference in Madrid, 2018, *mimeo.* (ESHET stands for European Society for the History of Economic Thought.)
38. Not surprisingly, pro-free-market economists have protested. See – for example – Mark Skousen, 'The trumpet gives an uncertain sound', chapter 1, pp. 9–34, in Mark Skousen (ed.), *Dissent on Keynes* (New York and Westport: Praeger Publishers, 1992).
39. Paul Samuelson, *Economics: An Introductory Analysis* (New York: McGraw-Hill Book Company, 1st edition, 1948), p. 253.
40. Samuelson, *Economics*, 1st edition p. 307.

41. Mark Skousen, 'The perseverance of Paul Samuelson's economics', *Journal of Economic Perspectives*, vol. 11, no. 2, 1997, pp. 137–52. See, particularly, pp. 148–51. The latest World Bank figures show that in 2023 the Russian Federation had a nominal GDP just above $2,000 billion, whereas that of the USA was almost $27,500 billion.
42. David Laidler noted the ambiguity in the use of the two words in the work of both John Stuart Mill and Knut Wicksell in his 1991 book on *The Golden Age of the Quantity Theory* (Hemel Hempstead: Philip Allan, 1991), pp. 14–17, 127–9.
43. Lauchlin Currie, *The Supply and Control of Money in the United States* (Cambridge, MA: Harvard University Press), p. 62.
44. I argued in my 2011 *Money in a Free Society* that Keynes was "a broad money man". See Tim Congdon, *Money in a Free Society*, pp. 83–5.
45. Benjamin Friedman, 'Money, credit and interest rates in the business cycle', pp. 395–458, in Robert J. Gordon (ed.), *The American Business Cycle: Continuity and Change* (Chicago: University of Chicago Press, for the National Bureau of Economic Research, 1986).
46. Ben Bernanke and Alan Blinder, 'Credit, money and aggregate demand', *American Economic Review*, vol. 78, no. 2, 1988, pp. 435–9.
47. Ben Bernanke and Mark Gertler, 'Inside the black box: the credit channel of monetary policy transmission', *Journal of Economic Perspectives*, vol. 9, no. 4, 1995, pp. 27–48.
48. All statistical series have noise. When money growth was dominated by new bank credit to the private sector (as it was increasingly from the 1970s until the Great Financial Crisis of 2007), the rates of growth of credit, money and nominal GDP would logically be highly correlated. It was unsurprising that occasionally the relationship between credit and nominal GDP was better than that between money and nominal GDP, but this did not establish a case for bank credit as – in all circumstances – a determinant of nominal GDP.
49. For more detail, see pp. 1–2 of one of my recent think tank pamphlets, Tim Congdon, *Inflation: Why has it come back? And what can be done?* (London: Politeia, 2023), available on https://www.politeia.co.uk/publication-inflation-why-has-it-come-back-and-what-can-be-done/
50. I accessed the online record of Bailey's remarks in August 2024 on https://committees.parliament.uk/oralevidence/13328/pdf/. The evidence was described as being collected by the House of Lords' Economic Affairs Committee enquiry on 'The Bank of England: how is independence working?'. The question which prompted Bailey's answer was from Lord King, who had preceded him as the Bank's Governor.
51. Bailey was completely wrong, as a matter of fact. Until 2008, the long-run pattern in the UK, like elsewhere, was for broad money and bank lending to the private sector to often grow by similar amounts and at similar rates. It is true enough, as Bailey noticed, that in the two years to early 2022, high growth of broad money had not been accompanied by similarly high growth of bank lending to the private sector. But this was to overlook – or perhaps

to forget – that between 2009 and 2012, the stock of money and the stock of bank lending to the private sector had changed *in opposite directions*. Money growth had been positive, while the change in bank lending to the private sector was *negative*. See Tim Congdon (ed.), *Money in the Great Recession* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2017), pp. 66–70. Bailey's sometimes casual attitude towards facts is discussed again in a different, although related, context on pp. 231–4 of Chapter 9.

52. The marked acceleration in money growth had, in fact, occurred in 2020, not 2021. The annual growth rate peaked in February 2021 only because low growth in the months before February 2020 dropped out of the annual comparison. The acceleration in money growth was due, above all, to the Bank's asset purchases. It was not due to an autonomous increase in the savings ratio, as changes in the savings ratio do not necessarily have any bearing on the quantity of money. The quantity of money is a liability of the banking system and can grow only if banks' assets also grow or the ratio of deposits to total liabilities increases. See p. 36 below.
53. Axel Leijonhufvud, *On Keynesian Economics and the Economics of Keynes* (New York and Oxford: Oxford University Press, 1968), p. 112.
54. See the footnotes on Leijonhufvud's *On Keynesian* Economics, p. 143.

PART I

Some background theory

1. The quantity theory of money: a new restatement

Views on an economy's future – on the outlook for growth, employment and inflation – depend on the theory of national income held by the people who propose them, as well as the facts of the conjunctural situation. This chapter appeals to and develops an established approach to the subject which comes under the label "the quantity theory of money".[1] Indeed, the quantity theory is so well-established that quite detailed statements of its main features were given in the sixteenth century by the French philosopher, Jean Bodin (1530–1596).[2] Its central proposition is the so-called "equation of exchange", a standard item in hundreds of textbooks. Its most familiar form runs as follows,

$$M.V = P.T ,$$

where M is the quantity of money, V the velocity of circulation, P the price level and T the volume of transactions. The equation of exchange is sometimes described as a truism or even as an identity, where the two sides of the equation are the same because of how its terms are defined. Milton Friedman (1912–2006) became famous in the late twentieth century for advancing a related set of policy recommendations carrying the label of "monetarism".[3] He is often considered the foremost modern exponent of the quantity theory of money. At one point, he even compared the role of the equation of exchange in economics to that of the Einstein formula for mass-energy equivalence ($E = mc^2$) in physics.[4]

Friedman acknowledged his intellectual debt to Irving Fisher, a professor at Yale University from 1898 until 1935, and a prolific writer on economics until his death in 1947. It was Fisher's 1911 book, *The Purchasing Power of Money*, which proselytized the M.V = P.T formula in the then quite new academic discipline of economics, and M.V = P.T is often known as "the Fisher equation". The young John Maynard Keynes, who had only recently been appointed to a lectureship in economics at Cambridge University, reviewed Fisher's book for *The Economic Journal*. (*The Economic Journal* is the flagship publication of the Royal Economic Society, and it was then – and still is today – the

leading economics publication in the United Kingdom for university teachers.) Keynes' review was mostly friendly, and the book undoubtedly made a deep impression on him. Nevertheless, Keynes later said that much of his intellectual evolution was "a long struggle to escape" from the incumbent doctrines of his early adulthood, which included the quantity theory. Towards the end of the twentieth century, Mark Blaug, a historian of economic thought, put it more sharply. In his words, "Keynes began by loving [the quantity theory of money], but ended by hating it."[5] (An assessment of the matter by Keynes' biographer, Robert Skidelsky, was more restrained.[6]) The three names – Fisher, Keynes and Friedman – recur on many occasions in the following pages.

Despite its distinguished pedigree, the equation of exchange is beset by ambiguity and imprecision, and in its familiar unadorned version has to be rejected as unsatisfactory. The quantity theory of money demands a clear and more robust restatement. Friedman made an attempt to provide such a restatement in the opening chapter of a 1956 book, *Studies in the Quantity Theory of Money*, published by the University of Chicago Press.[7] Keynes' analysis in his *General Theory* of the motives for money-holding (transactions, precautionary and speculative) was a major influence on the Friedman restatement.[8] But the 1956 book is sometimes seen as an example of the sort of work in which the so-called "Chicago School" excelled in its heyday. As is celebrated or deplored (depending on one's point of view), the hallmarks of Chicago School thinking were support for free-market capitalism and advocacy of monetary stability to help capitalism work better.[9]

The opening chapter of the current book can be seen largely as a response to the many challenges faced by the quantity theory, and indeed by "monetarism", in the seven decades since Friedman's restatement. The challenges have been miscellaneous, over a wide front, and large in number, and the reader may judge that the rest of the chapter is untidy and repetitive. Further, its approach differs from Friedman's in fundamental respects, as will emerge in Chapter 2. Much of the action takes place in the footnotes. Nevertheless, the discussions in the rest of the book – about the recent Covid-related business cycle, and the impact of money growth on the high inflation of 2022 and 2023 – rely on the ideas and concepts developed in the next five sections.

Section I argues that the ambiguous Fisher equation is an unsuitable basis for a restated quantity theory, and contends that the correct measure of money in macroeconomic analysis is broadly defined (that is, it is one which – in principle – includes *all* money balances); section II says that the focus of the current restatement is on the transmission mechanism, in which macroeconomic variables adjust in response to changes in the quantity of money, and also provides an account of money creation in a modern economy; section III provides the core of the present restatement of the quantity theory, recalling the approach favoured at interwar Cambridge University by Keynes and his

colleagues, which sees national income *and wealth* as determined (and hence in equilibrium) when agents' demand to hold money is equal to the actual quantity of money.

Section IV is concerned with the transmission mechanism in "the commodities market", meaning the market in the goods and services which constitute national output; section V deals with the transmission mechanism in asset markets, particularly the markets in equities and real estate, and emphasizes that these variable-income assets are far more significant in real-world business and finance than the fixed-income securities (or bonds) highlighted in the Keynesian textbooks; section VI provides evidence for the quantity theory of money; section VII develops a synoptic account of a typical business cycle based on the quantity-theoretic transmission mechanisms discussed until then. An implication of sections V and VII is that much cyclical instability arises from disturbances to the income–expenditure flow from asset price movements, while these asset price movements often have a monetary origin. The assets under discussion here are those which have variable income dependent to a degree on, for example, management performance. Section VIII is about the pricing of fixed-income assets, a more awkward and unsettled topic. The concluding section IX therefore contrasts a money-based view of fluctuations in national income with the Keynesian textbooks' multiplier story; it insists on both the superiority of a money-based view, and more generally the continuing analytical power and policy relevance of quantity-theory thinking. The argument tries to be consecutive, but there is much to say and at times it may be difficult to follow. Box 1.1 therefore serves as a summary and guide.

BOX 1.1 GUIDE TO SECTIONS IN CHAPTER 1

I. The Fisher equation: its ambiguities and weaknesses
II. Determining the quantity of money
III. The notion of monetary equilibrium, and the determination of equilibrium national income and wealth
IV. The transmission mechanism in "the commodities market"
V. The transmission mechanism in assets markets
VI. Evidence for the quantity theory of money
VII. Monetary developments in a typical cycle
VIII. The problematic "rate of interest"
IX. Conclusion: the causes of cyclical instability in practice

I.

The M.V = P.T Fisher equation is often the most prominent item in the shop-window of the quantity theory, at its initial presentation. But all of the four variables in the equation have several potential meanings, and – unless these variables are tightly specified – the equation is imprecise and unsatisfactory.

The first ambiguity in the equation of exchange arises because money can be defined in more than one way. Thus, "the quantity of money" is occasionally said to consist only of liabilities of the central bank – that is, the note issue and banks' cash reserves – and is thereby equated with "the monetary base".[10] The practice even extends to top central bankers when they equate monetary policy exclusively with actions affecting the size of the central bank balance sheet. But this cannot be the whole story: a tiny fraction of transactions by value is completed with notes and banks' own expenditure is only a small part of aggregate demand.[11]

More plausible definitions include bank deposits, since the overwhelming majority of payments in today's world use deposits. Two types of definition then come into contention, those that include only deposits (sight deposits in the United States of America, current accounts in the United Kingdom) which can be used without giving any notice, and those that include all, or virtually all, deposits (time deposits in the USA, deposit accounts in the UK).[12] Definitions including only immediately accessible deposits are said to refer to "narrow money", whereas those that include all, or virtually all deposits are "broad money".

In the rest of this book the phrase "the quantity of money" should always be understood to mean "broad money". The rationale for downplaying the monetary base and narrow money will become easier to understand as the book's contents are presented. However, the essence of the matter is straightforward. Basic to the book's analytical framework is that – if money is out of kilter with agents' expenditure decisions and asset portfolios – it is the expenditure decisions and asset portfolios that adjust, not the other way round.

But this is not true with narrow money. If my sight deposit is too large relative to my expenditure and assets, I can change it by transferring the excess to another type of deposit, probably one that pays interest and can be withdrawn only after giving notice. (In a phrase to be recalled near the chapter's end, I can change it by a "money transfer".) Both my own sight deposits – and the aggregate level of narrow money in the economy – can therefore alter in response to the relative attractiveness of different kinds of deposit within the broad money total, as well as to the wider economic background. When it does alter in this way, it does not affect money-holders' decisions on expenditure and portfolios,

and it is such decisions that impact on the economy as a whole and matter in macroeconomic analysis.

By contrast, if all my bank deposits are too large relative to my expenditure and assets, I have to spend more on goods and services, or acquire more assets, to eliminate the excess. An all-inclusive measure of money is not changed by shifts in the relative size of its components. Obviously, as a matter of logic it cannot be changed by such compositional shifts. Broad money – not the monetary base or narrow money – must be the aggregate which figures in a convincing monetary theory of national income.[13] (The same point is developed in the US context particularly in Chapter 6.) To summarize, the quantity of money can be regarded for most purposes – and certainly for the purposes of the present study – as consisting of notes and coin held by the public and practically *all* the deposit liabilities of the banking system. Further, the present chapter, and indeed the book itself, could be understood as exercises in – or even as a manifesto for – broad-money monetarism. (The argument in the last three paragraphs is easiest to make if a sharp divide holds between, on the one hand, the white of money and, on the other, the black of goods and services, and non-money assets. In practice, a shady area of grey – with many liquid assets difficult to identify exactly as either money or non-money assets – complicates matters. There is a "boundary problem", as noticed in footnote 18 to the Introduction.)

The second ambiguity in the equation of exchange stems from the elusiveness of the notion of "transactions" in the uncluttered M.V = P.T version of the equation of exchange. Economists, and non-economists seeking advice from economists, are usually interested in national income and output, and the price level of output, and hence in their determinants. But the level of transactions in any economy is not at all the same thing as that of national income and output. As Table 1.1 shows, transactions through settlement systems in the American economy had in 2021 a value of just above $1,550 trillion or more than 65 times nominal GDP, which was $23.3 trillion in the year. Crucially, transactions are carried out in assets, while purchases and sales of *existing* assets are not part of the transactions in the so-called "income–expenditure–output circular flow" which fix national income, expenditure and output in a direct and definitional sense. In his 1930 classic *Treatise on Money*, Keynes said that transactions in assets took place in "the financial circulation", while transactions in goods and services, plus such payments as those for factor services, belonged to "the industrial circulation".[14] Keynes' distinction is echoed several times in the rest of this chapter, particularly in section VII.

By implication, a distinction might be drawn between two formulations of the equation of exchange, one in terms of transactions, and the other in terms of national income. The transactions version can be presented as before, but with the subscript *t* added to both the velocity and price level terms, as below,

Table 1.1 Transactions through major US noncash payments systems in 2021

Name of system	Description	Volume of transactions, in millions	Value of transactions, in $ trillions' ('000s of billions)	Average transaction size, $
Fedwire	Large-value, real time	204.5	991.8	4,849,878
CHIPS	Inter-bank settlement	127,900	448.7	3,508
FedACH	Includes direct debits	17,900	37.0	2,067
Electronic Payments Network ACH	Includes direct debits	29,100	72.6	2,495
Total value of all transactions through noncash systems	-	-	1,550.1	-

Source: US Treasury Department, *The Future of Money and Payments* (Washington, DC: US Treasury), p. 9.

$$M.V_t = P_t.T.$$

V_t is called the "transactions velocity of money" and P_t is a "price level" which must contain the prices both of assets transacted in the financial circulation, and of goods and services transacted in the industrial circulation. But should anyone be interested in a price level which muddles up the prices of assets with the prices of goods and services? In his *Treatise*, Keynes derided it as "a hotch-potch standard" which would prove "unreliable as a guide to the Purchasing Power of Money".[15] This was a telling jibe against Irving Fisher's 1911 book on the topic.

What about the formulation in terms of national income? Can that rescue the key ideas in the discussion? The same step is carried out as in the last paragraph, with the subscript *y* added again to the velocity and price level terms, to give,

$$M.V_y = P_y.Y,$$

where M continues to signify the quantity of money, V_y is known as "the income velocity of circulation", P_y is the price level of the goods and services that enter national income/output, and Y is national income/output.

The phrase "the income velocity of money" appears many times in Keynes' famous 1936 work, *The General Theory of Employment, Interest and Money*, whereas "the transactions velocity of money" does not appear at all. Perhaps Keynes believed the P_y term to correspond to an analytically useful price level and, hence, that the income version of the equation of exchange was more useful than the transactions version. But arguably this gain has come at the cost of loosening the notion of "velocity" from business reality. Few people would say that the purchase of a second- or third-hand car is intrinsically much different from that of a new car. However, only the value added in a new car is part of national output, because second- and third-hand cars were usually manufactured a few years ago. So the velocity of the money in used-car transactions does not affect "the income velocity of money", whereas the velocity of money used in new-car transactions does affect it. At one point in *The General Theory*, Keynes protested against the income velocity notion. It was, he remarked, "merely a name which explains nothing … The use of [the] term obscures … the real character of the causation, and has led to nothing but confusion."[16]

This may have been going too far, but it warns against a mechanical application of the terms in the equation of exchange to real-world categories and issues. The third section below develops a different approach to the quantity theory of money which largely reflects the objections of Keynes and his Cambridge colleagues to equation-of-exchange thinking. Before moving on, it has to be said that the terms in the equation of exchange cannot be entirely avoided. Velocity is an item of economists' mental furniture and occasionally they have to sit on it, even if it makes them uncomfortable. (The income velocity of money is mentioned repeatedly in Chapters 4, 6 and 10.)

II.

Friedman's 1956 restatement of the quantity theory asserted that it was. "in the first instance a theory of the demand for money. It is not a theory of output, or of nominal income or of the price level."[17] This was a new and idiosyncratic departure, since many previous authorities had made confident assertions that the quantity theory was indeed about the relationship between money, on the one hand, and nominal incomes and prices, on the other.[18] A central purpose of the current restatement is to throw light on the monetary transmission mechanism, whereby *the demand to hold money* is matched up with the quantity of money (or *"the money supply"*). This section is concerned with the determination of the quantity of money in modern conditions, while the following three

sections are about the definition of monetary equilibrium and the monetary transmission mechanism as such.

Since most of broad money consists of bank deposits, their creation must in some sense be the work of the banking system. But how exactly does money come into being? By what process or processes do banks introduce new money into the economy? In one of his theoretical papers Friedman ducked the issue by appealing to "helicopter money", conjuring up a vision of bank notes falling from the sky.[19] He may have wanted to recall the era when gold or silver were the principal monetary assets, and the quantity of money increased adventitiously – as if out of the sky – when new mines were discovered.

Nowadays money has ceased to be a commodity like a precious metal. Instead, virtually all money is a liability of banks, whether it takes the form of legal-tender notes issued by the central bank or of deposits issued by commercial banks.[20] In one sense the creation of new money in this sort of world, the world of so-called "fiat money", is straightforward. Because the central bank's notes are legal tender and must be taken in payment, they can be increased by the simultaneous addition of identical sums to both sides of its balance sheet. Shockingly (or so it seems), new money comes out of "thin air". As Galbraith remarked in his 1975 *Money: Whence it Came, Where it Went*, "The process by which money is created is so simple that the mind is repelled."[21]

At first glance commercial banks are in a similar position. People believe that payments can be made from bank deposits, as long experience has established that this is the case. It seems to follow that deposits can be increased by the simultaneous addition of identical sums to both sides of a bank's balance sheet. The expansion of its balance sheet occurs if a bank sees a profitable opportunity to buy a security (when it credits a sum to the account of the person who sells the security and the security becomes part of its assets) or to make a new loan (when it credits a sum to the borrower's deposit, which is its liability, and registers the same sum on the assets side of the balance sheet as a loan). It is certainly the case that in modern circumstances much money creation does take place in this way, so that deposits have been described as "fountain-pen money", "cheque-book money" or "keyboard money" to reflect the ever-evolving technology of writing.[22]

But there is a catch. Commercial banks do not have the power to issue legal tender cash. Since they must at all times be able to convert customers' deposits back into central bank notes, they must keep a cash reserve (partly in their vaults and tills, and partly in a deposit at the central bank) to meet deposit withdrawals. If an individual bank expands its balance sheet too quickly relative to other banks, it may find its deposits have become so large that cash withdrawals exceed cash inflows. Potentially it could run out of cash. The expansion of deposits by commercial banks is therefore constrained by the imperative to maintain a positive cash reserve. Indeed, over multi-decadal

periods in many nations commercial banks have kept a relatively stable ratio of cash to their deposit liabilities.

The discussion suggests two approaches to conceptualizing the creation of money in a fiat-money economy. The creation of money can be seen, first, as the result of the extension of credit by the banking system, where the system is consolidated to embrace both the central bank and the commercial banks. The "credit counterparts" on the assets side of the consolidated banking system's balance sheet must equal the liabilities on the other, and can be categorized in several ways. For example, assets could be viewed as the sum of loans, securities and cash. However, to split them into claims on the domestic private and public sectors, and the overseas sector, is more interesting, as private borrowers and the government have different motives when they seek bank finance. It is of course the deposit liabilities which are monetary in nature and so are of most significance to the subject in hand. Non-monetary liabilities include banks' equity capital plus their bond issues plus an assortment of odds and ends, such as deferred tax. Clearly, an identity can be stated:

> Change in the quantity of money (i.e. in bank deposits, and notes and coin in circulation) = Change in banking system assets – Change in its non-monetary liabilities;

and in more detail

> Change in the quantity of money = Change in banks' net claims on the public sector + Change in net claims on the private sector + Change in banks' net claims on the overseas sector – Change in their non-monetary liabilities.

Central banks and the International Monetary Fund have large databases on the credit counterparts to money growth, and the information is basic to monetary analysis.[23]

The other approach to money creation takes its cue from banks' need to maintain cash reserves to honour obligations to customers (that is, obligations to repay deposits and to fulfil payment instructions). As has been noted, in some historical periods banks have maintained stable ratios of cash to deposit liabilities. In their transactions members of the non-bank public can use either cash or bank deposits, depending on their relative convenience and cost. If transactions technology is fairly stable, the ratio of the non-bank public's cash to its deposits ought also to change little over time. It follows that deposits held by the non-bank public can be viewed as a multiple of their cash holdings. Indeed, the quantity of money as a whole can be understood as a multiple of the total amount of cash issued by the central bank.[24]

The credit counterparts arithmetic and the base multiplier approach add value to thinking about the monetary situation, and no one can dispute that

both are legitimate as accounting frameworks. In this book the preference is very much for the credit counterparts framework rather than that which appeals to the base multiplier. This preference would upset Milton Friedman, as is noted below in Chapter 2. All the same, it is crucial to the sketch, in Chapters 7 and 8, of the relationship between money and inflation in the USA and the UK in the early 2020s, and to the successful forecasts based on that relationship.

Evidently, a modern economy contains both money-holders and money-issuers. The money-holders include the non-bank private sector agents (households, companies and non-bank financial institutions) who or which typically carry out about 80 per cent of the economy's expenditure and are the only net wealth-holders.[25] (Central and local government account for the balance of national expenditure. A figure of about 20 per cent – for the sum of general government consumption and public investment – is common in modern liberal democracies. As soon to be explained, the government's monetary position is very different from that of private sector agents.)

By contrast, the banking system is the dominant money-issuer. Banks specialize in carrying out payment instructions from their customers, a business in which they have distinctive expertise and have made large investments. Of course, banks have to settle debts between themselves, which they do by means of transfers across central bank reserves. Such reserves, which are fully convertible into legal tender, do constitute "money" for the banking industry, but only for it. Inter-bank settlement is largely for the purpose of matching up accounts and is purely financial in character. No goods and services, and no payments for factors of production, are involved, and no effects on the expenditure–output flow or aggregate demand follow inter-bank settlement. Banks' cash reserves are therefore *not* part of the quantity of money. By extension, when banks hold balances with other banks, perhaps because of activity in an extensive inter-bank market, the resulting inter-bank deposits also do *not* belong to the quantity of money.[26]

One further participant in the economy is problematic from a monetary perspective: this is the state itself, and its constituent parts in central and local government. Because it has to protect a nation's borders against external aggression and to enforce the law within those borders, the state has a monopoly of legitimate force in the kind of society under consideration.[27] It can therefore commandeer resources from citizens to an unlimited extent, at least in principle. Within its own borders its credit-worthiness is unimpeachable; it does not need to hold significant money balances in order to be confident that "it can pay its way". Central and local governments do have accounts in the banking system, but the accounts are usually very small compared with incomings and outgoings; they are *not* included in the quantity of money. Public expenditure – often 20 per cent or so of aggregate demand in today's economies – is neither

constrained by nor systematically related to the state's money balances.[28] In short, the government's credit-worthiness differs fundamentally from the private sector's.[29] This gives rise to crucial asymmetries which are sometimes neglected or not fully appreciated.[30]

A logical point – often overlooked, but already adumbrated and essential to the larger argument – concludes this section. The quantity of money is held exclusively by genuinely non-bank private sector agents (households, companies, genuinely non-bank financial institutions) and cannot be changed by transactions between such agents. If purchases and sales between them take place in a closed circuit, these purchases and sales cannot alter the quantity of money. That is true, no matter how enormous the value of transactions.

Alternatively put, in an economy with no external trade or financial flows with other economies, the quantity of money can change only as a result of transactions between the non-bank private sector, on the one hand, and the banking system and the state sector, on the other.[31] This property of a monetary economy results from definitions and is beyond dispute. Nevertheless, the implications – which are a major undercurrent in the stream of analysis in sections IV and V, and in sections VII and VIII – turn out to be profound.

To illustrate the point, economists are sometimes tempted to say that, "an increase in the savings ratio will raise the amount of money people have in the bank". No, no such consequence follows. If any individual saves a higher proportion of income and puts more into his or her bank account than in the previous period, that money has to come from someone else's bank account. No effect on the total of bank deposits is to be expected, and no necessary connection holds between households' savings behaviour and the total of bank deposits. The notion that any non-bank individual's behaviour changes the aggregate amount of bank deposits is an illustration of what might be termed "the individual experiment illusion". The illusion is that transactions undertaken by any one non-bank individual – or even by large numbers of non-bank individuals – can change the total quantity of money. This is not true: it is in fact a common fallacy.

III.

The M.V = P.T approach to the quantity theory – as expounded by the Yale of the early twentieth century, and the Chicago of the 1950s and 1960s – was shown in the first section to have serious drawbacks. Is there an alternative? One option is to pay more attention to the Cambridge, England, of the 1920s and 1930s, where Keynes was interacting with colleagues and rivals, and they together constituted "the Cambridge School" of monetary economics. Their inspiration came significantly from Alfred Marshall, who had founded the Cambridge economics faculty in 1903. A basic principle of Marshall's

economics was that equilibrium – in terms of prices and quantities – was reached when supply equalled demand. The principle conquered the teaching of microeconomics from that time onwards. But Marshall wanted to use it not only in understanding an individual's attitude towards his or her money holdings; he hoped also that it might help in expounding the relationship – for the economy as a whole – between the total amount of money, on the one hand, and income and "property", on the other.[32] In the 1930 *Treatise on Money* Keynes lifted an entire passage from Marshall's 1922 *Money, Credit and Commerce* which ran as follows:

> In every state of society there is some fraction of their income which people find it worth while to hold in the form of currency … Let us suppose that the inhabitants of a country … find it just worth their while [after judging the advantages and disadvantages of holding currency] to keep by them on the average ready purchasing power to the extent of a tenth part of their annual income, together with a fiftieth part of their property; then the aggregate value of the currency of the country will tend to be equal to the sum of these amounts.

In the related footnote Keynes commented, "In modern conditions the normal proportion … of … total [bank] deposits to the national income seems to be somewhere around a half."[33] He was writing in the late 1920s. Over 30 years later in the first quarter of 1964, when the Bank of England had just started to prepare modern money supply statistics, the UK's nominal GDP was £32.6 billion and broad money, including building society deposits as well as bank deposits, was £15.0 billion. The ratio was still "somewhere around a half". (Note that the ratio was to rise steeply from 1980, as discussed in Chapter 4.)

Marshall's teaching motivated similar treatments, of his so-called "cash balance" approach, in the early-twentieth-century literature. An ambitious statement of the meaning of these ideas for macroeconomics follows at the end of the section, but attention needs to be paid first to certain key facts about present-day economies. It is important to recognize that money is held not only to facilitate transactions in capital and current items in the income–expenditure–output flow, but also to reside over long periods in investment portfolios as an alternative to non-money assets. Marshall had of course seen this with his reference to "property" in the above quotation. What is to be said about "property" in the real world, about the value and composition of household wealth?

Table 1.2 presents the relevant data for the USA at the end of 2021. Money was then about 11 per cent of gross household wealth, and was exceeded in importance only by corporate equities and real estate (mostly houses of course), which both represented over a quarter of such wealth, and by life insurance policies and claims on pension funds, which were a fifth.[34] The bulk of corporate equities were quoted on the USA's stock markets. These

Table 1.2 Value and composition of US household wealth at end-2021

-	In $ billions	As % of total before debt
Money, mostly deposits	18,272	10.9
Debt securities	2,720	1.6
Corporate equities	44,723	26.6
Life and pension assets	33,623	20.0
Non-corporate equity	15,320	9.1
Other financial assets	3,064	1.8
Real estate, mostly houses	42,429	25.2
Consumer durables	7,286	4.3
Non-profit business assets	739	0.4
Total assets, before debt	168,177	100.0
Total liabilities	18,354	-
Total assets, after debt	149,823	-

Note: In the US flow-of-funds data, non-profit organizations are presented with households, so that the above numbers include non-profit assets and debt, as well as households'. Personal disposable income in 2021 was $18,507.6 billion.
Source: US Federal Reserve *Financial Accounts of the United States* (June 2023 release), Table B101, p. 154.

compositional data suggest that, in a modern economy, the management of money in investment portfolios is to a considerable extent about seeking a balance between the "liquidity" conferred by money, and the returns derived from housing, equities, savings products managed by specialist financial institutions and other asset categories.

The word "liquidity" is an awkward one to define, but a basic theme is that assets which possess the property of liquidity reduce the expected future costs of running portfolios. Invariably, money offers a lower explicit return than non-money assets. Indeed, as has been noted, many money balances – like most sight deposits and current accounts – offer no nominal return at all. But money is retained in investment portfolios, even when these are seeking significant positive returns, because a money holding lowers the cost of re-arranging portfolios and taking advantage of opportunities. A section of chapter 17 of Keynes' *General Theory* remarked on the different liquidity of a range of assets, and proposed that some had "potential convenience" in transactions which justified a "liquidity premium".[35]

Different people have different preferences and investment habits. In his last book, on *The Market Theory of Money*, the influential English economist and

Nobel laureate, Sir John Hicks (1904–1989), suggested a new nomenclature. He said that some investors (whom he called "fluid") might want to hold a high ratio of money to assets in order actively to exploit opportunities, whereas others might be "solid" investors. Solid investors would hold little money and stick to the securities they had first chosen.[36] More generally, portfolios can be said to have different degrees of "liquidity", as well as the better-known characteristics of expected mean return and the risks associated with earning that return. However difficult to formalize and quantify, Keynes and Hicks agreed that liquidity is an attribute of securities and other assets, and hence of portfolios composed of securities and other assets.

Table 1.2 shows that directly held debt securities – or "bonds", more concisely – were a mere 1.6 per cent of gross US household wealth at end-2021. By implication, a great majority of households – accounting for the preponderance of American wealth – did not have a single bond in their possession. Nevertheless, many economics textbooks give pride of place to bonds in their analyses of the alternatives to money in portfolios. The focus on the money-bond choice is unrealistic, but it is entrenched in standard textbooks. Arguably, the entrenchment has led to serious misunderstandings about how changes in the quantity of money affect the economy. The point is elucidated in more detail in section V to this chapter, and also in Chapter 3.

Before finishing this section, a warning has to be given that the whole subject is bedevilled by what economists call "an identification problem". Marshall taught that, in equilibrium, the demand curve for a product intersects with the supply curve to determine both its price and quantity. But do the prices and quantities reported from a real-world situation signal the immaculate and pleasingly automatic meeting of supply and demand curves? Or do they instead reflect agents' confused attempts to interpret market data when no one knows the exact positions of the demand and supply curves? It must be the case that the money held in an economy by various people and companies is equal to the actual quantity of money in being. But that definitional certainty misses a vital aspect. Is this equivalence also a position *of equilibrium*, analogous to that connoted by the intersection of supply and demand curves in a price–quantity diagram?

It may be that, at the end of a period of production and trading, people and companies find – for whatever reason – that their bank balances are not at the levels they expected and planned at the period's start. Money is then in disequilibrium. So in the following period these people and companies set different prices and quantities from before. More generally, the world is such a complicated place that it contains phases when the economy is at or near monetary equilibrium (that is, when the prices and quantities involved in determining national income show little tendency to change between periods) and phases of monetary disequilibrium (when those prices and quantities are

changing constantly and perhaps dramatically between periods, and so are national expenditure, income and wealth).

Enough disclaimers, caveats and qualifications have now been offered. Having distinguished between monetary equilibrium and disequilibrium, we have reached a decisive moment. The crux of the monetary theory of national income and wealth determination – as understood in the present study – can now be stated. Here it is, indented because of its significance to our argument.

> The level of expenditure *by genuinely non-bank private sector agents* and the value of all the assets they own (their wealth) are in equilibrium, and in that sense determined, only when the broadly defined quantity of money is willingly held – at the associated prices and quantities – by the same private sector agents.

This way of expressing the quantity theory notices the nuisance caused by *the state's* attitude towards money, since an expansion in aggregate demand due to more government spending may have a small or unclear effect on *the private sector's* demand to hold money.[37] Let this complication be ignored, with the balance between public and private economic activity taken to be fixed in the necessary sense.[38] We reach the following core proposition, in the spirit of the interwar Cambridge School:

> The *equilibrium* levels of national income and wealth reflect the interaction of two influences,
>
> - the level of the broadly defined money aggregate, as determined by the banking system, its customers and monetary policy-makers, and
> - the ratio of money to national income *desired* by money holders, where the relevant money holders are genuine non-bank private sector agents (households; companies; non-bank, non-deposit-taking financial institutions) who or which have a meaningful "money demand function".

The proposition overcomes the criticisms of the "hotch-potch" price index implied by the transactions version of the equation of exchange, and of the question-begging, unsatisfactory phrase "the income velocity of circulation" implied by its income version; it is precise about the concept of money relevant to national income determination, and about the agents who or which matter to the economy's monetary equilibrium; and it makes room for those sceptical about monetarism by acknowledging that in the real world monetary equilibrium does not hold all the time. Admittedly, the words "equilibrium" and "desired" carry much weight in the proposition just made. Further, a related and perhaps major concession has been made by admitting the possible prevalence of monetary disequilibrium.[39]

IV.

Complaints are sometimes made that the quantity theory is vague about how the economy moves towards and achieves a new equilibrium when a shock change to the quantity of money has occurred. Paul Samuelson (1915–2009), a Nobel laureate and long-time rival of Milton Friedman, once asserted that the vagueness went so far as to make the so-called "transmission mechanism" of monetary change "a black box". In his view, monetarism sometimes came in "garden-variety" form, when it was "a black-box theory" with "mechanistic regularities" which could not be "spelled out by any plausible economic theory".[40]

Similar allegations continue to be made. In a speech in Glasgow on 4 April 2023 Silvana Tenreyro said, while serving the final months of her term as an external member of the Bank of England's MPC, that the effects of monetary policy were felt throughout the economy solely via interest rates and bond yields. She saw it as her job "to make clearer the similarities between [central bank operations meant to affect bond yields, but which might increase the quantity of money] and Bank Rate, and avoid the impression that there is an independent 'money' channel of [such operations]".[41] In making this claim Tenreyro reflected the influence of Michael Woodford of Columbia University, New York, the author of a 2003 work entitled *Interest and Prices: Foundations of a Theory of Monetary Policy.* According to Woodford, "a straightforward analysis … of inflation … is possible without any reference to either the evolution of the money supply or the determinants of money demand."[42]

In fact, accounts of the transmission mechanism – and hence of "an independent 'money' channel" – have abounded in a large and classic literature since David Hume and Richard Cantillon in the eighteenth century. One of the most lucid was given by Knut Wicksell (1851–1926), the Swedish economist, in his 1898 work, *Geldzins und Güterpreise*, translated into English and published under the auspices of the Royal Economic Society in 1936 as *Interest and Prices: A Study of the Causes Regulating the Value of Money.*[43] The key passage begins with the situation termed in this chapter "a monetary equilibrium". In this situation the amount of money held by all individuals – including "myself" – is appropriate given incomes and expenditure, and the associated price level of goods and services. But a shock is delivered. To quote from the 1936 translation,

> Now let us suppose that for some reason or other commodity prices rise while the stock of money remains unchanged, or that the stock of money is diminished while prices remain temporarily unchanged. The cash balances will gradually appear to be too small in relation to the new level of prices … I therefore seek to enlarge my balance. This can only be done – neglecting for the present the possibility of

> borrowing etc.– through a reduction in my demand for goods and services, or through an increase in [the supply of] my own commodity, or through both together. The same is true of all other owners and consumers of commodities … But in fact no one will succeed in realising the object at which each is aiming – to increase his cash balance, for the sum of the individual cash balances is limited by the amount of the available stock of money, or rather is identical with it. On the other hand, the universal reduction in demand and increase in the supply of commodities will necessarily bring about a continuous fall in all prices. This can only cease when prices have fallen to a level at which the cash balances are regarded as adequate.

Many subsequent accounts of the transmission mechanism are in a similar vein. Friedman in 1959 prepared a statement to the US Congress which recalled Wicksell's themes.[44] When individuals have an excess holding of money, they cannot rid themselves of the excess by transactions between themselves. In that event, according to Friedman, "they would simply be playing a game of musical chairs".[45] In response to a sudden increase in the quantity of money, expenditure decisions would keep on being revised – with new prices and quantities – until the right balance between money and incomes had been restored. While individuals may be, to quote Friedman,

> frustrated in their attempt to reduce the number of dollars they hold, they succeed in achieving the equivalent change in their position, for the rise in money income and in prices reduces the ratio of these balances to their income and also the real value of these balances.

These excerpts from Wicksell and Friedman call for elucidation. Four points will be developed in this section to elaborate key ideas. But the incorporation of wealth and asset prices in the transmission mechanism has such far-reaching ramifications that it demands a section – the next section, section V – to itself.

First, in Wicksell's account a rise in the price level, or a fall in the quantity of money, is posited at the start. This creates a disequilibrium. In his words, the quantity of money is "too small" relative to the price level. The key agents – the "owners and consumers of commodities" – are motivated in their behaviour by the disequilibrium, the difference between the quantity of money appropriate to the price level and the actual quantity of money. They spend less, leading to "a universal reduction in demand".

This is all plain and straightforward, or so one would have thought. Friedman hoped that even members of Congress would appreciate the force of the argument. On what basis can the past few sentences be characterized as being about "a black box"? The words are about as clear and transparent as they could be in the sometimes arcane subject of economics. Further, Wicksell's "universal reduction in demand" arises from the gap between agents' money holdings and the desired amount of these holdings, and nothing else. Contrary to Tenreyro's April 2023 speech, it does *not* arise from "the rate of interest", whether that be

the central bank rate, a bond yield, the inter-bank rate or banks' loan rate. It also does *not* arise from "credit conditions", "credit spreads" or the quantity of new bank loans to the private sector. Sure enough, "the rate of interest" (in one or many of its multiple meanings), "credit conditions", "credit spreads" and new bank credit are relevant to the description of full monetary equilibrium, and to the transition from one equilibrium to another. But first things must come first, and all of the list in the last two sentences are secondary or tertiary relative to money-holders' attitudes and intentions.

The second issue arising from the Wicksell and Friedman passages is the extent to which prices change because of the shock to the quantity of money. Wicksell said that, in the monetary disequilibrium under discussion, agents' transactions continue to affect the price level until money balances are again "adequate", again – that is – in equilibrium with agents' money-holding preferences. How much does the change in prices need to be? In *Interest and Prices* Wicksell expressed doubts about the quantity theory's boldest claim in this area of economics, that changes in money and the price level would – in the real world – be proportional much of the time.[46] But he did mention respectfully John Stuart Mill (1806–1873), the British economist whose *Principles of Political Economy* was the standard textbook of the late nineteenth century. As Wicksell quoted from Mill's *Principles*, he would undoubtedly have been aware of Chapter VIII of its book III, entitled 'Of the value of money, as dependent on supply and demand'. A crucial section ran,

> The value or purchasing power of money depends … on supply and demand … The supply of money … is the quantity of it which people want to lay out … [It], in short, is the money *in circulation* at the time … Supposing the quantity of money in the hands of individuals to be increased, the wants and inclinations of the community collectively in respect to consumption remaining exactly the same; the increase in demand would reach all things equally, and there would be a universal rise of prices … Prices would have risen in a certain proportion, and the value of money would have fallen in the same ratio … If the whole money in circulation was doubled, prices would be doubled.[47]

Thus a doubling of the quantity of money leads to a doubling of the price level.[48] The argument – sometimes called "the proportionality postulate" (or "proportionality hypothesis") – can be translated into more modern language, and remains central to contemporary economics. Given the economy's supply-side characteristics, and assuming stability in agents' demand-to-hold-money function and no changes to the non-income arguments in that function, changes in the quantity of money and the price level are equi-proportional in equilibrium.[49] To be clear, this is *not* an assertion that changes in the quantity of money and the price level are always equi-proportional in actual experience. However, the proportionality postulate still lies at the heart of quantity-theoretic doctrine,

even if nowadays proportionality is usually understood to hold between money and national income rather than money and the price level.

The argument in this restatement of the quantity theory has been that a broadly defined, all-inclusive measure of money is appropriate m macroeconomic analysis. It is important now, in a third area of discussion prompted by the quotations from Wicksell and Friedman, to anticipate and refute a sophisticated objection which is sometimes made. Crucial to our argument has been the idea that – once the quantity of money has been determined – transactions between money-holders cannot change it. In a 1956 classic work on *Money, Interest and Prices*, Donald Patinkin (1922–1995) put forward a terminology to elaborate the ideas and their implications.

He called the attempts by particular isolated agents to change their money balances "individual experiments". Individual experiments may alter the amounts that each agent holds and the distribution of money between agents. But – assuming that transactions take place within a closed circuit – they do not change the total quantity of money. Patinkin's phrase for changes in the total quantity of money was "the market experiment". Much of his book was about how, because of the underlying stability of agents' demand to hold *real* money balances, changes in the *nominal* aggregate quantity of money would ultimately affect nothing real and result merely in the same proportionate change in the price level. He emphasized that a "real balance effect" ensured an eventual alignment between money and prices.[50]

A challenge to Patinkin came in a 1960 volume *Money in a Theory of Finance* by John Gurley (1920–2020) and Edward Shaw (1908–1994), which Patinkin himself described – in a 1965 second edition of *Money, Interest and Prices* – as "pathbreaking".[51] The Gurley and Shaw book recalled that the quantity of money contained notes in circulation with the public, a liability of the central bank, and bank deposits, which are liabilities of commercial banks; they labelled that part of money issued by the central bank "outside money" and that part issued by commercial banks "inside money"; and they further remembered that the non-bank private sector both kept deposits with the commercial banks and borrowed from it. By implication, an increase in inside money, or bank deposits, due to a rise in bank borrowing by the private sector could not alter the net wealth of the non-bank private sector. Patinkin, along with Gurley, Shaw and others, further reasoned that – because this type of money expansion could not affect net wealth – it could not affect anything. Patinkin went so far as to say that enquiries into the effects of changes in inside money (that is, bank deposits) were "meaningless".[52] In his view, the real balance effect related to outside money (the monetary base, more or less) and only to outside money, and that was that.[53]

If the Gurley and Shaw objection to inside money were persuasive, and if Patinkin's endorsement of it were correct, the present exercise in broad-money

monetarism would be misconceived from top to bottom.[54] However, these authors' critique of inside money is questionable and arguably quite wrong. The misunderstandings are two-fold. First, Patinkin wrote as if the private sector were one agent. But of course it consists of millions of people and companies, and they have different preferences and capabilities. (If the private sector were one agent, there would anyhow be no purpose in borrowing from itself.) But instead the agents who or which hold money are not the same as the agents who or which borrow from banks, while the existence of a banking sector modifies the economy's production possibilities and the scope for intertemporal substitution. Changes in the size of bank deposits are not neutral and self-cancelling in their effects on the non-bank private sector, in part because it contains a multiplicity of heterogeneous agents.[55]

Second, banks engage in so-called "liquidity transformation". They invest in payments infrastructure, and offer money transmission and settlement services to their customers. As the costs of using deposits to make payments are therefore very low, the deposit liabilities on one side of the banking system balance sheet are highly liquid to private sector non-banks. On the other hand, the costs of taking out a bank loan include negotiation and the offering of collateral, while the bank has the costs of attracting and sustaining its funding of the loan. The assets side of the banking system balance sheet is illiquid to private sector non-banks. An increase in inside money may not in the first instance add to net wealth, but it does alter the non-bank private sector's liquidity. We must remember the insistence of both Keynes and Hicks that liquidity is an attribute of particular assets and hence of portfolios containing a diversity of assets.[56] One side of banks' balance sheets can be viewed as portfolios of assets, of greater or less liquidity, and the other as portfolios of liabilities, also of greater or less liquidity.

Because of its importance, the argument needs more detail. All companies are "legal fictions", in the sense that balance sheets balance, and assets and liabilities are the same. But in modern conditions companies are the dominant agents taking decisions on non-housing capital expenditure and inventory accumulation, with major repercussion on aggregate demand, output and employment. Their balance sheets have a mixture of liquid assets (particularly their money holdings) and illiquid assets (notably such items as "goodwill", which are notoriously difficult to value). If a particular concern has a high ratio of liquid to illiquid assets, this indicates that it has less vulnerability to cash-flow shocks than one with a low ratio. Stakeholders and analysts can therefore talk about the "strength" or "weakness" of corporate balance sheets, and expect such strength and weakness to affect corporate decisions.[57]

As changes in inside money have an impact on the liquidity of company balance sheets, they are also very relevant to demand, output and employment. In short, the *ratios* between different components of corporate balance sheets

can be of immense significance to macroeconomic outcomes, even if the *levels* of assets and liabilities – for both banks and non-bank companies – are always identical. Famously, Karl Marx believed that double-entry book-keeping was crucial to the emergence of capitalism. Organizations with balance sheets are, of course, pervasive in advanced capitalism. Something has gone wrong if a branch of monetary economics contends that such organizations can be eliminated from its analytical purview by assumption.

Anyhow, the empirical evidence is overwhelming that changes in bank deposits – in "inside money" – have powerful macroeconomic effects. (See section VI below on the facts.) If Patinkin, Gurley, Shaw and their followers were correct, annual growth rates of inside money of 20 per cent or 200 per cent or 2,000 per cent would be associated with identical macroeconomic outcomes because the two sides of the banking system balance sheet cancel out and changes in the size of the balance sheet are "a wash".[58] This is so far from reality as to be merely silly.[59]

One further topic needs clarification. Wicksell inserted a phrase – "neglecting the possibility of borrowing" – to qualify his claim that a deficiency of money balances would result in a "universal reduction in demand". This was remarkably prescient, in that it anticipated a much later major debate in monetary economics. Wicksell realized that the deficiency of money balances could be eliminated not by non-bank agents' attempts to acquire more money by spending less, but by some of these agents borrowing from the banks and thereby creating more money. In exchanges with Friedman over 70 years later the Cambridge economist, Nicholas Kaldor (1908–1986), correctly saw that this meant that an economy with fiat money could behave differently from an economy with commodity money.

He then leapt to an extraordinary conclusion that an excess or deficiency of money balances would *always* be brought to an end by changes in bank borrowing. Suppose that gold has ceased to be money and all money is the result of bank credit extension. Then, to quote from Kaldor's 1981 Radcliffe lectures at the University of Warwick, reprinted in a 1982 pamphlet entitled *The Scourge of Monetarism*, "If … more money comes into existence than the public, at a given or expected level of incomes or expenditures, wishes to hold, the excess will be automatically *extinguished* – either through debt repayment or its conversion into interest-bearing assets."[60] According to Kaldor, an excess or deficiency of money could therefore never motivate changes in expenditure or investment portfolios, as our excerpts from Wicksell and Friedman have argued.

But Kaldor's objection to monetarism is utterly implausible, because of the relative size in any economy of the change in bank borrowing and the level of total transactions. The common pattern is for new bank credit to be less than a quarter of 1 per cent of the value of transactions. This fact should be

sufficient to demolish the notion that new bank credit would automatically, as a matter of routine, ensure that the demand to hold money was aligned with the actual quantity of money. Moreover, the value of transactions – which is of course equal to the quantity of money multiplied by its transactions velocity – is always positive. Indeed, it would have to be positive whether the stock of bank credit were rising, stable or falling.

Despite these problems, Kaldor's polemics encouraged a school of thought which emphasized that much money creation is the result of what were termed "endogenous" processes. These were processes in which private sector agents interacted with each other in the creation or destruction of money balances, and did so independently of the state and the central bank. Many of its supporters went further by claiming that nominal national income and expenditure determined the quantity of money, rather than the other way round. In this cameo of so-called "reverse causation", Wicksell's "possibility of borrowing" was the usual mechanism to which they appealed.

The literature is extensive, but a few brief empirical observations should be enough to cast doubt on the most extreme claims from the endogenous money school. The heart of this school's approach is that, because banks' customers can borrow or repay loans from the banks, national income determines the quantity of money. But the great majority of bank loans are extended to acquire existing assets, meaning assets which were made in the past.[61] Such loan transactions are part of Keynes' "financial circulation". *They have no necessary connection with current national income and expenditure, and no first-round effect on the income-expenditure flow.* They do not properly belong to a discussion concerned with the setting of national income or expenditure at all.[62]

It must again be reiterated and emphasized that new bank credit is less than a quarter of 1 per cent of the value of transactions. Bluntly and obviously, the value of transactions – and the associated values of national income and expenditure – cannot be explained by new bank lending alone. As mentioned in the Introduction, some American economists have proposed that "the credit channel" – with a focus on the "special nature" of bank credit – is crucial to the transmission mechanism of monetary policy.[63] One motive of the credit channel idea seems to be to contrast "creditism" and "monetarism", and to put a credit-based account of national income on a pedestal high enough that it rivals a money-based account. Given the quantitative insignificance of new bank credit and the preponderance of asset transfers as the first-round purpose of bank credit extension, this is surely untenable.[64]

Notice also that another knockdown argument is available. Many agents have no bank debt whatsoever, but they engage in spending and investing, and so participate in the determination of national income and wealth. If they have no bank borrowings, how can bank credit be relevant to their expenditure and

portfolio decisions? Of course, in a modern economy with no barter, every agent must have money to enter into transactions with other agents. Relative to the ubiquity of money, credit-linked transactions are rare.[65] Purely credit-based accounts of national income determination are mistakes.

V.

So far the discussion of the passages from Wicksell and Friedman has adhered to their way of seeing equilibration as between money and "commodities", or money and "goods and services". This has the merit of clarity, of arriving at the heart of the matter without too much fuss. However, it is misleading. In the real world agents have to judge the right level of their money balances also against their payments to factors of production, and – much more important – against assets in their investment portfolios. In practice, the reaction of non-money assets to changes in the quantity of money has been one of the most vexed and unsettled areas of monetary economics. Table 1.2 showed that in the USA at a recent date the main non-money assets were housing and corporate equity, which were together worth almost five times as much as money in household wealth and 40 times as much as bonds. Although every economy has its own capital market structures and tax systems, similar patterns are found in all the world's capitalist liberal democracies.

In these societies, wealth is dominated by assets where the income they generate rises or falls over time, in line with cyclical fluctuations in national income and output. Such assets can be termed "variable-income assets". Happily, economic growth has ensured that the long-run trend has been for the nominal incomes from assets to increase. On the other hand, bonds are "fixed-income assets". As already noticed, one message of Table 1.2 was that very few households own fixed-income assets directly.

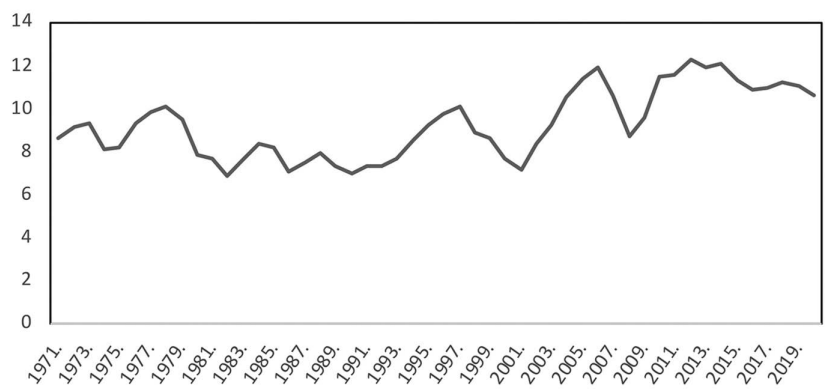
But households do own such products as life insurance products, with a high proportion of bonds in the assets, and mutual funds invested 100 per cent in bonds. At the end of 2021 the total assets of non-financial corporate business in the USA were estimated to have been almost $57,000 billion, with the bulk of this (almost $33,000 billion) belonging to shareholders. But business's other liabilities of $24,167.4 billion included liabilities in the form of debt securities amounting to $7,489.4 billion.[66] Moreover, government debt – at the end of 2021 over 120 per cent of GDP in gross terms – was predominantly of fixed-interest securities. Roughly speaking, the value of bonds traded in the USA is (at the time of writing, October 2024) about twice the value of GDP.

Bonds are therefore more significant in the institutional investment scene than they are to households, the ultimate wealth-holders. As will soon emerge, the effect of changes in the quantity of money on the two types of asset

– variable-income and fixed-income – are different in scale, and the difference is important to the economy's cyclical behaviour.

How do the prices of housing and quoted equities, which epitomize variable-income assets, respond to changes in the quantity of money? Housing yields rents to home-owners, which may be either rent actually paid between tenant and landlord or imputed rent when homes are occupied by their owners. A fair surmise is that – whatever form it takes – the dominant influence on the growth of rents is the increase in nominal national output. Moreover, the most neutral assumption in a model of economic growth would be that rents are stable relative to GDP. By contrast, two kinds of income stream are associated with corporate equity. These are profits, which may be retained within the business to finance investment or distributed to shareholders, and dividends, which are the amounts thus distributed. For each individual business profits are variable, and depend on the energy, skill and efficiency of management. However, for the economy as a whole success and failure even out. The long-run tendency in the USA has been for the share of profits in GDP to be relatively stable, although perhaps with some tendency to rise in the last 20 or so years (Figure 1.1.)

A reasonable assumption in theorizing is that – given the data over many decades – the incomes paid on variable-income assets are a constant ratio of GDP. The realism of the assumption can be questioned, and it should not be pressed too far. All the same, it gives fewer hostages to fortune than a generalization that incomes on variable-income assets change systematically relative to other incomes. The discussion in the last section noticed "the proportionality



Note: Profits are after inventory valuation and consumption adjustments.
Source: FRED database, provided by the Federal Reserve of St Louis website.

Figure 1.1 Corporate profits as a share of US GDP

postulate", that – in certain circumstances, once equilibrium has been established – changes in the quantity of money are associated with equi-proportional changes in nominal GDP. The necessary implication of the discussion is that, again in equilibrium, the value of all the variable-income assets in an economy rises or falls equi-proportionally with the quantity of money. This is hardly surprising. Asset values are the capitalizations of income streams. If money and national income change equi-proportionally, and if factor shares in national income are constant, the values of variable-income assets should conform to the proportionality postulate.

Readers may feel that the step just taken is radical and far-reaching and takes us into uncharted territory. But a side-glance at reality may justify more confidence in the idea being advanced. The USA has data on household wealth extending back to the end of the Second World War. How do money, personal income and wealth relate over a long period in this emblematic capitalist nation? Table 1.3 shows that personal disposable income has increased in the 75 years to 2021 at a compound annual rate of 6.5 per cent, rather less than that of corporate equity (most of it quoted) and real estate (mostly houses), which had compound annual rates of increase of 8.0 per cent and 7.7 per cent, respectively. But non-corporate business equity – which would have had a big farming component in 1946 – went up at a lower compound annual rate of only 5.7 per cent. If the three main types of variable-income asset are taken together, their compound annual rate of increase was 7.3 per cent. The rate of increase in money, of 7.0 per cent a year, lay between that of income and variable-income assets.

Table 1.3 Money, income and the value of variable-income assets in the USA, 1946–2021

-	% annual compound increases over 75 years to 2021
Personal disposable income	6.5
Money	7.0
Corporate equities	8.0
Non-corporate equity	5.7
Real estate	7.7
Real estate and business equity combined	7.3

Note: See notes to Table 1.2.
Source: US Federal Reserve *Financial Accounts of the United States* (June 2023 release), Table B101, p. 154.

Let us take it that the evidence supports the suggestion that the proportionality postulate applies to variable-income assets, where such assets dominate household wealth. The suggestion becomes basic to the transmission mechanism in the real world. When the quantity of money goes up by, say, 10 per cent, a reasonable conjecture is that the value of the stock market and the housing stock will also go up, probably over a few quarters, by a figure close to 10 per cent. (In qualification, Chapter 3 will propose that "overshooting" in equity markets is common. Chapter 8 includes a discussion of the relationship between money growth and UK house prices in the Covid period.)

Moreover, at the end of 2021, business equity and residential housing were together worth more than five times personal disposable income in the year 2021 (see Table 1.2). When asset prices are strong, people can sell assets to pay for consumption above income and extensions to their homes or to invest in any businesses they own; when they are weak, they may defer consumption and home improvements, stop expansion plans for small businesses, and save more out of income to boost accumulated wealth. *Pace* Samuelson, the transmission mechanism is not a black box at all. Through their impact on variable-asset prices, fluctuations in money growth are likely to have easily understood effects on demand, output and employment.

The relationship between changes in the quantity of money and changes in expenditure on "commodities" or "goods and services" – the relationship highlighted in the earlier excerpts from Wicksell and Friedman – might be termed the "direct effects" from money in the transmission mechanism. The mechanism just elaborated might then be viewed as an "indirect" one since it works through asset markets before it hits expenditure in shops, over websites and so on. Notice that no rate of interest and no debt securities have been mentioned in the last four paragraphs. An indirect effect in the transmission mechanism has been explained without reference to "the interest rate" or "bond yields" at all. Tenreyro and Woodford may be unhappy about the omission, but others may be concerned about the far greater selectivity of Woodford's 2003 book on *Interest and Prices*. That much-lauded volume is silent on the valuation of corporate equity and real estate, and relates to an economy without commercial banks, industrial and commercial companies, and non-bank financial institutions. (To be fair, Woodford has theorized about an economy with extensive financial intermediation, if with a credit-based account of national income determination.[67])

The points being made here may seem unsurprising – even fatuous – to readers active in business and finance who have never been taught any formal economics. But this area of economics, as it is learned in the classroom and from textbooks, is beset by an obsession with "the rate of interest". Mark Blaug, in the 1985 fourth edition of his widely-admired *Economic Theory in Retrospect*, blessed the remark that "the quantity theory of money assigns no

explicit role to the rate of interest and … no monetary theory is worth very much if it neglects the interest rate."[68] He proceeded to the assertion that the indirect mechanism is about the effect of changes in money on the rate of interest and then the effect of changes in the rate of interest on expenditure, and by implication that it is only about these effects.

Blaug attributed the first presentation of the indirect mechanism to a 1802 book on *Paper Credit* by Henry Thornton, an English banker who flourished at the time of the Napoleonic Wars. But nowadays discussion in this area of economics tends to be dominated by Keynes' treatment in his *General Theory*. According to Keynes' liquidity preference theory of "the rate of interest" (by which – to remind – he meant a bond yield), an increase in the quantity of money usually increases bond prices. Because bond prices and yields move inversely, the addition to the money stock causes a fall in the rate of interest. This fall has the further consequence of stimulating investment. Moreover, if national income is a multiple of investment (as in Chapter 10 of the *General Theory*), this becomes the key mechanism relating money to expenditure, output and employment. From here it is not far to Samuelson's puzzling denial that the quantity theory has a transmission mechanism, or the assertions from Tenreyro and Woodford that the connection between monetary policy and inflation relies exclusively on interest rates and bond yields.[69]

As just explained, in Keynes' *General Theory* the centre of attention was the effect of a change in the quantity of money on bond yields.[70] How might this be measured? One possible way is to obtain the relevant data for major cyclical episodes, and to quantify the relative importance of the Keynes' mechanism by comparing changes in the value of bonds with those in the value of variable-income assets. This is the purpose of Table 1.4 which looks at US household data for the period from end-2019 to end-2022, that is, roughly speaking, the period in which the Covid-19 medical emergency began and came under control.

The message of the final column of Table 1.4 is that quarter-by-quarter changes in the value of variable-income assets held by households are a very high multiple of changes in the value of their debt securities. *In the second half of 2020 changes in the value of households' variable-income assets were more than 1,000 times that in the value of their debt securities.* Crudely, American households care far more about the stock market and house prices than they do about bond yields. Whatever some Keynesian economists think about the matter, this is surely a commonplace. Unavoidably, it has huge implications for macroeconomic analysis. Households' decisions on their current and capital expenditure (that is, "expenditure" in the income–expenditure flow, relevant to the national accounts), and on their investment portfolios, must be heavily influenced by their wealth and changes in its value. But such changes are

Table 1.4 Capital gains and losses on major asset classes in the USA's Covid-related business cycle

Net holding gains (in billions of $s) from →	Real estate	Corporate equities	Mutual fund shares	Equity in non-corporate business	Variable-income assets	Debt securities	Change in value of variable-income assets as multiple of that in value of debt securities, without regard to sign
2020:Q1	633	−4,798	−1,593	264	−5,494	121	45
2020:Q2	610	3,518	1,223	68	5,419	52	104
2020:Q3	722	1,768	532	294	3,316	−2	1,638
2020:Q4	983	3,847	977	418	6,226	5	1,205
2021:Q1	1,243	1,800	332	483	3,857	−122	32
2021:Q2	1,759	1,769	587	663	4,779	36	131
2021:Q3	1,887	188	−83	864	2,856	−32	90
2021:Q4	770	1,278	446	596	3,089	−5	685
2022:Q1	3,303	−1,018	−804	568	2,049	−200	10
2022:Q2	2,135	−5,108	−1,493	673	−3,794	−122	31
2022:Q3	−1,254	−1,016	−557	209	−2,618	−145	18
2022:Q4	−978	1,182	534	−197	541	54	10

Note: Personal disposable income was $16,388.6 billion in 2019 and $18,523.6 billion in 2022. The value of variable-income assets in the US economy is taken to be the sum of the four columns in the left of the table. This is for illustration. Other variable-incomes could be included.
Source: US Federal Reserve *Financial Accounts of the United States* (June 2023 release), Table R101, p. 141.

– above all – changes in the value of variable-income assets. (The argument is picked up and developed in more detail in Chapter 3.)[71]

Declarations by prominent economists that monetary policy is only about interest rates and bond yields must be regarded as strange, to say the least. A fair comment on many Keynesian textbooks is that they ignore altogether the direct effect of changes in the quantity of money on the economy, while restricting the indirect effect in the transmission mechanism to that arising from the liquidity preference theory of bond yields. Technically, changes in economic activity, output and employment depend on the so-called "IS curve", and nothing else. To the extent that they omit the direct effect and restrict the indirect effect to that working via bond yields, these textbooks are so misleading as to be dangerous. (In the author's view, a forecast of the values of the equity market and the stock of residential houses, and indeed all important asset categories, has to be part of any meaningful macroeconomic forecast. The point is developed at more length in Chapter 4, on pp. 140–42.)

The discussion in this section has been intended to open eyes and broaden horizons. The majority of university students are taught from textbooks which purvey Keynesian macroeconomics and snub the quantity theory of money. Sometimes the economy consists only of the transactions in the so-called "income–expenditure–output circular flow", which are said to determine GDP.[72] The level of GDP implied by these transactions can then be viewed as stable and persistent, unless it is upset by unspecified and intermittent "shocks".[73]

But this is to caricature the real world. As Keynes himself was well aware, and as he spelt out fully in his *Treatise on Money*, the economy contains transactions in assets as well as transactions in his "industrial circulation".[74] Transactions in assets, as well as a range of other transactions outside the circular flow, are so large that – to repeat – the value of transactions in a modern economy is a very high multiple of both those in the circular flow and GDP itself. Shocks from fluctuations in the value of securities and real estate are incessant, and imply that expenditure for some agents may sometimes have only a loose connection with their incomes. At the end of Chapter 7 of his *General Theory*, Keynes reminded his readers that, while every individual has the freedom to change the amount of money in his or her possession, at the aggregate level it is logically necessary that

> the total amount of money, which individual balances add up to, … be exactly equal to the amount of cash which the banking system has created.

Suppose that, for whatever reason, the quantity of money changes. Then

> … incomes and [the] prices of securities necessarily change until the aggregate of the amounts of money which individuals choose to hold at the new level of incomes and prices thus brought about has come to equality with the amount of money created by the banking system. This, indeed, is the fundamental proposition of monetary theory.

As Keynes saw, the price of "securities" – in fact, assets of all kinds – had to be incorporated in his "fundamental proposition of monetary theory".[75]

One more issue needs to be discussed before closing this account of the monetary transmission mechanism. The argument has been that – after a period of time, in which the economy is in disequilibrium – a shock to the quantity of money results in equi-proportional changes in national income and expenditure, and in the value of variable-income assets, as equilibrium is restored. But how long is that period of time?

As usual in this subject, Friedman had views and expressed them lucidly.[76] To quote,

> For most Western economies a change in the rate of monetary growth produces a change in the rate of growth of nominal income about six to nine months later … The effect on prices, like that on income and output, comes some twelve to eighteen months later, so that the total delay between a change in monetary growth and a change in the rate of inflation averages something like two years … In the short run, which may be as long as three to ten years, monetary changes primarily affect output. Over decades, on the other hand, the rate of monetary growth affects primarily prices.

Friedman was certainly exercised by the lags in money transmission and wrote much about them. While the passage quoted is representative, it was not the only view he held. Indeed, Edward Nelson, one of the Federal Reserve's top economists, noted in an intellectual biography of Friedman that his handling of the subject was sometimes "precarious" and "with evidence of backtracking".[77] All the same, "The two-year rule of thumb for the reaction of inflation to monetary policy actions, which entered Friedman's framework at then of 1971 and became a staple part of it thereafter, has … since become a standard part of practical monetary analysis."[78]

The two-year rule of thumb has the merit of definiteness. However, an argument can be made that it is too definite. In practice, the effect of a change in money growth on the economy will depend critically on how much unemployment and spare capacity it has or, in a phrase, on the so-called "output gap".[79] An acceleration of *x plus* 2 per cent in the rate of money growth may have little or no adverse impact on inflation for several quarters, if output is initially much beneath trend. Conversely, an acceleration of *x minus* 2 per cent in the rate of money growth may be followed by an early and abrupt acceleration of *x minus* 2 per cent in the rate of inflation if output is well above trend. The

Friedman generalization might be viewed as a statement of the likely outcome if the economy is starting from approximate monetary equilibrium, with output at trend. Taken this way, it turns out to be useful in understanding the Covid-related cyclical upheaval of the early 2020s. However, the lags between an upturn in money growth and peak inflation in the UK's two big boom-bust cycles of the late twentieth century were double Friedman's figure of two years.[80]

VI.

The discussion of lags completes our account of the money transmission mechanism. Already it has been necessary to look at patterns in the real world. The purpose of this section is to select and present more data on the money–GDP relationship, although – of course – these data are only a tiny fraction of what is available. Two bodies of evidence are examined – the US household wealth numbers already discussed, and the relationship between money growth and inflation for the G20 countries from 1980 to 2022. Basic to the whole subject is the validity of the proportionality postulate. Roughly speaking, the postulate is valid if and where – over the medium and long runs, when the economy has had time to equilibrate the demand to hold money with the quantity of money actually in being – the rates of change of money, broadly defined, and of national income and wealth are similar. It will turn out that a major qualification has to

Table 1.5 Changes in US household sector balance sheet, 1946–2021

-	Value at end-2021, as multiple of value at end-1946
Money, mostly deposits	155.9
Total financial assets	167.7
Total assets, before debt	182.3
Total liabilities	490.2
Total assets after debt	169.3
Personal disposable income	111.9
Ratio of money to income	1.39
Ratio of net assets to income	1.51
Ratio of gross assets to income	1.63
Ratio of all liabilities to income	4.38

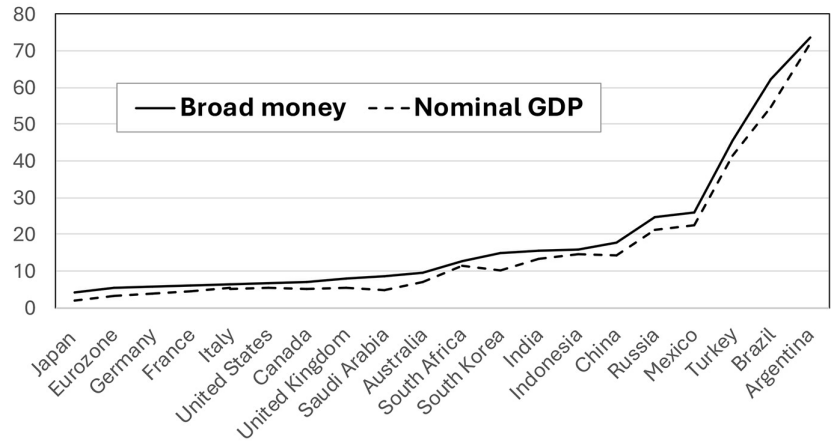
Source: Data downloaded from Federal Reserve flow-of-funds database, at September 2023, and author's calculations.

be mentioned, but this qualification does not disturb the intellectual integrity of the quantity theory of money.

Recall Table 1.3, which demonstrated the long-run similarity of the rates of increase in the US household sector's income, money holdings and holdings of variable-income assets. There is more to say. Table 1.5 shows that, in the 75 years from 1946 to 2021, American households increased their money holdings almost 146 times, while their incomes rose about 112 times. So the ratio between the two was not constant, but its change – of just under 40 per cent – was modest relative to the multiplications of both money and incomes. Further, an explanation was available for the rise in the money/income ratio. In this 75-year period American households became richer not just in absolute terms, but also with wealth growing relative to income. The net wealth-to-income ratio moved up from 5.4 in 1946 to 8.1 in 2021. On top of that, financial behaviour became more complicated. At the end of the Second World War, households had little debt, but by 2021 liabilities of all sorts were roughly the same size as income.[81] Plainly, financial transactions – transactions mostly in existing assets – must have increased relative to transactions in the income–expenditure flow. It becomes logical that, as a by-product of "financialization", money holdings should have increased in a typical year a bit faster than incomes.

As the USA has a fairly representative capitalist economy, the behaviour of its households over three generations provides a worthwhile insight into people's attitudes more generally towards their money holdings. Readers may nevertheless want information that relates to a larger and more diverse group of economies. At the time of writing (October 2024), the home page of the Institute of International Monetary Research carries a chart of the relationship between money and inflation for the G20 from 1980 to 2022. Specifically, it gives the annual compound growth rates of broad money and nominal GDP in this period of just over 40 years for these nations. Figure 1.2 reproduces this chart and gives key features of the ordinary-least-squares regression equation of the relationship shown. The message is unmistakeable: nations which had rapid growth of money also had rapid growth of nominal GDP, and often this meant much inflation, whereas nations with low growth of money had similarly low growth of nominal GDP.

Readers may be impressed by the evidence just presented. As a result, they may be flummoxed by some economists' dismissiveness towards both money as an element in the macroeconomic debate and the quantity theory of money more particularly.[82] They are right to be flummoxed, but they should perhaps be warned that the evidence has been chosen in order to bolster the persuasiveness of this restatement of the quantity theory.[83] Other evidence is less compelling, and more balanced accounts are given in Chapters 3 and 4.



Ordinary-least-squares equation of the relationship shown in the chart, between the compound annual % growth rates of broad money and nominal GDP in the G20 countries, 1980–2022

% annual change in nominal GDP =
-1.96+0.96% annual change in broad money

r^2	0.995
t statistic on regression coefficient	57.8
t statistic on intercept term	-4.4

Source: Data from IMF and author's calculations.

Figure 1.2 Money growth and inflation in the G20, 1980–2022

Nevertheless, the naysayers can go too far. Princeton's Paul Krugman, with his column in *The New York Times*, is widely regarded as the world's most influential economist. In May 2021, he used his column to sneer at the handful of pundits who had worried about the inflationary dangers implicit in excessive money growth.[84] Krugman drew a distinction between "zombie ideas", which shamble along "eating people's brains", and the much worse "cockroach ideas" which, despite their falsity, "always come back". Monetarists' claim of a connection between money and inflation was – according to Krugman – merely a cockroach idea. In his words, the then-emerging "buzz" about the subject was evidence of "an infestation of monetary cockroaches". Might one ask whether Krugman – a Nobel laureate – indulged in this sort of thing for instruction or entertainment?

However, in one respect the proportionality postulate did not work. As noticed, in the USA households' money increased slightly faster than households' income, with the argument being that money was needed for financial transactions that tend to grow more rapidly than incomes. The same sort of pattern might also be identified in the G20 evidence. The value of the coefficient on money in the OLS equation is not 1, but 0.96, while the intercept term of minus 1.96 achieves the usual test for statistical significance.[85] The G20 result is therefore that money tends to rise faster than national income over the medium and long terms.

A repeated pattern is that the "banking habit" spreads in the take-off stage of economic development and complements the rises in productivity and living standards. Even after most companies and people have bank accounts, the process of financialization – already mentioned in the US context – is commonly found in all market economies. In summary, when broad money is used as the favoured money aggregate, the strict proportionality postulate does not hold in many surveys of real-world experience. Instead, a standard feature of the data is that the income velocity of money falls in the medium and long runs. (The point is important to the argument in Chapters 4, 6 and 10.)

VII.

We have restated the quantity theory of money and presented evidence for the restated version. The second half of this book shows how it could be applied, across most leading economies, in spring and summer 2020 to make strong forecasts of rising inflation in the medium term.[86] Narratives are given for the American and British economies in Chapters 7 and 8. But it may be useful – ahead of those narratives – to outline a synoptic account of a typical business cycle based on the quantity-theoretic transmission mechanisms so far discussed. The account here is admittedly incomplete and does not pretend to be rigorous. The aims are to identify the key behavioural patterns at work and later to contend that a theory of national income determination based on these patterns is more realistic than one derived from the multiplier mechanism in the Keynesian textbooks.

For ease of exposition, an economy is taken to have a steady-state path of economic expansion, with growth rates of output, the capital stock, and the labour force which are constant trans-cyclically, but with growth subject to shocks that can take both monetary and non-monetary form. (Covid-19 was a classic example of a shock, which might have been entirely non-monetary, although – in the event – its monetary aspect was massively important.) These shocks occasionally cause cyclical instability around the trend. The capital stock consists of structures, machinery and knowhow which can be traded in the form of quoted equities, and buildings – both residential and commercial

– where ownership is established by title deeds and can change by means of well-recognized legal transactions. At this stage, it is assumed that the economy's asset menu does *not* include fixed-interest securities or "bonds". With one minor exception, they are ignored in the discussion of the cycle in the current section. However, their place in the economy – which will turn out to be problematic – will be explored in more detail in a rather tetchy and evasive section VIII.

Agents use money to buy and sell *both* the goods and services which constitute national income and output, *and* financial claims to assets representing the capital stock, and sometimes buildings and physical assets such as cars, boats, ships, farm equipment and so on. So the economy can be conceived as having

- a flow of transactions involving current items in national expenditure, equal after the event (or *ex post*) to incomes in national income and value-added in national output, and
- a flow of transactions in assets, which include transactions on the stock market, buildings (with their title-deeds), a range of physical objects (with ownership registration evidence) and so on.

The first such flow can be equated with the income–expenditure flow of the Keynesian textbooks, and the second as the flow of asset transactions. Notice that assets can be owned by unquoted companies and individuals, as well as companies. Houses, in particular, are mostly owned by individuals. Participants in asset markets include specialists (valuers, brokers and the like) whose incomes are based on asset values and turnover. The economy has a banking system, which issues the money used in transactions.[87]

On the steady-state growth path, the ratio of money to national income – like that of the capital stock to national income, or the ratio of capital to labour – is constant. Let it be assumed, when the economy is in its steady-state growth path, monetary equilibrium holds. Money growth is equal to the trend rate of output growth at, say, 2 per cent a year, and the price level is stable. The market value of the capital stock is equal to its replacement cost, with investment proceeding steadily at a rate which does not disturb this equivalence. Output and employment are also at their trend levels, with the output gap zero and employment at its natural rate.

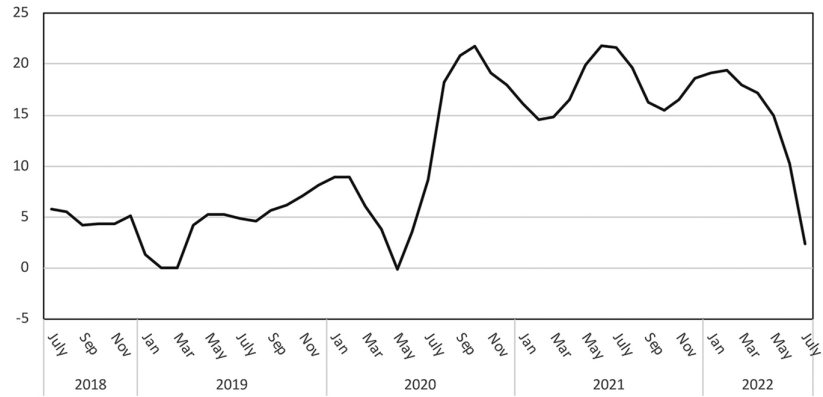
Now assume a monetary shock, a sudden and unanticipated increase in the rate of money growth so that in a one-year period it goes up by 12 per cent instead of 2 per cent. The 10 per cent shock can arise because either the state or the private sector borrows more heavily than usual from the banking system. The monetary shock could be a one-off, non-recurrent event (with the rate of money growth jumping in only one period) or a continuing change in the rate

of money growth to a new higher level. The form taken by the monetary shock is important to the economy's future behaviour, as is noticed in section VIII, but – for simplicity – it is taken in the next few paragraphs to be a one-off, non-recurrent event. In this, it resembles what happened in the USA in 2020, where 19 per cent increase in broad money in the five months to July (that is, with an annualized growth rate of 52 per cent) was very different from what went before or came after.

For the economy as a whole, with income and expenditure unchanged in the first instance, the actual ratio of money to income is above the desired ratio and the economy is characterized by monetary disequilibrium. The extra money balances must be held somewhere in the economy; they must be held, to be more exact, by households, companies and non-bank financial institutions. An important feature of most business cycles is that the money holdings of companies and non-bank financial institutions are more volatile than those of households, as is discussed in more detail in Chapter 3. It follows that an early pattern in these cycles is for the money balances of the company and financial sectors to rise at a more rapid rate than those of the household sector.

Households try to eliminate their excess money partly by increased consumer spending. Indeed, a link between excess money holdings and extra consumer spending is a rather obvious pattern – the most straightforward "direct effect in the commodities market" of our section IV above – to envisage in the circumstances under consideration.[88] Spending on such essential items as food, electricity and fuel is unlikely to change much. Instead the increase in spending will be particularly on discretionary items which include many durable products, notably cars and furniture. Dealers in durable products may meet the more buoyant demand initially by running down their inventories. In terms of the Keynesian aggregate demand categories, the one-off money injection boosts both consumption and inventory build-up.

Another aspect of household behaviour merits further discussion. Some households save by accumulating balances in banks and housing finance specialists (savings and loan associations in the American case, and building societies in the British, with many variants in different countries). The purpose of these balances is that, when enough has been saved and the time comes, they are used for the purchase of a home. If the upward blip of 10 per cent in aggregate money growth is accompanied by an upward blip also in balances intended for house purchase, a phase of extra housing turnover is to be foreseen. Indeed, house prices may increase by more than they otherwise would have done. (Figure 1.3 shows the house price boom in the USA during the Covid period; it is of the annualized change in three-month periods. Evidently, the acceleration of this annualized change was from a typical number in the two years to summer 2020 of about 5 per cent to a typical number in the next two years of 15 to 20 per cent, even though the Covid pandemic was – on



Note: Chart shows the three-month % annualized rate of change of "house prices, purchase only" index prepared by the Federal Housing Finance Agency.

Figure 1.3 The house price boom in the USA during the Covid pandemic

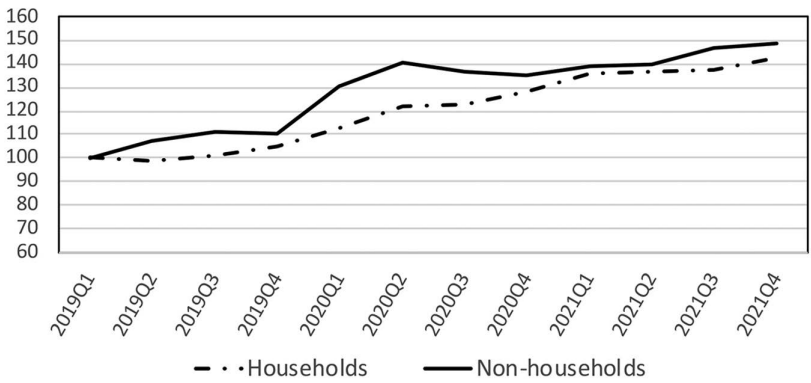
what might be termed "common sense grounds" – a negative influence on the economy and house prices. As noted above, US broad money soared by 19 per cent in the five months to July 2020.)

As just mentioned, a repetitive feature in the early stages of these cycles is that the money balances of the company and financial sectors rise at a more rapid rate than those of the household sector. The extra expenditure by households – in shops, over websites, in the housing market and elsewhere – is one reason that money is transferred to companies. But another channel is to be noted. With households having excessive money balances, they may choose to expand their non-monetary financial savings. Consequently, they may switch funds from their bank accounts to mutual funds (in the USA), SICAVs (in the European Union), and unit trusts (in the UK), as well as to pension funds and life insurance policies. At any rate, in the first few months after an acceleration in aggregate money growth, money held by the company and financial sectors tends to grow faster than money held by households.

Of course, only households can consume. Companies, however, can invest in capital equipment and build up inventories. With their money balances suddenly more comfortable than before, their decisions may affect aggregate demand if they do spend more on equipment, buildings and inventories. However, they may prefer to reduce their excess money by purchasing existing assets. For example, they may buy land or subsidiaries from other companies or, in the extreme, they may even embark on takeovers of other companies.

Plainly, if the entire corporate sector is flush with cash, and if all companies engage in purchases of existing assets, the price of these existing assets will increase. Companies will be valued at higher multiples of cash flows and profits, and the implied market value of their assets may exceed replacement costs.

The tendency of excess money to strengthen asset prices is reinforced by developments in the financial sector. As extra funds are received by unit trusts, mutual funds, SICAVs, pension funds and so on, these institutions have higher ratios of money to assets than before. Chapter 3 discusses in more detail how most savings institutions try to keep their money-to-asset ratios in line with industry benchmarks, with the result that these money-to-asset ratios are quite stable in the long run. Chapter 3 also explains how this stability means that asset prices rise with buoyant inflows to the long-term savings institutions, and – by the same reasoning – fall when the inflows are succeeded by outflows. Figure 1.4 shows the contrast between the rates of change of household and non-household money balances in the USA in the three years to the end of 2021. The chart shows the values of household and non-household money through the three years to the end of 2021, with the first quarter of 2019 taken as 100. At the end of the second quarter of 2020, when worries about Covid were intense, non-household money was up by 40 per cent compared with 18 months earlier. By contrast, household money had gained under 22 per cent in the same period.



Note: 2019 Q1 = 100. For explanation, see text.
Source: Federal Reserve *Financial Accounts of the USA* and author's calculations.

Figure 1.4 *Household and non-household money early in the USA's Covid-related business cycle*

The discrepancy between the growth rates of household and non-household money in the early stages of a typical business cycle is associated with greater strength in asset prices than in the prices of goods and services. The indirect effect of excess money in asset markets generates more conspicuous reports in the news media than its direct effect in the markets for goods and services. Indeed, asset prices may overshoot. Whereas the assumed 10 per cent monetary shock ought logically to be accompanied by roughly comparable gains in the stock market and house prices, business cycles in practice often see disproportionate movements in asset prices. Seemingly irrational "bandwagon effects" and the like may cause share prices to lurch upward by 15 per cent, 25 per cent, or more in a year. Some local housing markets may also report extreme numbers. However, at the end of the day, the prices of all assets must be anchored to the incomes and benefits they generate. The asset price buoyancy – in the context of an economy with a money growth shock of only 10 per cent – may seem to be an inexplicable aberration, with the flow of asset transactions separate from most people's day-to-day "getting and spending" activities. But at least three mechanisms connect the flow of asset transactions and the income–expenditure flow.

First, as asset owners feel better off, they consume a higher ratio of their incomes, a response known in the literature as "a wealth effect". It is easy to understand and does not need much further comment. But notice that households may choose to convert part of extra non-housing wealth into additions to the housing stock, perhaps by moving to a larger home, perhaps by making improvements to their current property or in some other way. As the building of new houses and home improvements is part of the Keynesian national income category of "gross domestic fixed capital formation", there is a clear interaction between asset markets and the income–expenditure flow.

Secondly, companies make profits by selling products above cost. Some businesses specialize in making capital equipment, where such equipment includes ships, aeroplanes, cars and so on. If the market value of various kinds of capital equipment reflects the wider upward movement in asset prices, and if the market value is then well above replacement cost, it makes sense for businesspeople to order the production of new ships, aeroplanes, cars or whatever. In general, the market value of assets has to be related to their replacement cost and, in equilibrium, they should be the same. If not, a range of market responses comes into play to restore equilibrium. Again, asset markets and the income–expenditure flow are interconnected.

Finally, it was mentioned earlier that asset markets provide employment to various sorts of specialists, where these specialists have incomes based on asset values and turnover. These incomes reflect the volatility that stems partly from the occasional overshooting (and undershooting) of asset prices. The financial rewards of estate agents and surveyors, and the lawyers involved in

conveyancing, are influenced by the number and value of housing transactions, where most such transactions are in already-built properties.

Investment banks are organizations which run trading books in securities and sometimes underwrite new securities issues for a fee; they also provide advisory services to companies, particularly when companies are involved in major restructurings (takeovers, divestments of subsidiaries and the like). Famously, or notoriously, depending on one's point of view, investment banks sometimes pay bonuses larger than base salaries, but the bonuses come and go with fluctuations in the amount of business done. With the UK outside the European Union because of Brexit and with its companies therefore free to determine their own staff payment arrangements, Barclays announced in August 2024 that "material risk-takers" might, if they were successful, be paid bonuses ten times their fixed pay. Goldman Sachs had already said that cuts in its basic pay to key individuals had been accompanied by increases in the maximum bonus ratio to 25.[89]

In short, high share prices and buoyant corporate activity result in extra-large bonuses, and then higher incomes for investment bank staff and higher expenditure by them. The same is true – if not perhaps to the same degree – for professionals in the real estate sector, as housing markets become livelier. The income–expenditure flow is impacted by the flow of asset transactions. In fact, processes like this were very evident in the USA early in the Covid-19 period. The Federal Reserve was in overdrive in late March 2020, buying up government bonds from the US savings institutions. Unsurprisingly, these institutions had ample money balances which were available to invest in new corporate bond and equity issues. According to a report from Reuters on 2 April 2020, "Highly rated US corporate bond issuers raised a record $110.502b. this week, according to Refinitive IFR … The market for new investment-grade debt has boomed since the Federal Reserve and Treasury Department announced monetary and fiscal stimulus to help contain the economic fallout from the pandemic." The incomes of bond traders and underwriters were bolstered by the record issuance of new paper, with talk of bonanza conditions in some financial markets.[90]

The last few paragraphs have explored the behaviours which relate the 10 per cent one-off monetary shock to both asset prices and, crucially, incomes and expenditure in the income–expenditure flow. Plainly, the extra money feeds into aggregate demand, which will be higher than before and with a rate of output growth above that of the economy's supply-side capacity. The 10 per cent money shock was administered to an economy assumed at the outset to be in monetary equilibrium with output at its trend level and unemployment at its natural rate. In the following year output will therefore be above its trend level and unemployment will be beneath its natural rate.[91] The economy will suffer a degree of over-heating. Upward pressures on prices will spread from asset

markets to both labour markets and markets in goods and services, and inflation on the much-publicized consumer price indices will start to rise.

A basic theme of this book has been an emphasis on the link between money and the price level, and changes in the growth rate of money and the rate of inflation. But this is not to deny that pay and wages are set in the labour market, and the prices of goods and services "in the commodities market". Of course, pay and wages are set in the labour market, and the prices of goods and services in the vast number of markets found in real life for hundreds of thousands of goods and services. Of course. No one disputes that the dynamics of inflation are heavily conditioned by the balance between supply and demand in labour and product markets. Such concepts as "the output gap", the "natural rate of unemployment" and the so-called "Phillips curve" – the typical ingredients of New Keynesian analysis – have to be incorporated in a complete account of the determination of inflation.[92]

But – by the same token – money and asset markets must also be incorporated in a complete account of the determination of inflation. The exclusion of money and asset markets from the New Keynesian analytical approach, and indeed much central bank research in the twenty-first century, is as dishonest and wrong as overlooking the undoubted connections between inflation and supply/demand balances in the relevant labour and product markets. Krugman has alleged that some monetarists talk about money and inflation as if the relationship between them could be understood without any reference to the messy realities of business life, as if indeed there were such a thing as "immaculate inflation".[93] As far as the broad-money monetarism is concerned, that allegation is misplaced and unjustified.

At any rate, let us return to the one-off 12 per cent money shock assumed in this synoptic account of the business cycle. About a year or so after the shock has occurred, exceptional increases in asset prices and aggregate demand have caused output to rise above its trend level and unemployment to drop beneath its natural rate. Whereas the economy in its previous steady-state equilibrium had stable prices, it now has some inflation. Let us further assume – realistically – that inflation in terms of consumer prices is lagged relative to and less extreme than the inflationary froth in asset markets. So in the second year it is, say, 1½ per cent rather than nil. With money growth dropping back from the unusual 12 per cent number to the trend 2 per cent a year, real money growth is still positive, although at a mere ½ per cent a year. It is lower than the trend growth rate of output and indeed than actual output growth in the boomlet now under way. In the second year of the boomlet the economy still enjoys – if "enjoys" is the right word – the impetus from the original money shock, so that output again grows at an above-trend rate and unemployment goes even further beneath the natural rate. So the *increase* in inflation is higher in the second year than in the first and actual inflation reaches, say, 3½ per cent.

With inflation at 3½ per cent and money growth at 2 per cent, real money growth has now gone negative. Because prices in the shops, over websites and so on are now advancing noticeably, and because their incomes are moving ahead because of more overtime and greater employment, households need extra money balances. But it has been assumed that the aggregate rate of money growth is at the 2 per cent annual figure associated with the economy's steady-state equilibrium. A necessary result is that non-household money balances – the bank deposits held by companies and non-bank financial institutions – grow more slowly or even contract. As the cycle matures, non-household money is squeezed.

Just as the abundance of non-household money at the start of the cycle was positive for asset prices, so the squeeze on non-household money two or three years later is negative for them. The stock market may go sideways or fall. Most households may be irritated by the unwelcome inflation at the retail level, but their nominal incomes are growing quickly enough that they are better-off than before the boomlet. For people who have incomes based on asset markets, the situation is different. Moreover, the boost to aggregate demand from the strength in these markets may begin to go into reverse. The housing market, in particular, tends to be a good leading indicator for the economy as a whole, so that – for example – housing starts may go down. Even so, as the economy reaches into the second and third year of the boomlet, aggregate demand and output are still sufficiently robust to keep companies busy with new orders. Inflation might even rise again to, say, 4 per cent.

With our assumed 2-per-cent-a-year money growth running at a rate equal to the trend growth rate of output, and the key condition for the restoration of monetary equilibrium therefore being met, it has to be the case that eventually the economy returns to its steady-state growth path. In our account of the economy's trajectory into its third year, inflation has climbed to 4 per cent and the excess inflation from the start of the cycle has been altogether 9 per cent (that is, 1½ per cent plus 3½ per cent plus 4 per cent). Assuming agents' money-holding preferences are stable, the inflation for the cycle as a whole has somehow to be related to the 10 per cent or so of excess money which occurred with the 12 per cent one-off monetary growth shock at its start. Perhaps, in years four and five, asset price weakness has become so pronounced that aggregate demand tumbles, output growth is much less than trend or output actually goes down. The output gap may have been positive for a couple of years during the boomlet, but it is negative for some quarters late in the cycle. Inflation at the consumer level falls and is briefly replaced by deflation, before it returns to the zero figure in the steady-state equilibrium. The recovery of steady-state equilibrium may take four or five years from the original shock.

Our synoptic account of a typical business cycle, analysed from a quantity-theory perspective, may or may not be judged convincing. One aim has been

to identify recurrent features of real-world cycles and to suggest that these features are consistent with such quantity-theoretic claims as the underlying stability of agents' money-holding behaviour; another has been more specific, to anticipate the narratives – in Chapters 7 and 8 – of the Covid-related business cycle in the USA and the UK in the 2020s.

The interplay between the income–expenditure flow and the flow of asset transactions has been highlighted, with movements in asset prices clearly influenced for several quarters by the one-off 10 per cent excess money shock at the start of the cycle. It can be taken – as a reasonable surmise – that, by the time the cycle has played out, equities and real estate are higher in nominal terms than they would otherwise have been, if only by about 10 per cent. But the phrase "the rate of interest" has not been used once. The story has been told as if the economy had neither a bond market nor a central bank setting its own rate by various interventions in real-world bond and money markets.

VIII.

This neglect may outrage many readers, but it has been deliberate. The treatment of variable-income assets has been constrained by an easily understood equilibrium condition, that in the long run rates of change in the quantity of money, the level of nominal national income and the value of the wealth in *variable-income assets* are the same. Now let us see if something equally straightforward can be said about *fixed-interest securities*, about bonds and bond yields.

According to the liquidity preference theory of the Keynesian textbooks, the one-off increase in the quantity of money should prompt investors to *buy* more bonds, raising their price and *lowering* the yield. But – if we think about the business cycle described in the last section – that would be an odd reaction. In our hypothetical business cycle, the sudden once-for-all addition to the quantity of money cannot be matched by a similar amount of extra output. A cyclical upward blip in output may occur, but eventually the economy returns to its original growth path. Indeed, once back on that growth path the price level is roughly 10 per cent higher than it would otherwise have been. As bonds have fixed nominal returns, their holders must be worse off than before. Logically, smart investors should react to the news of the 10 per cent excess money growth rate in year one by *selling* bonds, and buying equities and real estate with the proceeds. That would of course *raise* bond yields.

In his *General Theory*, Keynes assumed away this outcome. The liquidity preference theory dominates its book IV, and in its books II to IV a premise of the analysis is that the so-called "wage-unit" (that is, wage costs per unit of output) and hence the price level are constant. Inflation therefore cannot reduce the real value of bonds because – very simply – the assumptions of

the discussion eliminate the possibility. Unfortunately, books II to IV of the *General Theory* are not the real world. Inflation is not only far more common than deflation, but also it does cut the real value of fixed-interest securities. Why don't investors require a higher nominal yield to anticipate it? Keynes was well aware of the point, as a discussion of inflation and the rate of interest figured quite prominently in his earlier *Treatise on Money*.[94] (Book V of the *General Theory* – in which the wage-unit is allowed to vary – has nothing on the implications of a rise in the price level on bond investors and their attitudes. There are some pages on the implications of *falling* prices, but Keynes again conjures up his worries about absolute liquidity preference is a context where portfolio choice is exclusively between money and bonds.[95] As explained several times in this book, that context is absurdly unrealistic.)

So what in practice would happen to bond yields in year one of our hypothetical business cycle? Would they go up or down? In the late twentieth century, leading theorists – notably Robert Lucas and his colleagues at the University of Chicago – tried to handle the question by emphasizing the importance of investors' expectations. A body of thought developed, which pivoted on a so-called "rational expectations hypothesis". The hypothesis proposed that agents were clever enough, and sufficiently alert, that policy-makers could not repeatedly fool them. In other words, if policy-makers took decisions which resulted in inflation, investors would react so that – in future, at least – they could not be cheated by the loss in the value of money due to inflation. According to one description of this approach, people would "take into account what they believe to be the 'correct' macroeconomic model". For example, if they accept a monetary theory of inflation, "they will make the best use of all publicly available information on rates of monetary expansion in forming their expectations of future rates of inflation".[96]

Even in the early twenty-first century, when the quantity theory of money has been unfashionable, many people say on the record that inflation has a monetary cause. But – as was explained in the Introduction – this begs the question of whether they see the monetary base, narrow money or broad money as the relevant notion of money. The Introduction showed that several economists, reputed to be authorities on these matters, including even Milton Friedman, had been wrong at one time or another in their views of inflation. The mistakes were attributed there partly to the selection of an inappropriate money measure. But sceptics might dismiss the argument as merely a matter of opinion, with the author of the current work having no greater wisdom than his thousands of economist rivals.

Anyhow, let us try to apply rational expectations thinking to the USA of the early 2020s. In 2020 the country had the fastest increase in the quantity of money, broadly defined, since 1943. The growth rates of the monetary base and narrow money were even higher, although the macroeconomic significance of

these money concepts has been questioned by the broad-money monetarism advocated in this book. If the Chicago-style rational expectations approach were correct, bond yields ought surely to have moved upwards straightaway and by a large amount. Further, that rise in bond yields ought to have been registered in the inflation expectation implied, for example, by the difference in yield between a conventional US Treasury security with ten years to maturity and the yield on a Treasury security where its real value was protected against inflation (a so-called "Treasury inflation-protected bond"), also with ten years to maturity. Figure 1.5 shows the US inflation rate expected over the next ten years by investors in the world's largest, most sophisticated and most well-informed bond market, on a daily basis from the start of 2020 to August 2024.

The chart must come as a disappointment to protagonists of the rational expectations hypothesis. Money growth was on a rampage in spring and summer 2020, with numbers far into the double digits per cent at an annual rate and extraordinarily high figures if movements in one- or three-month periods were annualized. Monthly gains of about 1 per cent (that is, at an annualized rate almost into the teens per cent) were still common in 2021. But bond markets seem to have paid little attention. Bond yields plummeted just as the Federal Reserve flooded asset markets with money. Indeed, yields in spring and summer 2020 were such as to imply that the bond market expected *less* inflation over the next decade than in the 2010s, despite the money growth explosion of 2020 and although the 2010s had had the most subdued inflation in the



Source: FRED database, at the website of the Federal Reserve Bank of St. Louis.

Figure 1.5 *Expectations of inflation % over the next ten years, as implied by relative yields in the US bond market, in the early 2020s*

post-war period. The expected ten-year inflation rate remained under 1½ per cent – and therefore lower than in 2019 – until late July 2020. Admittedly, it did then rise until spring 2022. But, on the face of it, bond investors responded to the *actual* rate of inflation, as it soared and eventually approached double digits; they were not applying economic theory and adjusting *expected* inflation according to money growth news.

In Chapter 4, reference is made to an investment panel supported by the IMF, *in December 2020*, where top economists talked to the theme of a "lower-for-longer" world, that is, a world in which inflation and interest rates would be lower for longer than expected before Covid. In fact, the ten-year inflation rate expected by the US bond marked did rise in that month slightly above their level a year earlier, that is, before Covid was a big worry. But – as late as November 2020, when presumably the IMF panel was being organized – the expected ten-year inflation rate remained lower than in December 2019.

So what is to be said about how bond yields will change in response to an increase in money growth? The answer must be that no economic theory is sufficiently comprehensive and insightful for anything definite to be said about the likely direction of the change, let alone for economists to be able to forecast the size of change appropriate for any particular rate of money growth.[97]

If the world were ruled by logic and we were starting from an already inflationary situation, a reasonable view is that a permanent increase in money growth of x per cent a year would be accompanied – in short order – by a permanent increase in both expected inflation and yields on long-dated and irredeemable bonds also of x per cent a year.[98] But, in any plausible real-world circumstances, few policy-makers would say bluntly that they intended to increase inflation in that way. Market practitioners would therefore puzzle about whether any reported increase in money growth was a one-off accident or a sign of an enduring loss of control. Contrary to Keynes' liquidity preference theory of bond yields, and to many other approaches to the subject, the relationship between money growth and bond yield movements is contingent, unpredictable and uncertain. Much depends on how investors think and what they believe, but their thought processes and beliefs vary over the decades.[99] That is one justification for not including bonds in an account of how the business cycle is conditioned by developments in the banking system and the quantity of money.

IX.

It is time to conclude. This restatement of the quantity theory of money has concentrated on the monetary transmission mechanism while also giving evidence to support the key claims. In modern circumstances, the proportionality postulate is concerned with the relationship between changes in the quantity

of money and changes in nominal GDP rather than changes in the price level. It has to be qualified during cycles because of the possibility of monetary disequilibrium. Furthermore, even over the medium and long runs, strict equiproportionality may not hold because of "financialization" and other factors.

All the same, substantial bodies of evidence from numerous economies are clear that, over the medium and long runs, changes in velocity are small relative to changes in both the quantity of money and nominal national income. The statement "large changes in the quantity of money are a necessary and sufficient condition for large changes in the nominal national income" may be an exaggeration, but it points macroeconomic discussion in the right direction. Policy-makers – particularly those at the top of today's central banks – would be mad to ignore it. Central banks may nowadays have a substantial degree of operational autonomy from governments and politicians, but they cannot conjure resources from thin air and they are certainly not omnipotent.[100]

We have seen that in the final weeks of March 2020, the Federal Reserve engineered rates of increase in broad money which were much higher than the underlying trend rate of growth of US output. In the month of April 2020, M3 broad money increased by 7.4 per cent. If that had continued for a year, the quantity of money would have climbed by 135 per cent. Does it need to be said that the laws of monetary economics are the same in North and South America?

Early in this chapter a reference was made to Keynes, in which he was said to have ended by hating the quantity theory of money. Without doubt his thought processes when writing the 1936 *General Theory* were different from those when writing the 1923 *Tract on Monetary Reform* and the 1930 *Treatise on Money*. Indeed, in the *Treatise* Keynes explicitly said that "formerly" he had been "attracted" to quantity-theory reasoning, but he wanted to move on. In his view, to obtain "real insight" we need to bring in "the rate of interest" and "the distinction between … savings and investments".[101]

These remarks seem to foreshadow the liquidity preference theory of the rate of interest and the multiplier theory of national income determination in *The General Theory*. The two ideas – signature themes of the Keynesian revolution – were incorporated in the 1948 Samuelson textbook on *Economics* and its subsequent 19 editions. But the data on asset value changes highlighted in section V above argue that the liquidity preference theory of the rate of interest does not deserve its place in the sun. After all, in late 2020 changes in the value of the variable-income assets held by American households were more than 1,000 times larger than those in the value of their bonds. And does it need also to be recalled that the multiplier theory in the *General Theory* is about output *in real terms* and hence in employment? The *General Theory* is not about the determination of the price level and inflation, except in its rather miscellaneous and disorganized book V.

The criticisms of the Keynesian textbooks can be taken much further. Earlier it was noted that university textbooks sometimes view the economy as consisting only of transactions in a so-called "income–expenditure–output circular flow", with these transactions determining GDP. But our synoptic account of a typical business cycle shows this to be too limited an approach. As real-world economies also have transactions in assets, and as the income–expenditure flow and transactions in assets are interconnected, the characterization of the income–expenditure flow as "circular" is not just misleading, but quite wrong.

The multiplier theory of national income determination says little more than that – if part of aggregate expenditure is a constant proportion of the total – changes in the total are a multiple of changes in the part. This may be crucial to the "science" of Keynesian macroeconomics, but a more facile proposition could hardly be imagined. To have traction as a "theory", the textbooks appeal to a distinction between so-called "autonomous" and "induced" expenditure. Consumption is said to depend on income and to be a stable function of it, and hence to exemplify "induced expenditure". The marginal propensity to consume is then a given, which may be denoted here by β. By contrast, investment is supposed not to depend on income and instead to be buffeted around by "animal spirits", as businessmen in the private sector respond to the latest fashion, confidence swings and the like, as well as the rate of interest. Investment is the dominant kind of "autonomous expenditure". With income viewed mechanically as the sum of consumption, C, and investment, I, a little manipulation leads us to the multiplier. ($Y = C + I$, where $C = \beta.Y$, so that $Y = \beta.Y + I$ and also $= 1/(1-\beta).I$, where $1/(1-\beta)$ is the multiplier.)

But is the autonomous-induced distinction viable? Never-ending changes in the rate of money growth are an obtrusive feature of most economies, and – as has been explained in this chapter – they are associated with similarly never-ending fluctuations in asset prices, particularly the prices of variable-income assets. The fluctuations in asset prices have almost definitional effects on some households' incomes and spending power, notably on the incomes and spending power of investment bankers, lawyers, auctioneers and so on. As with any other group, their expenditure will vary with income. Clearly, the resulting changes in expenditure arise because these professional incomes depend on asset prices and turnover. The underlying premise of the circular flow – that incomes are received only from current expenditures, and that expenditures depend only on recent income – is unsustainable.

The Keynesian textbook account of national income determination rests on two claims, that

- consumption depends on income, whereas investment does not, and
- consumption is a stable function of income.

Neither claim stands up to serious examination. Ups and downs in the stock market and house prices alter not only household incomes, but also the propensity to consume from period to period. Consumption in the next period can change for reasons which have little or nothing to do with income in the current or immediately past period. Cyclical instability can be interpreted as due largely to the impact of asset price volatility on *both* consumption *and* investment. Moreover and crucially, asset price volatility is motivated, above all, by fluctuations in the rate of growth of broad money. The Keynesian textbook story – where instability is due only to changes in autonomous expenditure – is a parody of reality.

In any discussion of the behaviour of the price level and nominal GDP, and of inflation in both commodities and assets, the quantity theory of money remains not just relevant, but crucial. The quantity theory of money was originally the quantity theory of the *value of money*, since its central message accords with the laws of supply and demand. If too much money is created, its value will fall, whereas – if an economy becomes short of money balances – their value will rise. The main propositions of the quantity theory are fundamental to the analyses, in the rest of this book, of the relationship between money and inflation in the 2020s.

NOTES

1. At one time the quantity theory of the *value of* money was contrasted with the cost-of-production theory of the value of money, which was related to the labour theory of value. This contrasting made sense when money took mostly metallic form, but is obviously anachronistic in a fiat-money economy. See part 4 of Knut Wickell, *Lectures on Political Economy* (London: George Routledge and Sons, 1935, translated from the Swedish by E. Classen), vol. 2, on 'The exchange value of money'. (The *Lectures* had originally been published in Swedish in two volumes in 1903 and 1906.) Wicksell judged that the quantity theory was "the only one which can make any claim to real scientific importance" (p. 141). Notice that Wicksell's discussion preceded Irving Fisher's 1911 *The Purchasing Power of Money.*
2. Jean Bodin, *La réponse aux paradoxes de Malestroit* (1568) is covered in many histories of economic thought. An English translation was published in 1997. Denis O' Brien (trans.), *Reply to the Paradoxes of Malestroit* (London: Thoemmes Continuum, 1997).
3. Arguably, monetarism comes in different shapes and sizes, and several versions can be differentiated. In a 1987 paper the author suggested that the "American monetarism" of, in particular, the Chicago School was different from "British monetarism", the brand of monetarism which was important in inflation control in Britain in the late 1970s and early 1980s. See 'How do

British and American monetarism compare?', essay 13, pp. 275–303, in Tim Congdon, *Money in a Free Society* (New York: Encounter Books, 2011).

4. Friedman, *Money Mischief* (New York: Harcourt Brace Jovanovich, 1992), p. 39.
5. The quotation is from p. 1 of Mark Blaug, 'Introduction', pp. 1–3, in Blaug and others, *The Quantity Theory of Money* (Aldershot: Edward Elgar Publishing, 1995).
6. See Robert Skidelsky, 'J. M. Keynes and the quantity theory of money', pp. 80–95, in Blaug and others, *The Quantity Theory of Money*, particularly the section at the top of p. 83.
7. Milton Friedman, 'The quantity theory of money: a restatement', pp. 3–21, in Milton Friedman (ed.), *Studies in the Quantity Theory of Money* (Chicago: University of Chicago Press, 1956).
8. A long debate in the history of economic thought has been concerned to quantify the extent of this influence. See, for only one treatment, George Tavlas, *The Monetarists* (Chicago and London: University of Chicago Press, 2023), pp. 5–13 and the ensuing discussions in the book.
9. See Rose E. Emmett, *The Elgar Companion to the Chicago School of Economics* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2010). In 1977, Friedman retired from the University of Chicago after teaching there for 30 years and moved to San Francisco. The distinctive Chicago tradition of monetary economics now lies in the past and is only a matter of historical record.
10. For an example, see p. 45 of Scott Sumner, *The Money Illusion: Market Monetarism, the Great Recession, and the Future of Monetary Policy* (Chicago: University of Chicago Press, 2021).
11. The author emphasized the point in Tim Congdon, 'If "money matters", what about the monetary base?', pp. 185–200, *Journal of Economic Affairs* (Chester: Wiley, for the Institute of Economic Affairs), vol. 43, no. 2 , June 2023. See particularly section 3, pp. 189–91.
12. Drawing the boundary between bank deposits definitely inside an all-inclusive money measure and just outside is often difficult. Should foreign currency deposits be included? What about deposits with a long term to maturity? Are balances to be included if they are liabilities of a banking-type institution which does not belong to a settlement system? Monetary economics is not an easy subject.
13. The argument in the last few paragraphs was also made by the author in a 1990 paper reprinted in part 8 of Tim Congdon, *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1992). See, in particular, pp. 179–83.
14. John Maynard Keynes, *The Treatise on Money:* vol. 1, *The Pure Theory of Money* (Elizabeth Johnson and Donald Moggridge [eds], *The Collected Writings of John Maynard Keynes*, vol. V [London and Basingstoke: Macmillan for the Royal Economics Society, 1971, originally published 1930], p. 48).

15. Keynes, *Treatise*, vol. 1, p. 236.
16. Keynes, *The General Theory of Employment, Interest and Money* (Elizabeth Johnson and Donald Moggridge [eds], *The Collected Writings of John Maynard Keynes*, vol. VII [London and Basingstoke: Macmillan for the Royal Economics Society, 1973, originally published 1930], p. 299.
17. Friedman, in Friedman (ed.), *Studies in the Quantity Theory of Money*, p. 4.
18. Mark Blaug, *Economic Theory in Retrospect*, 4th edition (Cambridge: Cambridge University Press, 1985), p. 690.
19. Milton Friedman, *The Optimum Quantity of Money* (London and Basingstoke: Macmillan, 1969), pp. 4–5. Helicopter money also appears in *Money Mischief*, pp. 29–37.
20. A trivial exception is the coin issue, but it is so tiny as hardly to matter nowadays. But see footnote 1 above and footnote 46 below on the status of metallic money in Wicksell's monetary economics.
21. John Kenneth Galbraith, *Money: Whence it Came, Where it Went* (Boston: Houghton Mifflin, 1975), p. 29.
22. See p. 58 of Gordon Pepper and Michael Oliver, *The Liquidity Theory of Asset Prices* (Chichester: John Wiley & Sons, 2006) for fountain-pen money; see pp. 43–7 of William Barber, *The Works of Irving Fisher*, vol. 11: *100% Money* (London: Pickering & Chatto, 1997, originally published 1935) for cheque-book money, or "check-book money" in Fisher's American spelling; the phrase "keyboard money" has appeared in newspapers in recent years, to express the typing of scriptural money amounts on computer keyboards.
23. Perhaps the most important of the papers crucial to the development of credit counterparts analysis was written in the mid-1950s by the International Monetary Fund's second head of research, Jacques Polak. See Jacques Polak, 'Monetary analysis of income formation and payments problems', *IMF Staff Papers* (Washington: IMF, 1957), vol. 6, issue 1, pp. 1–50. See also Gerald Steel, 'The credit counterparts of broad money: a structural base for macroeconomic policy', *Lancaster University Management School Economic Working Paper Series*, 2014, no. 4.
24. The derivation of the banking system multiplier is a textbook commonplace. But see, for example, Friedman and Schwartz, *A Monetary History of the United States*, pp. 776–808 for a rigorous and extended treatment.
25. The overwhelming majority of nations have positive net public debt.
26. If a money demand function with the usual arguments (income and the own return on the deposits) were estimated for inter-bank deposits, the results would be worthless. However, a tricky definitional issue is raised. Non-bank financial institutions are of two kinds, those that receive deposits from customers and so have liabilities mostly fixed in nominal amounts, and those which have quite different liabilities and may even be managing assets with no fixed objective in mind. Those which take in deposits may not be legally the same as banks, but they are sufficiently similar as to be "quasi-banks". Should deposits at quasi-banks be included in money or not? For over 20 years the practice in the UK has been to measure deposits at quasi-banks

when these come from banks and other quasi-banks, and to exclude such deposits from the true "quantity of money". The treatment is the same as with inter-bank deposits, with the definitionally inconvenient quasi-bank institutions known as "intermediate other financial corporations" (IOFCs). Broad money in (what might be regarded as a legally complete definition) is called M4 and broad money excluding the IOFCs is M4x. M4x is the more appropriate definition of money in macroeconomic analysis. Similar difficulties are found in other countries, but the UK has taken a lead in separating out the IOFCs from the rest of the financial system. Notice that – again – estimating a conventional money demand function for IOFC deposits would be a silly exercise. To the extent that IOFC deposits are (unwisely) included in broad money, money demand functions are corrupted by their influence.

27. The insight is usually attributed to Max Weber in his *Economy and Society*: To quote, "A compulsory political organization with continuous operations will be called a 'state' [if and] insofar as its administrative staff successfully upholds a claim to the *monopoly* of the *legitimate* use of physical force in the enforcement of its order." Guenther Roth and Claus Wittich (eds), *Economy and Society* (Berkeley: University of California Press, p. 54., translated from Max Weber, *Wirtschaft und Gesellchaft* [originally published, 1921]).
28. The point was noticed by the author in his first pamphlet on monetary economics, *Monetarism: an Essay in Definition* (London: Centre for Policy Studies, 1978). See the discussion on pp. 56–8 of the publication. The argument connected monetarism with the distinction between marketed (mostly private sector) output and non-marketed output (mostly public sector) in Roger Bacon and Walter Eltis, *Britain's Economic Problem: Too Few Producers* (London: Macmillan, 1976).
29. The Eurozone is an unusual monetary jurisdiction, since governments cannot borrow without limit from the central bank. Discussion of this important point is beyond the scope of this book.
30. This may be the place to mention the so-called "Hahn problem", advanced by the Cambridge economist, Frank Hahn (1925–2013), in several papers. According to Hahn, "the formulation of a model of the economy which can account for money is immensely difficult and remains to be accomplished" (Frank Hahn, *Equilibrium and Macroeconomics* [Oxford: Basil Blackwell, 1984], p. 261). See also Chapter 7, pp. 147–58, 'On some problems of proving the existence of equilibrium in a monetary economy', in that book for more detail on the "problem". As this allegedly important issue was left unresolved, Hahn became a consistent critic of monetarism and Milton Friedman. With another Cambridge economist, Robert Neild, he organized a letter to *The Times* – signed by 364 British academic economists – in protest against the 1981 Budget, which had raised taxes in a recession in order to restore medium-term fiscal sustainability. (For more on this episode, see the author's paper 'Did the 1981 Budget refute naïve Keynesianism?', essay 10, pp. 206–32, in Tim Congdon, *Money in a Free Society* [New York: Encounter Books, 2011].) Given the ubiquity of money use in modern market

economies, and the evident massive saving of transactions costs relative to a barter-based economy arising from that, one has to ask whether Hahn intended his problem seriously. But the contrast between the private sector's and the state's credit-worthiness may throw light on the matter. Private sector agents have finite credit-worthiness and must therefore hold money in order to have the means to settle debts; the state has no such constraint and does not need to hold money in the same way. An implication of this asymmetry is that, when money creation is financed by state borrowing from the banking system, the effect disrupts any pre-existing equilibrium in the private sector's balance sheet. Monetary policy – as traditionally understood – then becomes possible, rather obviously. Hahn is not the only academic to have put forward a seemingly fundamental conundrum of this sort. See the extensive discussion below on pp. 44–6 of the inside-money-is-not-net-wealth claim associated with the names of Gurley and Shaw, and Patinkin.

31. The point is captured in the credit counterparts identity, as it is usually stated. The assumption of a closed economy is needed to keep the size of the discussion under control. The monetary approach to the balance of payments is a vast subject in its right. The cogency of this approach depends on the possibility that excess or deficient money balances are removed by transactions with foreigners.
32. Keynes, *Treatise*, vol. 1, pp. 229–30, quoting from Marshall's *Money, Credit and Commerce*. (The quote is from book I, chapter iv, section 3 of the original edition, Alfed Marshall, *Money, Credit and Commerce* [London: Macmillan, 1922]. These are pp. 44–5 of a 1960 reprint for the New York publisher, August Kelley.) See also pp. 28–34 of Alan Walters, *Money in Boom and Slump* (London: Institute of Economic Affairs, 1971, 3rd edition).
33. Keynes, *Treatise*, vol. 1, p. 230. See footnote 1 on that page.
34. Gross household wealth is wealth before the deduction of liabilities, that is, net wealth plus all debt.
35. Keynes tried to formalize the idea of a "liquidity premium" on some assets, particularly money, in *The General Theory*. See Chapter 17 and particularly pp. 226–9, in the 1973 edition in the *Collected Works* series for the Royal Economic Society.
36. John Hicks, *A Market Theory of Money* (Oxford: Oxford University Press, 1989), p. 67.
37. Before the privatizations of the 1980s and early 1990s, UK public corporations had an account at the Treasury, a government department, and typically only minor bank accounts; after privatization they all had bank accounts, sometimes large ones. Privatization therefore raised the equilibrium ratio of money to GDP.
38. The author does not dispute that inflation arising in the public sector, where wages are set by bargaining between the government and public sector unions, is not subject to monetary policy. What might be termed "the public sector problem" for monetary economics and policy-making has been important in the UK, which for much of the post-war period was a unitary

state, with highly centralized institutions and strong public sector unions. See, for example, the section on 'Why did monetarism have so much trouble in the early 1980s?: the public sector problem', pp. 95–104, in Chapter 4 of Tim Congdon, *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1992). Trade union power was reduced by the reforms of the Thatcher and Major periods, with extensive privatization of industry and the utilities, and legislative changes.

39. The argument here emphasizes that the key quantity-theory propositions are valid only in equilibrium. (After the 19 per cent jump in M3 in the five months to July 2020, the US economy was plainly *not* in equilibrium.) This emphasis on their equilibrium character of the propositions is not new. It was noticed, for example, by Schumpeter in his *History of Economic Analysis* (Joseph Schumpeter, *History of Economic Analysis* [London: George Allen & Unwin, 1954, 12th impression, 1981], p. 1102.)
40. Paul Samuelson, *The Collected Scientific Papers of Paul Samuelson* (Cambridge, MA: MIT Press, 1972), vol. 3, p. 755.
41. Silvana Tenreyro, 'Quantitative easing and quantitative tightening', speech given at the Scottish Economic Society annual conference, 4 April 2023. The quotation comes from the section 'QE is an asset swap'. The speech is available at https://www.bankofengland.co.uk/speech/2023/april/quantitative-easing-quantitative-tightening-speech-silvana-tenreyro.
42. Michael Woodford, *Interest and Prices: Foundations of a Theory of Monetary Policy* (Princeton: Princeton University Press, 2003), p. 109.
43. The 2003 Woodford book has the same title as Wicksell's 1898 contribution, with Woodford claiming to write in a "neo-Wicksellian" tradition. But the subtitles of the two books are very different, and some might feel – with the author – that the agenda and emphases of the two books are also very different.
44. See Milton Friedman, 'Statement on monetary theory and policy', given in Congressional briefings in 1959, reprinted on pp. 136–45 of R. James Ball and Peter Boyle (eds), *Inflation* (Harmondsworth: Penguin, 1969). The quotations are from p. 141.
45. James Tobin used the analogy of a "hot potato" in his account of the matter, rather than Friedman's musical chairs. James Tobin, *Essays in Economics* vol. 1, *Macroeconomics* (Amsterdam: North Holland, 1971), p. 273. To quote, "it is the beginning of wisdom in monetary economics to observe that money is like the 'hot potato' in a children's game: one individual may pass it to another, but the group as a whole cannot get rid of it." The sentence appeared originally in a 1963 article on 'Commercial banks as creators of money'.
46. By "money" Wicksell understood only "metallic money". At the time he was writing this was not a silly assumption, but it was being rapidly outdated by the growth of banking. Much of the argument of *Interest and Prices* is in fact about the alleged supersession of the quantity theory of money in a world where payments were increasingly being made from bank deposits created

by the extension of bank credit. Wicksell did not make the leap of regarding bank deposits as money. For the tendency of his contemporaries to describe bank deposits (that is, money to modern economists) as "credit", see David Laidler, *The Golden Age of the Quantity Theory* (New York and London: Philip Allan, 1991), particularly pp. 14–15.

47. John Stuart Mill, *Principles of Political Economy* (London: Longman, Green and Co., 1900, new impression of sixth edition), pp. 298–9. Later, in his *Principles*, Mill qualified this conclusion by again – as with Wicksell a few decades later – invoking "credit".
48. David Hume made the same argument over a century earlier. See Thomas Mayer, 'David Hume and monetarism', *Quarterly Journal of Economics*, vol. 95, no. 1, Aug. 1980, pp. 89–101.
49. Technically, the money demand function has to be homogeneous of degree zero.
50. The phrase "real balances" seems to have been used first by Keynes. See footnote 2 on p. 192 of Keynes, *Essays in Biography* (Elizabeth Johnson and Donald Moggridge [eds], *The Collected Writings of John Maynard Keynes*, vol. X [London and Basingstoke: Macmillan for the Royal Economics Society, 1972, originally published 1933]). The phrase appeared in a memoir of Aldred Marshall, written in 1924.
51. Donald Patinkin, *Money, Interest and Prices* (New York: Harper & Row, 1965, 2nd edition), p. 295.
52. Patinkin, *Money, Interest and Prices* p. 300. The Chicago-based Nobel laureate, Eugene Fama, also went down this track in his article 'Banking in a theory of finance', *Journal of Monetary Economics* (North-Holland Publishing Company), vol. 6, 1980, pp. 39–57. He agreed with Patinkin, and Gurley and Shaw, that – as inside money growth does not constitute a positive wealth effect – it cannot affect anything. All these authors seem to have overlooked that, if this argument can be made about commercial banks' liabilities, it can also be made about the central bank's liabilities ("outside money"). The reasoning is straightforward. If central banks' assets are entirely claims on the private sector (such as the mortgage-backed securities now held in large amounts by the Federal Reserve) and central bank liabilities are also held 100 per cent by the private sector, the private sector cannot be better off if the central bank expands. The situation might appear more promising if central bank assets are claims on government. But – if Barro's contention that public debt is not net wealth in the hands of the public is accepted – then again an increase in the monetary base as a result of central bank acquisition of government debt is not a positive wealth effect. (Robert Barro, 'Are government bonds net wealth?', *Journal of Political Economy*, vol. 82, no. 6 [Chicago: University of Chicago Press, 1974], pp. 1095–117.) In short, if the thesis of Fama's 1980 article were right, monetary policy – understood as the consequences of changes in the balance sheets of either the central bank or the commercial banks – could not affect anything. "Fama's attack on the problem of integrating monetary theory and value theory is radical:

he simply abolishes monetary theory" (Kevin Hoover, *The New Classical Macroeconomics: A Sceptical Enquiry* [Oxford, UK and Cambridge, MA, USA: Basil Blackwell, 1988], p. 5.) The conclusion is peculiar, even crazy. Evidently, something has gone wrong. Might one suggest that an increase in the quantity of money influences the economy by a mechanism other than a wealth effect? Perhaps it does so – as suggested in this chapter – by changing the liquidity of the non-bank private sector. In an interview for a *New Yorker* journalist in 2009, when asked about the causes of the then Great Recession, Fama replied, "We don't know what causes recessions … We've never known" (Philip Mirowski, *Never Let a Serious Crisis Go to Waste* (London, UK and New York, USA: Verso, 2013), p. 179).

53. In other words, Patinkin approved of what might be termed "monetary-base monetarism". See footnotes 10 and 11 above for more on this approach, which – in the author's view – disintegrates when confronted with obvious facts about real-world institutions and magnitudes.
54. An objection to Patinkin's argument was raised in Boris Pesek and Thomas Saving in their 1967 book, *Money, Wealth and Economic Theory* (New York: Macmillan). Their argument was that deposits enabled banks to conduct their business and were an input to their activities rather than purely a liability. Whatever the accounting conventions, they argued that money was net wealth to the community. A large and unsettled debate was opened up. One view was that the issue turned on whether banks' assets were government securities (when banks' deposit liabilities might be viewed as partly a claim on government and so net wealth) or loans to the private sector (when they were not net wealth). But – when someone receives a payment into his or her bank account – he or she is usually not interested in, and does not know, whether the bank's assets are government securities or loans to the private sector. Depositors' concerns are about other matters. Crucially, they worry about their own bank's solvency and liquidity, and the extent to which a lack of these might impair the convertibility of deposits into legal-tender cash. For these vexed issues, see the entries on "inside and outside money" and "real balances", by Thomas Mayer and Donald Patinkin, respectively, in the 1992 *Palgrave* dictionary of economics (Mayer, "Inside and outside money", p. 415, in Peter Newman and others, *The New Palgrave Dictionary of Money & Finance* [London: Macmillan, 1992], vol. 2, and Patinkin, "Real balances", pp. 295–7, in Newman, *Palgrave*, vol. 3). Mayer's verdict was that "Pesek and Saving showed that the traditional sharp dichotomy between inside and outside money is invalid." Notice that the author's argument in the text is very different from that made by Pesek and Saving. Its nub is that commercial banks are engaged in liquidity transformation, and that – as far as their depositing and borrowing customers are concerned – deposits are far more liquid than loans. With liquidity accepted as a distinct attribute of portfolios (in line with claims by Keynes and Hicks in several places), changes in inside money can then affect agents' perceptions of their liquidity and hence their behaviour. Notice further that non-bank companies – like banks – have

identical assets and liabilities, so that a preliminary view – in line with the thinking of Patinkin, Gurley, Shaw and others – might be that their existence cannot change the net wealth of the community. Why then do companies exist? Something is wrong with the reasoning offered by Patinkin, Gurley and Shaw. (The author is very grateful to David Laidler for directing him to the debate stirred up by the contributions from Pesek and Saving. Professor Laidler has no responsibility for the views on the subject expressed in this footnote – and indeed in the text – which are very much the author's.)

55. If changes in the size of bank balance sheets cannot affect anything, one has to wonder why banks exist at all.
56. See also Livio Stracca, 'Should we take inside money seriously?', *ECB Working Paper Series* (Frankfurt: European Central Bank, December 2007), no. 841. Stracca regards inside money as "money produced by the private sector", although how money-holders are to know whether the money they receive from a particular transaction has this property is unclear. Bank deposits are said to help in "alleviating asymmetric information between buyers and sellers". Stracca exemplifies the belief among central bank economists that the inside-money-is-not-net-wealth argument is cogent and important.
57. When in early 2009 making the case for (the operations which became) the UK's "quantitative easing" programme, the author estimated an equation for the relationship between, as the independent variable, the company sector's ratio of bank deposits to its bank borrowing, and, as the dependent variable, the growth rate of real private domestic demand. The equation had explanatory power, while the t statistic on the independent variable met the usual statistical test. Tim Congdon, *How to Stop the Recession* (London: Centre for the Study of Financial Innovation, 2009), pp. 4–5.
58. Today's central bankers occasionally appeal to the inside-money-is-not-net-wealth argument. In a speech in April 2023 Ben Broadbent, Deputy Governor of the Bank of England, remarked, "… at least for the private sector as a whole, its interactions with the banking system – deposit claims on the one hand, bank loans on the other – are essentially a wash and do not represent net wealth." Ben Broadbent, 'Monetary policy: prices vs. quantities', speech given at the National Institute on 25 April 2023. The quotation is from the section on 'Macro models and the determination of demand'. The speech is available at https://www.bankofengland.co.uk/speech/2023/april/ben-broadbent-speech-hosted-by-national-institute-of-economic-and-social-research
59. The statistical database maintained for over 60 years by the International Monetary Fund for its scores of members relates to the credit counterparts to broad money growth. The analytical framework is designed to inform the agenda for countries with a need to repay foreign borrowings. If the banking system's balance sheet were merely "a wash", the IMF approach – used, for example, in setting IMF programmes for the UK in the late 1960s and 1970s – would be misconceived. The growth rate of bank lending to the private

sector could reach any number – a number into the hundreds per cent – and not matter to anything.

60. Nicholas Kaldor, *The Scourge of Monetarism* (Oxford: Oxford University Press, 1982), p. 22. Kaldor's italics are in the original. His statement is correct only if the repayment is of bank debt or if "the interest-bearing assets" are acquired from the banking system. Why the debt repayment or asset acquisition should always and automatically take this form is unclear.
61. A high proportion – often over a half – of banks' claims on the private sector are residential mortgages. A standard pattern in most economies is that the number of mortgages extended, in any period, is a multiple of new houses built for purchase in the private sector.
62. Let it be conceded that bank credit can affect spending and output when second- or third-round effects are introduced. In the first round a bank creates new money by extending a loan to buy an asset, with the asset taken as loan collateral; in the second round the new money may be used in the purchase of goods and services; and so on. But – rather obviously – the second-round transaction is subordinate to the monetary theory of national income determination. *Bank credit matters because it creates money; it does not matter to national income determination in its own right.*
63. The "credit channel" of monetary policy transmission has been proposed by, for example, Ben Bernanke, Alan Blinder and Mark Gertler. (Bernanke and Blinder, 'Credit, money, and aggregate demand', *American Economic Review*, vol. 78, no. 2, Papers and Proceedings of the One-Hundredth Annual Meeting of the American Economic Association [May, 1988], pp. 435–9; and Bernanke and Gertler, 'Inside the black box: the credit channel of monetary policy transmission', *Journal of Economic Perspectives* , vol. 9, no. 4, fall 1995, pp. 27–48.)
64. Ben Bernanke was nevertheless awarded the Nobel Prize in 2022 for his work on bank credit. See the Nobel Prize lecture 'Banking, credit and economic fluctuations' at https://www.nobelprize.org/prizes/economic-sciences/2022/bernanke/lecture/
65. Credit cards might appear to be an exception, but many people link payments of outstanding balances to their bank accounts and they are then charge cards.
66. *Financial Accounts of the United States* (Washington: Federal Reserve), 2nd quarter 2023 issue, Table B103, p. 139. At the end of 2021 the market value of corporate equities, including unquoted equities, was $51,341.2 billion, according to the Federal Reserve. The market value of equities was well above the book value in company accounts. At the same date the Federal Reserve estimated the assets of non-financial non-corporate business – including unincorporated, mostly quite small businesses – as almost $26,000 billion, with liabilities of just above $10,000 billion. According to the Fed data, non-corporate business had issued no debt securities at all. See *Financial Accounts of the United States* (Washington: Federal Reserve), 2nd quarter 2023 issue, Table B104, p. 140.

67. Michael Woodford, 'Financial intermediation and macroeconomic analysis', *Journal of Economic Perspectives*, vol. 24, no. 4, 2010, pp. 21–44.
68. Mark Blaug, *Economic Theory in Retrospect*, 4th edition (Cambridge: Cambridge University Press, 1985), p. 161.
69. Political – even ideological – commitments may be part of the trouble in this part of economics. In an encyclopaedia entry on the quantity theory, David Laidler suggested that the modern form of the quantity theory – or "monetarism" – also had political overtones, "being linked to a 'conservative' economic policy agenda in popular economic understanding". See David Laider, 'The quantity theory of money', pp. 603–7, in Brian Snowdon and Howard Vane (eds), *An Encyclopaedia of Macroeconomics* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2002).
70. Keynes' *General Theory* had nothing to say about the determination of "the interest rate", in the senses of either the central bank rate or the inter-bank rate. In this it was unlike the *Treatise on Money* which has Chapter 32 in the second volume devoted to it. To repeat, the interest rate in the *General Theory* was a bond yield. But, if the implicit premise of the *General Theory*'s treatment were that changes in the quantity of money affected only the prices of bonds and had no effect on the prices of other securities and assets, that was patently absurd in real-world financial markets. Unfortunately, Tenreyro and many others seem to have been deluded by the many Keynesian textbooks in which changes in the quantity of money affect only bond yields, and not the prices and yields on other assets. This has led to much theorizing about the supposed ineffectiveness of monetary policy at low interest rates, with many thousands of pages blathering on about such phantoms as "the liquidity trap" and "the lower bound". Chapters 3 and 8 – as well as the current discussion – try to sort out the mess.
71. The Samuelson textbook was clearly influenced by Keynes' *General Theory*. In a 1986 interview Samuelson said that, as an undergraduate at the University of Chicago in the early 1930s, Keynes "wasn't much discussed". However, he did sample the *Treatise on Money* and "probably" read the *Tract on Monetary Reform*, both books with more quantity-theoretic material than the *General Theory*. (See p. 153 of David Colander and Harry Landreth, *The Coming of Keynesianism to America* [Cheltenham, UK, and Brookfield, USA: Edward Elgar Publishing, 1996]. See also pp. 303–4 of Paul Samuelson, *Economics* [New York: McGraw-Hill, 1948, 1st edition] for an early treatment from Samuelson of the effect of changes in the quantity of money on the rate of interest.) The author has argued that – via the textbook – Samuelson's economics, with its hostility to the quantity theory and monetary policy, has done much harm. See Tim Congdon, 'The modern money machine: review of Nicholas Wapshott *Samuelson Friedman*' *The New Criterion*, vol. 42, October 2020. He is far from being the first to notice the omission of the direct effect of changes in the quantity of money on the commodities market. See, for example, Patinkin, *Money, Interest and Prices*, p. 635. Was *The General Theory* a *general* theory at all?

72. Gregory Mankiw, *Macroeconomics* (New York: Macmillan International, 10th edition, 2019), pp. 16–18.
73. Christoher Dow, *Major Recessions: Britain and the World, 1920–95* (Oxford: Oxford University Press, 1998), p. 38.
74. The industrial circulation proposed in Keynes' *Treatise* might be understood as an anticipation of the income–expenditure so-called "circular flow" which is a centrepiece of Keynesian textbook macroeconomics.
75. Keynes, *General Theory of Employment*, Johnson and Moggridge (eds), *Collected Writings*, vol. VII, pp. 84–5.
76. The quotation in the next sentence comes from p. 42 of Blaug and others, *The Quantity Theory of Money* (Aldershot: Edward Elgar Publishing, 1995), where it appeared in Blaug's chapter, pp. 27–49, entitled 'Why is the quantity theory of money the oldest surviving theory in economics?'.
77. Edward Nelson, *Milton Friedman and Economic Debate in the United States, 1932–72* (London and Chicago: University of Chicago Press, 2020), vol. 2, pp. 232, 237.
78. Edward Nelson, *Milton Friedman and Economic debate*, vol. 2, p. 238.
79. The notion of "the output gap" is ambiguous. Two very different versions are in common use, one arising from Keynesian thought and the other from a monetarist approach. See essay 6 in the author's 2011 collection *Money in a Free Society* (New York: Encounter Books, 2011), pp. 142–64. The reference in the text is to the monetarist concept of the gap, as this is the notion used by the IMF.
80. See footnote 9 on p. 243 of Tim Congdon, *Keynes, the Keynesians and Monetarism* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing). The money/inflation lag in the Heath–Barber boom of the early 1970s and the Lawson boom of the late 1980s was about four years.
81. The peak ratio of liabilities to income was, in 2007, at almost 1.4, just ahead of the Great Financial Crisis. But the net-wealth-to-income ratio in 2007 was higher than it had been at any time before the 1980s.
82. See, for example, the discussions on pp. 35–6 and 141–3 of Ben Bernanke's 2022 book on *21st-Century Monetary Policy* (New York: W. W. Norton & Co., 2022).
83. The household sector has a more stable demand to hold money balances than companies or financial institutions. So the choice of the US household sector to demonstrate stable underlying behaviour is to bias the analysis. It is well-known that the relationship between money and nominal GDP is better in low-frequency work than in high-frequency work. So a regression of compound growth rates *over 40 or so years* (that is, at a very low frequency) again helps to deliver a result favourable to the quantity theory.
84. Paul Krugman, 'Krugman wonks out: return of the monetary cockroaches', *New York Times*, 13 May 2021.
85. For those unfamiliar with econometric practice, a t statistic on the coefficient of two is usually taken to be necessary for significance. The coefficient on the intercept term is over four.

86. Money growth in the leading economies collapsed in spring and summer 2022, justifying forecasts of – after a lag – a sharp slowdown in the growth of nominal GDP and hence inflation. At the time of writing (October 2024), this surmise appears also to have been correct.
87. In a rigorous and complete treatment, banks' asset composition would need to be discussed, not least because a shock to money growth is about to be administered. But this treatment does not pretend to be rigorous or complete.
88. Patinkin seems to have regarded the real balance effect mostly as an effect of changes in the quantity of money *on consumption*. See Note M on 'Empirical investigations of the real-balance effect', pp. 651–4, in Patinkin, *Money, Interest and Prices*.
89. Owen Walker, 'Barclays becomes first UK bank to axe EU bonus cap in race to attract talent', *Financial Times*, 9 August 2024.
90. William Cohan, 'Wall Street's COVID bonanza grew from the perfect storm of fear and greed', *Vanity Fair*, 27 July 2020. To quote from the article, "The Average Joe may be screwed in the pandemic, but with the Fed rescuing the capital markets, people who make money *from* money—hedge fund managers, private-equity moguls, investment bankers—are riding high."
91. The natural rate of unemployment is that at which inflation is stable. The literature on the concept – which emerged from contributions by Milton Friedman and Edmund Phelps in the late 1960s – is enormous.
92. The output gap was mentioned on p. 55 in the discussion of lags. According to New Keynesian theory, the natural rate of unemployment is accompanied by a stable rate of change in prices and wages, and is associated with a zero output gap. The Phillips curve is a relationship between the rate of change of wages and the level of unemployment. These matters are dealt with in standard texts.
93. Brad de Long, 'Paul Krugman: immaculate inflation strikes again', blog on Washington Center for Equitable Growth, 7 May 2018. The phrase "immaculate inflation" had first been used by Karl Smith about a decade earlier (see Paul Krugman, 'Immaculate inflation strikes again', column in *The New York Times*, 27 March 2018). Smith is a Bloomberg columnist specializing in tax and economic issues.
94. See the discussion of the "Gibson paradox", pp. 177–86, in Keynes, *Treatise*, vol. 2, *The Applied Theory of Money*.
95. Keynes, *General Theory of Employment,* Johnson and Moggridge (eds), *Collected Writings*, vol. VII, pp. 265–7.
96. Brian Snowdon and Howard R. Vane, *Modern Macroeconomics: Its Origins, Development and Current State* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2005), p. 226.
97. However, the central bank can always set its own lending rate because it is the monopoly supplier of base money. Standard theory says that a monopolist can set the price or quantity, but not both. In practice, central banks set the price.

98. Yields on shorter dated bonds would be related to the central bank rate, which can be determined by administrative fiat, as explained in the previous footnote.
99. As a young man, the author worked in a UK stockbroking firm (L. Messel & Co.) and was a commentator on the market in UK government (or "gilt-edged") securities. He watched money data and warned clients about the inflationary dangers of high money growth. In this setting, rapid money growth did indeed boost bond yields without any lag at all. But a generation or two later, bond investors had different attitudes and beliefs. See also chapter 11, pp. 141–91, based on a paper written by Gordon Pepper and Robert Thomas in 1973, in Gordon Pepper, *Money, Credit and Asset Prices* (Basingstoke: Macmillan Press, 1994). On p. 189 Pepper noted that "market patterns" – the nature of markets' response to macroeconomic news – changed over the years according to the relative influence of commentators of different schools of thought.
100. A case can be made that, in the twenty-first century, central banks were being asked to do too much, so that they lost sight of their priority to keep inflation down. See Otmar Issing, *Central Banks – Independent or Almighty?* SAFE (Safe Architecture for Finance in Europe), policy letter no. 92. Frankfurt: Leibniz Institute for Economic Research.
101. Keynes, *Treatise,* vol. 1, p. 229.

2. How this restatement differs from Friedman's

The version of the quantity theory of money developed in this book owes much to Milton Friedman, whose name has so far been mentioned 50 times.[1] However, Friedman's position in contemporary monetary economics can be a nuisance, even for those who agree with him on such basic ideas as that money's behaviour matters to the economy and that monetary control is vital to the defeat of inflation. In his lifetime, he became so influential that he had the ability almost to legislate on the meaning of the quantity theory of money. He could lay down the law particularly on the contents of "monetarism", where monetarism was widely seen as an adaptation of the quantity theory for modern policy-making purposes.[2] In fact, the quantity theory had been understood in general terms for over 300 years before Friedman. As noticed in the Introduction, a number of different and perhaps rival "monetarisms" can be identified.

The present account of the quantity theory differs from his 1956 restatement – and indeed his career-long positions – in at least three material respects:

- It has a quite different view of the processes that determine the quantity of money.
- It rejects the 100 per cent cash reserve proposal put forward by economists at the University of Chicago in the interwar period and occasionally endorsed by Friedman.
- It insists, to a far greater degree than in Friedman's work, on the need to accord pre-eminence to a broadly defined money measure in macroeconomic analysis and policy-making.

Each of these deserves a section. But the background to the first two points is that in his career, Friedman devoted far more time to the attributes of money demand functions than to the plumbing of the financial system; he was not greatly interested in the nitty-gritty operation of the banking system and its implications for the determination of the quantity of money. Biographers agree that Friedman became persuaded about the validity of the quantity theory

between 1950 and 1952, only after he had been an economist for almost 20 years.[3] It seems that he never focused on understanding how banks work. In their many years of co-authorship and intellectual partnership, Friedman's expertise was in statistics and monetary theory, while Anna Schwartz was the specialist on banking.[4] Both of them thought that the quantity of money should be viewed as a multiple of the monetary base, which they took to be under the direct control of the central bank. They paid little attention to banks' main commercial objective, which is, of course, to earn a profit on capital and pay dividends to shareholders. Friedman's work largely ignored the relationship between, on the one hand, banks' capital and risk appetites and, on the other, their attitudes towards balance sheet composition and expansion.[5]

I.

Section III in the last chapter argued that monetary expansion could be seen as the result of banks' credit extension to the state and the private sector. Chapters 7 and 8 of this book apply that view on money creation to the USA and the UK in the Covid-affected period. Thus, Chapter 7 explains the increase in US broad money by banks' credit extension, mostly (although not entirely) as a result of decisions taken by the US Federal government, the US Treasury and the Federal Reserve.[6] The growth of the quantity of money is not related at all to the monetary base and the money multiplier. Similarly, Chapter 8 ignores the growth of the monetary base in the UK during the relevant period. Our approach has therefore been a rejection of that favoured by Friedman for all of his long career.

In fact, any supposed mechanical relationship between the monetary base and the quantity of money has vanished in the twenty-first century. Much of the explanation is that leading central banks started in the early twenty-first century to pay interest on banks' cash reserves, which altered their attractiveness relative to other assets and their role in commercial bank balance-sheet strategies.[7] This practice was an initiative of the European Central Bank and started with the introduction of the new European currency, the euro, in 1999. The new arrangement was more favourable for commercial banks than those which had previously existed, with a number of separate national currencies and central banks. The Bank of England followed in 2006 and the Federal Reserve in 2008. The payment of interest on cash reserves has made them more worthwhile to hold. Ratios of cash reserves to banks' deposit liabilities are therefore much higher, and less predictable, than in the middle of the twentieth century when Friedman and Schwartz conducted most of their statistical research.

This research may have been responsible for Friedman's belief that a form of proportionality postulate held between the monetary base and the quantity

of money, with an *x* per cent rise in the base necessarily associated with an *x* per cent increase in the quantity of money. He put his trust in a relationship of this sort in his 1959 Millar lectures in New York (in the USA) and over 20 years later in his 1980 evidence on monetary policy, given to the Treasury and Civil Service Committee of the House of Commons (in the UK).[8] The essence of his position was that, if the central bank wanted to increase (or decrease) the quantity of money by *y* per cent, it should organize its purchases (or sales) of securities from (or to) the banking system by the requisite amount, and the desired increases (or decreases) of *y* per cent in both the monetary base and the quantity of money would eventuate.

But an awkward fact for Friedman is that central banks and commercial banks do not normally interact like this. The central bank views commercial banks, in one respect, as its customers. In particular, the central bank is concerned that these customers have sufficient cash to be able always to repay deposits with cash. Friedman wrote as if the central bank controlled the *quantity* of the monetary base and should be indifferent to short-term interest rates, which could be left to "market forces". In practice, central banks control the *price* of the loans they make, and of the short-term securities they trade in markets where they are dominant participants. The quantity of the base is allowed to vary to meet the banks' requirements.[9] In a phrase, it is "demand-determined".

The contrast between the two approaches – between the base multiplier method of determining the quantity of money and the view that the base is demand-determined – was of huge practical significance in the USA for almost three years starting from 6 October 1979. With consumer inflation in the double digits and threatening to stay there, Paul Volcker and his top colleagues at the Federal Reserve decided to respond to monetarist criticism, notably that from Friedman. They began to target the quantity of cash reserves in order to curb the growth of money, while the Fed funds rate was set free to reach its own level. Interest rates soared in response to this change, with the prime rate charged on bank loans climbing to an all-time peak of above 20 per cent. The US economy succumbed to a serious recession. Friedman distanced himself from Volcker's and the Fed's activities and denied that monetarism had had a fair trial. Inflation did come down, although the relationship between changes in banks' cash reserves and the price level was hardly close. The disputes and recriminations raised by the episode caused Volcker and the Fed to revert to interest-rate-setting on 5 October 1982.[10] Since then, no major central bank has tried to run monetary policy by controlling the quantity of monetary base assets.[11]

Much more could be said about this subject, but a fair generalization is that Friedman failed to persuade central bankers, central bank economists, and most other economists of the real-world validity of his views on monetary

control. The base multiplier approach to the determination of the quantity of money is rejected by most economists and not part of the current restatement of the quantity theory of money. Occasionally, references are made nowadays to the monetary base, as if it still were involved critically in the processes which create money.[12] But they have become infrequent.

In the late 1980s, Ben McCallum (1935–2022), a monetary economist at Carnegie Mellon University, wrote several papers proposing a so-called "McCallum rule".[13] The rule prescribed central bank action to control the size of the base in order to influence nominal national output and inflation. For some years, the McCallum rule, with its appeal to the monetary base, was seen as a rival and alternative to the Taylor rule. The Taylor rule is discussed elsewhere in this volume.[14] It is one equation in fashionable three-equation New Keynesianism and relies on the central bank interest rate as a measure of monetary policy. The omission of money from the Taylor rule helps it to fit in New Keynesianism, which is an openly non-monetarist body of thought. Anyhow, banks' reserve holding behaviour has been so disturbed by the payment of interest on reserves in the early twenty-first century that past relationships between the base and broader measures of money have been fractured. As the McCallum rule depended on those relationships, it no longer fits the data.

II.

A leading strand in interwar Chicago University monetary economics was the proposal that bank deposits – or at any rate bank deposits which could be used without notice – should be backed 100 per cent by cash reserves.[15] Friedman sympathized with this suggestion, particularly in papers written early in his career.[16] But it forms no part of the restatement of monetarism now being advanced.

Friedman once wrote a book with the title *Free to Choose*.[17] Its message was the superiority of capitalism over socialism; it argued that free choice by property-owning individuals would give better economic results than the direction of resource allocation and production by a government bureaucracy. But, in a competitive capitalist economy, banks require a loan book to earn profits from their balance sheets. If banks' assets are to be 100 per cent cash, they cannot have loan books and they cannot make profits from extending credit.

As far as banks are concerned, the state's imposition of the 100 per cent cash reserve requirement would be a blatant assault on management autonomy and an existential threat to profitability. Few more radical and oppressive government interventions in a free enterprise economy could be imagined. Apparently, Friedman – like several other Chicago economists – believed that agents in a market economy should be free to choose, unless they were bankers who wanted to set their cash ratios to maximize profits subject to the

well-known constraints. It must be asked, "On what basis are banks so different from non-banks in a capitalist economy that their operations are to be subjected to intrusive regulation which would crush their profits and destroy their very reason for being?".[18]

In the late twentieth century, Milton Friedman and Friedrich Hayek were the world's two most famous and lionized advocates of classical liberalism. Neither of them liked to be regarded as conservative. Certainly, their views on the best institutional structure for money and banking did not endorse existing arrangements. In a late-career paper, again with Anna Schwartz, Friedman did not repeat the 100 per cent cash reserve proposal, but the two authors wanted the government's role in money issuance to be as limited as possible.[19] Hayek advocated the complete denationalization of money, in a remarkable, if unwitting anticipation of the proliferation of cryptocurrencies in the twenty-first century.[20]

The present restatement of the quantity theory does not appeal to any reform on such radical lines. In the current system of relations between the state and the banking system, the central bank has four characteristics:

- It possesses the monopoly right to issue legal-tender money.
- It is mandated by the state to keep the real value of that money fairly stable.
- It provides banking services only to the government and the banking system, not to non-banks.
- It is separate from a competitive and profit-oriented commercial banking system, which has mostly non-bank customers.

In the author's view, these arrangements are justified not only by practical experience and their universal adoption, but also because they have a clear theoretical rationale.[21]

III.

As has been emphasized more than once, the favoured money aggregate throughout this book is broadly defined to include nearly all of banks' deposit liabilities and, in fact, to be dominated by bank deposits. In the classic 1963 work *The Monetary History of the United States, 1867–1960,* which Friedman co-authored with Anna Schwartz, the two authors said that "our" concept of money was a broadly defined one, including time deposits.[22] This sounds consistent with a commitment to broad money as the correct aggregate in macroeconomic analysis. However, Friedman's views in this area of the subject fluctuated during his career. During the 1970s and 1980s, he often referred to the M1 narrow aggregate, perhaps because this aggregate was easier to fit into the base multiplier approach to money stock determination.[23] At

one point, Friedman said that the debate about the relative merits of different money concepts was unproductive because ultimately all the aggregates moved together.[24] However, in both the Great Recession and the Covid-related business cycle, the aggregates moved at wildly different rates, contradicting Friedman's observation.[25]

The promotion of broad money in the current work resulted, in Chapter 1, in a fairly precise monetary theory of the determination of national income and wealth. This is an advantage over the woolliness and equivocation on the topic which unfortunately blighted Friedman's career when he was most in the public eye. Clearly, the monetary transmission mechanism cannot be the same for narrow money and broad money. The two types of aggregates differ in size and hence in their relationship with other macroeconomic variables, and they are held by different agents. By sticking to *one* aggregate, it has been possible to put forward *one* account of the monetary transmission mechanism. Given the widely – although falsely – rumoured opacity of the monetarist transmission mechanism, this is an important merit.

If self-described "monetarists" refer to "the aggregates" in the plural, the implication is that an assortment of transmission mechanisms is relevant, with distinctive nuances and angles. Questions are raised about their relative power and different ways of working. This generates confusion and uncertainty and gives comfort to critics of monetarism – Krugman, Woodford, Tenreyro, and so on – when they deny the existence of a money channel altogether. Moreover, the essence of the transmission mechanism in Chapter 1 was that – if a monetary disequilibrium had emerged, and if the quantity of money were a given amount for the next few periods – national income and wealth had to adjust to restore monetary equilibrium in those next few periods. Excess or deficient money was therefore *causing* changes in expenditure decisions and asset portfolios. Because of the scope for money transfers to change narrow money (as noted above on pp. 29–30), narrow money does not have this causative property.

Friedman's most serious forecasting error, his "blooper", came in the early and mid-1980s, as was noted in the Introduction. He predicted in his *Newsweek* column a big rise in American inflation which did not happen. The argument of the last paragraph is fundamental to understanding what went wrong. In the early 1980s, dollar interest rates fell sharply, with the Fed funds rate tumbling from a peak of 19.1 per cent in June 1981 to under 9 per cent for much of 1983. The rise in M1 in this period was largely attributable to transfers from very high interest-earning time and wholesale deposits (which had not been in M1) to lower-return or nil-return deposits inside M1. (The *relative* advantage of the very high return deposits fell sharply because of the drop in the *general* level of interest rates.) Also important was a side effect of the 1980 Depository Institutions Deregulation and Monetary Control Act, which

allowed the checking accounts inside M1 to pay interest. Essentially, the high growth of M1 was due to money transfers within the broad-money total, which were prompted by changes in relative returns on different types of deposit. Such money transfers had – and today still do have – no effect on broad money; similarly, they had – and have – no necessary significance for *either* money-holders' expenditure decisions *or* their portfolio allocations between money and non-money assets. The money transfers in and out of M1 in the early 1980s did not justify an alarmist view on inflation – or indeed any view on inflation at all.

Narrow money may occasionally be a good indicator of economic conditions, but this gives it only a bit part in the transmission mechanism. Another weakness of narrow money is that it hardly fits meaningfully into discussions of portfolio selection, since the nearest alternative to narrow money is another kind of money balance. Our account of monetary transmission has highlighted the quantitative importance of variable-income assets in household wealth and the applicability of the proportionality postulate to these assets.

IV.

This book was described in Chapter 1 as a manifesto for broad-money monetarism. Indisputably, in Friedman's lifetime, monetarism was closely associated with him and the University of Chicago. Indeed, the association was so close that the phrase "Chicago School monetarism" not only circulated widely but to many people and for a long period it defined the quantity-theory tradition. In its heyday, roughly in the three or four decades from the mid-1950s, quantity-theoretic alternatives to the Chicago School were to be found but were very much overshadowed.[26]

The subject of the present-day position of Chicago School monetarism cannot be evaded. Views may differ among economists, and these matters are controversial. Anyhow, the author's assessment is that Chicago School monetarism is dead. The main reason for making this observation is the complete absence of protests against the US money explosion of 2020 and 2021 from economists in the USA with a Chicago background. The absence of protests is probably explained by the embarrassment of the inflation warnings made by Chicago-connected economists as a response to the Fed's asset purchases from late 2008. The warnings were epitomized in the Open Letter to Ben Bernanke in 2010, which was mentioned in the Introduction. Its warnings of "currency debasement" were much too shrill and were later mocked by Paul Krugman as "conspiracy theorizing".[27] But this was not the only example of inept forecasting. In May 2009, Allan Meltzer, invariably categorized as a "monetarist" and usually seen as close to Milton Friedman, warned in an article in the *New York Times* that "the enormous increase in bank reserves – caused by the Fed's

purchases of bonds and mortgages – will surely bring on severe inflation if allowed to remain."[28] In the event, banks' ample cash reserves were not reined in, but no such "severe inflation" eventuated in the 2010s.

Having been so thoroughly wrong in the previous major cyclical upheaval, most Chicago-connected monetarists stayed silent in 2020 and 2021. The question becomes, "Where were the Chicago monetarists going wrong?" The answer lies in the debates over the pros and cons of the different money aggregates emphaszed in this book. The inflation anxieties of Allan Meltzer in May 2009, and of the signatories of the Open Letter to Ben Bernanke 18 months later, were prompted by the rapid increases in banks' cash reserves and, by extension, the monetary base. This reflected their view of how the economy worked. The concern about the monetary base was widely shared and was consistent, for example, with Thomas Mayer's definition of monetarism in a classic essay.[29] Unfortunately, Mayer, Meltzer and numerous others, including Friedman, were in error.

To repeat the message of Section I above, the base multiplier approach to the determination of the quantity of money is unreliable. The relevant aggregate in macroeconomic analysis must be one which is broadly defined, while the quantity of broad money is determined by the extension of credit by the banking system. Sure enough, commercial banks are subject to solvency and liquidity constraints, and their attitude towards the holding of cash reserves is part of a description of the banking system's equilibrium. But, at the time of the Great Recession, economists in the Chicago tradition discussed the determination of the quantity of money only within the fixed-coefficients framework of the base multiplier. This was too rigid.

In the real world, banks' attitudes towards the expansion of their balance sheets depend at least as much on their capital and solvency as on their cash reserve holdings. In particular, it was vital – in late 2008, 2009 and 2010 – for economists to appreciate that banks were confronted by huge demands for extra capital in the Basel III rules. Meeting those demands meant several years of contraction of banks' loan portfolios. Central banks made large asset purchases in the USA, the Eurozone, the UK and elsewhere for a few years from 2008. But the positive monetary effects of these purchases were offset by falls in banks' loan portfolios. The net consequence was very slow growth of broad money and modest inflation.[30]

For clarity, the statement that Chicago School monetarism is dead is not intended as a criticism of economists working at the University of Chicago today. Members of the Chicago faculty continue to write about monetary economics with distinction.[31] Further, anyone proposing the demise of Chicago School monetarism in the twenty-first century must use words carefully. Chicago School monetarism may lie in the past, but that is not to deny the enormous contribution made in the twentieth century by Friedman and his

Chicago colleagues, both to the scholarship of monetary economics and to the understanding of real-world economies.

NOTES

1. Keynes' name has appeared 52 times. It makes sense for the author to be called a "Keynesian monetarist"!
2. Thomas Mayer's paper on 'The structure of monetarism' is an example of an attempt to pin down the meaning of monetarism, when it was very much under the influence of Friedman and the Chicago School. See pp. 1–46 in Mayer (ed.), *The Structure of Monetarism* (New York: W. W. Norton & Co., 1978).
3. His acceptance of the quantity theory seems to have been rather sudden in 1951 or 1952, with the writings of Clark Warburton, chief economist at the Federal Deposit Insurance Corporation, being a crucial influence. James Forder, *Milton Friedman* (London: Palgrave Macmillan, in the 'Great Thinkers in Economics' series, 2019), pp. 116–23.
4. Jennifer Burns, *Milton Friedman: The Last Conservative* (New York: Farrar, Straus and Giroux, 2023), pp. 202–3.
5. Friedman and the Chicago School, with their emphasis on the monetary base and the base money multiplier, had a huge influence on American monetary economists. In the author's view, the resulting bias in thinking was an important reason why, for example, leading figures at the Hoover Institution did not appreciate that the big jump in banks' capital requirements implied by the Basel III proposals in autumn 2008 was a seriously deflationary shock to the world economy. See his two chapters, pp. 27–77, in Tim Congdon (ed.), *Money in the Great Recession* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2017).
6. The commercial banks complied with the effects of these decisions on their balance sheets.
7. See, for further details on the change in the USA, George Selgin's 'Interest on Reserves and the Fed's Balance Sheet', testimony to the Congressional Sub-Committee on Financial Services, Monetary Policy and Trade, given on 17 May 2016, and available on https://www.cato.org/publications/testimony/interest-reserves-feds-balance-sheet#. See also Selgin's book, *Floored!: How a Misguided Fed Experiment Deepened and Prolonged the Great Recession* (Washington: Cato Institute, 2018).
8. Milton Friedman, *A Program for Monetary Stability* (New York: Fordham University Press, 1960), pp. 50–51, and Milton Friedman, *Monetarist Economics* (Oxford: Basil Blackwell, for the Institute of Economic Affairs, 1991), pp. 53–55.
9. For the author's views on this subject, see Tim Congdon, 'On some principles to fix the quantity of bank money', pp. 98 – 115, chapter 8, in Sheila Dow, Jesper Jesperson and Geoff Tily (eds), *The General Theory and Keynes for*

the 21st Century (Cheltenham, UK, and Northampton, USA; Edward Elgar Publishing, 2018).

10. William Silber, *Volcker: The Triumph of Persistence* (New York and London: Bloomsbury Press, 2012), pp. 192, 224.
11. In qualification, in the late 1980s and 1990s, the Swiss National Bank set a multi-year target for the growth of the monetary base (see p. 3 of *The Swiss National Bank 1907–2007*, a book summary, at file:///C:/Users/timco/Downloads/festschrift_summ.en.pdf), but this approach was dropped in 1999.
12. See, for example, Robert L. Hetzel, *The Great Recession: Market Failure or Policy Failure?* (New York: Cambridge University Press, 2012), p. 223, and – in the very different context of the Covid crisis – Scott Sumner's interview on 'Macroeconomic musings' with David Beckworth, 20 May 2020, on the Mercatus Center website, on https://www.mercatus.org/macro-musings/scott-sumner-governments-response-covid-19-and-future-level-targeting. According to Sumner, the Federal Reserve had not at that point (late May 2020) taken sufficiently expansionary measures against the shock of Covid-19. He regarded "a basic principle" of monetary expansion that a programme should be organized by "increasing the supply of base money and reducing the demand for it".
13. See, for example, Benjamin McCallum, 'The case for rules in the conduct of monetary policy: a concrete example', *Review of World Economics*, vol. 123, no. 3, 1987, pp. 415–29.
14. See p. 142 for more on the Taylor rule.
15. The proposal for 100 per cent cash reserves against deposits was basic to the Chicago approach to monetary policy in the 1930s. See George Tavlas, *The Monetarists* (Chicago: University of Chicago Press, 2023), pp. 74–81.
16. The 100 per cent cash reserves idea was one component of Friedman's 1948 proposed "monetary and fiscal framework for monetary stability". See Milton Friedman, *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), pp. 135–6. See also Burns, *Milton Friedman*, p. 209, where Friedman in 1952 evidence to Congress recommended the abolition of the Federal Reserve "in its present form" and 100 per cent cash reserve banking.
17. Milton Friedman, *Free to Choose* (New York: Harcourt, Brace & Co., 1980). The book sometimes appears with only Milton Friedman as the author, and sometimes with his wife, Rose Friedman, as co-author.
18. Criticisms of the Chicago plan from a free-market perspective are rare, but – in the author's view – they are necessary, compelling, and long overdue. Thomas Sargent, the 2011 Nobel laureate in economics, also noticed the damage to banking as an industry from the Chicago plan in his contribution, 'Drawing lines in US monetary and fiscal history', pp. 161–80, in G. Page West III and Robert Whaples (eds), *The Economic Crisis in Retrospect* (Cheltenham, UK, and Northampton, USA; Edward Elgar Publishing, 2013).
19. Milton Friedman and Anna Schwartz, 'Has government any role in money?', pp. 289–314, in Anna Schwartz, *Money in Historical Perspective* (Chicago and London: University of Chicago Press, 1987). See, particularly, p. 311.

20. Friedrich Hayek, *The Denationalization of Money* (London: Institute of Economic Affairs, 1976; 2nd edition 1978).
21. The author dislikes and is opposed to the contributions of both Friedman and Hayek to this area of economics. One of his early papers was provoked by Hayek's proposed denationalization of money: Tim Congdon, 'Is the provision of a sound currency a necessary function of the state?', pp. 2–21, *National Westminster Quarterly Review* (London: National Westminster Bank), August 1981 issue. Note that, traditionally, central banks did not pay interest on banks' cash reserves with them. Banks unsurprisingly wanted to minimize their non-earning cash reserve assets, subject to the constraint that they must never run out of cash. Commercial banks therefore wanted a relationship with a strong bank, from which they might be able to borrow cash in an emergency. The strongest bank in any society is likely to be the banker to the government; the banker to the government logically becomes the ultimate reserve bank. By implication, the central bank should combine the functions of being banker to the government and banker to the banking system. The issuance of legal-tender fiat paper by the central bank and scriptural money (or deposits) by commercial banks saves on resources compared with a commodity-based standard. Furthermore, the flexibility of a managed currency and its scope for the application of human intelligence ought to result in better macroeconomic outcomes than a capricious system based on commodity money. The profits from the note issue should belong to the state and not the private sector. Of course, in practice, matters are complex, not least because central banks nowadays do pay interest on reserves. There is much more to say. (The evidence so far, since the USA's suspension of gold convertibility in 1971, is very discouraging in this area of international public policy. The record of "human intelligence" in monetary management has been poor compared with that of the gold standard.)
22. Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton: Princeton University Press, 1963), p. 630.
23. For most of the twentieth century, under Federal Reserve rules, banks had to maintain cash reserves against sight deposits (the main constituent of M1) but not against time deposits (which became the dominant element in M2 and M3).
24. "The Fed has specified targets for several [money] aggregates primarily … to obfuscate the issue and reduce accountability. In general, the different aggregates move together" (Milton Friedman, 'The case for overhauling the Federal Reserve', *Challenge* [July–August 1985], pp. 4–12). The quotation is from p. 5.
25. Tim Congdon, *Money in a Free Society* (New York: Encounter Books, 2011), pp. 252–3.
26. For more on the background, see Thomas Humphrey, 'Role of non-Chicago economists in the evolution of the quantity theory in America 1930–1950', *Southern Economic Journal*, vol. 38, no. 1, July 1971, pp. 12–18.

27. Paul Krugman, 'Top of Form, Bottom of Form, QE Truthers', *New York Times*, Opinion Pages, 12 February 2015.
28. Allan Meltzer, 'Inflation nation', *New York Times*, 3 May 2009.
29. See footnote 2 above. Thomas Mayer (ed.), *The Structure of Monetarism* (New York and London: W. W. Norton & Company, 1978), p. 2. The list of monetarist principles included number 7, with "Use of the reserve base or similar measure as the indicator of monetary policy."
30. See footnote 5 above.
31. Pedro Teles, Harald Uhlig and João Valle e Azevedo, 'Is the quantity theory of money still alive?', *Economic Journal*, vol. 126, no. 591, March 2016, pp. 442–64. Uhlig was a professor of economics at Chicago when the 2016 paper appeared in the *Economic Journal* and remains so at the time of writing (October 2024).

3. Can central banks run out of ammunition? The money–equities interaction channel in monetary policy

Much current financial commentary asserts that – when interest rates have dropped to levels near to zero – "central banks have run out of ammunition".[1] The argument here will be that such assertions are without foundation. Indeed, allegations of central bank impotence represent a grotesque misunderstanding of both the scope of monetary policy and the structure of its transmission mechanism. The argument will pivot on the proposition that changes in the quantity of money affect the equilibrium level of all asset prices and hence have powerful indirect effects on aggregate demand.[2] They are relevant, in particular, to the level of the stock market.

The first section explains that the central bank can always increase the quantity of money. The second section reviews the thesis that monetary policy might still be exhausted, despite this ability. The thesis depends for its authority on claims in Keynes' *General Theory* about the downward rigidity of bond yields in a so-called "liquidity trap". Implicit here is the apparent belief that movements in bond yields are all-powerful in determining the future course of aggregate demand. This belief is unconvincing, to say the least. This is shown in the third section, where data from the United States of America are cited to illustrate and establish the main points. The argument mimics and extends that already made in section V of Chapter 1.

The next section is more specific, discussing the monetary behaviour of non-bank financial intermediaries, particularly long-term savings institutions, again in the USA. This serves as background to a detailed account of an adjustment process named here "the money–equities interaction channel". The process is closely related to, and an important part of, the so-called "portfolio rebalancing channel" prominent in recent research on the effects of central bank asset purchases.[3] The description is stylized, in order to emphasize key features. The penultimate section considers whether equity markets may "overshoot" their equilibrium values as portfolios are rebalanced. The final section submits that, despite the stylized presentation in this chapter, the discussion of the money–equities interaction channel is realistic. Indeed, the

channel is basic to the working of monetary policy in a modern economy. By contrast, the relationship between changes in the quantity of money and bond yields is unimportant.

I.

The phrase "monetary policy" can be conceived in different ways. A modern approach is to define monetary policy as the setting of the central bank rate in the parsimonious three-equation model of New Keynesianism.[4] No attention is paid in the model to the quantities of either the monetary base or any money aggregate. This airbrushing of money quantities from any macroeconomic photographs is arguably an injustice to the richness of the previous literature on the subject and the complex interdependencies found in real-world economies.[5]

All the same, many economists do not believe that the central bank can exert direct control over the quantity of money. Everyone accepts that the central bank is the monopoly issuer of its own liabilities, which are virtually the entirety of the monetary base, and that it necessarily controls the supply function of monetary base assets.[6] But much contention has arisen about the characterization of this supply function. A prominent tradition of thought – promoted, for example, by Milton Friedman and other monetarist economists, and discussed in Chapter 2 – said that the central bank can and should be concerned with the *quantity* of base assets. Further, it postulated that an increase in the quantity of the base had a roughly proportionate positive effect – via the "base multiplier" – on the quantity of money.[7] On the other hand, most monetary economists nowadays believe that in practice central banks fix the *price* of central bank credit, in order to influence a spectrum of interest rates, with such operations having a less predictable bearing on the quantity of money.[8]

These debates are important as part of the background to the current chapter, but they are not its focus. The assumption throughout the chapter is that the central bank not only can take steps that increase the quantity of money, but also can calibrate them to increase the quantity of money by a particular amount.[9] Sure enough, transactions between itself *and the banking system* may sometimes have an inexact relationship with the quantity of money, which consists of course of money balances *held by private sector non-banks*. Circumstances can even be imagined in which operations that are expansionary in intent – to boost the monetary base assets held by commercial banks and/or to lower the central bank rate – have no effect on the quantity of money.[10] These circumstances are rare; they are likely to prevail only when the economy and financial system suffer from exceptional trauma.[11]

In any case, it remains open to the central bank – even in such extreme conditions – to pursue money expansion by other means. It can issue liabilities

against itself – by, for example, adding to commercial banks' cash reserves – and use the proceeds to purchase assets from the non-bank private sector. When the purchases add to the non-bank private sector's bank deposits, the quantity of money rises dollar for dollar, euro for euro or whatever. Leakages in the process can occur, but they do not cast doubt on the central bank's ability to expand the quantity of money.[12] A positive effect on the amount of money, of a predictable size, is to be expected. That is so even if the central bank prefers to quantify the effects of its measures by reference to an interest rate.[13]

In the rest of this chapter, it is taken for granted that the central bank can always expand the quantity of money and that such expansion is potentially infinite. If central banks have run out of ammunition, the predicament is not due to an inability to increase the quantity of money. On 26 March 2020 Jay Powell, chairman of the USA's Federal Reserve, responded to a journalist's question about whether any limit applied to the Fed's money-creation powers. His answer was, "Essentially the answer … is no."[14] This answer was correct.

II.

Money has a Janus-like quality. It facilitates two kinds of transactions, those in assets which are likely to survive for many future periods, and those in goods and services produced in the immediate past period. It must therefore have – simultaneously – an equilibrium relationship with the value of assets that constitute national wealth, and with the value of goods and services consumed and invested in the current period (and hence with national income, output and expenditure). (This was discussed above in Chapter 1, particularly in its sections III to V, and sections VII and VIII.) Money-holders have to look both forwards and backwards for the information they need to balance money against other assets in their portfolios.

A wide variety of assets is relevant to the portfolio balancing decisions. Non-money assets can be divided into three main categories:

- those that pay a fixed income ("bonds"),
- those that pay a variable income usually dependent on the success of the investment made ("equities" and real estate, which receive dividends and rents, respectively), which were introduced in section V of Chapter 1, and
- those that give some kind of use value rather than a monetary return (consumer durables and personal chattels, including such items as works of art).

In an overwhelming majority of nations, bonds are smaller in wealth totals than the sum of variable-income assets and use-value assets. However, economic theory has long been preoccupied by – indeed, almost fixated on – the

relationship between the quantity of money and the price of bonds. The fixation has sometimes gone so far as to exclude discussion of the relationship between the quantity of money and the value of assets other than bonds.[15]

Perhaps the most influential example of this trope was Keynes' 1936 *General Theory*, which introduced the liquidity preference theory of what he termed "the rate of interest". His interest-rate notion was in fact a bond yield. It was said to constitute a "monetary phenomenon" in that it equilibrated the demand to hold money with the quantity of money created by the banking system.[16] In the key pages of the *General Theory*, the conceptual experiment at work was that the monetary authorities engineered a change in the quantity of money and thereby altered the pricing of long-dated bonds held by the non-bank public.[17]

Keynes and his disciples regarded the liquidity preference theory of the rate of interest as a major innovation, and it was canonized – for example – in the IS and LM curves of Hicks' IS-LM model. But some early critics, notably Dennis Robertson, attacked the liquidity preference theory because it overlooked the role of capital markets (and "loanable funds") in setting bond prices and yields. In one vital respect *The General Theory* was in fact less general than its predecessor, the 1930 *Treatise on Money*.[18] In the *Treatise*, portfolio balancing was not between money and bonds, but between money and "securities". Indeed, Keynes opened up remarkably in the special preface to the German and Japanese editions. One striking sentence ran,

> My central thesis regarding the determination of the price of non-liquid assets is that, given (a) the quantity of inactive deposits offered by the banking system, and (b) the degree of propensity to hoard or state of bearishness, then the price level of non-liquid assets must be fixed at whatever figure is required to equate the quantity of hoards with the quantity of hoards which the banking system is creating.

Here was the germ of a theory of the equilibrium pricing of all "non-liquid assets". A few paragraphs earlier Keynes had allowed himself to ponder the choice between money and housing ownership. To quote, "When a man in a given state of mind is deciding whether to hold bank deposits or house property, his decision depends not only on the degree of his propensity to hoard, but also on the price of house property."[19]

The context of the late 1920s, when the *Treatise* was being written, must be recalled. In those years the surge in the US stock market was the focus of much attention on both sides of the Atlantic. It was therefore unsurprising that Keynes should propose a theory to determine the price level of "securities", where the word "securities" included equities.[20] An extended account in Chapter 10 of the *Treatise* noted that people had to make two choices. They had to choose how much of their income to consume rather than to save, and

– once the level of savings had been fixed – they had to balance their wealth between "securities" and money in the form of "savings deposits". A strong and clear statement was ventured that "The price level of securities as a whole, and hence of new investments, is the price level at which the desire of the public to hold savings deposits is equal to the amount of savings deposits which the banking system is able and willing to create."[21]

In other words, the price of the aggregate of all securities depends on the amount of money set aside (out of aggregate money) for investment portfolios and investors' desired ratio of such money to the value of securities. Moreover, the handling of the subject in the *Treatise* invited the interpretation that securities were principally equities.[22] If so, Keynes offered a monetary theory of the determination of the combined value of the stock and bond markets before he confined himself in the *General Theory* to a narrower theory which focused on bond yields.

Why was the *General Theory* more limited in this respect? What caused Keynes to change direction? He knew that the speculative element in the *General Theory*'s liquidity-preference theory was similar to the degree of "bullishness" (or "bearishness") in the *Treatise*, because a section of the *General Theory* said as much.[23] The suspicion has to be that he was all too aware of the empirical improbability of his suggestion of absolute liquidity preference, that is, of a "liquidity trap" in which the demand for money became infinitely interest-elastic and money injections could not lower bond yields.[24] Bluntly, if investors are allowed to balance money against equities and real estate in their portfolios, the risk of chronic stagnation because of the liquidity trap becomes incredible.

At a banausic level, when savers commit funds to a long-term savings institution, the institution's job is to invest the money in a diverse range of assets. If long-term savings institutions – pension funds, life insurance companies and so on – let their money inflows pile up on their balance sheets, their assets would become indistinguishable from the banks'. That is not their purpose. They do not, like banks, invest in payments infrastructure to attract deposits of cash. Sure enough, such institutions do vary their ratios of money to assets, but they do not let these ratios approach 100 per cent.

If it is accepted that long-term savings institutions with substantial portfolios of equities and other variable-income assets are an abiding element in modern capitalist economies, and if it is also taken for granted – realistically – that they will never allow their cash to become more than a low fraction of their assets, then large-scale money creation by the state must have a positive effect on asset prices. Despite this, a substantial literature on the liquidity trap has burgeoned over the decades. Increasingly the phrase has ceased to refer to the specific problem highlighted by Keynes, in which perverse expectations about a future capital loss on bond holdings might play havoc with monetary policy.

Instead it has become a convenient peg on which critics of profit-seeking financial systems can hang their denunciations of the entire capitalism system.[25]

Some economists have alleged that economics has no worthwhile theory to account for fluctuations in the stock market. According to George Akerlof and Robert Shiller in their 2009 book *Animal Spirits*, "No one has ever made rational sense of the wild gyrations in financial prices, such as stock prices. These fluctuations are as old as the financial markets themselves." The lacuna in economic theory is – in their view – a serious matter, since "these prices are essential factors in investment decisions, which are fundamental to the economy". Further, "the facts" about "the wild gyrations" cannot be escaped, and "we are left once again with more evidence that animal spirits are central to the ups and downs of the economy". Akerlof and Shiller acknowledge that analysts might be able to throw light on the stock prices of particular companies, but – again to quote – they "cannot do this for the aggregate stock market".[26] It seems that Akerlof and Shiller have not read Keynes' *Treatise on Money*. In that book, Keynes could perhaps have assembled the remarks on the pricing of non-liquid assets in one place and made them more coherent. All the same, the remarks were there. Their unmistakeable message was that rational sense could be made of the stock market by expanding a money-based theory of its fluctuations.

III.

The textbook preoccupation with the liquidity preference theory of bond yields might be defensible if bonds were by far the most important asset class in modern economies. But the data show that this is not so. For the sake of illustration, the composition of household wealth in the USA at the end of 2019 is shown in Table 3.1. (The USA is unlikely to understate the relative importance of bonds, as it is usually seen as having a lower ratio of bank intermediation to national income than comparable Asian and European nations.) Table 3.1 demonstrates that variable-income assets were far more important in household wealth than fixed-income. Bonds in direct ownership represented only 4.1 per cent of gross assets, whereas assets that were undoubtedly variable-income – that is, real estate, unquoted business equity and equities – were no less than 56.3 per cent of gross assets.

With use-value assets ("consumer durables") and other assets a further 7.2 per cent of wealth, it is plain that fixed-income securities were far from being the preeminent asset type in the USA at this date. (Table 3.1 is on much the same lines as Table 1.2 in Chapter 1, which related to end-2021 rather than end-2019. A collapse in households' holdings of bonds occurred between the two dates, due to heavy selling to other market participants. The selling was motivated by the negligible returns offered by bonds in 2020 and early 2021,

Table 3.1 Constituents of household wealth in the USA at end-2019

-	$ billions	% of gross assets	% of net worth
Real estate	33,517	25.0	28.6
Unquoted business equity	12,343	9.2	10.5
Bonds	5,548	4.1	4.7
Life insurance & pension assets	29,602	22.1	25.2
Equities (inc. mutual fund shares)	29,602	22.1	25.2
Money held by households	13,606	10.2	11.6
Consumer durables	5,753	4.3	4.9
Other assets	3,914	2.9	3.3
Gross household wealth	133,885	100.0	114.1
Total liabilities	16,549	12.4	14.1
Household net worth	117,335	87.6	100.0

Note: Personal disposable income in fourth quarter 2019 at annual rate was $16,645 billion.
Source: US Federal Reserve *Financial Accounts of the United States*, Q1 2020, Table B.101, p. 138 and the author's estimates.

and was well-timed. In the last nine months of 2020, bond yields were under 1 per cent, even for ten-year US Treasury bonds. The very low level of yields reflected economists' forecasts of persistent disinflation because of the after-effects of the Covid pandemic. As discussed elsewhere in this volume, the forecasts – which seem to have persuaded and duped many institutional investors – turned out to be completely wrong.)

True enough, a significant proportion of life company and pension fund assets would have been in bonds, and households would therefore have held much more in bonds on an indirect basis. But – given that their claims on life insurance companies and pension funds were under a quarter of gross assets – this point cannot alter the main message of Table 3.1. Variable-income assets – and even equities by themselves – account for a significantly higher share of household wealth than fixed-income assets. It does not necessarily follow from this fact that the effect of changes in the quantity of money on variable-income assets has greater implications for behaviour than the effect of such changes on fixed-income assets, but a strong presumption in that direction is surely sensible.[27] In fact, studies of the impact of balance sheet developments on consumer spending sometimes ignore household bond holdings altogether, being concerned instead with the contrasting effects of changes in housing and

stock market wealth.[28] In view of the widely acknowledged albeit controversial thesis that government bonds are not part of a nation's net wealth, this neglect of bond wealth is easier to defend.[29] (At end-2019, US households' holdings of government securities were $1,896 billion, leaving other bonds at $3,652 billion or a mere 2.7 per cent of gross wealth.)

A protest might be registered that movements in bond yields affect the valuation of all assets, because bond yields determine the rate of discount that investors apply to the valuation of future income streams from equities and real estate.[30] But three counter-arguments can be made. First, the historical record in the USA in the post-war period is that in some years the value of bonds held by households changed in the opposite direction to the value of other assets. In the 74 years from 1946 to 2019 inclusive, there were 15 such years.[31] Changing inflation expectations may have had different impacts on bonds, with their fixed nominal return, and on other asset classes, where nominal returns ought to adjust upwards with the general price level. Second, many investors hold only money and equities. Frankly, they are just not interested in bonds or bond yields. As some equity investors put the matter rather unkindly, "bonds are for wimps".[32] Given that at least a proportion of investors are of this type, it is unclear why bond yields should drive the rate of discount on equities rather than the other way round. Surely, a more sensible view is that there is mutual interaction. Third, changes in the value of debt securities held by the household sector were small compared with changes in the value of equities similarly held. Disregarding sign, the average value of the annual change in bonds held by households in the 1946–2019 period was 0.35 per cent of the value of all household wealth at the end of the previous year. The comparable figure for equities was 2.23 per cent, more than six times higher.[33] (As noted in section V of Chapter 1, the disparity in late 2020 and 2021 between changes in the value of variable-income assets and in the value of debt securities was even more dramatic than this.)

Defenders of macroeconomists' concentration on bond yields might object that the emphasis on the household sector's wealth in the last paragraph is incorrect. They might say that bond yields have a more important effect, as far as the wider economy is concerned, via the corporate sector and particularly because bond yields affect investment. This is a large area of debate, where the matters at issue cannot be resolved in the space available in the current chapter. Nevertheless, corporate investment decisions are undoubtedly affected by both corporate bond yields and the "cost of equity". A sharp rise in equity valuations is likely to boost corporate investment, just like a fall in bond yields, as Keynes conceded when he wrote his *General Theory.* A footnote in Chapter 12 gave the game away. In his words, "a high quotation for existing equities involves an increase in the marginal efficiency of the corresponding type of capital and therefore has the same effect … as a fall in the rate of interest."[34]

IV.

In the real world, equities are owned by a variety of investors. Of course, individuals and companies hold equities, as well as long-term savings institutions. Table 3.2 shows the composition of holdings of US equities at the end of 2019. US-based long-term savings institutions were only slightly more important than American households as investors in US stocks, but it is likely that the bulk of the foreign holdings – which amounted to almost 15 per cent of the total – were in the hands of institutional investors. On this basis a reasonable generalization is that long-term savings institutions – mostly mutual funds, pension funds and insurance companies – are representative holders of US equities.

This facilitates analysis and discussion, because ample data are available on the money holdings kept by such institutions. Undoubtedly, these holdings have been lodged almost entirely in investment portfolios and have the ultimate purpose of improving the returns to ultimate beneficiaries (pensioners, those insured by life policies and so on). They correspond virtually in their entirety to "savings deposits", as that term was used by Keynes in his *Treatise on Money*. Of course, many households also keep money balances that are available for investment in equities, but such balances (to serve the "speculative demand for liquidity", in Keynes' terminology in his *General Theory*) are not readily distinguished from transactions and precautionary balances. A merit of tracking long-term savings institutions' money balances is their almost exclusive commitment to portfolio investment, which obviates the need

Table 3.2 Holders of US corporate equities at end-2019

-	Value in $ billions	% of total
Long-term savings institutions	22,670.7	41.2
Households	21,287.4	38.7
Rest of the world	8,196.8	14.9
Non-financial corporate business	2,308.7	4.2
Banks, brokers and dealers	314.4	0.6
Government	206.4	0.4
Total	54,984.4	-

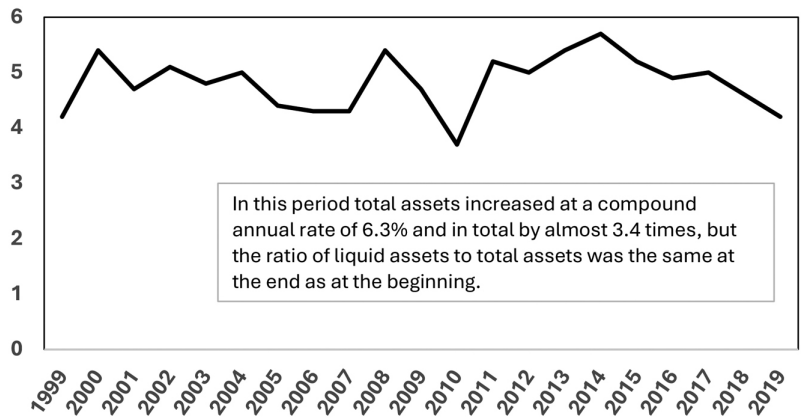
Note: The category "Long-term savings institutions" includes property-casualty insurance companies, life insurance companies, private pension funds, Federal government pension funds, state and local government pensions funds, mutual funds, closed-end funds and exchange-traded funds.
Source: Federal Reserve data in *Financial Accounts of the USA*.

to make a distinction between Keynes' different money-holding motives. Over two-thirds ($38,470.6 billion) of US corporate equities were publicly traded at end-2019.

As already noted, long-term savings institutions hold a diverse range of assets. Both life insurance companies and pension funds have a "significant proportion" of their assets in bonds, partly to meet regulatory requirements. However, some funds available to the retail investor are committed wholly to equities. This is particularly true in the mutual fund industry. At the end of 2019 total funds managed in mutual funds were $24,593 billion and over half of the total ($14,126 billion) was represented by equity-only funds.[35]

What is the relationship between their money holdings and mutual funds' total assets? The annual data prepared by the Investment Company Institute since the late 1950s are one source of information, although a much larger body of statistics for a wider range of institutions is available in the Federal Reserve's flow-of-funds data going back on a quarterly basis to 1952.[36] Figure 3.1 offers a chart of the mutual funds' ratio of liquid assets to total assets from 1999 to 2019. (Liquid assets would have been dominated by money as such.)

The stability of the ratio is noteworthy. Although the ratio does vary somewhat, the variations have a much smaller effect on changes in assets than changes in their liquid assets. The stability being highlighted here recalls that of the income velocity of circulation, a phenomenon often observed by Milton Friedman and other exponents of the quantity theory of money.



Source: 2020 *Investment Company Fact Book* (New York: Investment Company Institute).

Figure 3.1 *Liquid assets as % of total assets for all mutual funds in the USA, 1999–2019*

V.

In order to illustrate the working of the money–equities interaction channel, a schematic example is now developed. Although an abstraction from reality in order to emphasize the key points, the material in the last section shows that the discussion has a basis in fact. Suppose that

i. long-term savings institutions are the only holders of equities in the economy under consideration,
ii. long-term savings institutions hold equities and no other assets, and
iii. all equities are publicly traded.

It is evident that the equilibrium value of the assets of the n long-term savings institutions is equal to

$$A_n = \frac{M_n}{m},$$

where M_n is the quantity of money held by long-term savings institutions and m is these institutions' average ratio of money to assets. Further, with long-term savings institutions holding only equities and their assumed status as the exclusive holders of equities, A_n is also the value of all the publicly traded equities in the economy.

The proposition being made is clearly in the spirit of Keynes' ruminations in the *Treatise* about the value of an economy's stock of securities. M_n is analogous to his notion of "the amount of savings deposits which the banking system is able and willing to create", while m expresses "the desire of [the relevant members of] the public to hold savings deposits". (In this section so far, the relevant members of "the public" are the long-term savings institutions – and only these institutions. But other types of economic agents will soon come into the story.)

Some numbers can be offered to illustrate the money–equities interaction channel in practice. Suppose that the total quantity of money in an economy is \$20 trillion, that a tenth (\$2 trillion) of this is held by the long-term savings institutions reflecting households' equilibrium desire to commit funds to institutional investors, and that the long-term savings institutions' equilibrium preferences are to maintain a ratio of money to equities of 4 per cent. Then the equilibrium value of publicly traded equities in this example is \$50 trillion.

Let an "exogenous" monetary shock to the economy now be imagined, with central bank asset purchases from the non-bank private sector which – in a very short period of perhaps only a few days or weeks – push up the quantity of money from \$20 trillion to \$23 trillion.[37] Let it be conjectured that, in a

notional first round of transactions, $1 trillion of the extra $3 trillion of money balances is in the hands of long-term savings institutions. Plainly, our formula argues that – if the institutions adhere to the usual 4 per cent cash ratio – the equilibrium value of equities has to jump by 50 per cent. This is perhaps surprising, given that the aggregate quantity of money has risen only 15 per cent. As will emerge, it is important to distinguish between the equilibrium of the long-term savings industry – which might be seen as a "partial equilibrium" – and the general equilibrium of the economy as a whole, when households and companies are introduced as well.

The change from a stock market worth $50 trillion to another worth $75 trillion – or, in jargon, the comparative-static adjustment – is unlikely to happen overnight. Suppose that the extra $1 trillion of institutions' money is split evenly among them in proportion to their funds under management. Then the actual money-to-assets ratio for the industry averages 6 per cent, and a majority of institutions are likely to have money-to-assets ratios of above 5 per cent. Hence, many or all of them are out of equilibrium, with the industry having an excess supply of money. Institutions A, B and C in a second round of transactions make net purchases of $200 billion of equities, at prices higher than those prevailing before, from institutions D, E and F. The effect is to drive up the equity market by 10 per cent. The 10 per cent rise in prices lowers the industry's actual money-to-assets ratio from 6 per cent to under 5.5 per cent.

Institutions D, E and F hold the extra money received both earlier from asset sales to the central bank and the $200 billion from their recent sales in the market. So they now have money-to-assets ratios of well above 6 per cent, against the long-run target of 4 per cent. In a third round of transactions, institutions D, E and F therefore become net buyers of equities to the tune of $250 billion, again at higher prices than before. $250 billion of money is partly returned to institutions A, B and C and also is acquired by institutions G, H and J. The excess demand for equities enhances prices by another 10 per cent and cuts the industry's money-to-assets ratio to under 5 per cent. On the assumption that the long-term savings institutions are the only holders of equities in the economy, some institutions will be net buyers in one round of transactions and in another they will be net sellers. However, because of our assumptions, transactions between the institutions are within a closed circuit and cannot change the amount of money held by the industry as a whole. The industry's equilibrium is restored – with the resumption of a 4 per cent money-to-assets ratio, after a sequence of transactions rounds – by a rise in equity prices of 50 per cent, from $50 trillion to $75 trillion.[38]

In the real world, the adjustment process takes time in what might be called, following Irving Fisher, a "transition period".[39] To make the story more realistic, our assumptions can be relaxed. During the transition period rising equity prices stimulate responses which spread the new money balances around

the economy. For a start, allow the household sector to own some equities in the initial situation. As households see the institutions chasing equity prices higher, they sell some of their holdings to the institutions. The institutions' money holdings are thereby lowered and partly transferred to households. Further, let the institutions have more diversified portfolios. As they see the bull market in equities taking valuations to levels not justified by "corporate fundamentals", they begin to acquire bonds as an alternative to equities. If they invest in bonds newly issued by the corporate sector, their money balances are reduced and companies' money holdings increase.

Finally, imagine an economy with a mixture of publicly traded equities and unquoted, privately held businesses. Whether assets are quoted on the stock market or not is determined largely by the increase in value that arises from having a quotation, relative to the costs of obtaining and maintaining a quotation. If values in the quoted market move far ahead of those in the unquoted market, the owners of privately held businesses may be tempted to seek a quotation. The issuance of new shares to the institutions again has the effect of transferring money balances from the financial sector to the household and corporate sectors.

The initial exogenous shock to the quantity of money was assumed to be 15 per cent (from $20 trillion to $23 trillion) and to be registered disproportionately in the financial sector, where the long-term savings institutions' money balances leapt 50 per cent from $2 trillion to $3 trillion. This appealed to reality, in that central bank asset purchases (mostly of government bonds in practice) tend to be predominantly from the financial sector. Our discussion of the money–equities interaction channel showed how the excess money held by the institutions would tend to lift equity prices, as they tried to bring their actual money-to-asset ratios down towards the "normal" figure of 4 per cent. In one sense a 50 per cent increase in equity prices would bring back equilibrium, in that the institutional savings industry would return to the 4 per cent ratio and hence to its equilibrium money-holding pattern.

However, a range of suggested behavioural adjustments in the transitional period implied that during it money balances would leave the financial sector, and move to companies and households. The circulation of money balances between the economy's sectors and agents would have the effect that, over time, the increase in money holdings registered by all of them would come near to the aggregate figure of 15 per cent. Equity prices might overshoot for some months or quarters, but – when the extra money had been dispersed evenly around the economy – the gain in equity prices would also be closer, in a new "general equilibrium", to 15 per cent.

The discussion in the last few paragraphs recalls numerous treatments in recent academic literature about the "portfolio rebalancing channel".[40] Descriptions of this channel note that in their asset purchase programmes

central banks tend to focus on relatively safe assets, such as government bonds. This is supposed to push down yields on safe assets and to encourage substitution into higher-risk assets, which might initially be corporate bonds, and then on to equities and real estate.[41] Some papers propose that central bank asset purchases work partly through stimulating new bank lending to the private sector. However, an obtrusive fact is that the implementation of "quantitative easing" programmes in the five years from late 2008 was associated with contractions in the stock of such lending in several leading economies. An alternative view is that quantitative easing (QE) found its core rationale in the need to counter the destruction of money balances, with this money destruction arising from the effect of banks' sharply raised capital requirements on their portfolios of risky loan assets.[42] On this basis, the beneficial results of QE for economic activity may have been to a significant extent caused by the positive impact of central bank asset purchases on asset prices, including the prices of equities. The wealth effects of changes in the quantity of money become a central element in the transmission mechanism. The wealth effect on consumption may be larger than the effect (the so-called "Keynes effect") of lower interest rates on investment and, via the celebrated multiplier and IS function, on aggregate demand. But the subject requires empirical determination.

VI.

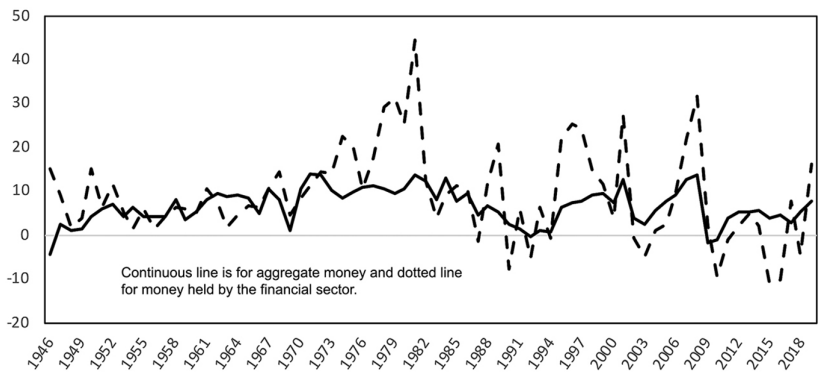
The account of the money–equities interaction channel in the last section was simplified in order to demonstrate key features of the adjustment processes at work. One part of the example may have seemed stilted, the contrast between the 15 per cent increase in aggregate money and the 50 per cent increase in the money balances held by the long-term savings institutions. But the example was consistent with historical experience, as a repetitive feature of the cyclical behaviour of money is that fluctuations in the growth rate of money held in the financial sector have greater amplitude than fluctuations in the growth rate of aggregate money. This is a huge topic than cannot be analysed in depth here, but some evidence for the USA is presented in Figure 3.2 on the next page.[43] The figure shows the per cent rates of change, in the year to the fourth quarter, of aggregate money and money held in the "domestic financial sector", of which the long-term savings institutions are a major component, from 1946 to 2019. The marked ups and downs of financial sector money in the 63-year period are evident. The standard deviation of the changes in financial sector money, at 10.46, was more than two-and-a-half times higher than that of the changes in aggregate money, at 4.02.[44] If it is assumed – plausibly – both that long-term savings institutions keep stable ratios of money to total assets and that rates of increase in aggregate money were correlated with those of nominal national income, the high volatility of the institutions' money balances

would tend to motivate fluctuations in equity prices that had greater amplitude than fluctuations in nominal national income. This is in fact a salient characteristic of modern capitalist economies.[45]

This chapter argued at the start that central banks can always expand the quantity of money. It has now been shown that the likely results of sudden accelerations/decelerations in money growth are

i. more pronounced accelerations/decelerations in the growth of money held in the financial sector, including that belonging to long-term savings institutions, and
ii. overshooting of equity markets, in both directions, as the institutions try to cope with the excess (or deficient) supply of money.

Admittedly, in the real world, money is not trapped in the financial sector. The departure of equity markets from their long-run equilibrium values motivates behavioural responses from companies and households which cause money to leave the financial sector when equity prices are high, and to be injected into it when they are low. Nevertheless, these transfers of money between sectors in no sense qualify the argument that major fluctuations in equity markets can be a by-product of central bank operations. On the contrary, they illuminate the processes at work and help to explain why these fluctuations can have profound impacts on wider macroeconomic outcomes. These impacts tend to be



Note: Chart is of annual % rates of change; for explanation, see text.
Source: Federal Reserve data in its *Financial Accounts of the USA*.

Figure 3.2 *The contrasting volatility in the USA of aggregate money and money held by the financial sector*

much larger, and also more systematic and reliable, for a particular quantum of central bank asset purchases (and of course sales, when policy-makers want to slow the economy) than those which stem from changes in bond yields.

More polemically, widespread enthusiasm for Keynes' liquidity preference theory of the so-called "rate of interest", and the textbook orthodoxy that it is the lynchpin of monetary policy, are misguided. A careful reading of his *Treatise on Money*, and indeed of certain passages in *The General Theory*, suggests that Keynes was well aware of the relationship between money growth and equity markets. It is puzzling that some accounts of the portfolio rebalancing channel pay exclusive attention to the effects of central bank asset purchases on bond yields when such effects are a sideshow to the much more important channel working through the equity market (and in fact via other asset markets, including real estate, that is, residential and commercial property).[46]

VII.

We have seen that many economists – perhaps even a majority of those involved in macroeconomic analysis and commentary – believe that the important effects of monetary policy operate entirely through interest rates, either the central bank rate itself or the government bond yield. (The Introduction included a quotation, given on p. 41, from Silvana Tenreyro of the London School of Economics, which was exactly to this effect.) These economists further consider that – when these rates are close to zero or have even gone negative – monetary policy has been exhausted and central banks "have run out of ammunition". According to Lord Turner, former chairman of the United Kingdom's Financial Services Authority, in a debate reported in the March 2020 issue of *Prospect* magazine, "The Covid-19 crisis will confirm that when a major shock threatens the world economy, central banks acting alone are now almost powerless to stimulate nominal demand and economic growth, or to stop inflation falling below target." He noted that QE had been used in 2008 and 2009 to "drive down long-term yields in line with short-term policy rates" and so to counter the Great Recession, but in his judgement "the impact on real business investment was minimal: when companies can already borrow at historically low rates, cutting the interest rate further makes little difference to capital expenditure plans."[47]

These remarks seem extraordinary, even preposterous, in view of the major advances in stock markets that followed QE announcements – by central banks on both sides of the Atlantic – in the crises of 2009 and 2020.[48] Three points have surely been made clear by the sequels to those announcements. Central banks can always increase the quantity of money by purchasing assets from non-banks; the money balances thereby injected into the economy boost asset

prices and household wealth; and increases in asset prices support household consumption and facilitate corporate investment. The wider ramifications are stimulus to spending, output and employment. Monetary policy exhaustion is a curiosum of economic theorists, deluded by a few sentences on supposed "absolute liquidity preferences" in Keynes' *General Theory*. In the real world, central banks – with their power to create at nil cost unlimited amounts of high-powered money and bank deposits – can never run out of ammunition.

Keynes' liquidity preference theory was and remains an interesting contribution to economic theory and will always demand comment in the history of economic thought. But its empirical significance as an explanation of real-world interest rates is open to discussion, as was seen in section VIII of Chapter 1. Bonds are, of course, a major asset class in modern economies, but they are only one type of asset. In all modern economies, they have a smaller weight quantitatively in household wealth portfolios than equities and real estate. According to Dennis Robertson in the debates that followed the publication of *The General Theory*, Keynes' book overstated the role of "the rate of interest" which had been "elevated to a position of commanding theoretical importance". Robertson noted sarcastically that, "nothing was ever allowed to happen – money was not allowed to affect prices, wage-rates were not allowed to affect employment, I had almost added, the moon was not allowed to affect the tides – except through the rate of interest: it became, as never before, the keystone of the whole theoretical arch."[49] Perhaps a standard university macroeconomics course should spend more time on the interdependence of monetary policy and the valuation of equities (and perhaps also of houses), and less on the liquidity preference theory of bond yields.

NOTES

1. For an example, see Paul Krugman, 'Can the Fed and friends save the economy?', column in *The New York Times*, 3 March 2020.
2. In his well-regarded *Economic Theory in Retrospect*, Blaug distinguished between the direct and indirect effects of changes in the quantity of money. (Mark Blaug, *Economic Theory in Retrospect* [Cambridge: Cambridge University Press, 4th edition, 1985], pp. 158–61.) The emphasis in this chapter on the indirect mechanisms via assets and asset prices is not in any way to decry the direct mechanism. Further, an argument could be made that "an interaction channel" is also to be found between the changes in the quantity of money and in the value of residential property, and this channel may indeed be of greater empirical significance than that between money and equities. The subject is broached, but not fully developed, in Chapter 1.
3. For the USA and internationally, see Brett Fawley and Christopher Neely, 'Four stories of quantitative easing', *Federal Reserve Bank of St. Louis Review*, vol. 95, no. 1, 2013, pp. 51–88, and Saroj Bhattari and Neely, 'A survey of the

empirical literature on US unconventional monetary policy', *Federal Reserve Bank of St. Louis Working Paper 2016 – 021A*, pp. 1 – 47. The Bhattari and Neely paper has a reference to the portfolio balance channel on p. 1 and a section on the effect on equity markets on pp. 18–20. For the UK, see Jonathan Bridges and Ryland Thomas, 'The impact of QE on the UK economy – some supportive monetarist arithmetic', *Bank of England Working Papers no. 442* (London: Bank of England, 2012), pp. 1–51.

4. Richard Clarida, Jordi Galí and Mark Gertler, 'The science of monetary policy: a New Keynesian perspective', *Journal of Economic Literature*, vol. 37, no. 4, 1999, pp. 1661–707.
5. David Laidler is well-known for his insistence that the quantity of money matters to macroeconomic analysis. See, for example, 'Monetary policy without money: Hamlet without the ghost', pp. 111–34, in *Macroeconomics, Monetary Policy and Financial Stability: A Festschrift in Honour of Charles Freedman* (Ottawa: Bank of Canada, 2003).
6. The monetary base includes the coin issue, usually a liability of the mint, which is separate from the central bank.
7. The point was noted above on pp. 89–90. But see Milton Friedman and Anna Schwartz's classic *A Monetary History of the United States* (Princeton: Princeton University Press, 1963, pp. 776–808), which has an Appendix B on the 'Proximate determinants of the nominal stock of money', in which changes in high-powered money (or "the monetary base") are seen as determining the quantity of money.
8. The argument has appeared in many places, particularly in work from the post-Keynesian school. See, for example, Basil Moore, *Horizontalists and Verticalists: The Macroeconomics of Credit Money* (Cambridge: Cambridge University Press, 1988), pp. 263–5.
9. The UK authorities in the early 1980s varied the pace of sales of government debt outside the banking system in order to keep money growth closer to target. See chapter IV, 'Bank lending and monetary control', pp. 122–45, in Charles Goodhart, *Monetary Theory and Practice* (London: Macmillan Press, 1984).
10. The author has proposed the concept of a "narrow liquidity trap" in which central bank operations to expand the monetary base have no effect on the quantity of money. See essay 4 in Tim Congdon, *Money in a Free Society* (New York: Encounter Books, 2011), particularly pp. 67–71.
11. The narrow liquidity trap (see note 10) can arise either because banks do not want to expand their earning assets despite ever-increasing cash holdings or because the private sector suffers from such financial trauma that even at a zero central bank rate it does not want to increase its bank borrowings. The latter case was noticed in the early 1930s by Ralph Hawtrey in his idea of "a credit deadlock". See Roger Sandilands, '"Hawtreyan credit deadlock" or Keynesian "liquidity trap"?: Lessons for Japan from the Great Depression', in Robert Leeson (ed.), *David Laider's Contributions to Macroeconomics* (London: Palgrave Macmillan, 2010), pp. 329–65.

12. Ryland Thomas, 'UK broad money growth and nominal spending during the Great Recession: an analysis of the money creation process and money demand', chapter 3, pp. 78–100, in Tim Congdon (ed.), *Money in the Great Recession* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2017). See, particularly, pp. 85–6.
13. Ben S. Bernanke, 'The new tools of monetary policy', *American Economic Review,* vol. 110, no. 4, 2020, pp. 943–83, discussed the effect of central bank asset purchases without any reference to the quantity of money. It concluded nevertheless that QE plus forward guidance could, in the right circumstances, act as "new monetary tools" which "are capable of adding about 3 percentage points worth of policy space [i.e. a cut in Fed funds rate], relative to traditional policies" (p. 974).
14. See p. 198 below.
15. In Blaug's *Economic Theory in Retrospect* the indirect mechanism always involves the rate of interest, and often the relationship between Wicksell's concepts of the market and natural rates of interest. See the reference here in footnote 2, and to p. 161 and pp. 648–50 in Blaug, *Economic Theory.* Blaug make no mention of the effect of changes in the quantity of money on the value of corporate equity, houses or commercial property.
16. Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. VII, *The General Theory of Employment, Interest and Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1973; originally published 1936), chapter 13, pp. 165–74.
17. Johnson and Moggridge (eds), *Collected Writings of John Maynard Keynes*, vol. VII, *General Theory*, pp. 171–72, 196–7.
18. Don Patinkin noticed this in his 1976 book, *Keynes' Monetary Thought: A Study of Its Development* (Durham: Duke University Press). See, particularly, pp. 81–2.
19. See 'Prefaces to Foreign Editions', pp. xx–xxvii, in Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. V, *A Treatise on Money* and vol. 1, *The Pure Theory of Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1971; originally published 1930). The sentence about the money-housing choice is on p. xxvi and the sentence on non-liquid assets in general is on p. xxvii. Keynes' use of the word "hoard" is strange, since the deposits under consideration could be construed as having the active purpose of helping portfolio management.
20. Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. V, *A Treatise on Money* and vol. 1, *The Pure Theory of Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1971; originally published 1930), pp. 127–31.
21. Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. V, *A Treatise on Money* and vol. 1, *The Pure Theory of Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1971; originally published 1930), p. 129. The sentence is

picked up almost a hundred pages later, in a discussion of the American stock market, on p. 224: "Thus, the actual level of security prices is, as we have seen in chapter 10, the resultant of the degree of bullishness of opinion and of the behaviour of the banking system."

22. "If the [central] bank increases the volume of bank money so as to avoid any risk of the financial circulation stealing resources from the industrial circulation, it will encourage the 'bull' market to continue, with every prospect of a rising value of [the price level of new investment] which will lead to over-investment later on." Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. V, *A Treatise on Money* and vol. 1, *The Pure Theory of Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1971; originally published 1930), p. 227.
23. Johnson and Moggridge (eds), *Collected Writings of John Maynard Keynes*, vol. VII, *General Theory*, pp. 173–4.
24. Robertson hinted at Keynes' lack of confidence about his ideas. See p. 371 of Gordon Fletcher, *Understanding Dennis Robertson: The Man and His Work* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2000).
25. Geoff Mann, *In the Long Run We Are All Dead: Keynesianism, Political Economy and Revolution* (London: Verso, 2019), pp. 232–4.
26. George Akerlof and Robert Shiller, *Animal Spirits* (Princeton and Oxford: Princeton University Press, 2009), p. 131. (All the quotations are from this page.) Note that Akerlof and Shiller equated the quantity of money with M1 and understandably doubted that this measure of money could have much effect on the economy. See pp. 74–9 of their *Animal Spirits*.
27. The author used Federal Reserve flow-of-funds data (particularly, page B.101) to obtain data on household wealth from 1946, while he acquired from the Bureau of Economic Affairs website series for the change in real household consumption and the consumption deflator. He prepared relevant data on annual changes to the fourth quarter over the 1948–2019 period, with 72 observations. He conducted a least-squares regression of the change on household consumption in real terms on changes in the value of household holdings of real estate (mostly residential housing), consumer durables, money, corporate equities including mutual funds, life insurance and pension assets, equity in non-corporate business and other assets, with the value in both nominal terms (as if agents were subject to money illusion) and in real terms (i.e. after adjustment for the consumption deflator, as if agents were not subject to money illusion), in both cases without lags. For the equation using the change in nominal-value wealth items (which had an r-squared of 0.35), the only independent variables to meet the usual significance test with a *t* statistic of above 2 were "real estate" (with a *t* statistic of 3.54 on the regression coefficient of 0.23) and "corporate equities including mutual funds" (with a *t* statistic of 3.04 on the regression coefficient of 0.05). (The *t* statistic on the "debt securities" [or bonds] term was 0.44 on a coefficient of 0.01.) For the equation using the change in real-value wealth items (which had an r-squared of 0.47),

independent variables to meet the usual significance term with a *t* statistic of above 2 again included "real estate" (with a *t* statistic of 2.22 on the regression coefficient of 0.15) and "corporate equities including mutual funds" (with a *t* statistic of 2.30 on the regression coefficient of 0.03). (The *t* statistic on the "debt securities" [or bonds] term was 1.45, also on a coefficient of 0.03.) Much more work could be done, but the statement in the text seems legitimate. Contact the author at timcongdon@btinternet.com for further details of the statistical work.

28. John Muellbauer of Nuffield College, Oxford, has authored and co-authored several papers on the relationship between wealth and consumption. See, for example, Valérie Chauvin and John Muellbauer, 'Consumption, household portfolios and the housing market in France', *Economie et Statistique/ Economics and Statistics*, Institut National de la Statistique et des Études Économiques (INSEE), issue 500-501-5, 2018, pages 157–78. The general finding is that housing wealth is the most important type of wealth in determining changes in consumption. Empirical work sometimes find a role for corporate equities (as in this chapter – see note 27 immediately above), but bonds directly held by households never figure in the analysis.
29. Robert Barro, 'Are government bonds net wealth?', *Journal of Political Economy*, vol. 82, no. 6, 1974, pp. 1095–117.
30. Keynes in the *General Theory* made this point, as emphasized in Axel Leijonhufvud, *On Keynesian Economics and the Economics of Keynes* (Oxford: Oxford University Press, 1969), and discussed below and see the reference in note 34.
31. Contact the author at timcongdon@btinternet.com for further details of the statistical work.
32. Paul Farrell, 'A raging bond-market bull', published 4 March 2003 on the MarketWatch website (www.marketwatch.com). "We've heard it all: Bonds are boring. Bonds are for wimps. Bonds are losers."
33. See footnote 24 above for the source of the calculation. Note that the change in the value of assets held reflected both net saving and revaluations. The revaluations would nevertheless be the dominant influence on the annual changes in most years. It should be noticed that changes in the value of real estate (housing, mostly) were often larger than changes in the value of equities.
34. Johnson and Moggridge (eds), *Collected Writings of John Maynard Keynes*, vol. VII, *General Theory*, p. 151.
35. Data come from the *2020 Investment Company Fact Book* (Washington, DC, and London: Investment Company Institute, 2020), Table 7 in the Data Section, p. 202. The total value of mutual funds exceeds that held by US households, because some holdings are outside the USA and others belong to US resident corporates. Of the $14,126 billion of equity-oriented mutual funds' assets at end-2019, over a third ($4,830 billion) was directed to non-US equity markets.
36. For some work using the Federal Reserve's financial accounts data, see pp. 363–9 in essay 16 in the author's *Money in a Free Society.*

37. A remarkable jump in US financial sector money occurred in the first quarter of 2020 (of 35.7 per cent, from $842.1 billion to again $1,142.6 billion). See p.183 below for further discussion. See Chapter 7 more generally for the decisions on monetary policy in the USA in March and April 2020.
38. The argument here follows the same lines as that in a 2005 monograph by the author. See Tim Congdon, *Money and Asset Prices in Boom and Bust* (London: Institute of Economic Affairs, 2005), pp. 38–9.
39. William Barber (ed.), *The Works of Irving Fisher*, vol. 4, *The Purchasing Power of Money* (London: Pickering & Chatto, 1997), chapter IV, pp. 55–74. According to Barber, Fisher "recognized that 'transition periods' – in which adjustments to disturbances were being worked out – typified economic reality" (p. 9).
40. Perhaps this is the time to notice that it also recalls a much larger and longer-established literature on the many non-neutralities to be observed in the cyclical short run after changes in the quantity of money. The literature goes back to Hume and Cantillon in the eighteenth century, but the current work on the portfolio rebalancing channel was also foreshadowed in "the tentative sketch", pp. 229–34, in Milton Friedman and Anna Schwartz, 'Money and business cycles', pp. 189–235, in Milton Friedman, *The Optimum Quantity of Money* (London and Basingstoke, 1969), originally published in the 1963 *Review of Economics and Statistics*, vol. 45, no. 1.
41. The literature is extensive and far from conclusive. For an example, see Itay Goldstein, Jonathan Witmer and Jing Yang, 'Following the money: evidence for the portfolio balance channel of quantitative easing', *Bank of Canada Staff Working Paper No. 33* of 2018 series (Ottawa: Bank of Canada), pp. 1–46.
42. Tim Congdon, 'Sir Charles Bean on the UK's decade of super-low interest rates: comment', pp. 257–64, *Journal of Economic Affairs* (London: Institute of Economic Affairs), vol. 38, no. 2, 2018. See also the author's chapter 2, 'The debate over "quantitative easing" in the UK's Great Recession and afterwards', pp. 57–77, in Tim Congdon (ed.), *Money in the Great Recession* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2017).
43. For the UK evidence, see Congdon, *Money and Asset Prices in Boom and Bust*, pp. 30–37.
44. In a regression of the annual changes in financial sector money on the annual changes on aggregate money, the estimated regression coefficient was 1.54 with a *t* statistic of 6.25. Again, contact the author at timcongdon@btinternet.com for further details of the statistical work.
45. The point has been much emphasized by Robert Shiller in several places. See, for example, p. 185 of Robert Shiller, *Finance and the Good Society* (Princeton: Princeton University Press, 2012) with the remark, "excess volatility is most apparent for the aggregate stock market".
46. Kenneth Kuttner, 'Outside the box: unconventional monetary policy in the Great Recession and beyond', *Journal of Economic Perspectives*, vol. 32, no. 4, 2018, pp. 121–46. According to Kuttner (p. 142), the correct research

message is that "quantitative easing functions primarily through the removal of duration risk from the market". Kuttner's paper makes no reference to the effect of QE on any recognized quantity-of-money aggregate, although it does mention banks' cash reserves.

47. 'Are central banks now impotent?', a debate between Adair Turner and Paul Tucker, *Prospect* magazine, March 2020 issue.
48. See footnote 37 above. In the month from 16 March – following the Fed's announcement on Sunday 15 March – the S&P 500 index rose by 16.6 per cent; in the three months from 16 March it rose by 28.5 per cent. In the UK, the Bank of England announced on 5 March 2009 that it would initiate operations with the Asset Purchase Facility that had already been created. ('Markets and operations' section, *Bank of England Quarterly Bulletin* [London: Bank of England], Q2 2009 issue, pp. 69, 81–6.) The FTSE 100 share index hit a six-year low of 3512 in early March. By the end of the year it had risen by 54 per cent. (Philip Scott, 'FTSE 100 rallies 22% in 2009', report for www.thisismoney.co.uk website on 31 December 2009.)
49. Fletcher, *Understanding Dennis Robertson*, p. 357. Fletcher's quotation was from a 1949 paper by Robertson in the *Three Banks Review.*

4. Why were economists' forecasts in the Covid pandemic so badly wrong?

As remarked in the Introduction, the great majority of economists failed to anticipate the inflation of the early 2020s. But it was worse than that. Many influential economists expected the Covid-19 pandemic to be followed by years of disinflation or perhaps even falling prices. A noteworthy example was Olivier Blanchard, who had been chief economist at the International Monetary Fund between 2008 and 2015. He wrote a 24 April 2020 column for the Vox CEPR Policy Portal under the title, 'Is there deflation or inflation in our future?'.[1] The preliminary abstract ran as follow,

> Will falling commodity prices, stumbling oil prices, and a depressed labour market bring low inflation and perhaps even deflation, or will very large increases in fiscal deficits and central bank balance sheets bring inflation? This column argues that it is hard to see strong demand leading to inflation. Precautionary saving is likely to play a lasting role, leading to low consumption, and uncertainty is likely to lead to low investment. The challenge for monetary and fiscal policy is thus likely to be to sustain demand and avoid deflation rather than the reverse.

Blanchard was far from alone in making an assessment of this sort. Richard Clarida, as vice-chair of the Federal Reserve board, spoke to the Economic Club of New York on 21 May 2020 on the American prospect. In his view, "the COVID-19 contagion shock will be disinflationary, not just over the next few months but over the next few years."

Similar messages were conveyed by large-scale forecasting exercises from other major central banks and supranational bodies such as the IMF and the Organisation for Economic Co-operation and Development. The exercises often came from teams of economists using powerful computers to estimate multi-equation models, with the ample resources at work presumably intended to show the forecasters' seriousness and commitment.

This book has shown that, at the end of 2020, broad money was up compared with a year earlier by over 20 per cent in the USA and by more than 10 per cent in most other developed economies. Policy announcements in March and April of that year had made it very likely that money growth would reach these elevated figures. Basic quantity-theory monetary economics signalled

risks of more inflation and higher interest rates. But on 14 December 2020, Tobias Adrian – head of the monetary and capital markets department at the IMF – wrote a blog about 'What to do when low-for-long interest rates are lower and for longer'. Clearly, Adrian expected the damage from Covid-19 to mean that interest rates would have to be lower for longer.[2] As he noted, he had in the previous month joined a panel hosted by the IMF concerned with *New Policy Frameworks for a 'Lower-for-Longer' World*. The other panel members were the just-mentioned Richard Clarida from the Federal Reserve, Philip Lane, chief economist at the European Central Bank, and Carolyn Wilkins, senior deputy governor of the Bank of Canada. They were all top-ranking figures in the field of international macroeconomics.

In fact, the highly rated economists and the computer-based forecasting teams had blundered. By autumn 2021 it was clear that the world economy was rebounding vigorously from Covid, with buoyant demand leading to marked shortages of raw materials and components, as well as to troublesome production bottlenecks; 2022 and 2023 saw the leading Western nations experience the highest inflation for 40 years. On 5 April 2022, Agustín Carstens, general manager at the Bank for International Settlements, said in a speech to the Geneva-based International Center for Monetary and Banking Studies that he was "surprised" by the return of inflation. He admitted that, "In the end inflation far exceeded the forecasts", and the misses from the 2021 forecasts had been "unusually large". Even the prognoses in his organization's iconic *Annual Economic Report* had gone badly awry.[3]

The Bank of England prepares elaborate forecasts for the UK economy. It was as wrong-footed by the return of inflation as other central banks. Several months into 2021 the principal fear among most of the Bank's economists was that they had not done enough to check a potentially persistent period of demand weakness. (See Chapter 8 for further discussion. In qualification, Andrew Haldane, the chief economist, became worried about inflation in early 2021, but he was not representative.) As late as May 2021, its *Monetary Policy Report (MPR)* opined that in the rest of the year a brief phase of strong growth and "modestly" above-target inflation was to be expected, but thereafter – to quote – "growth and inflation [will] fall back, with inflation around the target [of 2 per cent] two and three years ahead." Importantly, these benign inflation outcomes would be delivered – according to the *MPR* – without any significant change in interest rates. At the time Bank rate was 0.1 per cent.

In 2023 interest rates rose sharply in all the leading Western nations to deal with the inflation problem. At least the Bank of England realized by mid-2023 that public concern about the wrong forecasts justified an external review of its forecasting procedures. On 28 July 2023 its Court announced the appointment of Dr Ben Bernanke to carry out the review. Bernanke has already been mentioned in this book – in the Introduction and Chapter 1 – as an originator of the

idea of "a credit channel" of monetary policy transmission, which was cited in 2022 when he was awarded the Nobel Prize in economics.[4] The Bernanke report duly appeared in April 2024 and is mentioned, very critically, at various points in the rest of this chapter. The main aim of the chapter is to answer the question, "Why were so many forecasts, from supposedly authoritative sources, wrong in such comprehensive fashion?".

I.

The argument here is that the mistakes made by the overwhelming majority of economists can be explained by their neglect of monetary influences on the business cycle and inflation. The focus is very much on the UK, but the points have wider application and relevance. As noted in the Introduction, most inflation forecasts in the USA were shockingly poor in the Covid-affected period. Indeed, the above quotations from Adrian, Blanchard, Carstens and Clarida illustrate a massive if common misjudgement. These four might excuse themselves on the basis that there were hundreds of other economists and market participants making a similar assessment.

The following pages outline a monetary theory of nominal national income determination, which is very much in the tradition of the quantity theory of money and has been foreshadowed by the more detailed treatment in Chapter 1. A standard criticism of this theory amongst the currently fashionable mainstream in economics is that the *level* of the velocity of circulation is too volatile for the theory to have practical validity in policy-making.

However, empirical evidence for the UK is presented here that such criticism is misguided as regards *changes* in the velocity of circulation. Such changes both conform to a widely observed statistical distribution and, to mention a key technical term which is basic to contemporary analysis of economic time series data, they are "stationary". Crucially, this implies that the changes in velocity revert to their mean value in the period under examination. Moreover, the mean value of changes in velocity in the UK has been low on average over most medium-term timescales in the last 30 years, admittedly after more erratic experience in the 1970s and 1980s. (A "medium-term timescale" is to be understood as a period of at least five years.)

It follows that the rate of change in the quantity of money is likely to have a good medium-term relationship with that of nominal GDP. Given that the trend rate of output growth in the UK has declined since the mid-twentieth century and is at the time of writing (October 2024) little more than 1 per cent a year, the medium-term relationship between money and inflation must also be quite close. The neglect of money aggregates in Bank of England research is therefore the dominant culprit for the fiasco of its recent inflation forecasts. The Bernanke report might have been expected to notice the relevance of

money trends to inflation. But in fact it contained not a single reference to any money aggregate or any money-based account of the determination of national income.

The trouble is deep-seated. Because of their very structure, the standard macroeconomic forecasting models of today are unable to incorporate the mean-reversion of the change in velocity as a key feature. This may not matter much to inflation forecasts when money growth is low and stable, and the economy enjoys "monetary equilibrium". However, when the quantity of money has been subjected to a large shock – whether upwards or downwards – the economy is likely to be characterized by "monetary disequilibrium". (The notions of "monetary equilibrium" and "monetary disequilibrium" were introduced in section III of Chapter 1.)

Agents' attempts to restore equilibrium in the cyclical short run then have profound impacts on demand, output and employment, and affect the price levels of both assets and current production. As the standard UK forecasting models did not include these impacts in 2020 and 2021, they were unable to identify and anticipate the likely inflationary consequences of the money growth explosion being recorded at the time. The models – which have been similarly challenged in other episodes of money growth volatility in the UK – suffer from a fundamental weakness.

II.

According to the quantity theory of money, as usually stated, the level of national income *in nominal terms* depends on "the quantity of money". One position – which is very much favoured and endorsed in the current work – is that the quantity theory is most persuasive when the quantity of money is understood to include all conceivable money balances and so is broadly defined. Thus, in their celebrated *Monetary History of the United States, 1867–1960*, Friedman and Schwartz said that money broadly defined to include time deposits was "our concept of money". The quantity of money can then be regarded as consisting of notes and coin held by the public and *all* the deposit liabilities of the banking system. A brief but ambitious statement was ventured in Chapter 1 that *equilibrium* national income reflects the interaction of two influences, that is,

- the level of this broadly defined money aggregate, as determined by the banking system, its customers and monetary policy-makers, and
- the ratio of money to national income *desired* by money holders.

As noted there, the words "equilibrium" and "desired" carried much of the weight in the statement just made. They begged a number of questions which the rest of this chapter goes some distance to try to answer.

The "equation of exchange", famously proposed by Irving Fisher in his classic 1911 *The Purchasing Power of Money*, takes less for granted. The ratio of money to income is the inverse of the "income velocity of circulation" in one of its most well-known versions. As in Chapter 1, the equation may be stated as $M.V_y = P_y.Y$, where M denotes the quantity of money, V is the income velocity, P is the price level of output and Y is national income/output. This equation lies at the heart of the monetary approach to national income determination and guides the discussion in this chapter, but readers should be warned that it has a chequered reputation.

Evidence from all economies indicates that, over the medium and long runs, changes in velocity are small relative to changes in both the quantity of money and nominal national income. As will soon be explained, the claim that medium-term changes in velocity are small relative to those in money and national income does *not* imply that velocity is constant. Nevertheless, the relative smallness of changes in velocity over the medium term (over periods of, say, five or ten years) is important to the quantity theory. It appeals to a bedrock principle, that the private sector's underlying preferences in the holding of money are stable over time.

At least three considerations argue that velocity will vary over the years. To understand them, the distinction between an economy in monetary equilibrium and another suffering from monetary disequilibrium needs to be remembered. In monetary equilibrium, national income and wealth are at levels where agents (households, companies and non-bank financial institutions) are at ease and satisfied with the money balances they hold. Because they are at ease and satisfied with the amount of money in their possession, they are not inclined to alter their expenditure patterns or asset portfolios. More technically, the demand to hold money balances – which depends partly on income and wealth, and partly on the return to money compared to the return on other assets – is equal to the quantity of money actually in existence. By contrast, when the economy is out of equilibrium, agents have too much or too little money relative to income and wealth. This disequilibrium is typically symptomized by large movements from one quarter to the next in aggregate spending and asset prices, as people and businesses try to restore a better balance between their money holdings and other variables.

The demand to hold money balances is usually represented by a function of the following form,

$$M_d = f\left(Y, r\right),$$

where M_d is the amount of money demanded and Y is again national income/output. r might be read as "the rate of interest", but would be better understood as a term (which economists call "the own return on money") measuring the attractiveness of money relative to alternative assets. Clearly, the ratio of money to income – and, hence, velocity – can vary between different periods because of changes in the own return on money. The variations in velocity arising from this source – which is the first of our three disturbing influences – could in principle occur while the economy remains in monetary equilibrium.

The second consideration is more long-term. As economic growth unfolds, people use more equipment and infrastructure, and they accumulate assets. In consequence, the ratios of both capital to labour and financial wealth to national income increase. Financial transactions – and the size of the financial sector – expand relative to transactions in goods and services. Money is of course used in financial transactions. As a result, the quantity of money has a tendency to rise faster than national income and output, and its velocity shows a persistent downward trend. The pattern – which is an aspect of a larger process labelled "financialization" – was noticed by Milton Friedman in his 1959 Millar lectures and recalled in section VI of Chapter 1. Friedman conjectured that it would cause broad money in future decades to go up about 1 per cent a year more than national income in the United States of America. In the subsequent 50 years this conjecture was almost exactly correct.

How should this pattern be described more formally? When the money demand function is presented as,

$$M_d = f\left(Y, r\right),$$

implicitly the demand for money obtains *at one particular time,* when – for example – the ratio of financial wealth to income is given. But the last paragraph argued that over the decades the ratio of financial wealth to income tends to increase. The money demand function at time t can be stated as

$$M_d = f_t\left(Y, r\right),$$

The value of f increases over the years by an expansion coefficient, g, due to "financialization". So the ratio of money to national income rises over the long run and at time t will be $f_0(1+g)^t$, where of course f_0 is the function's initial value. The rise in the ratio of money to national income is the same thing as a fall in velocity. Because the fall in velocity is rooted in preferences and technology, it is consistent with equilibrium behaviour. More generally, a systematic fall in velocity *over a sequence of years* – if probably a small fall in

any typical year – is compatible with the bedrock idea, that agents have stable underlying attitudes towards their money holdings.

Something similar to the American pattern observed by Friedman has no doubt also applied in the UK. But in analysing UK monetary statistics, which began in their modern form in 1963, another consideration needs to be remembered. In the early post-war decades the British banking system was subject to almost continuous restraint on its growth, because of the correct belief that fast growth of bank credit was liable to cause a widening of the current account deficit on the balance of payments and to weaken sterling on the foreign exchanges. Credit booms were in conflict with the UK's participation in the Bretton Woods system of fixed exchange rates.[5]

Official restraint often took the form of simple and crude prohibitions on new bank lending. As a result, even in the mid-1960s banks were not competing freely and were smaller, relative to national output, than they would have been in a more liberal environment. In the 1970s and 1980s, Conservative pro-market governments removed the artificial curbs on bank balance-sheet expansion. In the newly competitive situation UK banks paid more for deposits and the equilibrium ratio of money to national income rose. (Broad money contains a high proportion of interest-bearing deposits.) To repeat, an increase in the ratio of money to national income is equivalent to a fall in velocity.

Finally, a third and perhaps the most awkward upsetting factor has to be highlighted. In the cyclical short run the economy can be shocked out of its equilibrium by large changes in the rate of money growth. If so, agents' money holdings are not at the *desired* level and national income is not in *equilibrium*. The Covid-related cyclical episode, which started with a huge drop in velocity in spring and summer 2020, illustrates this risk of "monetary disequilibrium". Economists suspicious of the quantity theory of money might protest that the cyclical volatility of velocity is a blatant weakness of the whole line of thought. The answer is that – if the quantity of money is jolted from its previous level by, say, a 10 per cent or 20 per cent jump or tumble in only a few months – households and businesses cannot be expected to adjust their behaviour immediately. The return to equilibrium may take many quarters, perhaps even a few years, with the processes at work subject to the lags which Friedman warned might be "long and variable".

Two examples can be cited now, but these, and two others, are further discussed later in this chapter, on pp. 139–40. The first relates to the Heath–Barber boom of the early 1970s, and the subsequent bust. In September 1971 the Bank of England announced the Competition and Credit Control reforms, which allowed banks to grow their assets rapidly and was accompanied by a surge in annual broad money growth to 21.8 per cent in the third quarter of 1972 and a local peak of 22.9 per cent a year later.[6] In that cycle, the peak rates of increase in inflation and nominal GDP came in 1975, roughly three

years later. The second arose in the late 1980s, with the Lawson boom. Money growth had been reduced in the early 1980s, but accelerated sharply from late 1985 and in 1988 its annual rate exceeded 18 per cent.[7] Forecasts of a boom and a rise in inflation ultimately proved correct, but the highest annual rates of increase in nominal GDP were recorded in late 1987 and early 1988, and the worst inflation numbers came as late as 1990.

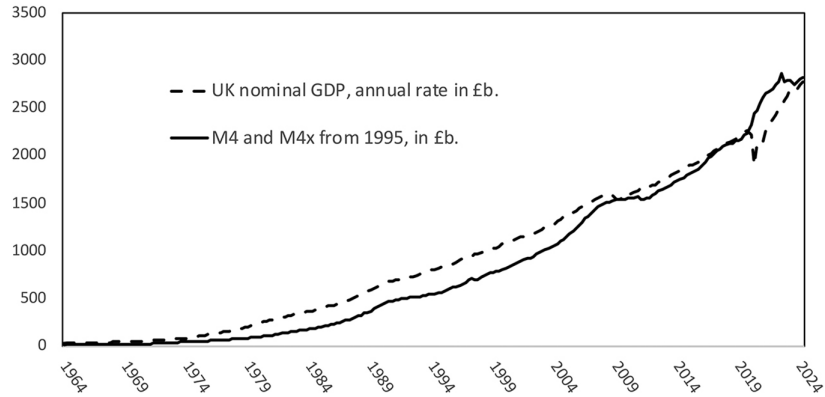
These examples argue that the occasional marked cyclical instability in velocity does not invalidate the quantity theory of money. The critical issue is whether velocity has a tendency to return to its longer-run trend after shocks to equilibrium have been registered. The evidence – soon to be set out in more detail, both in this chapter and Chapter 10 – needs careful statement. The UK pattern in the late twentieth century and early twenty-first century was that the velocity of circulation itself did not return to a constant mean value. But changes in velocity around a low long-run mean value do have the property of mean-reversion; they have this property of stationarity even if the processes of adjustment are sometimes heavily lagged, and may need as long as four or five years fully to work themselves out. The quantity theory of money may have to be qualified and carefully-presented, but its essence survives confrontation with the data.

III.

The current defence of a quantity-theoretic analysis of UK inflation pivots on the long-run behaviour of broad money velocity in the UK. If it were true that agents had stable money-holding preferences which kept velocity or its change stable over multi-year periods, large increases in the quantity of money – such as that seen in 2020 and early 2021 – would be expected eventually to result in a large increase in inflation.

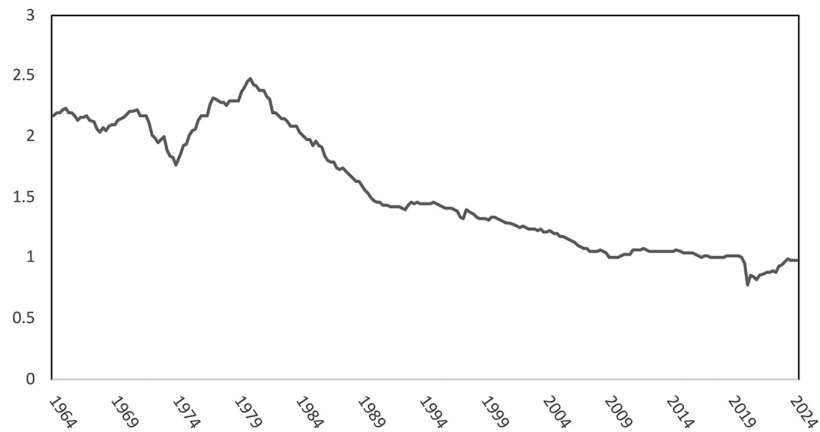
Figure 4.1 is of quarterly data, and shows the levels of the quantity of money broadly defined and national income at an annual rate (that is, with the quarterly numbers multiplied by four), from 1964 to early 2024.[8] Over the period between the first quarter of 1964 and the second quarter of 2024, broad money rose from £15.0 billion to £2,818.3 billion or at a compound annual rate of 9.0 per cent, while nominal GDP went up from £32.6 billion to £2,777.3 billion or at a compound annual rate of 7.7 per cent. Whereas in 1964 money was less than half annual GDP, in 2024 money and nominal GDP were roughly the same size. Figure 4.2 shows the velocity of circulation of broad money in the UK over the 61 years to the second quarter of 2024, and Figure 4.3 gives the change in velocity, compared with a year earlier, over the same period.

Figures 4.2 and 4.3 identify a sudden and large plunge in velocity in 2020. This should be seen as a glitch due to Covid and the highly expansionary policy response. To understand underlying behaviour, analysis may sensibly



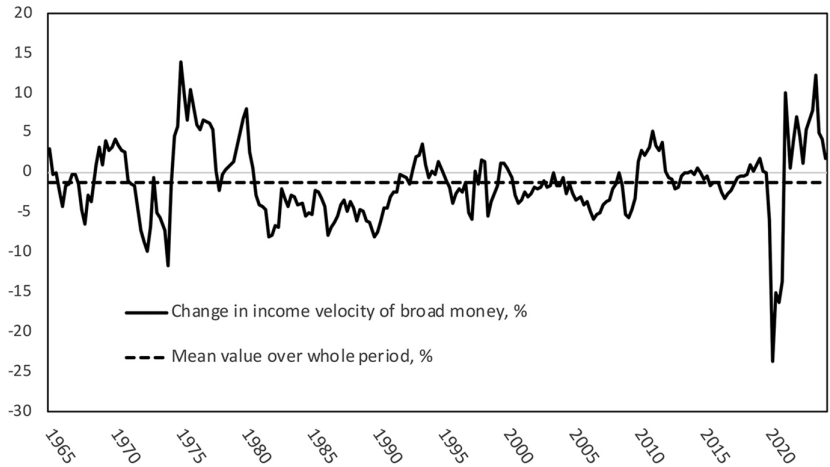
Note: Data are quarterly; broad money is M4 until 1995 and M4x thereafter.
Source: Broad money series from Bank of England, and nominal GDP from UK's Office of National Statistics.

Figure 4.1 UK nominal GDP and broad money, 1964–2024



Source: Data as in Figures 4.1 and author's estimates.

Figure 4.2 Income velocity of circulation of UK broad money, 1964–2024



Note: The series is quarterly and is of annual % changes.
Source: Data as in Figure 4.1 and author's estimates.

Figure 4.3 *Change in income velocity of broad money in the UK, 1965–2024*

concentrate on the preceding 56 years from 1963 to 2019. Plainly, velocity was not constant. The compound annual rate of decline over the 56-year period from 1963 to 2019 was almost 1.4 per cent. However, this way of characterizing the historical record is misleading. Velocity actually *rose* significantly from just under 2.2 at the end of 1963 to almost 2.5 in the first quarter of 1980. As discussed above, official restrictions on the banking industry held down the ratio of bank business to GDP. But also important in the 1970s was rapid inflation, which cut the own return on money balances in real terms and made them unattractive to hold. In the 1980s, banking was greatly liberalized, inflation was brought under control, and positive real interest rates were paid on interest-bearing deposits. Whereas velocity tended to rise in the 1960s and 1970s, it fell heavily in the 1980s.

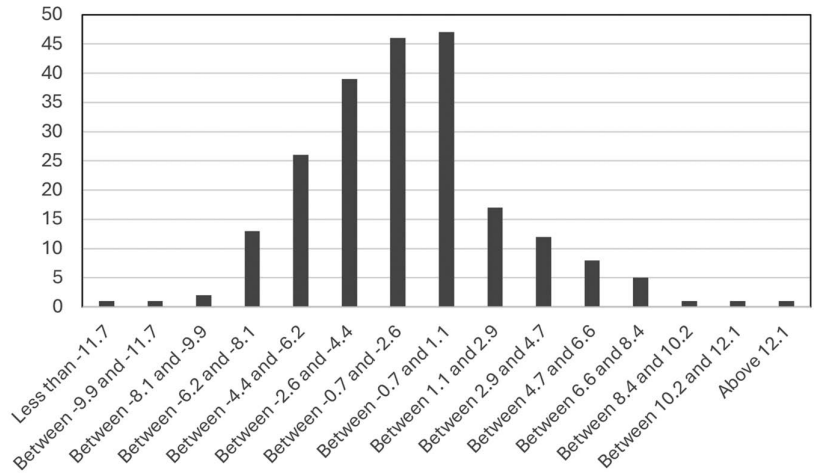
The contrast between the pre-1980 and post-1980 periods was important to the subsequent reputation of the quantity theory of money in the UK. Many observers asserted that money had become unstable in its relationship with the economy, contradicting the defining tenets of the quantity theory or "monetarism", as it was widely labelled in the media at the time. (It needs to be said

that the structure of UK monetary policy-making in those years, from 1976 to 1985, made little sense unless the broad-money monetarism discussed in this volume were valid. As discussed in Chapter 2 and elsewhere, broad-money monetarism was and remains different from the Chicago School monetarism associated with Milton Friedman and other American economists.)

The numerous assertions of money demand instability made in the 1980s went too far. The behaviour of velocity had potential explanations in the changes in the own return on money and the liberalization of the banking system, as identified in the above discussion of the forces that could cause changes in velocity. At any rate, in the decade to the first quarter of 1990, velocity declined from 2.48 to 1.48 or at an egregiously high compound annual rate of 5.0 per cent. As Figure 4.2 and 4.3 bring out, its fall thereafter was more moderate, at least until the Covid-19 shock of 2020. In the 15 years to mid-2007 – which corresponds roughly to the UK's so-called Great Moderation – velocity went down by a compound 1.8 per cent a year. The Great Recession of 2008 and 2009 was accompanied by a major reversal of the financial liberalization of the previous 30 or so years, with banks required to maintain higher capital/asset ratios and more liquidity relative to their deposit liabilities. Competition between banks – including competition for deposits – was less intense. Moreover, the Bank rate was a derisory 0.5 per cent or less from 9 March 2009 to 2 November 2017, implying negligible deposit rates. Savers still kept some of their wealth in the bank, but the real return was meagre compared with, say, the 1980s. In the 12 years to the fourth quarter of 2019, velocity did fall, but only from 1.06 to 1.02, and the compound annual rate of decline was a trivial ¼ per cent.

If the velocity of money were an unpredictable will-o'-the-wisp, data for the change in velocity should not conform to any known statistical distribution. Figure 4.4 gives a histogram, showing the frequency of annual per cent changes in velocity within certain bands, for the 1965–2019 period. Within this 55-year period, the average annual change in velocity was a fall of just under 1¼ per cent, as the post-1980 experience of 39 years of mostly falling velocity outweighed the pre-1980 experience of generally rising velocity. Of the 220 values, 158 (71.8 per cent) lay between minus 4.4 per cent and plus 1.1 per cent. According to the Kolmogorov–Smirnov test, the data are not inconsistent with the change in velocity being normally distributed. In other words, the data argue that – if the quantity of money grows at a particular x per cent rate – the most likely associated change in nominal GDP in this 55-year period would have been between values of x per cent minus 4.4 per cent and x per cent plus 1.1 per cent.

Despite all the turbulence and controversy in the decades under discussion, an analyst could then say that a double-digit rate of money growth would very probably be associated with an annual increase in nominal GDP of over 5 per

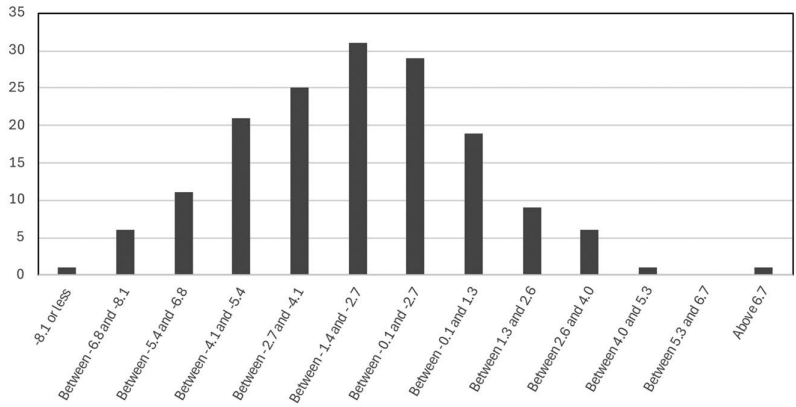


Source: Data from Bank of England.

Figure 4.4 *Frequency of changes in UK broad money velocity within certain bands, 1965–2019*

cent. (Remember that in the year to February 2021, M4x rose by just above 15 per cent.) Given that the trend growth rate of UK output has not been above 2½ per cent in recent decades, a further message is that a double-digit annual rate of money growth would almost certainly be incompatible – except perhaps for a few freak quarters of disequilibrium – with consumer inflation as low as the 2 per cent official target announced in December 2003. The conclusion would be reinforced by the weakness of productivity growth in the last decade, which implies a trend annual rate of output growth of little more than 1 per cent.

Critics might object that the normality of the distribution is a matter of chance, since it depends on a combination of values pre-1980 when velocity was rising and post-1980 when it was falling. Figure 4.5 therefore presents a histogram of the changes in velocity recorded from the peak in velocity in the first quarter of 1980 until the end of 2019. Within this 40-year period, the average annual change in velocity was a fall of 2.1 per cent, with the effect of the relative stability of velocity from the early 1990s largely offsetting that from the crash in velocity in the 1980s. Of the 160 values, 145 (90.6 per cent) lay between minus 6.8 per cent and plus 2.7 per cent. According to the Kolmogorov–Smirnov test, the data are again not inconsistent with the change in velocity being normally distributed. The economic interpretation is



Source: Data from Bank of England.

Figure 4.5 *Frequency of changes in UK broad money velocity within certain bands, 1980–2019*

as before. Occasional sharp changes in velocity might occur, but over periods of several quarters a double-digit annual rate of money growth would undoubtedly conflict with the official inflation target.

What do tests for "stationarity" say? The strongest monetarist claim – that velocity reverts to a constant mean value – is rejected by the data. Given the pattern for velocity shown in Figure 4.2, that is hardly surprising. Figure 4.2 instead suggests that equilibrium velocity has typically been changing over the years, with the average value of the annual change (regardless of sign) being just above 3 per cent. Now a vital result can be given. The usual tests for stationarity in the *change* in velocity are successful for both the entire period before the Covid-affected years (that is, between the final quarters of 1964 and 2019), for the period of mostly falling velocity from 1980 to the Covid-affected period (that is, the first quarter of 1980 to the final quarter of 2019), and for the period of only small falls in velocity from 1991 to 2019.[9] A glance at Figure 4.3 – with its oscillations around a mean – hints that the success of the tests is unsurprising.

As noted earlier, in the period under consideration the compound annual rate of fall in velocity was 1.4 per cent, while – as noted above – the average annual rate of decline was a touch lower at 1.3 per cent. Econometric work shows mean-reversion of the change in velocity towards these low figures. In some medium-term sub-periods in which the stationarity of the change in velocity was observed, the change in velocity was even less than 1.3 per cent.

The proposition can be advanced that the mean-reversion of the change in velocity was a deeply entrenched structural characteristic of the UK economy in the period under review. The analysis of velocity has been grounded in a defining feature of the quantity theory of money, namely the stability of private sector agents' money-holding behaviour. The levels and changes in nominal GDP can therefore be interpreted in terms of the quantity theory of money, with the evidence suggesting that the processes of adjustment can last several years. To recall and summarize, nominal GDP reflects the interaction of two influences, the level of this broadly defined money aggregate, as determined by the banking system and monetary policy-makers, and the desired ratio of money to national income (that is, the inverse of velocity).[10]

IV.

To understand the failure of the economic forecasts made in 2020 and early 2021, it is of course essential to look at the models on which they were based, and to appraise their realism and usefulness. Computer-based modelling began in the UK in the 1960s, as computers themselves started to be used outside laboratory contexts. The models had for many years a standard format, which rested on Keynesian macroeconomic theory of the kind presented in, for example, the Samuelson textbook, *Economics: An Introductory Analysis*. The textbook has already been discussed to some extent in Chapter 1, but there is more to say. At its core is "the Keynesian theory of national income determination". Specifically, national income and output depend on national expenditure, which in turn is to be understood as a stable multiple of so-called "autonomous demand". Autonomous demand consists of investment plus government spending, and – unlike consumption – does not depend on national income. In practice, these national income-expenditure models have equations for each of the main components of aggregate demand, that is, for consumption, investment, stock-building (or "the change in inventories"), exports and imports. (Numbers for government spending usually depends on stated official plans.) Forecasts of national income and output are the sum of the demand components.

In other words, in the real world, forecasting is very much a matter of simple addition.[11] The claim that total demand is a multiple of autonomous expenditure is honoured more in classroom instruction than in computer-based modelling. The future behaviour of consumption takes up far more attention than that of investment because – when adding up the total – consumption is much larger. The addition of the demand components may seem primitive, but it has the virtue of respecting the undoubted real-world identities of *ex post* aggregate demand with aggregate output and incomes. Any forecasts – even one prepared by economists with quite different analytical premises from those of Keynesian income-expenditure modelling – must also respect these identities.

Forecasts prepared in this way are invariably for national income and output *in real terms*, not nominal. This is loyal to Keynes' *General Theory*, which – as the book's title says – is about employment. In books II to IV of the *General Theory*, Keynes assumed constancy in what he termed "the wage unit", meaning wage costs per unit of output. So – in the critical sections of his most fêted classic – Keynes had nothing to say about inflation. Any change in nominal demand then implied an identical change in real output and hence in employment.

In book V of the *General Theory*, Keynes let the wage unit and the price level change, and he conceded that changes in the quantity of money were relevant to changes in the price level However, in successive editions of Samuelson's textbook the change in assumptions between the core books II to IV and the afterthought book V was never noticed. The Keynesians knew that they had to explain inflation somehow or other, and their preferred strategy was to concentrate on the labour market. A more detailed discussion follows on p. 142, and on pp. 258–9 in Chapter 10, but a fair generalization is that Keynesians of all shades believe that prices depend on costs, particularly wage costs, and changes in wage pressure reflect the balance between supply and demand in the labour market. The quantity of money does not appear – at all or anywhere – in the standard income-expenditure model; it certainly has no role in the determination of inflation.

The Bernanke report's account of the Bank of England's forecasting procedures in the early 2020s appeared to run on quite different lines. The Bank's "benchmark model" was allegedly a so-called "dynamic stochastic general equilibrium" model labelled COMPASS, with agents assumed to be characterized by "optimizing behaviour and rational expectations". The Bank's 2013 working paper on COMPASS said that it was "an open economy, New Keynesian DSGE model, estimated on UK data using Bayesian methods".[12]

Readers should take these remarks with several pinches of salt and treat them sceptically. DSGE theorizing began with a difficult 1982 paper by two American economists, Fynn Kydland and Edward Prescott.[13] They developed a so-called "real business cycle" model of the economy. Output was determined by a production function, and the quantity of inputs (the labour force, and hence its hours of work and productivity; and the capital stock); it did not depend on aggregate demand, as it would have done in Keynesian macroeconomics. Perhaps unsurprisingly, output changed in response, above all, to changes in hours worked and shocks to productivity. In their model monetary policy was irrelevant to fluctuations in economic activity!

If the key component of Bank of England forecasting exercises were truly a real business cycle model, it would be paradoxical and baffling that the results were contained in a document called the *Monetary Policy Report*. Monetary policy can remain of interest only if the DSGE model is supplemented by a

New Keynesian qualification that prices and wages are "sticky", and take time to adjust to shocks. But – whatever the hopes and fears expressed in the 2013 working paper – the Bank's economists in fact spend their time on subjects closer to the day-to-day reality of monetary policy decision-making. To quote from the Bernanke report itself, "Reflecting the de-emphasis of COMPASS, the model is no longer used to predict the effects of changes in interest rates or asset prices on the economy", where these changes are "a fundamental element of the forecast".[14]

One final characteristic of the typical forecasting model needs to be noticed. The models are short-run in perspective, and usually look not much more than a year or two ahead. This again harks back to the *General Theory*, in which the theory of national income determination of books II to IV was set within a so-called "Marshallian short run" with the capital stock given. Keynesian macroeconomics is distinct from the economics of growth, in which the capital stock and output per head are increasing over many years; it should instead be viewed as an attempt to formalize accounts of the fluctuations – in output and employment – that occur in the business cycle.

The *General Theory* did use the phrase "the trade cycle". It even has a chapter on the subject, towards the very end of the book. Notice the implied radical contrast between the macroeconomics of *The General Theory* and DSGE modelling. In Keynes' macroeconomics, short-run changes in aggregate demand (and hence output) can differ from the economy's given supply potential, resulting in changes in unemployment; in DSGE modelling the most significant cause of changes in output, even in the short run, is changes in the economy's supply potential. The Bernanke review is silent on the radical contrast. In the author's view, this silence is strange. It is uncontroversial that DSGE modelling and Keynesian income–expenditure forecasting come from utterly different ways of thinking about the economy.

The earlier sections showed that in the UK's business cycles of the past 50 or so years the mean-reversion of the change in velocity is relevant, above all, to *the determination of nominal national income over the medium term*, which may be *periods as long as four or five years.* (See also the synoptic account of a business cycle in sections VII and VIII of Chapter 1.) By contrast, the standard macroeconomic model is concerned to determine *real national income and output typically in the next two years.* Further, the standard models often makes no reference to any money aggregate, and accords no role to money in the determination of real output or inflation.

According to Bernanke's report, Bank of England forecasts are nowadays made for three-year periods subsequent to the publication of the *MPR*s. Despite all of his comments on the Bank's DSGE methodology, and despite its supposed borrowings from both New Classical and New Keynesian streams of thought, the Bank of England's latest and presumably state-of-the-art models

still have no active role for the quantity of money to determine anything. Moreover, at the end of the day aggregate demand is the sum of the demand components, and the change in aggregate demand determines the change in national income and output.

The omission of money from the standard models may not entirely invalidate them in relatively settled conditions, when money growth and inflation are stable, and agents' demand to hold money is not that far from the actual quantity of money in existence. However, when the economy suffers from severe "monetary disequilibrium", the models are liable to fail totally. Their equations do not contain the mixture of direct and indirect effects described in the monetary transmission mechanism of sections IV and V of Chapter 1. Examples of "monetary disequilibrium" can be found in the following episodes:

- spring and summer 1972 (because of the leap in money growth then under way, following the Competition and Credit Control reforms),
- in late 1987/early 1988 (after an acceleration in broad money growth, after the end of "over-funding", a form of "quantitative tightening", in autumn 1985),
- in late 2008 and early 2009 (when money threatened to contract, as banks reacted to the Basel III proposals by shrinking their risk assets), and
- in spring and summer 2020 (because of the excess money balances created by the Bank of England's asset purchases).

In all these episodes movements in the prices of equities and houses were large, and reflected agents' efforts to restore monetary equilibrium after shocks to broad money. In all these episodes also the UK's well-known forecasting groups were wildly inaccurate. An egregious example came in early 1988. The consensus was a sharp slowdown in the economy ahead of a year in which the growth of domestic demand was close to the highest in the UK's post-war history. According to Christopher Smallwood writing in *The Sunday Times* newspaper, "For economic forecasters 1988 will go down as the *annus horrendous*. It was the year they all got it wrong. And not just a little bit wrong, but spectacularly wrong". (In fact, Smallwood exaggerated. The author of this book, along with a small forecasting team at his then employers, prepared a forecast which was right in essentials. Monetary variables were prominent in the exercise.)[15]

But even worse was the complete failure of UK forecasters in the early 1970s to foresee the inflationary damage inherent in the broad money growth of over 20 per cent recorded in the Heath–Barber boom. At the time the National Institute of Economic and Social Research was regarded as the UK's foremost non-governmental forecasting body.[16] It supported the extreme fiscal

expansionism in the 1972 Budget. It also believed that a statutory incomes policy ("the Counter-Inflation Programme"), introduced by a January 1973 Act of Parliament, could keep inflation down to a single digit annual rate, regardless of the money growth rate of over 20 per cent. In the February 1973 issue of its *Review* it expected the growth of national output to be 5 per cent a year in both 1974 and 1975, after 6 per cent in 1973.

In the event, growth was a spectacular 8.0 per cent *in real terms* in 1973, but – with inflation threatening to take off to scary levels and the current account of the balance of payments lurching heavily into deficit – the government took measures to dampen demand. Instead of 5 per cent growth, output fell by 0.9 per cent in 1974 and by 0.2 per cent in 1975.[17] The National Institute had hoped that fiscal expansionism, accompanied by a statutory incomes policy, would promote an enduring boom. In the event, one year of unsustainably high growth was followed by a cyclical setback which, until that date, was the UK's worst since the Second World War.[18]

It is important to realize that the present critique of the standard models is radical and far-reaching. Let it be acknowledged that forecasts can be prepared in which

- the rate of growth of the quantity of money is determined by monetary institutions' new extension of credit (according to the identity of the so-called "credit counterparts arithmetic"),
- each sector of the economy has to hold part of the quantity of money, since it must be the case (yet another identity) that every sectors' money holdings sum to aggregate money, and
- as all agents must willingly hold their money balances for the economy to be in equilibrium, changes in the sectors' money holdings have impacts on their behaviour, and so have implications for consumption, investment and so on.

A forecasting team could also impose on itself a monetary straitjacket. This would constrain the future path of nominal GDP by the expected behaviour of the quantity of money and a requirement that money's velocity respect the stationarity of its change. The stationarity of this change was identified in section III above as a structural attribute of the economy.

But the Bank of England – like other central banks – has shown little interest in preparing forecasts based on quantity-theory thinking.[19] In any case some of the crucial mechanisms at work in semi-monetary models of this sort emphasize the impact of changes in money growth on the prices of assets like housing, commercial property and corporate equity, and the further effects of movements in these asset prices – in subsequent rounds of transactions – on

demand and output. The Keynesians – both Old and New – turn up their noses at such analyses, restricting themselves to discussion of the effects on aggregate demand of changes in interest rates and bond yields.[20]

The original source of this restriction, as emphasized in the Introduction, was Keynes' undue commitment to his liquidity preference theory of the rate of interest in *The General Theory*. In that volume Keynes forgot – or anyhow decided to neglect – the rudiments of a monetary theory of the determination of *all* asset prices broached in his *Treatise on Money*. He also mocked the seeming irrationality of operators in the stock market, comparing investment to "newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole".[21]

He thereby started a tendency to dismiss the behaviour of speculative asset markets as of no interest to macroeconomics. Sneering at the symbols of capitalism has subsequently been a persistent theme of Keynesian economists, being common to such figures as Paul Samuelson in the second half of the twentieth century, and Robert Shiller and Paul Krugman in the last 30 years.[22] On 30 November 2020 Shiller was joint author of a piece for the Project Syndicate website, which conceded that there was "much puzzlement that the world's stock markets haven't collapsed in the face of the Covid-19 pandemic", but suggested as an indisputable fact that "asset markets are substantially driven by psychology and narratives".[23] In an article for the Vox website on 10 May 2021, under the title 'Why stocks soared while America struggled', Krugman was quoted as asserting, "No matter how many times we keep on saying the stock market is not the economy, people won't believe it, but it isn't. The stock market is about one piece of the economy – corporate profits – and it's not even about the current or near-future level of corporate profits, it's about profits over a somewhat longish horizon."[24]

This was an odd way for the Keynesians to proceed. Chapters 1 and 3 have shown that variable-income assets are far more important in people's wealth than fixed-income assets. Moreover, for most of the time their price changes are much larger than changes in the value of bonds. Further research is needed, but a plausible thesis is that changes in the value of equities and real estate are many times more powerful in their effects on spending than changes in the value of bonds. To claim that economists can forecast output, employment and inflation, and yet that they cannot forecast – and should not even try to forecast – the stock market and the value of houses, is to admit obvious, even blatant inconsistency. Sure enough, the price gyrations of the stock market and even of residential housing contain much that is fickle, volatile and unstable. But these gyrations can at times be a controlling element in the business cycle. An argument in this book has been that the key determinant of the nominal

value of variable-income assets is the quantity of money, broadly defined. It speaks volumes that – in their late 2020 meditations on "sky-high" share prices – Shiller and his associates said nothing about the money explosion of 2020.

V.

To repeat, national income forecasting in central banks is usually based on the Keynesian income–expenditure model, which has undoubted intellectual roots in Keynes' *General Theory*. But in the last 30 years increasing attention has been paid to the school of thought – discussed in the Introduction and Chapter 1, and indeed in the Bernanke report – which takes the label of New Keynesianism. In New Keynesianism the labour market is at the front and centre of analysis, and inflation depends only on its workings. Roughly speaking, inflation is taken to be stable at its expected rate, unless the labour market is characterized by excess demand or excess supply. If excess demand obtains in the labour market, with unemployment beneath its "equilibrium" (or "natural") rate, inflation accelerates; if instead there is an excess supply of labour, with unemployment above its equilibrium rate, inflation decelerates. This so-called "accelerationist hypothesis" is captured by an equation known as "the expectations-augmented Phillips curve". The concept of the curve began with work by A. W. ("Bill") Phillips at the London School of Economics in the late 1950s, but it was radically re-interpreted by the next generation of economists, notably by Milton Friedman in his 1967 presidential address to the American Economic Association and Edmund Phelps (another Nobel laureate) in roughly contemporaneous journal articles.[25]

In the 1999 article by Richard Clarida, Jordo Galí and Mark Gertler, two equations were added to the expectations-augmented Phillips curve to create the three-equation New Keynesian model. As already mentioned in the Introduction, one of these was the so-called "IS curve", which bases aggregate demand on the level of the central bank interest rate and dates back to the controversies of the 1930s stirred up by the *General Theory*. The second was a "Taylor rule", which shows how the central bank reacts to inflation and the degree of slack in the economy, according to a formula devised in a 1993 paper by John Taylor.[26] The reaction is described wholly by the central bank's decisions on its most publicized short-term rate of interest. (Taylor is an economist at Stanford University who worked at the US Treasury in the George W. Bush presidency.)

Views about the usefulness of three-equation New Keynesianism vary among economists, but – as noted in the Introduction – it was applauded by Huw Pill, the Bank of England's chief economist, in a speech on 24 June 2022. The three-equation approach is attractive partly because of its brevity and compactness. On the face of it, the model is remarkable, as its mere three

equations purport to capture the complex reality of a modern economy. Its supporters are guided by the model to view inflation expectations as the crucial determinant of actual inflation. In general, they are relaxed about inflation prospects as long as the available evidence on inflation expectations suggests that such expectations are "well-anchored" (to use the common phrase) close to the inflation target.

The New Keynesians pay next to no attention to the quantity of money and its recent rate of growth. The three equations do not contain any reference to a money aggregate. In fact, the classic Clarida, Galí and Gertler article – often greeted on its initial reception as defining "the state of the art" in the subject – conceptualizes an economy without banks and the banking system, without a corporate sector distinct from households, and without non-bank financial institutions such as life insurance companies and pension funds. The broadly defined quantity of money is eliminated by assumption.

Because of these omissions the three-equation model cannot elucidate, for example, the impact of such central bank operations as "quantitative easing" and "quantitative tightening" (QT) on the economy. As the very phrases to denote these operations indicate, they have their first impact on the quantity of money. A monetarist would say that, once the effect of QE or QT on the quantity of money is calculated, the monetary theory of national income determination – as set out in Chapter 1 – can take over to assess the effects on the economy; a New Keynesian would reject the monetarist argument, perhaps alleging that no clear channel of transmission from the quantity of money to macroeconomic behaviour can be found. The Introduction and Chapter 1 of this book were written with the deliberate aim of refuting the New Keynesian allegation.

In late 2020 and early 2021, many top central bankers, in the UK and elsewhere, appealed to evidence on inflation expectations to reassure themselves that – despite the pervasive signs of booming demand and over-heating, and the despite the surge in the stock market and house prices – inflation would not be a problem over the medium term. An example is provided by Andrew Bailey's remarks in the press conference announcing the May 2021 *MPR*: "Overall, the risks to the Monetary Policy Committee's inflation projection are judged to be broadly balanced. Most measures of inflation expectations have been broadly stable since the February *Report*, and the MPC continues to judge that inflation expectations remain well anchored." As pointed out at the start of this chapter, the May 2021 *MPR* was hopelessly wrong in its inflation forecasts for 2022 and 2023.[27]

New Keynesianism uses the Taylor rule to seek insight on the appropriate specification of monetary policy. But – as New Keynesianism has no role for money – the Taylor rule unsurprisingly says nothing about the appropriate path for any money aggregate. One result is to encourage those who believe that

the setting of monetary policy is only about interest rates. As the Introduction noted, this type of interest-rate-only macroeconomics has flourished at the Bank of England and other central banks in recent years. It was argued there that interest-rate-only macroeconomics must take much of the blame for economists' catastrophic failure in the 2020s to forecast inflation properly.

VI.

The argument has been that the neglect of money in the standard macroeconomic forecasting model is a fatal design error. The data show that in the UK – over the period in which modern monetary statistics have been prepared – the ratio of money to nominal GDP has varied over the decades, refuting monetarist suggestions that changes in them conform to a mechanical proportional relationship. Nevertheless, the change in velocity is a stationary series. By implication, the change in velocity requires interpretation and discussion, and macroeconomic forecasters – including those at the Bank of England – must pay close attention to the behaviour of the quantity of money. But this is not what they do.

The weakness of the standard approach is its reliance on the income–expenditure model of national income determination set out in the Samuelson textbook. Whatever the various addenda and corrigenda reportedly made to that model from its contacts with real business cycle theory, DSGE modelling, New Keynesianism and the like, it remains the case that sum of the demand components is equal to aggregate demand. The weakness of the resulting forecasting procedures is demonstrated most clearly when the economy has to respond to a large upwards or downwards change in the rate of money growth. Such large changes cause agents to have too much or too little money relative to their income and wealth, and – if the large changes are not suddenly reversed – it is income and wealth that have to change to restore equilibrium.

The transit from disequilibrium to equilibrium affects asset prices and, via the exchange rate, the prices of foreign goods and services in the domestic currency (that is, in sterling, in the UK case); it is not relevant only to wages and unit costs, and the prices of goods and services. Any comprehensive account of the inflation process has to incorporate asset prices and the exchange rate. The expulsion of money from standard macro-modelling is associated with a focus on the labour market and a cost-accountancy view of inflation. This association may have been logical and understandable inside the confines of a Keynesian approach. But the Keynesian approach is too limited. Further, by tempting policy-makers to think exclusively in terms of particular costs and prices, it may lead them to favour prices and incomes policies as the right antidote to inflation. Attacks on a monetary view of inflation weaken the case

for the independence of central banks, and may may have dangerous consequences for future policy-making.[28]

The problems have been particularly evident in the Bank of England's research in the Covid-related cycle of the 2020s. The labour market is only one part of the economy. In many of the UK's business cycles in the post-war period, movements in asset markets have preceded those in labour markets. They have acted as an early-warning system for inflationary processes that have played out for four or five years from an initial monetary shock. In the latest episode big gains in house prices and the stock market in 2021 coincided with persisting worry on the Monetary Policy Committee about deflation. The discrepancy was extreme and ought to have been obvious to the Bank's top officials. The forecasting performance of most of the MPC's members in 2021 has to be condemned as inept. The Bank's chief economist, Andrew Haldane, was unusual in being anxious at the start of the year about a looming surge in inflation. He chose to leave the Bank's employment.

The failure of the Bank of England in the early 2020s follows a pattern. Just as in the Barber boom of the early 1970s, the Lawson boom of the late 1980s, and the Great Recession of 2008 and 2009, the Bank's economists and forecasters have been caught out. A case has been made in this chapter that – in all these cyclical upheavals – much of the trouble could have been avoided if more attention had been paid to developments in the banking system and the resulting fluctuations in the growth of money on the broad definitions. The Bank's economists and forecasters may protest that they have been responding to the latest trends in macroeconomic thinking, as well as to the consensus in their profession. A self-defence on such lines raises wider issues about how that professional consensus has evolved in the last few decades. This chapter has not hidden the author's scepticism about how much value has been added to a genuine understanding of the economy's workings by certain supposed advances in macroeconomic theory in recent decades.

Ben Broadbent, the Deputy Governor of the Bank of England with responsibility for monetary policy in the Covid-affected period, gave a speech to the National Institute of Economic and Social Research on 25 April 2023. Although billed as 'Monetary policy: prices versus quantities', part of its agenda was to respond to the monetarist critique of the Bank's handling of money and inflation in the previous three years. His concluding sentence said that, "as with just about every other economic indicator, changes in money holdings need some interpretation and their significance is not always 100 per cent obvious or 'inevitable'". Of course, data on money growth need interpretation. But the evidence presented in this chapter argues that an annual rate of broad money growth in the teens, if sustained for a few quarters, would very probably result in double-digit inflation. The ideas at work may not be entirely "obvious". But they are easy enough to understand within the analytical framework of the

quantity theory of money. The quantity theory of money may not be flawless, but it is consistent with much evidence, and is one of the most durable and familiar in economics.

VII.

The Bernanke report was published after the first version of this chapter was written.[29] Given the success of money-based forecasting in the 2020s, it might have been expected that the report would at least give a nod of recognition to the monetarist arguments. But that was not the position at all: money-based forecasting was ignored altogether. The report gave the appearance of having much to say in criticism of the Bank of England, offering no fewer than 12 recommendations for change. But that also was not in fact the case. The criticism amounted to nothing more than a tap on the wrist. Bernanke gave his full blessing to the Bank's overall approach to macroeconomic forecasting, and said that it needed only to be tweaked by better maintenance of data and updating of software.

The Bernanke report had next to nothing to say about the history of macroeconomic forecasting in the UK; it was simply not interested in how UK forecasters had conducted themselves in the Heath–Barber boom, the Lawson boom or the Great Recession. Instead of making comparisons of forecasts over time, between an unsatisfactory present and an often inglorious past, it compared them over space in the present. In particular, its Part III on 'Comparisons of forecast accuracy' examined the forecasting records of the Bank and six other leading central banks in the 2020s. A critic might say that this six (the US Federal Reserve, the European Central Bank, the Bank of Canada, the Reserve Bank of New Zealand, Norway's Norges Bank and the Swedish Riksbank) were chosen so as not to embarrass the Bank of England. Bernanke showed that all seven organizations committed serious errors in forecasting in the 2020s, with the Bank much in line with the others. In that sense it was not an outlier or particularly at fault. Earlier in this chapter, four senior individuals in international economic policy-making – Tobias Adrian, Olivier Blanchard, Agustín Carstens and Richard Clarida – were quoted, to show that they shared the erroneous consensus view about what Covid-19 meant for inflation. Given the wider intellectual climate, it is unsurprising that the six top central banks – like the Bank of England – fluffed their analysis of the subject.

If Bernanke had gone down an alternative route by considering the performance of the Bank of Japan and the Swiss National Bank, he might have reached a different conclusion. Unlike the seven he selected for his report, these two central banks did not engage in large asset purchases and so did not engineer sharp accelerations in broad money growth. Crucially, they also did

not see the same marked deterioration in inflation outcomes. (See Chapter 6 for more on this point.)

The reference to central bank asset purchases raises the question of how Bernanke – undoubtedly one of today's most influential central bankers – appraises the usefulness of this aspect of monetary policy. He has in fact written about the subject elsewhere, notably in his 2022 book *21st Century Monetary Policy: The Federal Reserve from the Great Inflation to COVID-19.*[30] But, in his report on the Bank of England, he says almost nothing about it. Part III has a section about the forecasting of 'Monetary policies' in the seven central banks in his sample. But this reduces to a discussion about the extent to which the central banks anticipated the large interest rate increases of 2022 and 2023, and of the celerity with which they changed their former complacency on interest rates. As far as asset purchases were concerned, there is only one sentence in the report. That sentence is in parentheses and merely says that asset purchases are not included in the comparison exercise!

The heart of the monetarist critique of central banks' reaction to Covid-19 is that they engaged in asset purchase programmes which were much too large and so caused an excessive increase in the quantity of money. The Introduction to this book said that the favourite theories of modern central bankers airbrush the quantity of money from their visualizations of the economy. We have seen in the current chapter that the Bernanke report on the Bank of England has a mass of references to New Keynesianism, DSGE models, rational expectations and the like, but none to the quantity theory of money or to any money aggregate.

Given the intellectual background, the Bernanke report's silence on the role of asset purchases in monetary policy might be regarded as appropriate, par for the course and to be expected. All the same, some might conclude that the Bernanke report did not deal meaningfully with the most important criticism of the Bank's policy-making decisions in the 2020s.[31] Bernanke's main complaint about the Bank was that its forecasting setbacks reflected the misallocation of personnel and other resources between different functions. He should instead have attributed them to the selection of inadequate and misleading models which had no role for the quantity of money to affect anything, let alone the inflation rate.

NOTES

1. Olivier Blanchard, 'Is there deflation or inflation in our future?', blog on Vox EU portal for 24 April 2020, available at https://cepr.org/voxeu/columns/there-deflation-or-inflation-our-future

2. Tobias Adrian, 'What to do when low-for-long interest rates are lower and for longer', IMF blog, available at https://www.imf.org/en/Blogs/Articles/2020/12/14/what-to-do-when-low-for-long-interest-rates-are-lower-and-for-longer
3. Bank for International Settlements, 'The return of inflation', speech by Agustín Carstens to International Center for Monetary and Banking Studies, 5 April 2022. Carstens' doctorate is from the University of Chicago.
4. See pp. 47–8 above.
5. For a classic statement of the case, see James Ball and Terence Burns, 'The inflationary mechanism in the U.K. economy', *American Economic Review*, vol. 66, no. 4, 1976, pp. 467–84.
6. The numbers cited relate to the M4 measure of money.
7. At the time, market commentary was focused on the growth of the M3 money measure, which did not include building society deposits. Its peak annual growth rate in the Lawson boom was in fact over 28 per cent in the first quarter of 1988. The statement in the text refers to the M4 money measure, which includes building society deposits. See p. 162 of *Economic Trends: Annual Supplement* (London: Her Majesty's Stationery Office, for the Government Statistical Service, 1989).
8. The M4 series in the Bank of England's database include numbers for 1963, but they show a large and implausible fall during 1963, which is presumably a series break of some sort. The author has used the series from the first quarter of 1964, about which he is more confident.
9. The author would like to express his considerable gratitude to Kent Matthews of Cardiff University and Paul Ormerod of Volterra Partners for their help in examining the data and obtaining key results. These results are fundamental to the argument of the chapter. Indeed, the chapter would not be viable in its present form without their contribution. The author remains responsible for all errors of fact and interpretation.
10. As noted in Chapter 1, the government sector is a complication. It was explained there that the government's a demand to hold money is utterly different from that of private sector agents, because of the government's fiscal powers and related creditworthiness within its own borders.
11. The author was a member of the Treasury Panel of Independent Forecasters (the so-called "wise persons") from 1993 to 1997, in recognition of the accuracy of his forecasts of the Lawson boom in the late 1980s, where he used a broad-money monetarist analytical framework. He cannot recall a single meeting of the Panel at which anyone viewed national income as a multiple of autonomous expenditure. Instead, as remarked in the text, the focus of discussion was on consumption, because it was the largest component of aggregate demand.
12. Stephen Burgess and others, 'The Bank of England's forecasting platform: COMPASS, MAPS, EASE and the suite of models', *Working Paper no. 471* (London: Bank of England, May 2013).
13. Finn Kydland and Edward Prescott, 'Time to build and aggregate fluctuations', *Econometrica*, vol. 50, no. 6, 1982, pp. 1345–70.

14. Ben Bernanke, *Forecasting for Monetary Policy Making and Communication at the Bank of England: A Review* (London: Bank of England, April 2024). The quotation is from the section on 'The Bank's modelling and forecasting tools' in part II.
15. Tim Congdon, *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1992), pp. 191–4.
16. The National Institute was in receipt of substantial amounts of public money to pay for its research; it was also close to the Treasury in terms of both physical location and intellectual mindset.
17. For more on the fiascos of National Institute forecasting, see Tim Congdon, 'A critique of two key concepts in Keynesian textbooks', pp. 44–76, in Steven Kates (ed.), *What's Wrong with Keynesian Economic Theory?* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2016), also available from the website of the Institute of International Monetary Research at https://mv-pt.org/wp-content/uploads/2019/05/159118-IIMR-Research-Paper1-web-002.pdf
18. The recession from late 1973 to 1975 was more protracted than the Great Recession of 2008 and 2009, but not quite as deep.
19. This is not to say that the Bank of England has totally ignored what the monetarists have had to say. From time to time its *Inflation Reports* and *Monetary Policy Reports* have included sections on broad money and its potential bearing on macroeconomic developments. See, for example, Box B, pp. 49–54, in the May 2024 issue of the *Monetary Policy Report* (London: Bank of England). The elimination of the monetary overhang noted there, on the ratios of both aggregate money to nominal GDP and household money to personal income, is much the same thing as the reversion to mean of the change in velocity discussed in the present chapter.
20. Old Keynesianism is to be understood as the theory of national income determination in the Samuelson textbook.
21. Keynes, *General Theory of Employment*, ed. Johnson and Moggridge, *Collected Writings*, vol. VII, p. 156.
22. For Krugman's indifference to stock market fluctuations, see, for example, Paul Krugman, *The New York Times*, subscriber-only newsletter for 6 August 2024, 'Market crashes happen: they don't necessarily mean much'.
23. Robert Shiller, Lawrence Black and Farouk Jivraj, 'Making sense of sky-high stock prices', blog article on 30 November 2020, Project Syndicate website, https://www.project-syndicate.org/commentary/making-sense-of-soaring-stock-prices-by-robert-j-shiller-et-al-2020-11
24. Emily Stewart, 'Why stocks soared while America struggled', feature on Vox website (www.vox.com), 10 May 2021.
25. Milton Friedman, 'The role of monetary policy', *American Economic Review*, vol. 58, 1968, pp. 1–17 and, for example, Edmund Phelps, 'Money-wage dynamics and labor-market equilibrium', *Journal of Political Economy*, vol. 76, 1968, pp. 678–711.

26. John Taylor, 'Discretion versus policy rules in practice', *Carnegie-Rochester Conference Series on Public Policy* (North Holland: Elsevier, 1993), vol. 39, pp. 195–214.
27. Also relevant here is the author's 2023 pamphlet for the Politeia think tank on the recent mishaps of British monetary policy: Tim Congdon, *Inflation: Why has it come back? And what can be done?* (London: Politeia, 2023).
28. On 10 March 2020, Archie Norman, chairman of Marks & Spencer and one of the UK's smartest businessmen, said that the Bank of England could not take plaudits for the fall in inflation then emerging. (See Bloomberg story on 10 March 2024, on 'M&S chair says UK rate rises have been "totally ineffective"'.) In his words, "What we've proved in the last three years is that monetary policy is totally ineffective. There's a marginal effect, but inflation was driven by global macro prices. It had no bearing on the price of gas. It had no real bearing on the price of food." Notice that economists who favour a cost-accountancy approach to inflation analysis are also liable to support prices and incomes policies as a remedy. This was an abiding theme of the UK policy debate in the 1960s and 1970s. The rise of monetarism – and so of a monetary policy-based approach to inflation control, which culminated in the granting of operational independence to the Bank of England in 1997 – defeated the advocates of prices and incomes policies in the public debate about economic policy. See, for background, Peter Jay, *A General Hypothesis of Employment, Inflation, and Politics* (London: Institute of Economic Affairs for the Wincott Foundation, 1976). Prices and incomes policies involved direct intervention in companies' price and wage setting, and might be seen as inconsistent with a free society. The subject is beyond the scope of the present work, but the current eclipse of a monetary view of inflation may alter the policy dynamics. If rather high inflation were to return on a semi-permanent basis, cost-accountancy interpretations might lead to renewed proposals of prices and incomes policies and to the downgrading of monetary policy.
29. This chapter began as a response to questions asked when the author gave evidence to the House of Lords' Economic Affairs Committee on 16 May 2023, in an enquiry on the independence of the Bank of England. It was too long to be suitable as evidence to the committee, but was circulated to some of its members.
30. Ben Bernanke, *21st Century Monetary Policy* (New York: W. W. Norton & Company, 2022), p. 316.
31. Those doubtful about the quantity-theoretic criticism of the Bank of England's performance in the early 2020s might dispute the claim that it was "the most important" such criticism in the period. But the financial press hardly noticed any other criticism. Numerous examples are available. Ambrose Evans-Pritchard of *The Telegraph* wrote a column on 28 April 2023, under the headline, 'It is high time for radical disruption within the Bank of England', which recognized the validity of the quantity-theoretic argument, and described central bank researchers as "captives of New Keynesian group-think and the hegemony of the DSGE model (dynamic stochastic general equilibrium)".

Jeremy Warner, also of *The Telegraph*, had an article about how 'We'll all pay for the Bank of England's blindspot for the bleeding obvious', on 4 March 2023, which included the sentence, "Very little understanding of complex economics is required to see that inflation is above all a consequence of too much money chasing too little supply." Martin Wolf, chief economics commentator on the *Financial Times*, has been and remains a consistent opponent of money growth targets. But on 4 September 2024, his column appeared under the title 'Lessons from the great inflation', in which he noticed the mean-reversion of the velocity of broad money in three jurisdictions. He also recalled his mention – in his *Financial Times* column of 20 May 2020 – of the author's very early warning about the inflationary dangers of unduly large central bank asset purchases.

PART II

Applications of the theory in the early 2020s

5. The money explosion of spring 2020, as it happened

The first half of this book set out a version of the quantity theory of money. According to this account, equilibrium national income depends on the interaction between private sector agents' money-holding preferences and the quantity of money, broadly defined. The quantity of money in turn depends on the banking system's extension of credit to the state and the private sector. The banking system consists of *both* commercial banks *and* a central bank. The commercial banks are motivated mostly by profit, extending credit subject to liquidity and solvency constraints; the central bank, acting as banker to both the state and the banking system, is motivated not by profit, but by – among other things – the objective of monetary stability.[1]

In the author's view, the above approach to the determination of national income should not be controversial. By implication, the behaviour of the quantity of money is fundamental to macroeconomic analysis, prognosis and prescription. However, in the received understanding of macroeconomics now prevalent in universities, central bank research departments and elsewhere, the quantity of money does not even have the status of being interesting. Rather, it is despised as a redundant fifth wheel or an irrelevant outlier, and sometimes it is merely ignored. As noticed in Chapter 1, Paul Krugman – perhaps the most influential economist in the world – deemed the notion of a link between money and inflation as "a cockroach idea". The purpose of the present chapter is to show that the author used his version of the quantity theory to make good forecasts – in late March and early April 2020, several quarters ahead of events – of the inflation flare-up of the early 2020s.

The author is chair of the Institute of International Monetary Research, which he founded in 2014. Every month he publishes, under the Institute's auspices, an emailed note summarizing money growth developments in the world's leading six economies. (The note is sent to about 3,000 email addresses.) But in late March and early April 2020, he was so astonished by the emerging money explosion that – in addition to the regular material – he penned a few special emails and sent them also to the Institute's email circulation list. Two of these are used below, in sections II and III, with their dates showing the evolution of

the data and the associated commentary. The focus was on the US numbers, where for a period of a few weeks in spring 2020 monetary and fiscal policy-making was a frenzy of expansionism. In those few weeks, the author's Friday evenings were dominated by his downloading of the Federal Reserve's *H8* press release, with its figures on US commercial banks' assets and liabilities. The number for "deposits" was the key one, since these were by far the largest constituent of broad money.

I.

1st Report, with Inflation Warning: 24 March 2020

A regular monthly email was sent out about a week before the end of March 2020. The indented material below is all from that email, although the paragraph order has been rejigged to create a more consecutive argument and statements in the first person have been suppressed.

> The Institute of International Monetary Research focuses on the relationship between trends in the growth of the quantity of money, broadly defined, and macroeconomic outcomes. At present, the Covid-19 coronavirus outbreak dominates the news, and is causing havoc with both the world economy and global macroeconomic forecasts. The damage to travel – and then to related industries, such as hotels, leisure, catering and conferences, and also to the demand for travel-related commodities (oil, for example) – is severe and far-reaching. Equity markets have crashed, inflicting losses on investors which will crimp consumer expenditure and aggregate demand.
>
> Last month this summary concluded its first paragraph, "There has to be at least a possibility that world output will … fall in 2020." The certainty of a fall is now conventional wisdom, with debate being about its size. The output fall is then being described as "a recession". However, it is an unusual recession, in that it is largely due to supply-side disruption, not to a drop in aggregate demand. That has not stopped governments from reacting as if it were a demand-deficiency recession. A range of measures will widen budget deficits by several percentages of GDP. The enlarged deficits will be financed to a significant extent from banking systems, leading to an acceleration in broad money growth. When the coronavirus outbreak comes under control, the larger budget deficits and the excess money balances will still be present. An inflationary boom is to be expected.
>
> The dimensions of the boom, and the extent of the inflationary damage, are uncertain at this stage. Much will depend on the rate of money growth in the rest of 2020, and the Institute will, of course, track the numbers in the main countries. Policy is likely to be particularly lax in the USA, which is hardly surprising in a presidential election year. The annual rate of broad money growth may well move into the double digits in coming months. But even in Germany there has been an intellectual somersault, with its government now envisaging a €150b. increase in public debt in response to the economic problems created by the coronavirus. Enormous figures are being given across Europe for the size of government loan guarantees. Many

comparisons are being made with "war", as if the coronavirus were a military rather than a medical threat. Wars are routinely followed by inflationary booms – and something similar seems all too plausible in several leading countries in the next two or three years.

The official response has varied between countries and it is too soon to be confident about the exact impact on world output in 2020. But the probability has to be a significant fall, perhaps of as much as 5 per cent. The probability must also be that a vaccine is available by mid-2021, that testing, self-isolation and quarantine measures become more effective, and that in coming months better treatments are made available, and that fewer infected patients die. By late 2021 the epidemic should be under control, and a big bounce-back in financial markets, and in aggregate demand and output, is to be envisaged.

In assessing the likely vigour of the bounce-back, money trends remain important. Some of banks' customers will suffer cash-flow strain, but governments have offered remarkably generous loan guarantee arrangements and – in contrast to the Great Recession of 2008 – central banks are trying to help banks rather than to punish them. It must be emphasized that – if the aggregate quantity of money is given – cash-flow shortfalls in some parts of the economy will be exactly offset by cash-flow abundance in others. Indeed, if the aggregate quantity of money is growing, many sectors will have excess money balances, relative to the temporarily lower level of output.

The main messages from the money data for the main countries this month are much the same as last month, with the obvious contrast between high money growth in the USA and weak money growth in the Eurozone, while the money growth rates in the two big developing economies, China and India, are stable. If it had not been for the coronavirus outbreak, our prognosis for 2020 – of roughly trend growth of world demand and output, in the context of modest inflation – would make sense. However, the coronavirus outbreak changes the analysis dramatically.

The Institute's verdict is that by late 2020 the annual rates of money growth in the four advanced jurisdictions monitored by the Institute will be as follows:

- The USA 10%–12 ½%
- Eurozone 6%–10%
- Japan 3%–4 ½%
- The UK 8%–10%

In other words, a major acceleration of money growth lies ahead, and some quarters in 2021 and 2022 will enjoy – if "enjoy" is the right word – an inflationary boom. The monetary interpretation of inflation is everywhere neglected in central banks today, even though the evidence for its validity and effectiveness is as robust as ever. Central bankers are at present doing their damnedest to indicate support for government measures to ease the massive economic pain being caused by many countries' coronavirus lockdowns; they seem to be casual about the money creation that is implied by the generosity of these measures. There are evident risks that 2020 and 2021 will prove a large-scale, if accidental and unintended, experiment in Modern Monetary Theory.

A shift in policy-making attitudes – towards awareness that increases in budget deficits may result in more monetary financing of those deficits, and then in higher

> money growth and inflation – is several quarters away. Thinking tends to lag events. Lags in commentariat discussion will slow the return of intellectual support for anti-inflationary policies, and lags in different countries' policy-making "machines" will slow the conversion of elite beliefs into anti-inflationary policy-making.

So, sufficient information was in the public domain by late March 2020 to suggest that vaccine availability would bring Covid-19 under control by the final months of 2021. Meanwhile, announcements about fiscal and monetary policy were already enough to justify forecasts of an inflationary boom. The expectation of a global output fall in 2020 of "as much as 5 per cent" was too pessimistic. According to the latest International Monetary Fund database (at the time of writing, in October 2024), the fall was 3.0 per cent, with world output measured on a current prices and exchange rates basis. The rises in 2021 and 2022 were 6.2 per cent and 3.0 per cent, respectively, on the same basis.

But the surmise about possible "lags in thinking" in "policy-making 'machines'" was right in spades. It was clear in most countries from spring 2021 that inflation was rising, but the vast majority of policy-makers belonged to "Team Transitory". Team Transitory – as it was labelled by Krugman, for example, in his *New York Times* column – believed that inflation would fall back quickly and without any change in monetary policy.[2] It was only in early 2022, more than 18 months after the phase of most rapid money expansion, that a majority of policy-makers accepted that their complacency on inflation had been wrong.

II.

2nd Report, with Inflation Warning: 30 March 2020

Much happened in the final week of March, causing the author to change his view and increase his concern about inflation. A special email was circulated on 30 March, in response to signs that annual money growth could rise well into the double digits in 2020, particularly in the USA. It is given below, again with some rejigging of the order of the material.

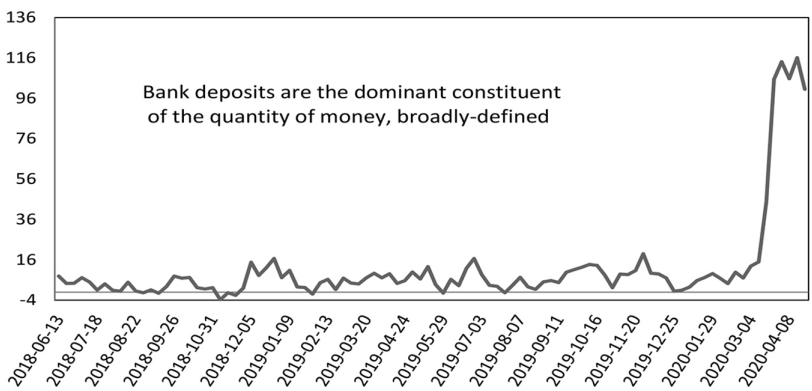
> Only a week has passed since the Institute's discussion of budget deficits and money growth trends in the usual monthly review of the main economies. But, in the context of the coronavirus pandemic and the policy response to it, a week is a long time in punditry.
>
> In the Institute's 24 March comment on global money numbers, it was suggested that by late 2020 the annual rates of money growth in the four advanced jurisdictions would be as follows:
>
> - The USA 10–12 ½%
> - Eurozone 6%–10%

- Japan 3%–4 ½%
- The UK 8%–10%

As far as the USA is concerned, this projection has already been overtaken by events. The last week has seen a remarkable jump in bank deposits in the latest mere one-week period. That is part of the story, but perhaps even more important are

- the passage of the $2,000 billion stimulus package (that is, the CARES legislation) and the Federal Reserve's evident preparedness to finance liberally the much-enlarged budget deficit, and
- the announcement on 23 March of Fed asset purchases that week of $625 billion, with no limit on future purchases. The $625 billion asset purchases might have been roughly half from the domestic non-bank sector, implying by itself perhaps another 2 per cent on broad money, again in just one week.

Prospects for US money growth and inflation have to be revised upwards. First, the latest weekly *H8* 'Assets and Liabilities of Commercial Banks in the United States' press release from the Federal Reserve shows that the bank deposits in US commercial banks rose by 2.3 per cent in the week to 18 March. (Let it be clarified and emphasized. The figure is not for a month of which the final week was the one that ended on 18 March. No, the 2.3 per cent rise was in a week. The increase in the four weeks to 18 March, that is, from 19 February, was 2.9 per cent or, at an annualized rate, 45.0 per cent. See Figure 5.1.) Moreover, the Fed has announced that in one



Note: Data are weekly, with 22 April 2020 being the last value.
Source: Federal Reserve database and *H8* press release.

Figure 5.1 *Annual % growth rate of deposits at US commercial banks, implied by the increase in the last four weeks*

week it bought $625 billion of securities in a restored programme of "quantitative easing". If about half of the purchases of securities were from non-banks, that would add about 2 per cent by itself to the broadly defined quantity of money. At least some of this effect ought to be registered in the weekly data for 25 March.[3]

Secondly, Congress and the administration have passed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act), with a fiscal cost of about $2,000 billion. One commentator (Ben Ritz, for Forbes) has suggested that – when an allowance is made for the loss of tax revenue due to the lockdown – the Federal deficit over the next 12 months or so might be $4,000 billion or not far short of 20 per cent of GDP. The market in US Treasuries may be the most liquid on the planet, but that does not mean it overrides the laws of supply and demand. Investment institutions' capacity to absorb that volume of debt – at current yield levels (in the ten-year area) of under 0.7 per cent – must be in doubt. Sure enough, the Fed has committed to finance the government on its own balance sheet if markets are fickle. But we must be clear. Direct central bank financing of a government deficit leads, in the first round, to roughly similar additions to both the banks' cash reserves and the quantity of money. In the modern era of macro-prudential regulation, the quantity of money may not rise – in second, third and subsequent rounds – by a multiple of cash reserves. All the same, the danger of a textbook multiple expansion of bank balance sheets has to be noted.

A week ago it was proposed that US money growth over the next year might be between 10 per cent and 12½ per cent. A correlation does hold over the medium term between increases in the quantity of money and increases in nominal GDP. Given that money and nominal GDP do track each other over time, it seemed plausible also to propose that inflation might reach 5 per cent at some point in the next two or three years. That assessment is now too conservative. The annual rate of money growth to spring 2021 might be between 10 per cent and 15 per cent, perhaps even heading towards 20 per cent.[4] If so, the right sort of maximum inflation rate to expect in the next few years would be in the band from 5 per cent to 10 per cent.

Are there any precedents? In the First World War, some quarters had similar annual money growth rates, while in the Second World War, the annual rate of M2 growth exceeded 25 per cent in 1943 and was also briefly above 20 per cent in late 1944/early 1945. But it is otherwise a struggle to find comparable figures in the historical record. (In the early 1970s – ahead of the notorious Great Inflation – the highest annual growth rates of M2 were just above 15 per cent.) In other words, 2020 may well see the highest growth rates of the quantity of money in American history, apart from some exceptional quarters in the world wars of the last century. Quite probably, money growth in 2020 will be the highest ever in peacetime.

The story is evolving – and perhaps it is too early to make a strong forecast of an eventual inflationary boom and to pass judgement on policy-makers. But the suspicion has to be that the Fed's top officials have been lulled by the benign inflation numbers of the past decade into thinking that the laws of economics are no longer operative. They may believe that the stubbornly low inflation since QE began in late 2008 means that QE on any scale does not result in more inflation. The truth is that – if the rate of increase in the quantity of money is well ahead of the trend rate of increase in goods and services – inflation is inevitable. If inflation does indeed take

off, some might see this as confirmation of the continuing relevance and validity of the quantity theory of money.

What signs need to be watched to anticipate an inflation upsurge? When the coronavirus outbreak comes under control (as it surely will), the money created by the recent fiscal and monetary largesse will still be in the economy. We are only a few months ahead of the next presidential election, and neither senior figures in the administration nor the Fed's top brass will be in any mood to withdraw the vast money stimulus. Inflation is being held down at present by the collapse in energy prices, while the annual inflation rates on which the media focus take some time to pick up any change in trend. (The increase in prices in the year to April 2021 will include the months of April, May and June 2020, when inflation pressures may have been very different in strength from those in February and March 2021.)

The money stimulus will cause asset prices to recover, and demand and output to grow rapidly, at least for a few quarters until bottlenecks are reached. The initial public response to the better news will, of course, be excitement and applause, not least because the recovery will be such good news after the misery of March 2020. Killjoys and skinflints, and defenders of sound money, will be ignored in the public debate. The conclusion must be that the USA's economic policy response to the coronavirus outbreak will be very inflationary, even if the political situation and lags in the inflationary process will make this a concern more in 2021 (and perhaps 2022) than in 2020. To repeat, assuming that money growth does reach the 15 per cent to 20 per cent band for a few months, the message from history is that the annual increase in consumer prices will climb towards the 5 per cent to 10 per cent area and could go higher.

The above email speaks for itself: it was the clearest possible warning – at the end of March 2020 – that the then conduct of US monetary policy was likely to result in the highest annual growth rate of the quantity of money in peacetime and that annual inflation would rise, at the least, to "the 5 per cent to 10 per cent area". Both these conjectures proved correct.

III.

3rd Report, with Inflation Warning: 6 April 2020

After another unsettling *H8* press release from the Fed on changes in the US banks' balance sheets and hence in the bank deposits which constitute most of broad money, a further special email was sent out on 6 April 2020. Its final paragraphs were more reflective than the previous material in this chapter.

We have another week of data on the US commercial banks' assets and liabilities. Deposits rose by 2.6 per cent in the week to 25 March, after a (revised) increase of 2.2 per cent in the previous week. The increase in the fortnight to 25 March may have been the highest ever in such a short period of time. The implied annualized rate of increase was not much less than 250 per cent. April will see record Treasury

bill issuance in the USA, with a very high proportion of the bills being taken up by the banking system (that is, the Fed as well as the commercial banks). Because of the way that the American official statisticians prepare monthly money data (with an average of weekly dates), it is plausible that broad money/bank deposits will rise in April by between 4 per cent and 5 per cent. (To clarify, this is a rise in one month. It is not the annual rate applicable to the month of April 2020.)[5]

The view in the last special e-mail can be reiterated that

- 2020 may see the highest increase in the broadly-defined quantity of money in the USA in peacetime, and
- more generally, the policy response to the coronavirus pandemic will be followed by an inflationary boom.

This is not necessarily a criticism of policy-makers, although one has to wonder if they understand what they are doing. Politicians have given priority to lives over livelihoods, which is to be expected in a democracy. Once that had been done, central bankers, public debt managers and financial regulators did not have much choice. They could not obstruct – or give the appearance of obstructing – governments determined to save lives.

Quantity theorists such as the author are sometimes criticized for taking a too mechanical view of the relationship between changes in the quantity of money and changes in nominal GDP. Critics say that the velocity of circulation of money "goes all over the place", or something of the sort. Figure 5.2 is a histogram of changes in the velocity of circulation of M3 in the USA going back to 1951. (The series does not rule out the possibility that it is normally distributed, according to the Kolmogorov–Smirnov test.) The middle quarters of 2020 will of course see a collapse in velocity, but the histogram argues that next year and 2022 will see it return towards the 2019 level. The reader can make up his or her mind about whether we should be concerned, for the world's largest economy, about the possible inflationary sequel to an annual money growth rate in the 15 per cent to 20 per cent band.

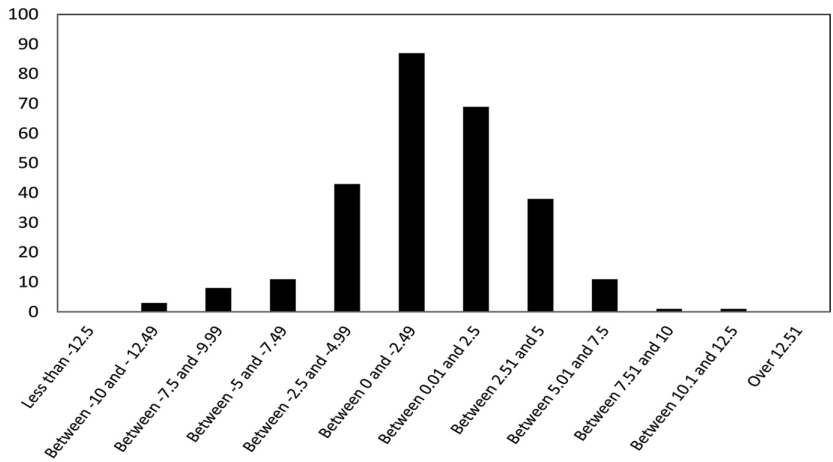
Can more be said about the prospects for the growth of money and nominal GDP in coming quarters? Variations in the ratio of money to nominal GDP (or "velocity") do occur, but large variations are unusual. In the medium term, they are ironed out as the underlying stability of agents' money holding behaviour takes over. It follows from the latest money data that – at some point in the next two/three years – the growth rate of US nominal GDP will accelerate towards a figure in the teens per cent. Given that the trend growth rate of real output is not much more than 3 per cent a year, a big resurgence in inflation is implied by our analysis. The only way to prevent this is for the Fed not just to end its current stance as the ready financier of the government deficit, but to withdraw the money stimulus (that is, to cause the quantity of money to fall by the "excess over normal growth" now being recorded). In a presidential election year, that seems very unlikely.

More announcements and data are emerging that bear on the prospects for US money growth in 2020, as the coronavirus hits the US economy. Comments are needed on the last two weeks of numbers in the Federal Reserve's *H8* 'Assets and Liabilities of Commercial Banks in the United States' press release. As noted

above, deposits jumped by 4.8 per cent in a mere fortnight to 25 March. Inspection of banks' assets shows that two main influences were at work.

First, companies drew down credit lines to have the cash to pay bills in the next few weeks – and also to pre-empt possible attempts by banks to cancel the lines. So "commercial and industrial loans" went up from $2,376.0 billion on 11 March to $2,740.9 billion on 25 March. A fair comment is that this movement is an exceptional, non-recurring one-off. All the same, the money is to be used and will soon pass to borrowing companies' employees and suppliers, and then to other agents in the economy, and it will have the usual effects of any increase in money balances. Secondly, banks' cash reserves climbed from $1,804.1 billion on 11 March to $2,491.6 billion on 25 March. The Fed's opening instalment of "quantitative easing" – which it was said in advance would be $650 billion in one week – must be the main driver here.

For those concerned about the eventual inflationary impact of the money growth acceleration, the one-off nature of the credit line drawdown might be a comfort. However, many grounds for alarm remain. More specifically, the US authorities will have difficulty financing the looming budget deficits from outside the banking system, in a non-inflationary way. Nothing unusual about holdings of Treasury securities in US banks' balance sheets is to be reported in the second half of March. "Treasury and agency securities" were $3,139.5 billion on 11 March and $3,182.3 billion on 25 March.



Note: % annual changes, quarterly values; bars refer to the number of values.
Source: Data from Shadow Government Statistics consultancy.

Figure 5.2 A histogram of changes in the velocity of broad money in the USA since end-1951

However, the issue of the *Financial Times* for the weekend of 4/5 April carried a story to the effect that "The US Treasury department issued a record amount of short-dated debt this week … The Treasury flooded the market with $319 billion of Treasury bills, which mature in one year or less – far surpassing the previous record of $190 billion seen in October 2008." The Treasury probably took the view that it could not finance the hugely enlarged Federal deficit – now expected to lie within a range from $2,500 billion to $4,000 billion over the next year or so – by longer-dated debt issues that might be of interest to non-bank investors. At least, it could not do so without a sharp and embarrassing rise in yields.

Commercial banks will be happy holders of short-dated Treasury bills, as long as there is a bit of a yield curve from which they can profit. Let me explain. Suppose the one-year yield is 1.5 per cent and that the cost of funding a purchase is nil. The return on the money seems pathetic at only 1.5 per cent. But remember that banks are highly geared with, say, a capital/assets ratio of 5 per cent and government securities having the attractive property that, under the Basel rules, no capital needs to be held against them. It is then obvious that – ignoring costs – the return on capital from buying one-year Treasuries is [(1.5/5) x 100] per cent, which is of course 30 per cent. Unfortunately, the one-year Treasury yield in the USA is at present 0.15 per cent. Banks still hold them as assets, partly because they help to meet liquidity requirements. All the same, a somewhat steeper curve will be needed to persuade the banks to acquire, say, $50 billion to $100 billion of short-dated US Treasuries per month.

What about the Fed itself? It doesn't have to make a profit, although it is supposed to avoid losses. The mechanics of monetary financing of budget deficits at central banks may puzzle people new to the subject, but they are simple in essence. The Fed has a deposit from the US Treasury on the liabilities side of its balance sheet, and holdings of US Treasuries on the assets side. If the Treasury issues $100 billion of new Treasuries, they are acquired by the Fed and add to its assets, and the Fed pays for them by increasing the Treasury's deposit also by $100 billion. (Where does the "money" come from? It comes out of thin air; it is just a balance-sheet entry.) When the Treasury purchases $100 billion of something – anything – from private sector non-banks, their bank deposits rise and that is extra money in the economy. It should be obvious from the last few sentences that the process is unlimited. (By the way, the debate over the last few years among economists – including alleged "experts" in the subject – about the supposed "exhaustion of monetary policy" is evidence of the shallowness of much so-called "expertise" in this supposed "science". Monetary policy can *never* be exhausted.)[6]

A reasonable surmise is that monetary financing of the Federal deficit will average between $100 billion and $150 billion a month over the next six months to a year. With US broad money on the M3 measure at just over $20,000 billion, the result will be an upward bump in broad money of between 7½ per cent and 10 per cent. Given that the Fed is also undertaking QE operations which include purchases of newly issued commercial paper (that is, securities issued by the private sector), it seems plausible that money growth in the year to late 2020/early 2021 will lie in the band between 15 per cent and 20 per cent. Quite probably, money growth in 2020 will be the highest ever in peacetime. The medium-term relationship between changes in money and changes in nominal GDP is shown in Table 5.1.

Table 5.1 Medium-term relationship between changes in money and changes in nominal GDP

-	% annual growth rate: M3	Nominal GDP
1960–2018	7.4	6.5
1960–1970	7.7	6.8
1971–1980	11.4	10.3
1981–1990	7.7	7.7
1991–2000	5.6	5.6
2001–2010	7.1	3.9
Eight years to 2018	4.0	4.0

The question must be asked, "does the Fed understand what it is doing?". At some point – probably by mid- or late 2021 – the coronavirus crisis will be over. Excess deaths globally may have run into the low millions (compared with a normal annual global mortality of about 60 million), but millions of lives will have been saved/extended by hospitals equipped with ventilators; "herd immunity" will be established, more or less; a vaccine will be available and will be administered to vulnerable groups; and so on. And what will happen to the "excess over normal" money balances created by public policy in 2020 and early 2021? The answer is that – as in the aftermath of wars – an inflationary boom in the world's leading economy has to be the central forecast. A major increase in inflation due to this boom is surely inevitable. Whether that increase is to 5 per cent or 10 per cent, no one knows for certain yet. But – given that the return to normalcy will be accompanied by bottlenecks and supply shortages, and given also that the current energy price slump may give way to an energy price surge – an inflation figure of over 10 per cent would be a logical associate of an annual rate of money growth of between 15 per cent and 20 per cent.

The Fed is a large organization, employing thousands of officials and economists with divergent opinions and different bodies of expertise. Three sets of reflections seem apposite. First, it is doubtful that most of the key decision-makers (on the Federal Open Market Committee) have an exact understanding of

- the institutional details of money creation, or
- the processes by which non-banks adjust portfolio and spending decisions to rises or falls in the rate of money growth.

If an unbiased third party were to put them – separately and individually – in a room (without experts or other committee members around to brief them), and to ask them relatively simple questions about these matters, they would not impress with their answers. This may seem shocking. In mitigation, much of the trouble stems from the chaotic state of macroeconomics and the theory of monetary policy. Also in mitigation, all these institutions do have individuals (in their research departments) who understand both how money is created and the monetary theory

of national income determination. They are usually in a minority and struggle against the consensus. It is very much up to the senior officials to bring these individuals forward, regardless of their own (that is, the senior officials') prejudices and the accepted career promotion ladders.

Second, it has just been remarked that central bank researchers interested in money, in the sense of "the quantity of money", "struggle against the consensus". That is – by implication – scathing about "the consensus". Arguably, there is no real consensus, just a babble. The truth is that most macroeconomic research in central banks nowadays neglects money – and does so deliberately. Instead a range of non-monetary theories – three-equation New Consensus Macro, the New Classical School obsessed by so-called "rational expectations", old Keynesianism with its mania for government spending and budget deficits, New Keynesianism with its focus on labour markets, "real business cycle theory", the creditism of Bernanke, Gertler and others, the debt-ism (as it might be called) of the Bank for International Settlements – have taken over from standard monetary economics, and jostle for attention. Standard monetary economics has been pooh-poohed, by-passed, sidelined, suppressed etc. So – when a former investment banker like Jay Powell asks about the consequences of a rise in the quantity of money of between 15 per cent and 20 per cent in one year – he hears a cacophony of conflicting opinions and assessments from the dozens of "economic experts" his organization employs.

Third, researchers interested in money, in the sense of the quantity of money, have themselves to blame – to a significant extent – for the mess in the subject. The author's position is not a secret. In his view, Milton Friedman was a force for good, and the rise of monetarism did lead to the control of inflation and the sharp improvement in macro-stabilization performance enjoyed in the Great Moderation (and the Great Stabilization, that is, the period of almost a decade of stable outcomes after the Great Recession). But even Friedman's contribution may be criticized as unsatisfactory or at least incomplete. He never was emphatic enough that the key propositions in monetary economics relate to an all-inclusive, broadly defined measure of money, with much chopping and changing in his preferences between M1, M2, the base and so on. But the transmission mechanism cannot be the same for M3 as for M1, since M3 is more than ten times larger than M1, and the two aggregates are held by different agents for different purposes. Friedman also believed in a money creation process (which turned on the monetary base and the base multiplier) that was misleading most of the time. The author's views here are,

- a simple-sum measure of broad money is the concept relevant to 1. the major theoretical propositions of the quantity theory of money ("monetarism"), 2. the monitoring of the macroeconomic situation, and 3. the conduct of policy, and
- changes in the rate of growth of broad money are best understood as the result of changes in banks' assets (that is, the credit counterparts), since – although commercial banks' balance-sheet expansion is subject to constraints of various kinds – banking systems nowadays, in a fiat-money world and with central bank help, can create money "out of thin air".

Samuelson said that the quantity theory of money had too many "black boxes", because it did not contain a convincing account of the transmission mechanism.

> Samuelson's position is questionable, but one has to concede that quantity theorists are often poor at explaining how changes in money growth rates impact on the economy. At any rate, it must *not* be assumed that Jay Powell will this week receive several memos from his research team on the inflationary dangers of monetary financing of budget deficits.
>
> Clearly, the author is alarmed about rapid money growth in the USA and the probability of a sharp rise in inflation over the next couple of years. Does that mean that the US administration and the Federal Reserve have made serious mistakes? Will they be to blame if the pessimistic prognosis proves correct? Frankly, the key players may have had little choice. In an open democratic society with free speech and a free press, politicians in the public eye must do everything possible to prevent avoidable deaths. Throughout the last few weeks they have confronted the "lives vs. livelihoods" dilemma, and the political and media pressures have obliged them to put lives first. If the US administration has decided that it will save lives, the Federal Reserve – the government's banker – is well-advised to be supportive and helpful. If it were obstructive and difficult, it could be criticized for causing avoidable deaths, and – rather obviously – that would be quixotic and foolish.
>
> All the same, too little thought was given at any stage to either
>
> - the problem of financing the enormous budget deficits that have emerged so suddenly, or
> - the inflationary implications of monetary financing of the deficit.
>
> The senior officials at the Fed – and in similarly placed central banking institutions in other leading nations – could plead, in self-exculpation, that the advice they receive from economists is diverse, inconsistent, muddled and unclear, as well of often being of extraordinary complexity. Quite so.

After April 2020, which saw a rebound in the US stock market, American monetary policy was less extreme. Money growth remained strong in May, June and July, but in the five months to the end of 2020 M3 went up by only 1.6 per cent (that is, on average, only 0.3 per cent a month) despite the enormous budget deficit. In the following year, that to December 2021, M3 again climbed at a high rate of 9.2 per cent. But the money explosion associated with Covid then came to an abrupt and almost complete halt. As the special email of 30 March 2020 noted, the USA was at that point experiencing the fastest money growth since 1943. After the Second World War, annual consumer inflation briefly headed towards 20 per cent. The Federal Reserve was obliged to take decisions which had the effect of checking money growth altogether, in both 1948 and 1949. Interestingly, much the same happened in the 2020s. M3 broad money was less than 0.1 per cent higher in March 2024 than two years earlier, and in much of the intervening period it had in fact been contracting.[7]

IV.

To summarize the last three sections, in late March and early April 2020 the author used his analytical framework to base forecasts of rising inflation – in the following two to three years – on developments in money growth. These developments in turn reflected the official policy response to counter the economic effects of the Covid-19 pandemic. The author translated policy announcements into quantitative impacts on broad money and, in a rough and ready way, applied the proportionality postulate to make forecasts of inflation. The forecasts turned out to be mostly correct.

The Federal Reserve and the US Treasury were aware that in spring 2020 policy was "loose", "easy" or "expansionary" in some sense, but they did not have the same approach. In fact, they ignored the remarkable behaviour of the quantity of money altogether. Would it be unfair to suggest that they lacked an organized, easily understood structure of analysis, reasoning and interpretation, a structure which could relate their key decisions to the future impact of such decisions on the economy and inflation?[8]

NOTES

1. The central bank has at least two other objectives, financial stability and the efficiency with which the banking system as a whole supports its non-bank customers in their business and other needs. Financial stability can be narrowly defined, as seeking to maintain the convertibility of bank deposits into legal-tender cash. These matters are beyond the scope of the current study.
2. If the reference to Modern Monetary Theory causes puzzlement, it is to be understood as the advocacy of uninhibited budget deficits on the grounds that such deficits are inevitably self-financing and cannot be inflationary unless unemployment falls beneath the "full employment" level. For more on these ideas, which are widely regarded as financially irresponsible, see Randall Wray, *Modern Money Theory: A Primer on Macroeconomics for Macroeconomics for Sovereign Monetary Systems* (Basingstoke, UK, and New York, USA: Palgrave Macmillan, 2015) or, at a more popular level, Stephanie Kelton, *The Deficit Myth* (New York and London: Hachette Books, 2020).
3. See Section III below. Bank deposits in fact rose by 2.6 per cent in the week to 25 March. (Note that this comment and those in the next four footnotes were added in October 2024. They were not written in 2020.)
4. In the event it exceeded 20 per cent, although not by much, in early 2021. The peak annual increase in M3 in fact came in June 2020, at 25.9 per cent.
5. The increase in M3 in the one month of April 2020 was in fact 7.4 per cent.
6. Chapter 3 above elaborated this theme in more detail.

7. Note that all the references to M3 broad money in this chapter are to the M3 series prepared by the Shadow Government Statistics consultancy, to whom the author is most grateful.
8. Some loose ends in the texts of the 2020 emails need to be tidied up. First, the suggestion that the Federal deficit might peak at over $4,000 billion proved right. See Chapter 7, with its section V on fiscal policy. Secondly, a conjecture was made that "in the next six months to a year" from April 2020 monetary financing of the Federal deficit would run at between $100 billion and $150 billion a month. According to the FRED database maintained by the Federal Reserve of St. Louis, the Fed's own holdings of US Treasuries were $3,340.8 billion on 1 April 2020 and $4,942.3 billion on 31 March 2021, a rise of $1,601.5 billion. According to the Federal Reserve's database, US commercial banks held $925.4 billion of US Treasuries and non-mortgage-backed agency securities in April 2020 and $1,328.0 billion of such securities in April 2021, giving an increase of $402.6 billion. So in the period in question the US Federal deficit was monetized to the tune of roughly $2,000 billion (that is, $1,601.5 billion plus $402.6 billion), a bit above the highest figure in the author's suggested bank of $100 billion to $150 billion a month. At any rate, this was the dominant cause of the money growth seen in that one-year period, as he expected it to be. Thirdly, the text said that in April 2020 M3 was ten times the size of M1. This was a mistake, as – at the time, with the definitions then applicable – M3 was about $24,500 billion and M1 was $4,500 billion. M3 was much larger than M1, but by more than five times, not by a ten-times multiple. The Federal Reserve revised its definition of M1 shortly afterwards.

6. Was it right in 2020 to forecast that the then money explosion would increase inflation? An analysis of the US situation

The coronavirus pandemic came not only as a profound shock to the major economies, but also exposed tensions between leading schools of thought. Uncertainty arose about the medium- and long-term consequences of both Covid-19 and the policy responses to it. A key question from the start was, "would the pandemic, and the consequent major upheaval in economic policy, lead to deflation or more inflation?". The first version of this chapter was written in summer 2020 as a contribution to the then emerging deflation vs. inflation debate. It starts by reviewing official policy in the opening months of the pandemic. It then reiterates the position taken by the author at the time, that is, in June and July 2020. The position was in the tradition of the quantity theory of money and developed the argument that inflation would rise significantly in the aftermath of the pandemic.

I.

The first result of the lockdowns that began in early 2020 was a reduction in output. This was hardly surprising, as many people not in "essential" parts of the world's economies were unable to go to work; they were – by law – stopped from making goods and providing services. Associated forms of restriction – mandatory social distancing and self-isolation – had devastating impacts on certain industries, notably catering, hospitality and travel. Governments tried by hand-outs of various kinds to shield citizens from the inevitable losses of jobs and income, and to protect businesses from a collapse of sales revenue. The loss of tax revenue due to the drop in output and the cost of the hand-outs added enormously to budget deficits. Meanwhile, central banks felt obliged to cover the enlarged deficits by the most readily available method. They increased the size of their own balance sheets and, in that sense, resorted to "the printing presses".[1]

Most central banks in developed countries supplemented monetary financing of budget deficits by asset purchases from the private sector in so-called "quantitative easing", with the aim of mitigating unemployment. When the purchases were from private-sector non-banks, the asset purchases added to their bank deposits. The combination of monetary financing of budget deficits and QE resulted in sudden and marked accelerations in the growth of deposit-dominated, broadly defined measures of the quantity of money. Most nations, including those in the G7 group, were affected, as shown in Table 6.1. An obtrusive feature is that the money acceleration in the United States of America was far more pronounced than in the rest of the G7. As has been noted elsewhere in this volume, in June 2020 the annual rate of increase in the USA's M3 money measure reached 25.9 per cent, the highest figure in its modern peacetime history.[2] But even the Eurozone – which had absorbed Germany, a nation renowned as an inflation fighter in the first 50 years after the Second World War – experienced a sharp upturn in money growth. In the year to January 2021, its M3 measure of broad money climbed by 12.5 per cent, almost the highest number since the single European currency was introduced in 1999.[3]

Table 6.1 Money growth in leading nations, G7 group and Switzerland, before and during Covid pandemic

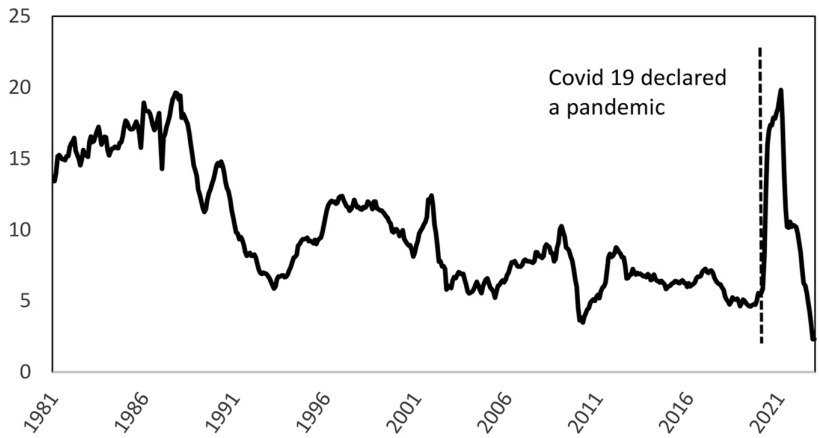
-	Compound annual % growth of broad money – 10 yrs to end-2019	Annualized rate of growth in three months to March 2020	Annualized rate of growth in six months to June 2020
USA	3.4	19.6	42.8
Eurozone	3.3	16.1	14.8
UK	3.8	16.7	18.6
Japan	2.6	1.8	9.6
Canada	7.2	17.9	23.9
Switzerland	4.7	7.1	7.2

Note: The annualization calculations are by the author. They assume that the growth rate seen in three- and six-month periods would have continued for a year. Thus, in the first six months of 2020 M3 rose by 19.5 per cent. Because of compounding, the annualized rate of increase is 42.8 per cent. The three G7 nations – Germany, France and Italy – are of course Eurozone members.
Source: For the USA M3 is used, with data from Shadow Government Statistics; for the Eurozone, M3 data from the European Central Bank; for Japan, M3 from the Bank of Japan; for the UK, M4x from the Bank of England; for Canada and Switzerland, the M3 series is from the database of the Federal Reserve Bank of St Louis.

Among the advanced nations, the money growth acceleration was least marked in Japan and Switzerland. In early 2020 they both saw faster money growth than was typical in the 2010s, but the change was little more than a wobble. Figure 6.1 gives a picture for the OECD area as a whole.

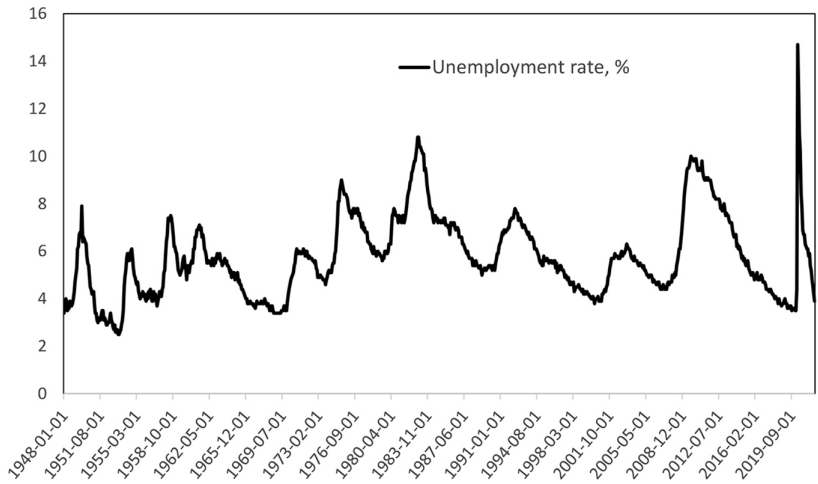
Views about the pandemic's later implications varied among economists. As noted at the beginning of Chapter 4, a majority of media comment and high-level analysis (from central banks and supranational bodies such as the International Monetary Fund) was concerned that high unemployment foreshadowed a significant period – perhaps even a period of several years – of disinflation (that is, a fall in the inflation rate) or even deflation (outright falls in the price level).[4] This reflected the influence of New Keynesian thinking, with its emphasis on labour and product markets as crucial to inflation.

In the US context, labour market developments in spring 2020 were indeed unprecedented and alarming. In the year to February 2020, non-farm payrolls, the most cited short-term indicator of employment trends, had on average increased by 190,000 a month. In March 2020, non-farm payrolls went down by 1,427,000 people and in April 2020, they collapsed by 20,514,000. The unemployment rate was under 4 per cent in early 2020, but soared in April to almost 15 per cent. Figure 6.2 shows that the rise in unemployment was to the highest level in the post-war period and that it took place in the shortest period



Note: Chart shows annual % increase in broad money, with monthly data.
Source: OECD database.

Figure 6.1 Money growth in the OECD area, 1981–2022



Source: Database of the Federal Reserve Bank of St Louis

Figure 6.2 Covid and the sharp jump in US unemployment in spring 2020

of time. Indeed, the plunge in employment was larger and more abrupt even than in the Great Depression of the 1930s.

Early in Chapter 4, Richard Clarida, one of the world's most prominent New Keynesians and vice-chairman of the Federal Reserve, was quoted as saying in May 2020 that "my projection is for the Covid-19 shock to be disinflationary, not inflationary", and to propose that the disinflation would persist "over the next few years". Given the New Keynesians' focus on the labour market and their total indifference to money trends, was Clarida's verdict at all surprising? Few observers believed that the increase in money growth posed immediate risks of more price increases, although some concern was expressed – by the author, among a handful of others – about inflation's trajectory over the medium term.[5]

This chapter explains why, over the next few years, a marked increase in inflation ought to have been expected. Its focus is on the USA, because of its particularly large increase in money growth in the critical period. The bedrock of the analytical framework is the quantity theory of money. A century of monetary experience is recalled, and it is demonstrated that in this period, increases in money growth were associated with similar increases in the rise of both nominal national income and inflation. By taking steps that drove such fast money expansion in spring 2020, US policy-makers were playing with fire.

Remarks are ventured towards the end of the chapter on key mechanisms that connect money and national income. These remarks echo the discussion of the transmission mechanism in Chapter 1.

II.

In the last few decades, quantity-theory analysis has suffered from disagreements about the concept of money most relevant to the determination of macroeconomic outcomes.[6] Some economists, notably Allan Meltzer in his *History of the Federal Reserve*, proposed that a narrowly defined money measure – M1, which included only the currency and sight deposits – was the right one to use.[7] By contrast, in their celebrated 1963 *A Monetary History of the United States* and most of their subsequent work, Milton Friedman and Anna Schwartz favoured a broadly defined measure. Usually designated as M2, it included time deposits and approximated all the deposit liabilities to non-banks of the US banking system. In their *Monetary History*, Friedman and Schwartz were explicit in blessing a money measure of this sort, characterizing it as "our concept of money".[8]

The favoured aggregate in this chapter, as in the rest of the book, is broadly defined. In the present context, two main reasons – already outlined in some detail in Chapter 1 – are salient.[9] First, for any money aggregate smaller than an all-inclusive one, the quantity can change because of transfers between different types of money balance within it. Such changes may reflect past developments and have no causal bearing on future macroeconomic outcomes. Consider, for illustration, an economy with broad money ("M3") of $1,000 billion, with interest-bearing money being $750 billion and its dominant element. The economy also has narrow money ("M1") of $250 billion, some of it being currency held by the public and all of it non-interest-bearing. Suppose that a drop in interest rates causes money-holders to switch $100 billion from interest-bearing money to non-interest-bearing money, while broad money is unchanged. Evidently, M1 in this example jumps from $250 billion to $350 billion, or by 40 per cent. This 40 per cent jump is entirely the result of money-into-money transactions, which may have no implications for aggregate demand or decisions about investment portfolios. It may be of no wider significance. But supporters of M1 might be duped into believing that the sharp rise in money growth portends a burst of extra expenditure and hence of more inflation.

The point has an important and quite recent illustration. Money-into-money transactions – motivated by changing returns on different money balances – were responsible in the USA for a leap in the annual rate of M1 growth from under 1 per cent in April 2008 to almost 17 per cent in December 2008. This certainly did not presage an upturn in spending, as a naïve version of the

quantity theory might lead one to expect. On the contrary, it was concurrent with the worst phases of the Great Recession and foreshadowed the intensification of that downturn. M1 was useless as an economic indicator in the Great Recession period.[10]

Second, national income is related to national wealth, and vice versa, and both must be in equilibrium – with each other and with other variables – if full macroeconomic equilibrium is to prevail. The key money aggregate in macroeconomics must therefore be one where at least some of its constituents matter to portfolio decisions, and where changes in it can affect asset prices. This is what was meant by a clumsy sentence at the end of chapter 7 of Keynes' *General Theory*, which was discussed in Chapter 1 and described by him as "the fundamental proposition of monetary theory".[11] By implication, an all-inclusive, broadly defined money measure is the one that economists should track. (The notion that currency – consisting of the note and coin issue – bears on investment decisions by major financial institutions is plainly silly. More generally, the nearest asset alternative to a sight deposit is another money balance, whereas the nearest such alternative to an all-inclusive aggregate must be a non-money asset. So it must be an all-inclusive aggregate that is relevant to decisions which affect large investment portfolios containing a range of non-money asset classes.)[12]

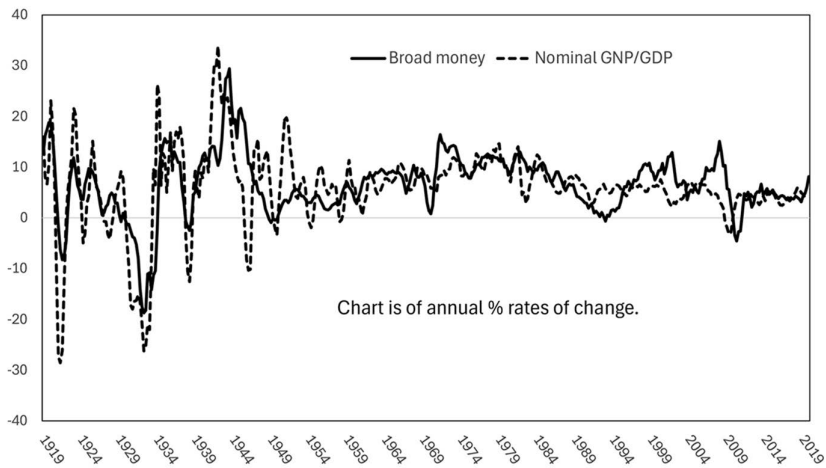
One difficulty with official US money statistics is that the definition of aggregates has changed over the decades. When they were working on their *Monetary History*, the M2 measure favoured by Friedman and Schwartz included *all* time deposits. However, in 1972 the Federal Reserve published money data starting in 1959, with a distinction between a new M2 concept which excluded "large time deposits", meaning deposits with a value of over $100,000, and M3 which included them. In 1959 the difference between M2 and M3 was trivial, but over the years large time deposits increased more swiftly than other money balances. The difference between M2 and M3 therefore increased enormously. Nowadays of course the great majority of deposits held by companies and financial institutions have a value of over $100,000, and their exclusion from M2 has the result that the Fed's published M2 statistic does not capture developments in corporate and financial sector liquidity. Moreover, like M1, M2 nowadays suffers from the drawback that its quantity can be affected by money-into-money transactions – obviously, for example, between small and large time deposits – without subsequent macroeconomic significance.[13]

Bizarrely, the Federal Reserve stopped publishing M3 data in early 2006, leaving M2 as its only representative of "broad money". Financial market participants were puzzled by the Fed's decision, not least because information on M3 constituents was still available in the public domain.[14] A private sector research company, Shadow Government Statistics, has from March 2006 used

this information to publish a monthly estimate for M3. For the purposes of this chapter, a broad money series going back to 1918 on a quarterly basis has been prepared, built up from the appendix to Robert Gordon's 1986 book on *The American Business Cycle* for M2 numbers before 1959, the Federal Reserve's own discontinued M3 data for 1959 to 2006, and the Shadow Government Statistics' M3 series for the post-2006 period.[15]

III.

Figure 6.3 shows the annual rates of change of money, as just defined, and nominal national income in the USA for the 101 years from 1918.[16] In other words, this is the picture of the relationship between money and nominal national income of which US policy-makers would have been aware ahead of Covid-19, if they had been interested in the subject. It is clear from the chart that no annual growth rates of broad money of over 20 per cent were recorded from the end of the Second World War to 2019, and that the most extreme monetary volatility occurred in the turbulent first half of the twentieth century with its two world wars and the Great Depression of the early 1930s. Broad



Note: Data are quarterly.
Source: For sources, see text.

Figure 6.3 *Money and nominal GNP/GDP in the USA in the century from 1918*

money rose by 18.8 per cent in the year to the third quarter of 1919, by 15.7 per cent in the year to the first quarter of 1935 and by 16.4 per cent in the year to the second quarter of 1971, but in Figure 6.3 no other numbers in peacetime came near to matching what happened in early 2020. In several periods the changes in money and nominal national income did not cling together in the neat and well-organized way that a quantity theorist might envisage. All the same, over the whole century the average annual rates of increase of the two variables – 6.6 per cent for money and 6.0 per cent for nominal national income – were close.

The similarity of the growth rates invites the interpretation that agents' money-holding preferences were stable, in line with familiar quantity-theoretic conjectures. Although small, the 0.6-per-cent-a-year difference between the growth rates of money and income might appear to conflict with this interpretation. However, in his 1959 Fordham lectures, brought together a year later in his short book on *A Program for Monetary Stability*, Friedman said that – in formulating monetary policy – an allowance should be made for a 1 per cent secular annual fall in the velocity of broad money.[17]

His rationale was that, as economies matured, their financial systems became more sophisticated, with financial assets growing faster than national income and financial transactions increasing relative to transactions in goods and services. As money would of course be used in financial transactions, it was unsurprising if it grew slightly faster than national income or output.[18] (This phenomenon of "financialization" was noticed above on p. 56 in Chapter 1 and pp. 128–9 in Chapter 4.)

Figure 6.4 shows the ratio of money to national income from 1959 to 2019 and, as expected by Friedman, it rose significantly. The annual compound increase in the ratio of money to national income was 0.85 per cent, a mere smidgeon beneath Friedman's conjectured 1 per cent. The fall in the ratio of money to national income in the late 1980s is surprising, in view of the longer-term pattern, but may be related to the sharp fall in interest rates after the Volcker monetary squeeze of the early 1980s. (Lower interest rates make interest-bearing deposits less attractive to hold. Note that the income velocity of circulation is the inverse of the ratio of money to national income, a point picked up in the next section.)

Detailed statistics on sector money holdings have been published annually by the Federal Reserve since 1945 and validate Friedman's hypothesis. In the Fed's data, money held by "domestic financial sectors" can be separately identified from that held in the rest of the economy. Friedman's hypothesis implies that money held by domestic financial sectors should grow faster than other money balances. From 1945 to 2009, this was the case, with money held by domestic financial sectors climbing – as a proportion of all money balances – from 1.5 per cent to just over 11.0 per cent. The compound annual growth rates



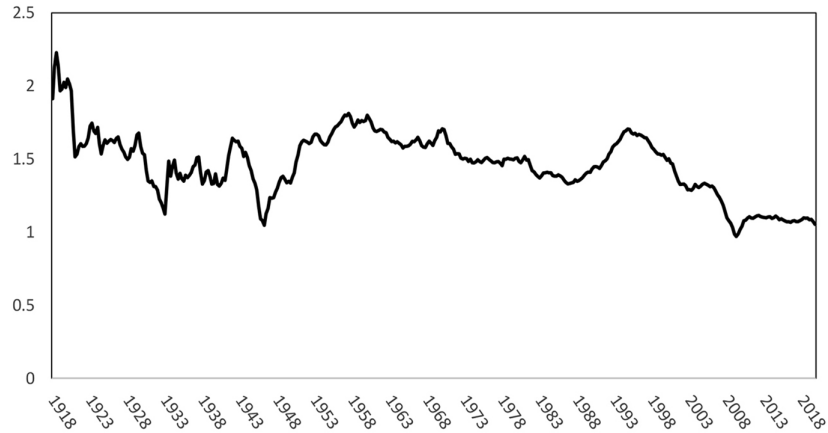
Note: Data series is quarterly; for sources, see text.

Figure 6.4 *Ratio of broad money to national income in the USA in six decades from 1959: Friedman's financialization hypothesis*

were 10.3 per cent for financial sector money and 7.0 per cent for total money.[19] Since 2009, the process of "financialization" may have stopped, reflecting – for example – the constraints on financial business in the Dodd–Frank legislation passed in 2010. Financial sector money nevertheless remains far more important today than it was immediately after the Second World War. Broadly speaking, the view that American households and companies have had stable underlying money-holding behaviour can be defended from the facts presented here.

IV.

Another way of looking at the evidence is to examine broad money's velocity of circulation and to consider its changes over the years. Figure 6.5 shows the income velocity of circulation in the century to end-2019 and Figure 6.6 annual per cent changes in velocity over the same period. In view of the above remarks on financialization, a constant – or even a relatively stable – velocity would not have been expected and is not found in practice. The compound annual rate of decline in income velocity, in the century under consideration, was 0.6 per



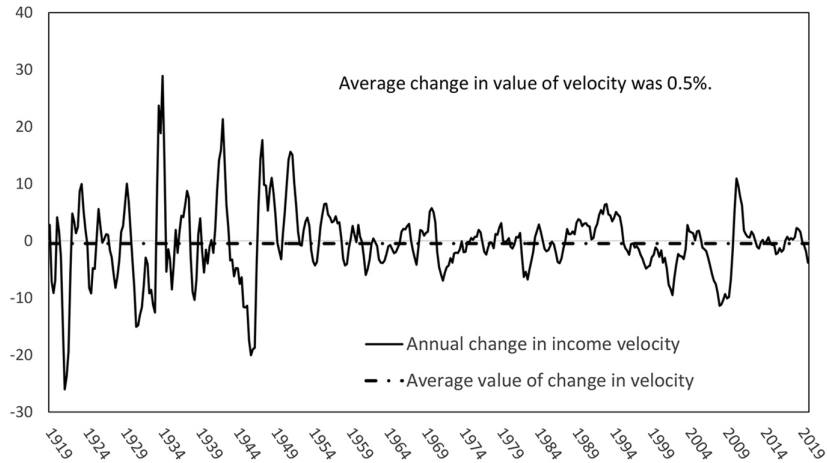
Source: For sources, see text.

Figure 6.5 *Income velocity of circulation of broad money in the USA in the century before the Covid-19 pandemic*

cent, but it is evident from the chart that most of this occurred in the relatively settled conditions after the Second World War. In fact, for over a decade from 1945, national income rose faster than money because the Second World War resulted in an overhang of money balances in 1945. The excess of money was dissipated partly in the inflation-prone conditions of the late 1940s and partly because of slow growth, or even stagnation, in the quantity of money. It was only from about 1960 that the financialization process took hold clearly.

The idea behind the proportionality postulate – that equilibrium velocity is constant and variations in velocity are around that constant value – is plainly contradicted by Figure 6.5. But Figure 6.6 is easier to fit into a quantity-theoretic framework. The average annual decline in velocity over the century under review was slightly under ½ per cent, while the series for changes in velocity is plainly of values oscillating above and below the ½ per cent number.

Sceptics about the quantity theory sometimes assert changes in velocity are unpredictable or even "all over the place", implying that they are not subject to any known statistical distribution.[20] Figure 6.7 shows a histogram of changes in the income velocity of circulation, using end-year values, for the century to 2019. Visual inspection suggests that changes in velocity conformed to the normal distribution, the most straightforward and well-known statistical distribution.[21] On that basis, the sceptics may need to revise their judgement. This

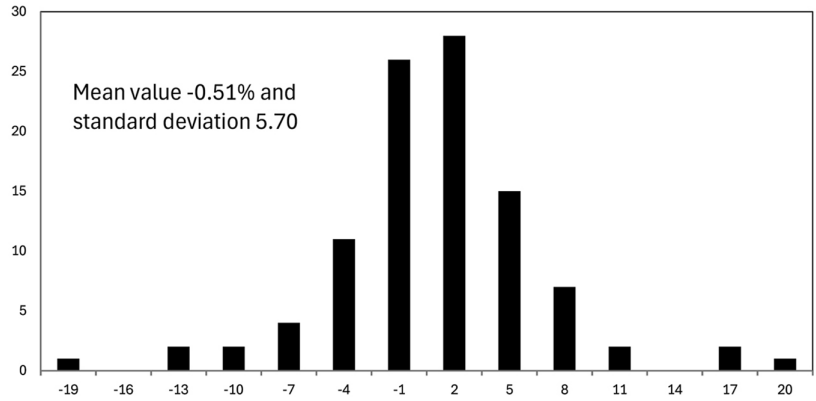


Note: Annual % changes.
Source: For sources, see text.

Figure 6.6 *Changes in broad money velocity in the USA in the century to Covid*

is not to deny that, from time to time, changes in velocity could take extreme values, with the histogram indeed reporting one decrease in velocity of almost 19 per cent and three increases in velocity of over 14 per cent. Nevertheless, the overwhelming majority – almost 80 per cent – of the values reported in this century lay between minus 4 and plus 5.

Figure 6.3 showed that monetary instability was more marked in the first half of the twentieth century than subsequently. Arguably, the American economy since the early 1950s has achieved better, more stable macroeconomic outcomes on a sustained basis, and this provides a more relevant background to monetary policy analysis in the early twenty-first century. In order to derive more precise conclusions about the likely consequences of the money supply explosion under way when the material for this chapter was first written, it may be sensible to use the data on velocity changes from the end of 1951. Figure 6.8 (on p. 180) presents a histogram of annual changes in the velocity of circulation of broad money for this somewhat shorter period, using quarterly data. As expected, the standard deviation of the values is lower than for the entire century to 2019, while extreme values are fewer. Again, visual inspection suggests



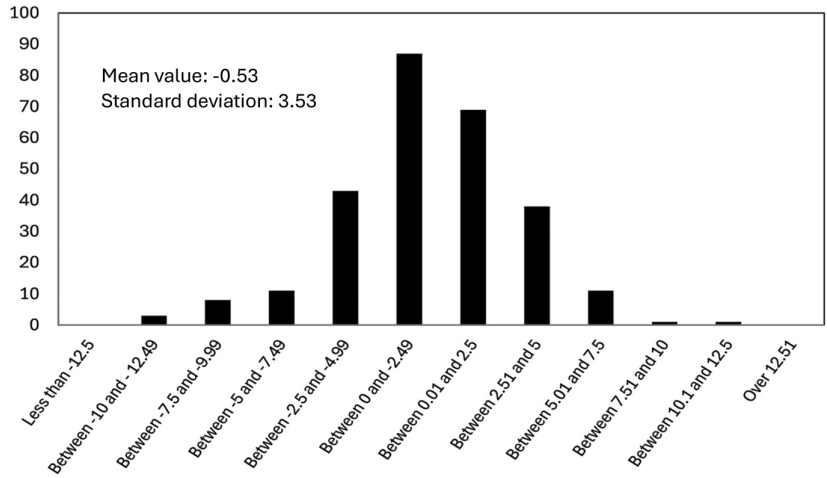
Note: minus % annual changes, end-year values; bars refer to number of values
Source: For sources, see text; also author's estimates.

Figure 6.7 *A histogram of changes in the velocity of broad money in the USA, in the century to 2019*

that changes in velocity conformed to the normal distribution.[22] Over 90 per cent of the values in the histogram are between minus 5 and plus 5.

The most extreme decline in velocity in this 68-year period, of 11.7 per cent, was in the year to the first quarter of 2008. This quarter was at the start of the Great Recession, when fears for the solvency of US shadow banking institutions caused a large-scale transfer of financial intermediation back to the mainstream banking system. That transfer gave an artificial boost to broad money, which was partly responsible for the size of the fall in its velocity. A big fall in velocity – of 9.5 per cent – was also recorded in late 2001 at the time of the bursting of the dotcom bubble, to which it may have been related. With these exceptions, only two phases of annual declines in velocity of more than 5 per cent – in 1971 and 1982 – were seen in the 68 years. Yet in the year to the second quarter of 2020, the quantity of money rose by over 25 per cent while nominal national income fell because official lockdown actions cut output. The decrease in velocity in the year to the end of the second quarter was therefore an extraordinary 27 per cent. Monetary developments at the height of the Covid-19 emergency were dramatically out of line with previous modern experience in peacetime.

In the early stages of their response to the coronavirus epidemic, several policy-makers saw an analogy between their situation and the challenge of war. The American government undoubtedly reacted to both the world wars of



Note: minus % annual changes, quarterly values; bars refer to number of values.
Source: For sources, see text; also author's estimates.

Figure 6.8 *A histogram of changes in the velocity of broad money in the USA since end-1951*

the twentieth century in much the same way that it did to Covid-19. It expanded the budget deficit and financed the enlarged deficit to such an extent from the banking system that money growth rose sharply. The First World War was associated with an acceleration in annual money growth from under 5 per cent in 1914 to almost 20 per cent in both 1916 and 1919, and a big post-war output boom ensued in 1919. But annual money growth – almost 19 per cent at the end of 1919 – crashed to minus 8 per cent in the third quarter of 1921. A violent slump from spring 1920 to summer 1921 came next.

In the Second World War, money growth peaked at almost 30 per cent in 1943, endowing the economy with excess money balances which remained after the end of hostilities. Consumer price inflation went above 20 per cent in early 1947, as wartime controls were relaxed. Inflation pressures were checked, but this required two years of nil money growth in 1948 and 1949. In other words, both world wars were succeeded by inflationary booms and severe monetary restraint to curb them.[23] What about the Vietnam War, where it is debatable whether the USA was at war or at peace? It too was accompanied by unusually high money growth and has often been indicted as being to blame for the Great Inflation of the late 1960s and 1970s.[24]

V.

In Chapter 4 it was proposed that the change in the velocity of circulation of broad money *in the UK* was mean-reverting. What can now be said about a much more important country, *the USA*?

A mass of information bearing on these questions has been collected here and reviewed. The conclusions are the same as elsewhere in the current book. The so-called "proportionality hypothesis" – that over time changes in money and nominal national income are equi-proportional – lies at the heart of quantity-theory reasoning.[25] An implication is that, when time series are examined, the velocity of circulation should be mean-reverting. The evidence is against this idea. Part of the explanation for the apparently disappointing result is Friedman's suggestion of a 1-per-cent-a-year secular fall in velocity as societies became more financially sophisticated. But this requires only a slight reformulation of the idea, with the proposition instead becoming that the change in velocity – which, as shown above, took a mean value in the 68 years from 1951 of only 0.5 per cent – should be mean-reverting. More rigorous statistical work confirms the stationarity of the change in velocity in this period.[26]

Admittedly, close year-by-year inspection of the data hints that the credibility of the mean-reversion hypothesis was undermined by the steep collapse in velocity in 2008 and a compensating precipitate rise in 2010. As discussed above, the 2008 drop in velocity may be understood as the result of a shift of business from the shadow banks towards the mainstream banks in the early stages of the Great Recession. The abruptness of the velocity shift in 2010 may also have been due to a transient special influence, with Fed funds rate and bond yields plunging quickly to very low levels, having an unusually positive effect on demand and output for a few quarters. Institutional developments in the banking system and swings in Fed funds rate could be seen as non-monetary variables, and in the 2008–10 period they undoubtedly had an effect on the course of demand and output.

Supporters of a monetary theory of national income determination are usually prepared to concede that non-monetary forces can affect the cyclical course of the economy in the short run. Such velocity movements as those seen in 2008 and 2010 do not necessarily oblige them to change their underlying commitment to the stability of money-holding preferences. The monetarist thesis is not that non-monetary influences on the economy are irrelevant and can be ignored. Rather it is that, although many non-monetary forces are relevant to short-term instability, they tend to cancel out over the medium and long terms. For example, the inventory cycle has a powerful effect on output fluctuations in periods of a few quarters, but the sum of inventory accumulation over an entire cycle is usually small and insignificant relative to the

total increases in aggregate demand and output. Again, changes in short-term interest rates set by central banks can matter enormously to interest-rate-sensitive sectors such as housing and so alter the economy's cyclical behaviour. But movements in the central bank rate cannot throw light on the manifold increases in nominal national income that occur over decades and centuries. When interpreting these increases, data on the quantity of money become fundamental. Indeed, such data are the only sensible kind of information to use in explaining the facts.

Celebrated economists denied in 2020 and 2021 that the quantity of money mattered to anything. As is noted also in Chapter 8, Jo Stiglitz, the Nobel economics laureate in 2001, protested in February 2021 that inflation had become a "bogeyman" that was "more fantasy than real threat nowadays".[27] Even some of those worried about inflation sidelined a quantity-theory-based forecast as beside the point.[28] Opponents of the quantity theory may have believed that the shock to the quantity of money and the velocity of circulation in spring and summer 2020 would not affect the determination of demand and output in later quarters (that is, in 2021, 2022 and so on). In other words, the fall in velocity that occurred in early 2020 would *not* – in their view – be offset by a corresponding and offsetting rise in velocity over the next two years or at any future point. But Figure 6.6 showed that, in the century to 2019, phases of falling velocity were followed by phases of rising velocity in line with the hypothesis of mean-reversion. It was necessary to return to the mid-1940s, when money grew rapidly in wartime, to find an upheaval in velocity comparable to that in 2020. As mentioned above, the economy was afflicted by an overhang of excess money balances from mid-1945 and its elimination was accompanied by 20 per cent inflation.

Anyhow, at the time of writing (October 2024) the evidence is available largely to settle the question. Velocity has not fully returned to its value at the end of 2019, but it has moved very close to it. In that sense, the quantity theory of money has been vindicated. The subject is taken up in more detail in Chapter 10.

VI.

To those who followed the money data, it was clear by early summer 2020 that the pandemic-related US money explosion had created a remarkable situation. It was remarkable not only in its own right relative to past experience, but also for the light which would be thrown on long-standing disputes about the usefulness of rival economic doctrines. Private sector agents' money balances were far in excess of those implied by stable money-holding behaviour at the prevailing levels of national income and wealth. In general, if money is out of equilibrium with national income and wealth, it must also be out of

equilibrium with the price levels of goods and services, and of assets in general. Alternatively stated, the surge in money growth to a peak peacetime figure had created in mid-2020 a severe monetary disequilibrium. Sceptics about quantity-theoretic analysis might nevertheless ask for more detailed evidence of such a disequilibrium; they might also want a structured account of how the disequilibrium would be overcome.

As noticed in Chapters 1 and 3, a recurrent pattern in previous cyclical fluctuations is that changes in money balances held by the financial sector have been more volatile than changes in money balances held in the rest of the economy.[29] On that basis the acceleration in the growth of aggregate broad money seen in early 2020 should have been accompanied by a more pronounced upturn in the growth of financial sector money. Flow-of-funds data at were not available for the second quarter of 2020 when the first version of this chapter was written (in mid-July 2020). But there had in fact been some rise in the rate of money growth even in the year to end-March 2020. A remarkable jump in financial sector money occurred in both the five quarters from the end of 2018 (of 61.0 per cent, from $709.6 billion to $1,142.6 billion) and particularly in the first quarter of 2020 (of an egregious 35.7 per cent, from $842.1 billion to again $1,142.6 billion).[30] In part the bumper first-quarter 2020 increase is likely to have been attributable to the heavy Federal Reserve purchases of securities in the week from Monday 16 March. These followed an announcement on the evening of Sunday 15 March, that the Fed would in short order acquire $500 billion of government securities and $200 billion of agency-backed mortgage securities.

Ample evidence exists that long-term savings institutions maintain low ratios of money holdings to total assets, and that over the medium and long runs these ratios are relatively stable.[31] The 15 March announcement preceded by only a few days a low point for the S&P 500 index of US common stocks, of 2,237.4 on 23 March. It was plausible that in following months the surge in financial sector money holdings would continue, with institutional investors reporting above-normal weightings of cash to assets. An understandable worry for such investors in these circumstances was that the abundance of money in the financial sector would sooner or later be associated with upward pressure on share prices, as and when cash-to-asset ratios returned to normal. A common phrase among market participants at the time was that they suffered from "fear of missing out" or "FOMO". In other words, the money supply acceleration of spring 2020 had created a situation in which, at least potentially, "too much money was chasing too few assets". By mid-July 2020 the S&P 500 index had already climbed by over 40 per cent from its March low. It was up another 20 per cent and 40 per cent six months and a year later, respectively.

Here were vital mechanisms connecting money to the real economy. The share price gains eased balance-sheet anxieties for American households

and companies. The bulk of households' large capital gains since the Great Recession lows of 2008 had been retained, providing scope for extra consumer spending and investment in housing equity in coming quarters. Meanwhile, companies were able to issue new securities with ease, a pattern which was surprising, even bewildering, when set against the gloomy news background. Paradoxically, company financings ran at strong levels even in the worst phase of the crisis, when the crisis is defined in medical terms.

As noted in Chapter 1, new issues of investment-grade debt boomed in late March and early April 2020 after the Federal Reserve's and the Treasury Department's stimulus announcements. Because of the impressive volume of fund-raising, companies would over the next few quarters be in a better financial position to undertake capacity expansion and commit resources to long-term investment projects. Both aggregate investment and the hiring of new staff would receive a major boost. Moreover, the incomes of those involved in securities underwriting benefited from the extra activity. According to a Bloomberg report on 12 June 2020, "bond issuers" had recently been "living in a land of milk and honey".[32]

Commitments to "quantitative easing" – by central banks on both sides of the Atlantic – were announced in the crises both of 2008 and 2009, and of 2020. This chapter has shown that over the last century the money-holding preferences of American households, companies and financial institutions have been stable in an important sense: they have been stable enough for the analyst to be confident that a large movement in velocity in one direction will be offset, over the next few years, by a similarly large movement in the opposite direction. Friedman was correct to recognize, in his 1959 Fordham lectures, that in the USA the ratio of money to national income would rise secularly because of processes which might be summed up in the word "financialization". The velocity of circulation might therefore not be mean-reverting. But the increase in the ratio of money to national income has typically been little more than ½ per cent a year, while the data suggest that the change in velocity has been mean-reverting.

In the spring of 2020 the leading economies suffered a shock from the Covid-19 pandemic that was unique in both its severity and character. The policy answer to the losses of output and income had similar features in the major nations. Nevertheless, the official response was bigger and bolder – or, some might say, more reckless and extreme – in the USA than elsewhere. The money surge coincided with the worst of the medical emergency, when many people were particularly anxious about the future. The precautionary demand to hold money was undoubtedly much stronger than normal. In that respect the rapid money growth might be deemed benign, in that it alleviated weakness in aggregate demand that might otherwise have been the response to the job losses, amid widespread fear and uncertainty. Even so the money balances of

the financial sector, including those of such long-term savings institutions as pension funds and life insurance companies, soared at a fantastic rate. This did not merely help to stabilize the stock market, but allowed it to recover to near-peak levels after many years of a bull market.

A realistic assessment in summer 2020 was that, at some point in the next few quarters, the coronavirus pandemic would no longer dominate the headlines. Business life, and household and corporate finances, might then be expected to return to normal. But it could not be escaped that in the USA the ratio of money balances to underlying expenditure and income was – in, say, the third quarter of 2020 – at least 30 per cent above its long-term trend figure.[33] (See also Figure 10.1 on p. 242.) If the stability of agents' money-holding behaviour were to reassert itself in the next two or three years, and if Keynes' "fundamental proposition of monetary theory" were to prove correct, exceptional macroeconomic developments were in prospect. *Either* the rise in nominal national income had to increase sharply, perhaps to an annual figure in the double digits per cent, *or* the money explosion of early 2020 has to be cancelled by an offsetting money squeeze.

Because their broad money liabilities amounted to about 80 per cent of US commercial banks' assets, a reduction in the quantity of money could be secured only by a similar fall in those assets. Such a fall would have necessitated a reduction in banks' loans to the private sector and/or in their claims on the US state. It was surely improbable that either course of events would appeal to American policy-makers in 2021 or 2022, against the grisly background of the Covid-19 pandemic. A reasonable conjecture was that a money squeeze would not be implemented, so that significant upward pressure on inflation was likely. (In practice, money growth stayed high in 2021, but did slow very sharply from early 2022. See the Appendix to this chapter.)

For the various schools of macroeconomic doctrine, much was at stake in the prospective period of post-pandemic adjustment. The quantity theory of money had been unfashionable for many years, and 2020's explosion in US money growth received little attention in academic circles or even in Federal Reserve commentary. It is noteworthy, for example, that the *Minutes* of the Federal Open Market Committee (FOMC) meeting on 9 and 10 June 2020 contained no reference to any money aggregate and therefore ignored the fastest growth of the quantity of money in the USA's peacetime history. The associated discussion noted that "The [forward-looking] simulations [from the Fed's research staff] suggested that the Committee would have to maintain highly accommodative financial conditions for many years to quicken meaningfully the recovery from the current severe downturn."[34] Notice again the phrase "for many years", similar to that used by Richard Clarida a few weeks before the FOMC meeting, in his talk to the Economic Club of New York. Was this to be interpreted as meaning until at least 2025 or 2026? And were

"highly accommodative financial conditions" supposed to preclude any rise in interest rates?

Also in June 2020, Burton Abrams of the University of Delaware wrote a column for *The Hill* website, in which he noted that mainstream economists had declared the quantity theory of money to be "dead". But a crucial test lay ahead. In Abrams' words, "The Federal Reserve is now engaged in a policy that will either put the nail in the quantity theory's coffin or restore it to the textbooks. Sadly, if the theory is alive and wins out, the [US] economy is in for a very rough ride."[35]

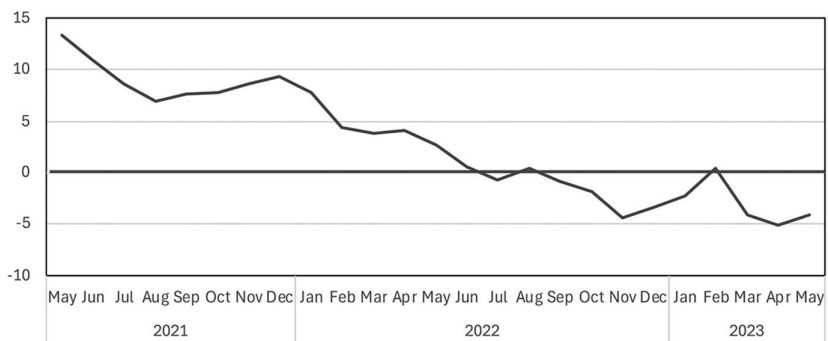
Chapter 3 of this book included a quote from Lord Turner in the March 2020 issue of *Prospect* magazine, to the effect that central banks had become powerless to stop a fall in inflation. In the event, the allegation of this kind of impotence came to look rather odd. Central banks were certainly to be embarrassed in the early 2020s, but not by an unstoppable *fall* in inflation. Instead they had to apologize – as they last had done in the 1970s and 1980s – for a troubling and almost wholly unforeseen *rise* in inflation.

APPENDIX

The Crash in US Money Growth from Spring 2022

A central theme of this book has been that an explosion in US broad money growth in spring and summer 2020 was responsible for the subsequent flare-up of inflation in late 2021 and 2022. However, following trends in money growth is a never-ending soap opera, a veritable Peyton Place of macroeconomics. The story can change quickly and unpredictably. Whereas 2020 saw the highest money growth since the Second World War, and money growth in 2021 was boosted by the monetization of the large budget deficits of the Biden presidency, the rate of money growth fell continuously from spring 2021. Even more noteworthy is that for a year from April 2022 the M3 quantity of money actually fell. The fall was not large, only 2.5 per cent in that 12-month period, relative to the previous rise, but it was a drastic change of trend. Figure 6.A1 shows the slide in money growth, using the three-month annualized rate of change as the metric.

One cause of the crash in money growth was that the Fed allowed the securities in its asset pile to mature and run off, and did not replace them with new purchases. But another was the effect of the rise in the Fed funds rate on bank balance sheets. Numerous banks had holdings of government securities which fell in value as interest rates increased. This was a significant hit to banks' capital, and undermined their ability and inclination to lend.



Note: Chart shows three-month annualized growth rate %.
Source: M3 series prepared by Shadow Government Statistics.

Figure 6.A1 Crash in US money growth in the two years to spring 2023

The severity of the plunge in money growth caught the author by surprise, but it was evident in the data and required a change in commentary as a response. Chapter 5 showed how alertness to money growth trends can be – and indeed ought to be – fundamental to macroeconomic prognostication. The May 2022 regular monthly email from the Institute of International Monetary Research noted that

> US money growth is slowing sharply and will probably soon be in the 1 per cent – 5 per cent annualized range needed to moderate inflation to 2 per cent or so. Fed announcements on asset sales make it even more likely that money growth will fall – quite soon – to the 1 per cent–5 per cent area (when the three-month change is annualized). *Outright contractions in broad money – over periods as long as three or six months – are not be regarded as impossible.*

The June email proposed that, if money growth stayed at a low or moderate level,

> Then enough has already been done to bring US inflation under control. The media – and indeed the Fed itself – are making a great song and dance about the Fed funds rate, up by 75 basis points in July to a 1½ per cent–1¾ per cent range. But the level of interest rates does not define the totality of monetary policy. In any assessment of monetary policy, the behaviour of the quantity of money is much more fundamental. On that basis, a reasonable view is that US inflation will return – after a nasty and unwelcome recession in 2023 – to inflation of about 2 per cent or so in late 2024 and 2025.

The conjectures here were both right *and wrong.* (The author does not claim divine powers of prophecy.) In the event, the Fed funds rate went above 5 per cent, and American banks suffered further large capital losses on their holdings of so-called "available for sale securities". (These securities are supposed to be very safe since they can be sold to the Fed to bolster liquidity and are mostly short-dated claims on the US government.) Silicon Valley Bank collapsed on 10 March 2023, after a run on its deposits prompted by fears of the scale of the losses on its bond book. Money growth remained low through 2023 and into 2024, and – as the author suggested – inflation did drop to about 2 per cent in late 2024. Clearly, the monitoring of broad money behaviour is useful for the analysis of inflation!

But the author was wrong about the risk of recession. One asset market – the stock market – did have a rocky period in 2022, with the S&P 500 index dropping by over 20 per cent between December 2021 and October 2022. But house prices stayed high and the bull market in stocks resumed from autumn 2022. The first quarter of 2022 recorded a fall in real GDP, and real GDP was lower in the second quarter of 2022 than in the final quarter of 2021. This was a recession, but only in a technical sense; it did not amount to a proper

recession as the word is commonly used. 2022 and 2023 were years of continuing growth in US demand and output, if not at the blistering pace of 2021. Unemployment remained low. The recession warnings were misplaced. Part of the explanation was that – despite the money contraction in the year to April 2023 – the US economy still had an overhang of excess money, due to the extraordinarily high money growth in 2020 and 2021. To summarize, in the two years to August 2021, US broad money – on the M3 measure – went up by almost 35 per cent. In the following two years the rise was less than 2½ per cent. But still – even during 2024, the ratio of money to GDP was higher than had been typical in the 2010s! (See Chapter 10 for more on this topic.)

NOTES

1. As is widely understood, most of the money creation did not involve printing new notes but instead the addition of new entries to balance sheets by tapping numbers into computer keyboards.
2. The data are from the Shadow Government Statistics research company (www.shadowstats.com).
3. The data are from the European Central Bank. In November 2007 the annual rate of M3 growth was 12.6 per cent, just a pip ahead of the January 2021 reading.
4. The summary verdict of the June 2020 issue of the International Monetary Fund's *World Economic Outlook* was "Deep downturn in 2020, sluggish turnaround in 2021" (p. 5), with consumer price inflation in the advanced countries (p. 7) put at 0.3 per cent in 2020 and 1.1 per cent in 2021, and in the USA specifically at 0.5 per cent in 2020 and 1.5 per cent in 2021.
5. See, for example, Charles Goodhart and Manoj Pradhan, 'Future imperfect after coronavirus', VOX CEPR policy portal, 27 March 2020. In their words, "The authorities, like most of the rest of us, have been caught short by the sudden advent of the coronavirus pandemic … This column asks what will happen when the lockdown gets lifted and recovery ensues, following this period of massive fiscal and monetary expansion. It argues that we will see a surge in inflation …" In Germany, economists associated with the Bundesbank tradition of monetary economics articulated concern about higher inflation. See 'Willst du das, Hans-Werner?', interview with Hans-Werner Sinn by Mark Schieritz, *Zeit Online*, 3 June 2020.
6. These disagreements mattered, because in the late 1970s the Federal Reserve was able to retain discretion in decision-making by setting a multiplicity of money-supply targets. The message from the money aggregates was always ambiguous and debatable. See Peter A. Johnson, *The Government of Money: Monetarism in Germany and the United States* (Ithaca and London: Cornell University Press, 1998), p. 197.
7. Allan Meltzer, *A History of the Federal Reserve*, vol. 1. *1913–51* (Chicago: University of Chicago Press, 2003), p. 204.

8. Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867–1960* (Princeton: Princeton University Press, 1963), p. 630. However, Friedman was not consistent in his adherence to broad money. See Edward Nelson, 'Milton Friedman and US monetary history, 1961–2006', *Federal Reserve Bank of St Louis Review*, vol. 89, no. 3, 2007, pp. 153–82, particularly, p. 163.
9. The author has set out these arguments, in somewhat different terms, in essay 16, on 'Money and asset prices in the US', pp. 346–73, of his 2011 collection *Money in a Free Society* (New York: Encounter Books).
10. The author developed this argument against M1 also in 'Money matters: post-Great Recession reappraisal', pp. 24–31, in *Central Banking* (London: Central Banking Publications), vol. XXVI, no. 3 (February 2016).
11. Elizabeth Johnson and Donald Moggridge (eds), *The Collected Writings of John Maynard Keynes*, vol. VII, *The General Theory of Employment, Interest and Money* (London and Basingstoke: Macmillan Press for the Royal Economic Society, 1973, originally published 1936), pp. 84–5.
12. Keynes' favoured concept of money was broadly defined, as the author explained in Congdon, *Money in a Free Society*, pp. 81–7.
13. The $100,000 dividing line between small and large time deposits has a strange consequence, that a time deposit of $98,000 in size is "money" in the M2 sense, whereas one of $102,000 is not. This is surely misguided. Moreover, the ability of agents to change their narrow money holdings by money-into-money transactions means that – at least to some degree – narrow money adjusts to national income, rather than the other way round. In the jargon of monetary economists, narrow money must be largely "endogenous". It therefore cannot fit into a monetary theory of national income determination where changes in money cause changes in national income. The author first set out, in formal terms, this criticism of narrow money in a 1990 paper explaining why his monitoring of UK broad money had enabled him to forecast the inflationary consequences of the 1986–89 "Lawson boom", so named after the UK's Chancellor of the Exchequer at that time. See pp. 182–4 of his 1992 collection *Reflections on Monetarism* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1992).
14. John Williams' Shadow Government Statistics, 'Fed abandons M3 without an honest explanation', issue no. 13B, 23 November 2005.
15. The M3 estimates prepared by Shadow Government Statistics can be cross-checked by publicly available data. As M3 is dominated by bank deposits, the author could – through the spring of 2020 – anticipate monthly changes in US broad money by following the Fed's weekly release on the balance sheet of the US commercial banks. In the year to 24 June, such deposits rose by 21.7 per cent.
16. For the 1918 to 1959 data, see pp. 803–6 of Robert J. Gordon (ed.), *The American Business Cycle: Continuity and Change* (Chicago and London: University of Chicago Press, 1986). The national product used in estimating velocity was gross national product, not gross domestic product, until 1959,

with the data again coming from the Gordon 1986 edited volume. The data, which are quarterly, are available from the author at timcongdon@btinternet .com.

17. Friedman, *A Program of Monetary Stability* (New York: Fordham University Press, 1960), pp. 90–91.
18. Friedman's views on the effect of changes in the US economy's financial sophistication on money velocity were controversial. Friedman and Schwartz developed the argument in their large 1982 volume on *Monetary Trends in the United States and the United Kingdom*. David Hendry of Nuffield College, Oxford, with colleagues, criticized their handling of data both in reviews of the book and later. See, for example, Neil Ericsson, David Hendry and Stedman Hood, 'Milton Friedman and data adjustment', VOX CEPR policy portal, 4 May 2017.
19. Using the Federal Reserve's flow-of-funds data, the author added "checkable deposits and currency", "time deposits" and "money market mutual funds" for the whole economy and for the category "domestic financial sectors". The whole economy series approximated the broad money total described earlier in the text. The data, which are annual, are available from the author at timcongdon@btinternet.com. (For more on the Fed's data, see footnote 30 below.)
20. Patrick Minford, *The Supply-Side Revolution in Britain* (Aldershot, UK, and Brookfield, USA: Edward Elgar Publishing, 1991), p. 71.
21. The Kolmogorov–Smirnov test says that the data do not differ significantly from those which are normally distributed. The author used a facility available on the Internet, at www.socscistatistics.com, to obtain the result.
22. The Kolmogorov–Smirnov test again says that the data are not significantly different from those which are normally distributed.
23. In a 4 April 2020 contribution to the Vox-EU CEPR policy portal website, 'Will inflation make a comeback after the crisis ends?', David Miles and Andrew Scott, reviewing the historical evidence in the UK, disputed that inflation is the likely sequel to wartime financial emergencies. See https://voxeu.org/article/will-inflation-make-comeback-after-crisis-ends. The Miles and Scott paper was partly a response to the Goodhart and Pradhan paper mentioned in footnote 5 above.
24. See, for example, Tom Riddell, 'The inflationary impact of the Vietnam war', *Vietnam Generation*, vol. 1, no. 1, 1989, *The Future of the Past: Revisionism and Vietnam*, article 4.
25. The theoretical statement usually refers to the equi-proportionality of changes in money and prices, with the quantity of output given. The statement in the text is loosely related to this proposition.
26. As in Chapter 4, the author must thank Kent Matthews and Paul Ormerod for their help with the analysis of the data. The interpretation in the current work, and responsibility for errors, lies with the author.
27. Joseph Stiglitz, 'Biden goes big', blog for Project Syndicate website, 1 February 2021.

28. Radu Vranceanu and Marc Guyot, 'Why the return of high inflation can no longer be excluded', blog on The Conversation website, 7 March 2021. In their words, they would "leave aside the quantity of money explanation of inflation" and rely on the expectations-augmented Phillips curve.
29. Using the series derived for the above discussion of Friedman's explanation for the secular fall in money velocity, from 1945 to 2019, the standard deviation of annual changes in whole-economy money was just over 4, whereas that for financial sector was almost 10½.
30. These items of information come from the Federal Reserve's flow-of-funds data, in the Z1 statistical release on *The Financial Accounts of the United States*. The release is published on a quarterly basis.
31. Congdon, *Money in a Free Society*, pp. 363–8. See also Chapter 3 in this volume.
32. The report referred mostly to bond issuance in Europe, affected mostly of course by the actions of the European Central Bank. But the same themes applied in the USA and elsewhere.
33. This reflects above all the 19 per cent jump in the four months to June, but it has also to be noted that money growth in 2019 was already higher than had been typical for most of the 2010s. In the nine years to mid-2019 the average ratio of M3 money to nominal GDP was 0.915; at the end of second quarter of 2020 the ratio was just over 1.225. (The estimates are by the author, using data from the Bureau of Economic Affairs for nominal GDP and Shadow Government Statistics for M3.)
34. *Minutes* of the Federal Open Market Committee meeting on 9 and 10 June 2020, published by the Federal Reserve Board in Washington, DC, p. 3.
35. Burton Abrams, 'The Fed's reckless experiment', *The Hill* website, 26 June 2020, available on https://thehill.com/opinion/finance/504702-the-feds-reckless-experiment

7. Applying the theory to the USA in the early 2020s

This book has restated the quantity theory of money and presented evidence for the restated version. How, then, could it be applied in spring and summer 2020 to make strong forecasts of rising inflation in the medium term? Detailed narratives are available in the work which the author did shortly after the Covid emergency was announced, as in Chapter 5. It is appropriate now to develop some key points in those narratives, with the focus in this chapter on the US situation and in the next on the UK.[1]

I.

After the turbulence of the Great Recession of 2008 and 2009, the US economy had much more stable policies in the years leading up to mid-2019. In the seven and a half years to June 2019, the average annual growth rate of M3 broad money was 4.1 per cent, with a standard deviation over that period of 0.9.[2] As measured by the standard deviation, money-growth volatility was much less than had been common in most of the preceding century. Indeed, Table 7.1 shows that the volatility of growth of both money and nominal GDP was lower in these seven and a half years in the 2010s than in any of the previous seven-and-a-half-year periods since the First World War. On the face of it, the table provides evidence to support the case for a constant-money-growth rule of the kind favoured by Friedman and others, but further discussion of this very important topic is beyond the scope of the present study.

According to the International Monetary Fund, the USA's national output was at trend in 2018, while in 2019 it was only marginally (0.7 per cent of trend output) above trend.[3] A reasonable view is that in mid-2019 the American economy was in or close to "monetary equilibrium", as that phrase was used in section III of Chapter 1. An upturn in money growth occurred in the nine months from spring 2019, but this was minor compared with what was to follow. At the end of February 2020 the M3 measure of broad money was just under $21,000 billion, a figure which is a key marker for the next few paragraphs.

Table 7.1 The stability of the growth rates of money and nominal GDP in the USA in the 20th and 21st centuries

Standard deviations in the 7½ year periods of:	Broad money	Nominal GDP
1922–mid-1929	3.7	6.7
Mid-1929–end-1936	11.6	16.1
1937–mid-1944	8.5	11.8
Mid-1944–1951	6.9	8.3
1952–mid-1959	1.5	3.6
Mid-1959–end-1966	4.3	2.1
1967–mid-1974	1.5	2.1
Mid-1974–end-1981	2.0	2.0
1982–mid-1989	2.3	2.3
Mid-1989–end-1996	2.3	1.2
1997–mid-2004	2.2	1.5
Mid-2004–end 2011	5.0	2.9
2012–mid-2019	0.9	0.9

Note: The data used is of annual growth rates %, on a quarterly basis. A salient feature of the data is that the extreme instability of money growth in the early 1930s coincided with the Great Depression. Stable money growth in the 1950s, the Great Moderation and the final period ('the Great Stabilization') was accompanied by relatively stable growth of nominal GDP.
Source: The sources are the same as used for the figures in Chapter 6. See, in particular, those mentioned on p. 174.

The Covid-19 medical emergency was announced by President Trump on 13 March, amid sliding prices and panic on the stock market, and widespread pessimism and alarm about the economic future. The Federal deficit started to widen dramatically, partly because of the loss of tax revenue, but also because of extra expenditure to mitigate the effects of the virus. The American central bank, the Federal Reserve, made clear its preparedness to finance the much enlarged budget deficit and also undertook large-scale asset purchases (or "quantitative easing") to stabilize financial markets. The monetary equilibrium was shattered.

II.

Stimulatory announcements – of both fiscal and monetary policy, and including QE – came through thick and fast in the closing weeks of March and all through April. It was soon clear that the CARES legislation would have a cost

of roughly $2,300 billion in the 2020 and 2021 fiscal years combined.[4] With other measures, the Federal deficit was likely to exceed $3,000 billion for an extended period and might even reach $4,000 billion. In the event, the cumulative 12-month total for the Federal deficit peaked at $4,320 billion in April 2021 and exceeded $2,900 billion from June 2020 to October 2021. If two-thirds of a deficit of $3,000 billion were financed from the banks, that meant an addition to broad money of $2,000 billion *in one year*, just under 10 per cent of the M3 stock at end-February.

But on top of that, the Fed committed itself to enormous QE operations. The asset purchases were on a particularly large scale in late March and April and were openly advertised as having the purpose of checking the slide in financial markets, including the stock market. The Federal Reserve financed the asset purchases by issuing cash reserves to the commercial banks, which became part of their assets. In the eight weeks from 26 February 2020 to 22 April 2020 the cash reserves held by US commercial banks at the Fed soared from $1,705.2 billion to $3,234.1 billion. The extra assets had to be matched, mostly, by extra deposit liabilities, and deposits are money. So the Fed's operations implied an addition to broad money – within about two months – of over 7 per cent.

Further, in the early weeks of the crisis, companies drew down credit lines out of fear that a worsening crisis might impair banks' solvency and hence their ability to extend credit. "Loans and leases in bank credit" – a category in Federal Reserve data which corresponds to bank lending to the private sector – climbed from $10,070 billion on 26 February to $10,874.6 billion ten weeks later. This change too added about 4 per cent to banks' assets and their deposit liabilities. More generally, the Fed's attitude towards the banks was almost the exact opposite of what it had been in the Great Recession. In the Great Recession the Fed and other regulatory agencies punished the banks by demanding large increases in their capital; in the Covid emergency they helped the banks by easing up on regulatory rules. Randal Quarles, the Fed's vice-chair for supervision, was important in this more pragmatic and easy-going stance.[5]

An explosion in money growth was implied by the Fed's and US government's announcements in late March, and their actions as the announcements took effect. Admittedly, the exact sequence and scale of official operations were uncertain, but – as the last three paragraphs have shown – it was not silly to propose that altogether the positive impact on broad money might be well above 30 per cent in two years.

BOX 7.1 THE ARITHMETIC OF THE USA'S 2020 MONEY EXPLOSION

At end-February 2020, the US M3 money measure was just under $21,000 billion.

[1] The fiscal cost of the CARES legislation

In the year to February 2020 the Federal deficit was $1,298.6 billion. The expected cost of the CARES legislation, passed on 27 March 2020, was given as $2,200 billion, mostly to affect the 2020 and 2021 fiscal years. The Federal deficit might therefore move out to $3,000 billion or more for at least two years. *If two-thirds of the deficit (at an annual rate of $3,000 billion) were financed from the banking system, broad money would increase by almost 10 per cent.*

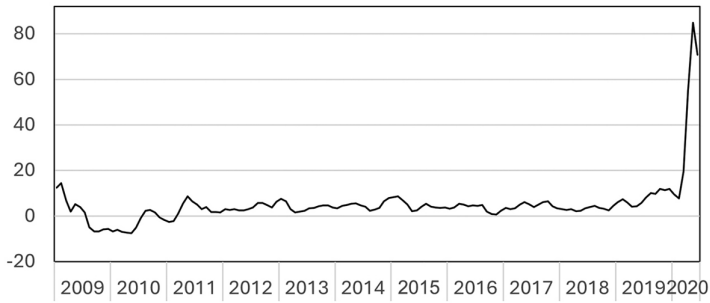
[2] Federal Reserve asset purchases

The Fed made announcements of large-scale asset purchases to stabilize financial markets. On 15 March the Fed said it would buy at least $500 billion of Treasuries and $200 billion of mortgage-backed securities in coming months. On 23 March the purchases became temporarily open-ended. The New York Fed spoke in terms of $100 billion a day, i.e., perhaps over $500 billion in a week. In June purchases were reduced to $80 billion of Treasuries and $40 billion of mortgage-backed securities per month. If $200 billion of asset purchases were from non-banks, the M3 increase would be 1 per cent. *An extra 3 to 4 per cent impact on M3 was plausible, at an annual rate.*

[3] Drawing-down of credit lines in the early weeks of the crisis

See text. "Loans and leases in bank credit" rose by just over $800 billion in the ten weeks to 26 February, *increasing broad money by almost 4 per cent.*

Effect estimated in one-year period	***$ billions***	***% effect on M3***
[1] Monetization of enlarged fiscal deficit	2,000	+9 to +10
[2] Fed asset purchases	600–800	+3 to +4
[3] Credit drawdown	800	+4
Indicated effect in total	3,400–3,600	**+16 to +18**



Source: Data are monthly and come from the Shadow Government Statistics consultancy.

Figure 7.1 *Three-month annualized growth rate % of M3 broad money in the USA, 2009 to mid-2020*

The consequent rate of money growth – of perhaps over 15 per cent a year – would be much higher than the 4 per cent recorded for most of the 2010s.[6] In the event M3 went up by more in *the one month* of April 2020 than it had *any full year* in the 2010s. Given the analysis of this chapter so far, and given also the monetary theory of national income determination developed in Chapter 1, a forecast could be given that the policy response to the Covid-19 medical emergency would result in an inflationary boom. Figure 7.1 – which shows the three-month annualized rate of increase of M3 from the Great Recession to June 2020 – indicates the speed and abruptness of the break in money growth in spring 2020. (The first charts in the previous two chapters, Figures 5.1 and 6.1, are on the same topic and should also be mentioned.)

III.

With the American economy starting from approximate monetary equilibrium in late 2019 and early 2020, that money explosion would result – if Friedman's proposed two-year lag turned out right – in a probable inflation peak in summer and autumn 2022. As the annual rate of money growth would almost certainly be in the teens per cent, a high risk of double-digit inflation had arisen. The outcome was not far from this conjecture. The annual rate of increase in the consumer price index – which had averaged just above 1.5 per cent in the 12 years to end-2020 – was 7.2 per cent at the end of 2021 and peaked at 8.9 per cent in June 2022. It has fallen since then, but at the time of writing (October 2024) remains slightly above the approximate 2 per cent target that the Fed

once set itself. (The annual increase in the so-called "final demand producer price index" – a measure of prices at factory gates – reached a local peak of 11.7 per cent in April 2022. The average annual increase in the five years to December 2019 – before Covid and the money explosion – was 1.3 per cent.)

Chapter 5 raised the question of whether the key people in the Federal Reserve understood what it was doing. The argument in the last section was that even in April 2020 ample evidence signalled that double-digit annual growth in broad money was certain, while basic monetary theory implied a high risk of double-digit inflation. Were any internal warnings given – using an analytical approach to monetary policy of the sort proposed in this book – that the additions to broad money due to the Fed's decisions were likely to culminate in an inflation rate close to double digits? It seems unlikely. On the contrary, the contents of the 26 March 2020 interview given by Fed chair Jay Powell to Savannah Guthrie – mentioned above on p. 102 – need to be recalled. Powell may even have believed that, because the Fed's money-creation powers were unlimited, the pace of money creation had no bearing on the future inflation rate.

Much of the trouble here seems to have stemmed from a misinterpretation of the previous crisis, that in 2008 and 2009. In the Great Recession, the Fed's asset purchase had led to explosively high growth rates of the monetary base and M1. Yet inflation in the early 2010s had been subdued. Many top Fed officials drew the conclusion that money, however measured, mattered not one jot to the USA's inflation performance. This book has insisted that the correct money aggregate in macroeconomic analysis is one that is broadly defined to include (at least in principle) *all* money balances. In the five years from mid-2008 the compound annual growth rate of US M3 was a meagre 1.9 per cent. Banks complied with the Basel III edicts on their capital requirements and shrunk their risk assets, and the fall in risk assets limited the growth of deposit liabilities. The behaviours of the monetary base and M1 were utterly different from the behaviour of broad money, and it was broad money that determined macroeconomic outcomes. The point seems to have been too subtle for many of the Federal Reserve's economists.

IV.

By early 2021 these economists must have heard at least whispers of outside concern about the inflationary potential of recent rapid money growth in the USA. But they seem to have instructed Powell about how to dismiss any such concern. In February, Powell (then aged 68) was given the opportunity – in his Semi-annual Monetary Policy Report to Congress – to express his views on money and inflation. In reply to a question from Senator John Kennedy (aged 69), he was vigorous in rejecting basic principles of supposedly old-fashioned

monetary economics.[7] To quote, "When you and I studied economics a million years ago M2 and monetary aggregates seemed to have a relationship to economic growth. Right now … M2 … does not really have important implications. It is something we have to unlearn I guess."

In further Congressional testimony in December 2021, he had the chance to recant, but instead doubled down on his previous position. The link between money and inflation had, in Powell's words, "ended about 40 years ago". In more detail, "Now, we think more of just the imbalances between supply and demand in the real economy rather than monetary aggregates. … It's been a different economy and a different financial system for some time."[8]

Almost certainly the source of Powell's ideas was advice from the New Keynesian economists at the Fed. Their research focus was not on the money aggregates, but rather the role of labour market imperfections in wage-setting. Again almost certainly, the two key officials were Richard Clarida, already mentioned, and John Williams, who had been appointed president of the Federal Reserve Bank of New York in 2018. Both were economists of considerable distinction, with scores of academic papers to their credit. No one could dispute their intelligence and good intentions. But they went along with the fashions in their subject, and in the early twenty-first century the quantity theory of money was deeply unfashionable.

Of course, fashions come and go. Several newspaper stories appeared in 2022 and 2023 about the possible resurrection of monetarism, because the high inflation of the early 2020s had an apparently plausible explanation in the behaviour of the quantity of money. One such piece appeared in the Streetwise section of *The Wall Street Journal* on 6 October 2023, under the title 'Monetarism is back'. According to its author, James Mackintosh, Milton Friedman's disciples were "delighted" because their theory seemed to be working again. But the notion that monetarism might be back was immediately qualified by the sentiment in the sub-title, 'It may not last'. Mackintosh claimed that Alan Greenspan, the legendary Fed chair from 1987 to 2006, had in 1993 "told Congress that the long-run relationship between money supply and inflation 'seems to have broken down'". Further, Mackintosh's assessment was that "for a quarter of a century" Greenspan was right and Friedman wrong. Mackintosh then proclaimed, "There was essentially no link between any of the various measures of money supply and inflation through the 1990s, 2000s and 2010s."

The Mackintosh article is interesting not just as one element in the American public debate, but also for this slur on the money–inflation relationship. One purpose of Chapter 6 was to present the facts on the relationship between broad money and nominal GNP/GDP for a long period, going back to the First World War. Arguably, those facts contradict the Mackintosh statement, but – as the details are somewhat technical – they can be relegated to a footnote.[9]

His statement was far from silly, but the implied conclusion about the money–inflation link encouraged policy-makers to play with fire. That is what they did in spring and summer 2020, and inflation took off in a way they had not imagined possible.

V.

The argument so far has been that the US inflation of the early 2020s had monetary roots, despite the apparent beliefs of Jay Powell and his senior colleagues that the relevant ideas ought to be unlearned. It has to be said that, despite occasional articles such as that penned by James Mackintosh in *The Wall Street Journal*, this argument has struggled to make progress in the American public debate. A prevalent claim has been that Larry Summers gave advance warning about the inflation. Summers, who was the US Secretary to the Treasury at the end of the Clinton presidency from 1999 to 2001 and then president of Harvard University until 2006, is one of the USA's most prominent economists.

Unquestionably, he did worry at an early stage about the inflationary implications of budget measures taken shortly after Jo Biden had become US president in January 2021. A feature (by John Cassidy) in *The New Yorker* magazine over a year later summarized the position:[10]

> In a column [in *The Washington Post*] published in February, 2021, Summers questioned the historic size of President Biden's $1.9-trillion *COVID*-relief proposal, which Congress passed the following month, and wrote, "There is a chance that macroeconomic stimulus on a scale closer to World War II levels than normal recession levels will set off inflationary pressures of a kind we have not seen in a generation." At the time that column appeared, the rate of consumer-price inflation was below two per cent. Today, it stands at 7.9 per cent. "Larry deserves credit for identifying the danger of inflation," Austan Goolsbee, an economist at the University of Chicago who worked in the Obama Administration, said. "At the start of 2021, the only people saying that were the folks that had predicted hyperinflation every year since 2008."

To give Summers his due, he then increased the volume and by summer 2021 was very explicit about the risks that excessive stimulus would cause overheating and a major rise in inflation. On 18 May he said, "We're taking very substantial risks on the inflation side." On 26 May, at a meeting reported by the CNN news agency, his warnings were more specific, with familiar sound-money phrases. In his words, "We are printing money, we are creating government bonds, we are borrowing on unprecedented scales." The CNN story also has some witty sentences from him about Powell's and the Fed's attitude towards the economy in the Covid emergency. To quote, "The Fed's idea used to be that it removed the punchbowl before the party got good … Now, the

Fed's doctrine is that it will only remove the punchbowl after it sees some people staggering around drunk."[11]

A number of comments are relevant here. First, Summers deserves praise in one sense. He was among the first – perhaps even *the* first – of the USA's leading economic opinion-formers to see that inflation, not deflation, was the main danger from policy-making in the Covid period.[12] In 2021 his warnings were placed in newspaper articles and media interviews, and to that extent they lacked the rigour expected in more academic writings. But in 2022 he co-authored a few more substantial contributions with colleagues based at the IMF, Harvard and equivalent institutions.[13]

Secondly, Summers may have been ahead of other leading American economist to warn about an inflation surge, but the very first of these (in *The Washington Post* in February 2021) was almost a year after the author started to bang the drum. (See Chapter 5 for chapter and verse. Goolsbee's statement – that the only economists then forecasting a big rise in inflation had been predicting "hyperinflation every year since 2008" – was plain wrong. For the author's views on inflation in the early 2010s, see p. 7 and p. 95 above) Further, the emphases in Summers' version of events were quite different from the author's. Summers was concerned that Biden's *fiscal* package was excessive, whereas the author highlighted unduly rapid growth of the quantity of money and hence mistakes in *monetary* policy. The focus on money enabled the author to recognize in late March and early April 2020, with no lag at all, that decisions then being taken by the Federal Reserve – as well as by the US Federal government – would lead to more inflation. In particular, the effects of the asset purchases on broadly defined money were central to his monetary analysis. Summers seems not to have picked up this line of argument at any point.[14] Admittedly, the fiscal and monetary narratives merge in some circumstances. They come to much the same thing if and when deficits are monetized.

Thirdly, the matters in contention here raise the larger issue of the relative efficacy of fiscal and monetary policy. Summers is far from being alone, among leading and influential US economists, in emphasizing fiscal policy. The author has to be acknowledge that he is at one end of a wide and diverse spectrum of views about the subject. In his view, the evidence – from the US data for recent decades – is that fiscal policy, as commonly measured by the change in the cyclically adjusted budget balance, has no reliable impact on economic activity.[15] In some years an increase in the cyclically adjusted budget deficit is associated with above-trend growth, in line with the Keynesian textbooks; in others it is associated with beneath-trend growth, which contradicts them.[16] Even more surprising for the Keynesians, multi-year periods of fiscal consolidation (that is, of successive years of reductions in the cyclically adjusted deficit) have sometimes been accompanied by above-trend growth. The larger conclusion is that it is debatable whether "fiscal policy" has the

effects on aggregate demand invariably propounded in the textbooks. By extension, the author regards fiscal policy as of little interest, in terms of its impact on aggregate demand, relative to monetary policy. Monetary policy is to be understood – above all – as defined by changes in the rate of growth of broad money.[17]

A key difference between the Keynesian textbooks and broad-money monetarism is to be found in their attitude towards variable-income assets, that is, corporate equity and real estate. As argued earlier in both the Introduction and Chapter 4, the Keynesian textbooks suppress references to the pricing of corporate equity and real estate, where the private ownership of these assets is an undoubted and distinctive attribute of market capitalism. Instead many textbooks see changes in the quantity of money as having their most important effects exclusively on "the rate of interest", either the central bank rate or bond yields. They also tend to proclaim – and indeed to celebrate – the ability of fiscal policy to alter macroeconomic outcomes, including equilibrium national income and wealth. But no Keynesian has asserted that an increase in the budget deficit causes a significant and related rise in the value of the stock market or, say, residential real estate. By contrast, it is basic to broad-money monetarism that, in equilibrium, changes in the quantity of money and the value of variable-income assets are equi-proportionate. (See pp. 48–55 in Chapter 1.) Moreover and by implication, the impacts of changes in the quantity of money on share prices and the housing market play a big role in the transmission mechanism of monetary policy.

These debates are pivotal to contemporary macroeconomics, but cannot be resolved here in a few words or even in a number of paragraphs. There is much more to say. Nevertheless, some claims by fiscally minded American economists do need to be challenged. With three colleagues John Cochrane conducted a sympathetic interview with Summers in April 2022. (Cochrane was then a fellow of the Hoover Institution at Stanford, but for many years he had been a professor at the University of Chicago.) According to Cochrane, at the start of his contribution to a Hoover Institution conference shortly after the interview, "the current inflation" had "a fundamental fiscal source". His next two sentences read, "We had a $5 trillion [$5,000 billion] fiscal helicopter drop. Inflation need not have been a surprise."[18]

This seems to be a reference to the size of the budget deficit in the Covid period. Specifying the exact period affected heavily by the Covid pandemic is itself for debate, but a fair view is that the two relevant full calendar years were 2020 and 2021. The IMF database at April 2024 showed that the general government deficit in those two years was $2,973.6 billion and $2,616.7 billion, respectively, given a combined figure of $5,590.3 billion, which looks like Cochrane's number. If this is what he meant by the phrase "a $5 trillion fiscal

helicopter drop", his analysis is open to three criticisms before even mentioning the alternative monetary explanation of the inflation.

First, for fiscal policy to be expansionary, it is not sufficient for the budget deficit to be large. Rather in the period in question it needs to be higher than before. (Fiscal policy is usually measured by the *change* in the fiscal balance, not the *level*.) In the two years 2018 and 2019 combined the USA's general government deficit was $2,353.0 billion. So the change compared with the two Covid-hit years was a bit more than $3,200 billion, still an enormous number, but not $5,000 billion.

Secondly, and more to the point, all economists accept that changes in the budget balance reflect two forces, that of policy decisions in changing the balance, which can be characterized as "fiscal policy", and that of the developments in the economy on the balance. Such developments include, above all, the role of the business cycle via the effects of changes in activity on tax revenues and certain expenditures, such as unemployment benefit. But in the period of interest here also crucial was the impact of Covid-related interruptions to output and spending. For Cochrane to assert that the American economy received stimulus from "a $5 trillion fiscal helicopter drop" implies that the inflation emerged because a "helicopter drop" of that size was organized by the US Treasury. But that is questionable. In the second quarter of 2020 the USA's GDP plummeted by over 8 per cent, while non-farm payrolls crashed in April by over 20 million workers. The downturn in the economy was plainly a major influence on the increase in the deficit. Let it be conceded that the CARES legislation – which was a discretionary stimulus – had a cost over the two years, 2020 and 2021, of $2,300 billion, as already noticed earlier in the chapter. But that is only a bit more than $1,000 billion in each year, much less than $5,000 billion.

Thirdly, and most fundamentally, the fiscal story does not fit the timeline of inflation. As the last two points have suggested, the correct definition of "fiscal policy" is complex and less than obvious. The concept of "fiscal policy" – in the sense relevant to having an impact on aggregate demand and the strength of inflationary pressures – needs to be adjusted, in the Covid period, by the effects on that deficit of *both* the cycle *and* the Covid damage to the deficit because of supply interruptions, lost tax revenue and so on. Arguably, Cochrane's proposal of a "a $5 trillion fiscal helicopter drop" does not respect the difficulties. Let it be suggested that the change in the deficit affects inflation in the year in which it occurs. The fiscalist thesis is then that an increase in the budget deficit raises inflation in the relevant contemporaneous year or that a fall in the deficit lowers it, again in the same period. Table 7.2 shows the numbers of interest to the US discussion, using the IMF concept of the general government deficit and the consumer price index to measure inflation.

Table 7.2 US budget deficit and inflation at the time of Covid

-	General government deficit, $b.	Change in government deficit, $b.	Consumer price index inflation, end-year, %	Average CPI inflation during the year, %	Change in end-year CPI, % points	Change in average CPI inflation, % points
2019	−1,251.02	−149.02	2.3	1.8	+0.3	−0.6
2020	−2,973.58	−1,722.56	1.3	1.3	−1.0	−0.5
2021	−2,616.68	356.91	7.2	4.7	+6.2	+3.4
2022	−1,047.99	1,568.69	6.4	8.0	−0.8	+3.3
2023	−2,405.03	−1,357.04	3.2	4.1	−3.2	−3.9

Source: IMF database for government deficit, Federal Reserve Bank of St Louis database for CPI, and author's estimates.

Plainly, the fiscalist thesis does not work. The deficit soared in the 2020 calendar year, while inflation started the year at a moderate figure and remained subdued. The deficit then came under control in 2021 and, more particularly, in 2022. But these were the two bad years for inflation. Finally, in 2023 the deficit rose again, now not because of Covid, but to a significant extent as a result of Biden's expansionary fiscal policy. According to the fiscalists, inflation ought to take taken off again. It did not. (To be clear, much of the rise in the deficit between 2022 and 2023 arose from an unplanned and undesired surge in interest costs on the public debt. Whether a jump in debt interest costs, which of course raises the deficit, should be regarded as "expansionary fiscal policy" seems moot. In the late Covid period, it was certainly involuntary as far as policy-makers were concerned.)

On the face of it, Cochrane's appeal to a "a $5 trillion fiscal helicopter drop" is rhetoric, which relies on a big number for its force. Careful interrogation of the meaning of the phrase and the associated figurework, and of the timing of the economic developments to which it purports to relate, suggest that it does not fit the facts.

Cochrane's comments on the inflation of the 2020s is part of a large project to elaborate "a fiscal theory of the price level", which is clearly intended to challenge a monetary theory of the price level where the quantity of money is the relevant variable. In a short note by Christopher Sims for the 2024 *Papers and Proceedings* of the American Economic Association (AEA), a product of the AEA's annual conference in San Antonio, Texas in January that year, the fiscal theory of the price level was again favoured.[19] Sims is a figure of great authority in the American economics profession, having been made Nobel laureate in 2011 jointly with his associate, Tom Sargent. The Nobel citation commended Sargent and Sims "for their empirical research on cause and effect in the macroeconomy". According to Sims in his 2024 note, the meaning of the fiscal theory of the price level is that "the price level keeps in balance the real value of outstanding government debt and the real value of expected future fiscal effort". Such effort is measured by "future real primary surpluses", meaning "conventional surplus plus interest expense". Further, in Sim's words, "Monetary policy can affect the timing of inflation changes but cannot prevent fiscal actions, or expectations of them, from influencing the price level."

Cochrane and Sims seem to view the relationship between fiscal policy and inflation as making itself evident in the long term, over periods of several decades. The obvious response is to compare rates of changes in the USA's nominal GDP with rates of change in broad money and a measure of fiscal policy, which here is simply the average level of the Federal deficit relative to GDP. This is done in Figure 7.2, which looks at the experience of six decades. Readers can be left to make up their own minds about the subject, and indeed the nature and direction of cause and effect. In the author's view the fiscal

	Fiscal influence	*Monetary influence*	
	Federal deficit as % of GDP, average in decade	% annual growth rate M3 broad money	% annual growth rate Nominal GDP
1960–70	–0.7	7.7	6.8
1971–80	–2.2	11.4	10.3
1981–90	–3.9	7.7	7.7
1991–2000	–1.5	5.6	5.6
2001–2010	–3.4	7.1	3.9
2011–2020	–5.7	5.6	3.6

Source: For the first column, FRED database, with data until 2013 using mnemonic FYFSGDA 188S and numbers thereafter estimated by the author from annual deficit and nominal GDP data. For money and nominal GDP data, see Table 7 in author's 2024 study for the IEA in London, *The Quantity Theory of Money: A New Restatement*.

Figure 7.2 *Fiscal policy vs. monetary policy: fiscal deficit, money growth and nominal GDP, by decade from 1960*

theory of the price level is not viable. The decade (the 1960s) with the lowest deficits had a moderate rate of increase in nominal GDP, with mild inflation; the decade (the 1970s) with the most inflation was associated with budget deficits of slightly more than 2 per cent of GDP, far from the most pronounced fiscal profligacy in the 60 years under consideration; the decade (the 2010s) with the largest deficits had the lowest increase in nominal GDP and negligible inflation. The empirics here may not be at the level of the Nobel Prize, but they do not need to be. The fiscal theory of the price level is surely not the right way to explain inflation.

NOTES

1. For the UK, see the next chapter. The author has written less about the Eurozone, but see 'Does the upturn in Eurozone money growth imply 5% inflation?', *SUERF Policy Note*, issue 242, June 2021 (SUERF: The European Money and Finance Forum, Vienna). The answer to the question given in the paper was "yes", when most forecasts were for inflation to remain indefinitely in the low single digits. In fact, the peak in consumer price inflation in October 2022 was 10.6 per cent.
2. The standard deviation was calculated from a series of annual growth rates on a quarterly basis. A regression of the data in Table 7.1 – that is, of the standard deviations of nominal GDP growth on the standard deviations of money growth in the 13 periods of 7½ years to mid-2019 – was surprisingly good. The positive regression coefficient of 1.37 had a *t* statistic of 8.49, while the

coefficient of determination (r^2) was 0.93. But the analysis, while suggestive, needs amplification to establish the case for the constant-money-growth rule.

3. IMF, *World Economic Outlook*, April 2023 database, accessed September 2023.
4. Penn Wharton Budget Model, 'The long-run fiscal and economic effects of the CARES Act', blog post, 5 May 2020, at https://budgetmodel.wharton.upenn.edu/issues/2020/5/5/long-run-economic-effects-of-cares-act
5. Jeanna Smialek, *Limitless* (New York: Alfred Knopf, 2023), pp. 214–17.
6. In the event, M3 growth in the two years from February 2020 was 32.4 per cent, but – surprisingly – much of it was compressed into the mere five months from February to July 2020. (The author wishes – once more – to thank the Shadow Government Statistics consultancy for the M3 numbers.)
7. *Semi-Annual Policy Report to the Congress*, 21 February 2021, printed for the Senate Committee on Banking, Housing and Urban Affairs (Washington: Government Printing Office). For a related media report, see Reuters, 'Powell's Econ 101: Jobs not inflation. And forget about the money supply' by Howard Schneider, 23 February 2021, at https://www.reuters.com/article/business/powells-econ-101-jobs-not-inflation-and-forget-about-the-money-supply-idUSKBN2AN2EJ/
8. The remarks appeared in evidence to the House of Representatives' Committee of Financial Services on 1 December 2021.
9. The data behind Figure 6.3 in Chapter 6 – which bear directly on the Mackintosh statement – invite a regression analysis. An equation between the two series for the century to 2019 is satisfactory for the quantity-theory approach, with a coefficient of determination (or r^2) of 0.37, a regression coefficient on the change in broad money term of 0.78 where this coefficient has a *t* statistic of over 15. However, an equation for the 30 years to 2019, with the same two series, is unacceptable from a quantity-theory perspective and – in that sense – the Mackintosh statement is correct. However, the average annual growth rates of nominal GDP and broad money in the 30 years to 2019 were 4.5 per cent and 5.5 per cent, respectively, while – as argued in Chapter 6 – the change in velocity was mean-reverting in the second half of the twentieth century and in the early twenty-first century, as it had been earlier. In the author's view, the data argue for respecting basic quantity-theory propositions, whatever the low quality of the regression between annual changes in the quarterly data for the final decades of the twentieth century.
10. John Cassidy, 'Is Larry Summers really right about inflation and Biden?', *The New Yorker*, 8 April 2022.
11. Matt Egan, 'Larry Summers sends stark inflation warning to Joe Biden', CNN Business report, 27 May 2021.
12. His position contrasts, for example, with that of Joseph Stiglitz: "Opponents of the Biden plan also disingenuously warn against inflation – that lurking bogeyman that is more fantasy than real threat nowadays. Indeed, some data suggest that wages may be falling in parts of the economy. But if inflation does emerge, the US has ample monetary and fiscal tools at the ready." Joseph

E. Stiglitz, 'Biden goes big', 1 February 2021, at https://www.project-syndicate.org/commentary/biden-right-to-launch-massive-rescue-plan-by-joseph-e-stiglitz-2021-02

13. See, for example, the paper by Marijn A. Bolhuis, Judd N. L. Cramer and Lawrence H. Summers, 'Comparing past and present inflation', *National Bureau of Economic Research working paper series,* no. 30116, at https://www.nber.org/papers/w30116
14. He may regard it as being without merit.
15. Tim Congdon, 'In praise of expansionary fiscal contraction', *Journal of Economic Affairs* (London: Institute of Economic Affairs), vol. 35, no. 1, February 2015, pp. 21–34.
16. See essay 8, and particularly pp. 196–7, in Tim Congdon, *Money in a Free Society* (New York: Encounter Books, 2011).
17. As there is no dispute that extra money balances arising from the monetization of the budget deficit have the same effects on equilibrium national income and wealth as any other extra money balances, the author's implicit claim is that non-monetized budget deficits – deficits that are financed by bond sales at the long end to non-banks – have no effect on equilibrium national income and wealth. That is indeed what he believes. The combination of expanding the budget deficit and increasing long-dated bond sales by the same amount does not increase equilibrium national income and wealth in either nominal or real terms; it merely increases the ratio of public debt to national income at a faster rate than before, almost certainly with adverse consequences for the state's debt interest costs.
18. John Cochrane, 'Inflation past, present and future: fiscal shocks, Fed response, and fiscal limits', chapter 5, pp. 63–114, in Michael Bordo, John Cochrane and John Taylor (eds), *How Monetary Policy Got Behind the Curve – and How to Get Back* (Stanford: Hoover Institution Press, 2023). See, particularly, pp. 63, 66, 68.
19. Christopher Sims, 'Origins of US inflation', *AEA Papers and Proceedings 2024,* vol. 114, May 2024, pp. 90–94. The quotation is from p. 90.

8. Applying the theory to the UK in the early 2020s

Discussion of the UK's inflation record in the 2020s takes the form here of a narrative that begins towards the end of the twentieth century. A fair comment is that it may be the first such extended treatment to relate inflation outcomes to changes in the growth rate of broad money. Further, it needs to be understood that the conduct of macroeconomic policy in the UK in this period was very different from that in the early post-war decades. Although from autumn 1985 broad money growth targets were not explicitly in force, top policy-makers recognized that inflation should be limited by monetary policy. Discretionary fiscal policy to influence the economy was constrained by the need for medium-term solvency in public finances. No one could pretend that policy remained "Keynesian" in the sense intended by the phrase "the Keynesian Revolution".[1] UK macroeconomic policy-making had been transformed by a "monetarist counter-revolution", if of a rather muddled kind.

From an economic perspective, the years in the UK from 1992 to 2007 have been widely termed "the Great Moderation". Low inflation matched the official target set out in legislation, while coinciding with steady, quite high output growth. The years from 2007 to mid-2012 were much more troubled and might be seen as "the Great Recession" and its aftermath. On the same basis, the period from mid-2012 to the start of 2020 could be described as "the Great Stabilization". As in the Great Moderation, UK annual consumer price inflation stayed within the band of 1–3 per cent specified in the legislation, except for 21 months between December 2014 and September 2016. In these 21 months, inflation was between zero and 1 per cent, with the undershoot attracting little criticism or concern.

I.

The undershoot on inflation could be attributed – in a cost breakdown analysis – partly to extreme weakness in commodity prices and, particularly, in energy prices. To some extent, these developments reflected global forces outside the control of UK policy-makers. But also relevant and more fundamental was

sluggish money growth. In the six years to the end of 2014 (that is, to just before the 21 months of sub-1-per-cent inflation), the average annual growth rate of the M4x broad money was 2.9 per cent. The 2.9-per-cent figure was the lowest over such a lengthy interval of time since the interwar period.

The Great Stabilization is surely a fair characterization, but the period should not be confused with heaven on earth. Supply-side performance – the average growth rate of output of the British economy over the years – was mediocre. But the stability of the growth from year to year was impressive and certainly matched the achievement of the Great Moderation. Further, after the undershoot in the middle of the decade, inflation remained on target. Arguably, the very satisfactory UK inflation outcome in the 2010s was consistent with the standard monetarist conjecture. Specifically, the velocity of circulation was not constant, but changes in it were much less than those in either the quantity of money or nominal GDP, and were around a low mean value.

Indeed, a remarkable and very important feature of these years has been overlooked in public discussion, but is crucial to the main claims of the present study. In the 1970s, Britain's monetarists – like their Chicago-based counterparts – advocated low and stable growth of the quantity of money, to be secured by officially announced targets. From 1979 the Thatcher government responded to these ideas and pursued an avowedly monetarist programme to combat inflation. Low and stable growth of the quantity of money was seen as the heart of monetary management in the UK. In practice, targets and outcomes were often far apart. All the same, the official focus on money growth deceleration did lead to a drop in inflation to about 5 per cent a year. But from 1985 the targets were abandoned, and both money growth and inflation accelerated back towards double digits.[2] (The average annual increase in consumer prices in the Labour government from March 1974 to May 1979, which preceded Thatcher, was 15.8 per cent.)

Curiously, it was in the Great Stabilization of the 2010s – many years later – that the British government and the Bank of England took decisions that did, in fact, procure low and stable growth of the quantity of money, on the broad definitions. They did this, even though they thought they were doing something quite different. Anyhow, as monetarist economists had hoped and expected, steady, non-inflationary growth of demand and output was secured.

II.

As Covid-19 hit in early 2020, the Bank of England's top officials were in constant communication with other central bankers, both in Europe and the USA. In the early weeks and months of the pandemic, policy announcements from the major central banks were similar. On 19 March, the Bank's Monetary Policy Committee endorsed £200 billion of asset purchases, to be split between

government securities and corporate bonds. On 18 June it added a further £100 billion to the total. A small proportion of the purchases were of corporate bonds, but government securities were much more important. The stock of gilts held by the Bank of England's asset purchase facility was stable in the three years to the start of 2020 at just above £371 billion. The figure soared in the eight months to October 2020 by just under £214 billion to £585 billion.

A discussion in footnote 26 to Chapter 1 explained the background and rationale to the estimation of the UK's M4x measure of broad money, and defended its usefulness for analytical purposes.[3] This measure of money is therefore used to explain the interplay between money and macroeconomic outcomes in the period under consideration. M4x was slightly above £2,250 billion at February 2020. Official asset purchases of £200 billion might be as much as 75 per cent from UK non-banks, implying an increase to M4x of £150 billion. So this £150 billion translated into a rise in M4x of just under 7 per cent. If that rise were compressed into a mere three-month period, the annualized rate of money growth would be over 30 per cent or so. In the event, M4x rose by 7.3 per cent in the three months to May, giving an annualized rate of growth of 32.8 per cent. The annual increase – which had been a moderate 4.5 per cent in February – was 12.5 per cent in July. These numbers were plainly disruptive relative to the experience of the 2010s, but received few mentions in the media and no comment at all in the Bank's own publications.

From its inception in late 1992, the UK's inflation-target regime included the publication by the Bank of England of a quarterly *Inflation Report*, the first of which had appeared in February 1993. But in November 2019 the results of the Monetary Policy Committee's deliberations were produced instead in a *Monetary Policy Report*, with the renaming of the report at least hinting that inflation was seen as yesterday's problem. The August 2020 *MPR* contained no reference to the acceleration in money growth, but did note that recent consumer inflation was "well below the 2 per cent target and was expected to fall further below it in coming quarters, largely reflecting the weakness of demand. At [its latest] meeting, the MPC judged that a further easing of monetary policy was warranted to meet its statutory objectives."

The judgement at the November MPC meeting remained that – in the next two years – inflation was more likely to undershoot than overshoot the 2 per cent target. The MPC hence decided on another round of asset purchases, this time of £150 billion. Over the next year the Bank's asset purchase facility did climb, almost exactly, by another £150 billion. In the following months the annual rate of M4x money growth went up further, reaching a peak of 15.3 per cent in February 2021. This was the highest number, on the annual growth metric, since M4x had been introduced as an aggregate in 1998. In fact, broad money growth had not been as strong – in the mid-teens per cent at an annual rate – since the Lawson boom of the late 1980s, more than 30 years earlier. The

Lawson boom culminated in a double-digit inflation rate in 1990. (For more on the Lawson boom, see p. 139 in Chapter 4.)

III.

As in the USA and other advanced countries, most high-level macroeconomic research and policy discussions in the UK were – through 2020 and even into early 2021 – about the risks that Covid would result in persistent deflation. Many respected observers applauded a big increase in the budget deficit as well as the Bank of England's asset purchases. Writing in the *Financial Times* on 22 June 2020, Gavyn Davies, former chief London economist at Goldman Sachs, opined that the resulting rise in public debt should be viewed as a "shock absorber". His judgement was that governments' response to the crisis, in the UK as elsewhere, enjoyed "a chorus of approval from the [economics] profession".[4] To quote again from its August 2020 *MPR*, the Bank of England said that it envisaged inflation rising in coming quarters, as the economy recovered from Covid and "spare capacity diminishes". The rise in inflation would be from annual rates of under 1 per cent at the time of the report's preparation and a further dip to about zero in early 2021. After that, consumer inflation was expected "to be around 2 per cent in two years' time [that is, in August 2022]".

This was not out of line with views widely held in other quarters in the UK or with international opinion. For example, Philip Lane, chief economist at the European Central Bank, said on 26 November 2020 in a speech at Trinity College, Dubin, that "the current priority for monetary policy" was "to ensure favourable financing conditions to support the economic recovery and counteract the negative impact of the pandemic on the projected inflation path".[5] Policy-makers across the advanced world were anxious not about the inflation risks of high money growth, but "the negative impact" of Covid-19 on their inflation projections.

Members of the Monetary Policy Committee gave speeches in late 2020 in which the worry was the possible inability of monetary policy to stimulate the economy and to take it out of the Covid slump.[6] An illustration is provided by Michael Saunders, an external member of the MPC. He participated in an online webinar on 4 December in which he set out, to cite the title of his speech, 'Some monetary policy options – if more support was needed'. Even though Bank rate could not fall much further, the MPC stood ready "to take whatever additional action" might be needed "if the outlook for inflation weakens". Although M4x had risen by 13.6 per cent in the year to November, there was no hint that a serious future problem would be above-target inflation. Saunders' speech was said not necessarily to represent the MPC majority, but it reflected the kind of thinking which had led to the announcement of the extra £150 billion of asset purchases.[7]

In summary, the overwhelming consensus among British economists in 2020 – and even as late as spring 2021 – was that Covid-19 would be followed by a long period of disinflation. The widespread expectation was a period of a few years in which policy-makers' main preoccupation would be combating beneath-target inflation. Few economists paid much attention to money data, but an exception was the Shadow Monetary Policy Committee (SMPC) under the aegis of the London-based think tank, the Institute of Economic Affairs. The Committee's members became concerned about excessive money growth and sent a letter to the *Financial Times* noticing the similarity of the latest money growth patterns to those in the last big period of cyclical excess over 30 years earlier. The letter appeared in the *Financial Times* on 26 April 2021 under the heading 'BoE [Bank of England] must end its asset purchases to avoid stoking inflation'. To quote,

> We believe that above-target inflation is to be expected in 2022 and perhaps 2023. In our view, the Bank of England will be to blame for this setback, as it took the measures that have pushed money growth to its current excessive level … We fear that inflation above 5 per cent is likely at some point in the next few years. We judge that the MPC's decision in November 2020 to embark on another round of quantitative easing, to the tune of £150bn, has proved particularly responsible for the current excessive money growth.

But the real Monetary Policy Committee had little or no interest in the behaviour of the quantity of money. A few weeks before the SMPC letter Gertjan Vlieghe, another external member of the MPC, had given an update on the economic outlook at Durham University. His assessment was still that the "pandemic shock was fundamentally a disinflationary shock". Without the official stimulus measures, a "severe disinflation" would have eventuated. In his view, the stimulus had been applied and "inflation is expected to return sustainably to target".[8] He referred not once to any concept of the quantity of money and evidently did not believe that the attainment of target inflation required an appropriately low rate of money growth. Almost exactly a month after the SMPC letter, Silvana Tenreyro, an economist of Argentine background who had joined the MPC in 2017 and has already been mentioned in Chapter 1, gave the keynote speech at a San Francisco conference. She compared policy-makers' response to Covid in the USA and the UK, and noted the commonality of diagnosis and prescription. She referred to UK households' "liquid asset balances" and wondered about how quickly they would be spent, but not to their money holdings and the equilibrium ratio of such holdings to income and wealth.[9]

IV.

In fairness to the Bank of England, it has to be noticed that some in-house dissent from the majority view had emerged by early 2021. Andy Haldane, the Bank's chief economist, had started to have reservations about the MPC's consensus on never-ending low inflation. These were expressed in a brave and noteworthy speech on 26 February, called 'Inflation: a tiger by the tail?'.[10] To quote from its final paragraphs, "Inflation is the tiger whose tail central banks control. This tiger has been stirred by the extraordinary events and policy actions of the past 12 months … [If] risks from the virus or elsewhere prove more persistent than expected, disinflationary forces could return. But, for me, there is a tangible risk inflation proves more difficult to tame, requiring monetary policymakers to act more assertively than is currently priced into financial markets … [F]or me, the greater risk at present is of central bank complacency allowing the inflationary (big) cat out of the bag."

In retrospect, this sounds prescient and smart, but it is important to realize that Haldane was not persuaded – in public at least – that excessive money growth was the cause of the UK's coming setback on inflation. Like Tenreyro, he saw households' accumulated liquid savings as likely to lead to too much spending. His speeches were silent on the rapid growth of broad money, although the accumulation of liquid assets by households was merely an aspect of that. Anyhow, he resigned from the Bank of England on 30 June 2021.

V.

The eventual return of double-digit inflation to the UK surprised and bewildered almost everyone, except for the handful of economists who followed money trends. As in other nations, leaders of economic thought and numerous pundits looked silly. The main macroeconomic numbers turned out sharply at variance with expectations, including the expectations implicit in the market pricing of various assets.

A theme of this study is that changes in the quantity of money need to be related to national wealth as well as national income and expenditure. In particular, changes in the quantity of money affect the stock market and residential housing, and sometimes do so in ways that have profound wider consequences. Indeed, a recurrent pattern in cyclical fluctuations is that asset price inflation precedes inflation in goods and services. By late 2020 money was growing rapidly in the UK. Was the weight of money already having noticeable positive effects on asset prices?

The stock market can be taken first, with the FTSE 100 index (30 December 1983 = 1,000) serving as a representative measure of UK share prices. On 15

February 2020 the FTSE 100 index was just under 7,400 and was close to the average value in the last two years. In the following month, to 14 March, it plunged by nearly a third to almost 5,200, as investors abandoned investments in oil companies, airlines, restaurant businesses and so on. But, in the balance of 2020, share prices moved ahead and by the start of January 2021 they were less than 10 per cent off the February 2020 peaks. The recovery may have been partly due to some switching away from US equities, which were soaring on the back of the US money supply explosion.

But an important polemical point needs to be made. By mid-2020 most people realized that the spread of Covid-19 could be checked by vaccines and that life would be back to semi-normality within a few quarters. All the same, Covid-19 was an undoubted negative for some industries and might reduce aggregate profits. The stock market should therefore have been pessimistic through late 2020 and 2021. In fact, it traded near to all-time peaks. As noted in Chapters 1 and 7, the argument applied with even more force in the USA. How did the resilience – even the buoyancy – of major asset classes make any sense, in view of the damage inflicted on so much of the economy by Covid? Of course, it did not make sense, unless observers noticed that the quantity of money had ballooned. If investors kept their money balances stable as a proportion of their investment portfolios, and if their money balances jumped by 50 per cent, the value of those portfolios had also to go up by 50 per cent.[11]

House prices come next, and here also the data upset "common-sense thinking", as it might be deemed. The Nationwide Building Society has prepared indices of house prices, both nationally and for UK regions, since 1952. It has a quarterly series, for all houses, old and new. For present purposes the focus is on how Covid and the Covid-related money growth acceleration affected UK house prices. The natural assumption has to be that Covid was bad for the UK economy and so ought to have been bad for house prices. But that is not the apparent message of the Nationwide's data. In the two years to the first quarter of 2020 the Nationwide all-houses index increased by 2.5 per cent. By contrast, in the two years to the first quarter of 2022 – effectively the period of the Covid pandemic – it advanced over five times more, by 12.6 per cent.

A feature of the data is that – even in late 2020, when Covid was still a source of public anxiety and the Bank of England remained nervous that monetary policy might fail to boost the economy – house prices were climbing and housing market activity was quite buoyant. The October 2020 UK Residential Survey, from the Royal Institution of Chartered Surveyors, was headlined 'Sales market activity continues to display strong momentum'. To quote from the report: "With regards to transaction volumes, a national net balance of +41 per cent of contributors saw a rise in agreed sales over the month. Again, the latest return has eased slightly compared to +54 per cent in September, but remains well above the average reading posted over the past year (+9 per

cent)." Housing market turnover is a useful leading indicator for the economy, because some big-ticket items of expenditure are correlated with it.

Enough has been said to support the argument that UK asset price inflation was higher in the Covid period than before it. The strength of asset prices in the otherwise unhappy Covid period seems odd, but it is consistent with a condition of "too much money chasing too few assets". Sections IV, V and VII in Chapter 1 emphasized that, when asset prices rise sharply, the economy is stimulated in several ways. Obviously, households feel better-off and consumption benefits from a positive "wealth effect". A more subtle point is that companies are able to issue securities on more favourable terms, reflecting the higher prices and lower yields in the corporate financial world. The increased value of corporate fund-raising has further ramifications. It boosts the incomes of the corporate finance teams and traders involved in the fund-raising, and transfers money balances from the financial system to industrial and commercial companies. By spring 2021 official data reported an impressive increase in the amount of money held mainstream UK corporates, with the annual rate of growth matching that seen in the Lawson boom. As noted above, this boom had led to double-digit inflation.

VI.

The year 2021 was a strange one for the British economy. Like other economies, the impact of the Covid pandemic on business activity was a diminishing influence as the months went by and vaccines became more widely available, but separating the pandemic's effects from those due to underlying economic behaviour was difficult. In the second quarter of 2020 – when the restrictions on inter-personal contact were strongest – national output, in real terms, was 21.5 per cent down on its level in the second half of 2019. It recovered strongly in the third quarter of 2020, when it jumped by 17.5 per cent, but then struggled to regain the previous peak levels. A May 2022 press release on monthly GDP from the Office for National Statistics reported real output in early 2022 as being little more than ½ per cent up on late 2019.[12]

A standard assumption in much macroeconomic forecasting is that economies have a positive and quite stable underlying trend rate of output growth. An apparently plausible interpretation of output's refusal to return to normal in 2021 and early 2022 might then be that demand was inadequate. By extension, the key policy authorities – the Treasury and the Bank of England – had failed to give enough stimulus to production. However, business surveys contradicted this interpretation. The Confederation of British Industry has conducted surveys of companies' intentions towards output and prices, and of constraints on output, as far back as 1958. It has, from the early 1960s, prepared a three-times-a-year and then quarterly survey reporting on labour shortages – both

unskilled and other – as a factor limiting output. Figure 8.1 shows, for the last 60 years, the per cent balance of companies saying that difficulty recruiting the two kinds of labour was holding back production.[13] In late 2021 shortages of skilled labour were almost as severe as in the Heath–Barber boom, which had been the labour market background to a dreadful peak 26.9 per cent increase in the retail price index in August 1975. Further, shortages of other kinds of labour, often unskilled, were the highest in the history of the CBI survey.

Survey evidence therefore implied that, by autumn 2021, the UK economy suffered from serious overheating. To obtain new employees companies would have to bid harder in the labour market, putting upward pressure on wage increases. Already global commodity prices had bounced back from their lows in March and April 2020, as the world's top economies had started to bring Covid under control. In particular, oil prices had not just overcome the worst of the shock from the interruption of travel and transport but threatened to rise above pre-Covid levels.

Companies increasingly expressed concern about shortages of key components and production bottlenecks. These were often – but not always – due, at least apparently, to international forces. Just as business surveys indicated potential dangers of increased wage inflation quite early in the recovery from Covid, so they revealed the growing threat from rising raw material and input



Note: % balance of companies in CBI survey citing lack of labour as a constraint on output.
Source: Data from the CBI.

Figure 8.1 Labour shortages, as seen by UK businesses, 1961–2022

costs. The October 2021 quarterly survey from the CBI had a positive balance of 81 per cent of companies expecting rising costs per unit of output in the next three months. This was the highest such positive balance since the mid-1970s. A condition of "too much money chasing too few assets" had become generalized throughout the economy, which was now experiencing "too much money chasing too few goods and services". It is important to emphasize that the survey evidence of intense excess demand, which economists of all stripes accept will lead to more inflation, predated Russia's invasion of the Ukraine in late February 2022.

VII.

In August 2021 the annual increase in the consumer price index was 3.2 per cent, just above the top of the corridor (of between 1 and 3 per cent) permitted by the official inflation target system. The blemish on the Bank of England's performance necessitated an open letter from its Governor to the Chancellor of the Exchequer. In the year to December 2021, the increases in the consumer price index and the retail price index were 5.4 per cent and 7.5 per cent, respectively. Four months later – that is, for the year to April 2022 – the numbers had become 9.0 per cent and 11.1 per cent, again respectively. The 11.1 per cent retail price index figure was above that in the summer of 1990, after the Lawson boom, and was the highest for 40 years. Some of the jump in inflation in early 2022 was widely attributed to an unforeseeable geopolitical shock, Russia's invasion of the Ukraine on 24 February. The invasion had several side effects on the prices of internationally traded products, with the most obvious being another increase in oil and gas prices.

All the same, inflation had moved well above target before late February. In the year to February 2022 – before any effect could have come from the Ukraine events – the consumer price index rose by 6.7 per cent, already more than three times the target figure. The peak in the annual rate of consumer price inflation was in October, at 11.1 per cent. In summer and autumn 2022 the figure was regularly above 10 per cent, more than five times that envisaged in the August 2020 *MPR*.

The onset of high inflation created new uncertainties for households and businesses. Important issues were the duration of above-target inflation, the severity of the inevitable policy tightening as the Bank of England tried to bring inflation back to target, and the risk of a recession in coming quarters. Economists wondered whether Bank rate – which had typically been ½ per cent or less in the decade to 2021 – might have to be raised to 5 per cent.[14] In the event, Bank rate rose on no less than 14 occasions, from a little above zero in late 2021 to a 5¼ per cent figure which took effect on 3 August 2023. Yields on British government securities rose sharply in 2022, partly in anticipation

of the increases in Bank rate and partly to preempt further erosion of their real value by inflation. The cost of servicing the national debt climbed steeply. As was noted by Treasury documents accompanying the March 2022 *Spring Statement* on taxation and the public finances,

> Debt interest spending is forecast to reach £83.0 billion next year [that is, the 2022/23 financial year] – the highest nominal spending ever and the highest relative to GDP in over two decades. This is nearly four times the amount spent on debt interest last year (£23.6 billion in 2020–21) and exceeds the budgets for day-to-day departmental spending on schools, the Home Office and the Ministry of Justice combined (totalling £78.3 billion in 2022–23). Spending on debt interest in 2022–23 is £42.2 billion above the October forecast and the OBR [Office for Budget Responsibility] say that the increase in the forecast for debt interest spending in 2022–23 "is also our largest forecast-to-forecast revision to debt interest on record".

These sentences contained a dire warning about the potential unsustainability of public finances. But Cabinet ministers and Conservative MPs – egged on by several newspaper commentators – urged both tax cuts and expenditure increases, as if the budget deficit could expand indefinitely relative to national output. They seemed to believe that nations can make themselves richer by running large budget deficits. Hardly anyone declared support for a balanced budget, although this had been the guiding principle of budgetary decisions in the second half of the economically successful Conservative government from 1979 to 1997.

The widespread enthusiasm for tax cuts reached a disastrous extreme in the premiership of Liz Truss. Truss and her Chancellor of the Exchequer, Kwasi Kwarteng, were influenced by a version of Reaganite supply-side economics espoused by Patrick Minford, an economist reputedly close to Margaret Thatcher when she was prime minister. Everyone knew that, in the short run, tax cuts might widen budget deficits. But, according to Minford, tax cuts would quickly deliver such a speedy and strong response in terms of extra supply (and so more tax revenue) that any damage to the public finances would be temporary. But participants in financial markets – including, crucially, the market in UK government (or "gilt-edged") debt – were sceptical, viewing the supply-side arguments as fantasy.[15]

A mini-budget from Kwarteng on 23 September included such large tax cuts that, in the 2022–23 fiscal year, an extra £40 billion of government bonds would have to be sold. The gilt market reacted unfavourably, driving down prices, and pushing up interest rates and bond yields. The implied further addition to debt servicing costs – over and above that already identified in the March 2022 *Spring Statement* – was potentially crippling. Kwarteng was forced to resign by pressure from his own party in parliament. As Truss had also promoted the ill-conceived tax-cutting agenda, she too had to resign in due

course. Her premiership lasted little more than seven weeks, from 6 September to 25 October 2022. As Kevin Dowd remarked in a blog for the pro-free market Mises Wire, Truss and Kwarteng "should have put fiscal prudence at the centre of their programme and accompanied their tax cuts with *even larger* cuts in government spending to reassure the markets".[16]

The Great Stabilization had become the Great Destabilization. Whereas in the late 2010s Britain had steady economic growth, on-target inflation and satisfactory public finances, by late 2022 worries about a recession were widely held, inflation was far above target and the interest bill on the public debt was soaring because of a severe loss of financial market confidence.

VIII.

In 1997 the Bank of England had been granted operational independence to conduct monetary policy, in the clear understanding that it would be answerable if inflation were significantly above or beneath target. But – with inflation perhaps soon to reach more than five times the target figure – its Governor, Andrew Bailey, denied responsibility. On 16 May 2022 he gave evidence to the Treasury Committee of the House of Commons. Why had inflation taken off? Bailey said that neither he nor his colleagues at the Bank of England had done anything wrong. Instead he indicted "a sequence of shocks" to costs and prices, nearly all of which came from abroad. Bailey's evidence that day is cited again in Chapter 9, where it serves as the setting for a discussion of inflation analysis based on breaking down costs into labour, raw materials and so on.

Plainly, Bailey and his colleagues thought that a large and conspicuous change in relative prices – that arising, above all, from the invasion of Ukraine – excused them from paying attention to the absolute price level. It did not, and never does. If the quantity of money is held back appropriately, a big jump in energy and food prices is offset by reductions (or smaller increases) in the prices of other products and services, and the overall inflation rate stays down. A key variable here is the exchange rate. Nations that are truly committed to price stability are not afraid of currency appreciation, which will lower the prices of every import relative to what would otherwise have occurred.

Some politicians laudably mentioned money trends in their contributions to the public debate. Liam Fox MP wrote for the ConservativeHome website on 18 May 2022 that, while adverse global inflation pressures were relevant, the UK was being hit by "the monetary inflation that afflicts those countries whose central banks have allowed persistent increases in the amount of money relative to existing output".[17] But – in the various statements emanating from the Bank of England – an egregious characteristic was the total silence on money.

In a lecture for the Institute of International Monetary Research in November 2021 Mervyn King, a former Governor now unconnected with policy-making, mentioned the omission. In his view, "A satisfactory theory of inflation cannot take the form 'inflation will remain low because we say it will'; it has to explain how changes in money – whether directly via quantitative easing or indirectly via changes in interest rates – affect the economy." On 13 June 2023 King, as a member of the House of Lords' Economic Affairs Committee, asked Andrew Bailey outright, "What is your theory of inflation?". Like Jay Powell in Washington, the emphasis in Bailey's answer was on the balance between supply and demand in the economy, although he conceded the possible importance of "the money impact". He even noted that *in 2021* "a number of people" had been exercised by "rapid growth in the M4 aggregate".[18]

Some journalists felt that Bailey's answer was so diffuse that in fact he had no organized theory about inflation at all. Kate Andrews of *The Spectator* wrote a story immediately after Bailey had spoken. Under the heading, 'Andrew Bailey's evidence session was the opposite of reassuring', she lamented Bailey's tendency to digress. Bailey had admitted that lessons were to be learned and pledged that the Bank would learn them. But Andrew's assessment was that, "despite repeating this sentiment over and over again, Bailey could not meaningfully come up with one good example of such a lesson, nor could he go into much detail on the mistakes the Monetary Policy Committee has made over the past two years".[19] To quote Andrews further,

> Bailey insisted that the evidence only started coming to light, about just how tight the UK labour market was, in 'November 2021, a little bit before Ukraine, but not that much.' But job vacancies had already hit a record high – over one million – by July. And the headline inflation rate was more than double the Bank's target by November. In the closest moment to admitting to a real mistake today, Bailey explained that 'we thought unemployment would rise,' leading to his theory that all of this was simply 'transitory'. 'We were wrong, frankly.' Very wrong, indeed.

An argument could be made that the Bank's economists did have, and still do have, a theory. Huw Pill, who followed Haldane as chief economist, was forthright in one of his early speeches about his doctrinal preferences. As mentioned in the Introduction, in an early speech he described the three-equation New Keynesian model as "canonical" and said that a version of it guided monetary policy-makers.[20] Taken at face value, these remarks implied that Pill and his colleagues had listened to the New Keynesians and were in awe of their work. They really did believe that the impact of policy decisions on the economy could be measured by the central bank rate and bond yields, as with the egregious "IS function" discussed in the Introduction and section V of Chapter 1. (In early 2022 one of Pill's interlocutors at the Bank was Silvana Tenreyro, whose views were discussed above, in sections IV and V of Chapter 1.)

Moreover, the Bank's economists have for many years based their forward analyses of inflation on the labour market, not on the quantity of money or asset markets. They have done this, even though – in cycle after cycle in the UK and elsewhere – the labour market has been shown to lag the economy, whereas the quantity of money and asset markets lead it. Evidence started to become available, through late 2020 and early 2021, of looming inflation risks. Enough of it was clear that Andrew Haldane, the Bank's chief economist at that time, put his job on the line by warning about the dangers. If Bailey came to appreciate the inflation threat only as late as November 2021, he deserved all the media criticism he received.

Because senior Bank officials neglected the relationships between money and the economy, they had no means of incorporating the behaviour of money in their forecasting. (Chapter 4 has discussed the issue in more detail.) Several speeches and talks from MPC members in the Covid period have been quoted in the current chapter. A consistent pattern in these pronouncements was to combine neglect of the quantity of money with a tendency to comment on problems several months back as if they were still live issues. As we have seen, well into 2021 the MPC was worried that monetary policy might be unable to boost demand and output, and that deflation might become entrenched. Its members betrayed their textbook Keynesianism, by too often adverting to such fanciful pathologies as "the zero bound" and "the liquidity trap".[21] They were doing this even as commodity prices were surging and UK house prices were increasing by over ½ per cent a month. As noted above, a small group of private sector economists, the Shadow Monetary Policy Committee, was able to use money trends in a largely correct inflation forecast several months before the Bank of England and its key policy-making committee realized that they should be worrying about inflation, not deflation.

NOTES

1. See, for example, essays 5 and 7 in the author's 2011 collection *Money in a Free Society* for further discussion.
2. The story of the rise and fall of money-target-focused monetarism in the UK is told in the author's 1992 collection, *Reflections on Monetarism* (Edward Elgar Publishing: Aldershot, UK, and Brookfield, VT, USA, 1992).
3. See also pp. 65–70 in Tim Congdon (ed.) *Money in the Great Recession* (Edward Elgar Publishing: Cheltenham, UK, and Northampton, MA, USA, 2017).
4. Gavyn Davies, 'Finding a strategy for public debt in the crisis', *Financial Times*, 22 June 2020.
5. Philip Lane, 'Monetary policy in a pandemic: ensuring favourable financing conditions', speech at Trinity College, Dublin, on 26 November 2020,

available at https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp201126~c5c1036327.en.html

6. The intellectual background here is still dominated by the notion of "absolute liquidity preferences", and hence "the liquidity trap", which goes back to Keynes. See footnote 17 to the Introduction for more on this sort of thing.
7. By contrast, the author's monthly YouTube video for the Institute of International Monetary Research in November 2020 – available at https://www.youtube.com/watch?v=LUNTa1FRU5k&list=PLudZPVEs3S82lh5QYlWNegc0hEOzg2hH7&index=17 – included an explicit warning that, "money growth rate is too high – and is likely to lead, for a few quarters, to an annual inflation rate above 5 per cent".
8. Gertjan Vlieghe, 'An update on the economic outlook', speech at Durham University, 22 February 2021, issued by the Bank of England.
9. Silvana Tenreyro, 'Responses to the Covid-19 pandemic: UK and US experiences', lecture to the Federal Reserve Bank of San Francisco spring conference, 26 March 2021, issued by the Bank of England.
10. Andrew Haldane, 'Inflation: a tiger by the tail?', pre-recorded speech given online, 26 February 2021, issued by the Bank of England.
11. The author has argued these points in many places, including Chapter 3 in the current work. See, for example, Tim Congdon's *Money and Asset Prices in Boom and Bust* (London: Institute of Economic Affairs, 2005).
12. The sources here are press releases from the Office for National Statistics (ONS). The data are revised frequently and there is surely little need for a more detailed reference.
13. The author is grateful to the staff at the Confederation of British Industry who supplied him with historical data. Quarterly numbers have been interpolated for the early years, when the survey was carried out three times a year.
14. David Milliken, 'Bank of England interest rate could hit 4% or more, ex-policymakers warn', Reuters story, 11 May 2022.
15. Patrick Minford, 'Trussonomics is already slaying the demons of stagflation; we need more of it', *The Sunday Telegraph*, 30 September 2022.
16. Kevin Dowd, 'Why did Trussonomics fail so quickly?', blog on Mises Wire, 21 November 2022. The author opposed the Trussonomics tax-cutting agenda in summer 2022 in his column for *The Critic* magazine, as Dowd noted in his blog.
17. Liam Fox, 'The Bank of England raised interest rates too slowly. Now it must be wary of raising them too quickly', Conservative Home website, 18 May 2022, available at https://conservativehome.com/2022/05/18/liam-fox-the-bank-of-england-raised-interest-rates-too-slowly-now-it-must-be-wary-of-raising-them-too-quickly/. Fox had earlier raised the matter in debates in the House of Commons.
18. '13 June 2023 – Bank of England: how is independence working?' – oral evidence given to the House of Lords' Economic Affairs Committee, transcript, available from https://committees.parliament.uk/event/18565/formal-meeting

-oral-evidence-session. Bailey did not seem to be aware that someone – that is, the author of this book – had rung the alarm bells in spring 2020.

19. Kate Andrews, 'Andrew Bailey's evidence was the opposite of reassuring', *The Spectator*, 13 June 2023.
20. Huw Pill, 'Monetary policy with a steady hand', speech given at the Society of Professional Economists online conference, 9 February 2022, issued by the Bank of England. Pill did caution, "Although estimated, I would emphasise that this is a stylised representation of the UK economy – I am using it for illustrative purposes, rather than to foreshadow any specific policy decision."
21. For an example, see p. 10 of the Vlieghe speech at Durham University on 22 February 2021, mentioned above in footnote 8.

9. Does cost accountancy provide a good framework for analysing inflation?

The causation of the inflation of the early 2020s was controversial at the time and no doubt will remain so. As might be expected, economists in central banks have been particularly active in the associated research. As Chapters 7 and 8 have shown, the subject has been a huge embarrassment for them. By far the most common procedure in economists' research endeavours has been to see the behaviour of price indices as determined by a variety of costs. The role of money in the causation of inflation has been overlooked consistently.

This book has referred to Ben Bernanke and Olivier Blanchard, two of the world's most highly regarded macroeconomists at the time of writing (October 2024). As was shown early in Chapter 4, Blanchard's assessment of the inflation prospect in April 2020 was quite wrong. He was far from alone in having an erroneous forecast, and it would be valuable to have from him and others a retrospective and perhaps apologetic analysis. Bernanke was also faulted in Chapter 4, on the grounds that he had prepared a misdirected review of the Bank of England's forecasting procedures. The review said nothing whatever about either the money growth explosion of 2020 or the monetarist critique of that explosion, which pivoted on the effect of excess money on inflation. Bernanke's neglect of the monetarist critique of the Bank's record in the 2020s was odd, since it had been the most prominent in the UK public debate.

Bernanke and Blanchard collaborated in 2023 in writing a paper which proposed a so-called "semi-structural model" of the determination of inflation. It too ignored altogether the role of money. A comment on the 2023 Bernanke and Blanchard paper is made later, but most of this chapter will expand the author's contribution in July 2022 for the *Central Banking* journal. The July 2022 piece was a response to evidence given a few weeks earlier, on 16 May, by Andrew Bailey, the Governor of the Bank of England, to the Treasury Committee of the House of Commons. By then the Committee's members were aware that inflation was far above target and wanted to know why. Bailey's answer was to cite a variety of unexpected (and supposedly unforeseeable) cost pressures, or "shocks", with a focus on import costs and the labour market. One issue raised is, "Does the Bernanke and Blanchard model represent much of an advance

on the kind of cost focus found in Bailey's evidence?" The final section of the chapter will argue that it does not.

I.

According to Bailey, in his May 2022 evidence to the House of Commons Committee, the inflation overshoot was due mostly to a series of "unprecedented" external shocks. More specifically, he mentioned the leap in energy prices from the Covid-related lows in 2020 and an "apocalyptic" threat to food prices, highlighted by the invasion of Ukraine. He was also worried about "a further leg of Covid" which was "affecting China" at that time, with China's strategic position in many supply chains viewed as another risk for UK import costs. He quantified the damage from the unprecedented external shocks as 80 per cent of the UK's inflation total, while claiming that the Bank of England had no control over them.

At one level, Bailey's remarks were unobjectionable. It is always the case that prices reflect costs plus profit margins, and that changes in a price index can be attributed to changes in the prices of its components. Unless profits are to be squeezed, large jumps in the cost of imported oil and gas, and of basic foodstuffs, affect the price of fuel at the pumps and of food in grocery bills. No one can dispute that. Bailey's remarks could be seen as being motivated by what might be called "the cost-accountancy approach to inflation". It relies on two undoubted identities,

- for an individual company, that between sales revenue and total costs plus profits, and
- for the whole economy, that between expenditures on national product and the incomes to which the national product gives rise.

But does this sort of analysis add much? Is it saying more than that inflation is the result of numerous isolated and unconnected price increases? Is anything extra being asserted beyond the statement that the behaviour of inflation is determined by that of companies when they raise prices? If so, the approach could be described as a confusion between symptoms and causes. The proposition is that prices depend on costs and profit margins, where costs are dominated – at the level of the economy as a whole – by labour costs. But many prices, particularly in the services sector, are barely distinguishable from labour costs. Obvious examples are the cost of a haircut and that of professional advice from lawyers and accountants. The risk is that cost-breakdown analyses degenerate into the vacuous claim that inflation depends on itself. (See also the earlier discussion, on pp. 220–21, about Bailey's evidence.)

When the price of anything increases sharply, a combination of supply and demand is responsible. Often a so-called adverse "supply shock" – which may have been difficult to forecast a year or 18 months earlier – is the immediate factor at work. But this begs the questions of why the supply shock occurred, why market developments elsewhere have not led to offsetting price falls in other products and services, and why the central bank has failed to anticipate the trouble.

Bailey's evidence to the Treasury Committee lacked analytical depth and ignored much relevant economic theory. It was unconvincing for at least three reasons. First, it was silent on why UK inflation differed from that in other countries, and was in fact appreciably higher than in some of them. Second, it focused on changes in the prices of the goods and services that constitute national output. This is too narrow. A salient characteristic of all inflation episodes – including the latest one – is that the prices of assets are affected at least as much as the prices of goods and services included in consumer price indices or GDP deflators. Third, and most unfortunately, it was wrong as a matter of fact. Each reason merits a section to itself. The concluding section comments on the Bernanke–Blanchard inflation model.

II.

The UK is not the only country in the world. The allegedly unprecedented external shocks of 2021 and 2022 must have affected all countries. If global upheavals were 80 per cent of the story, every country should – when Bailey was speaking – be recording roughly the same inflation rate as the UK and a similar acceleration in inflation. A glance at the data shows that this was not so. Admittedly, the USA, the Eurozone, the UK and Canada were in much the same boat. In the year to April 2022 – the year applicable at the time of Bailey's evidence – the annual increases in consumer prices were 8.3 per cent, 7.4 per cent, 7.8 per cent and 7.7 per cent, respectively. But Japan and Switzerland were sailing in another vessel. In the year to April 2022 the increases in their consumer price indices were much less, at 2.4 per cent and 2.5 per cent, respectively. As noted in Chapter 6, in spring and summer 2020 these two countries had much slower money growth than other leading developed nations.

The examples of Japan and Switzerland might be dismissed on the grounds that they are only two countries and account for a tiny fraction of the world's population. But in China, with its 1.4 billion population, the increase in consumer prices in the year to April 2022 was 2.1 per cent, up only modestly from 0.9 per cent a year earlier. India – also with a 1.4 billion population – had more of an inflation problem than China. Its consumer prices were up by 6.3 per cent in the year to April 2022. Nevertheless, the increase in inflation in the previous year had been imperceptible, of only 120 basis points, from a figure of 5.1 per

cent in April 2021. So – in both China and India – inflation had changed little in the year leading up to Bailey's evidence to the Treasury Committee. Table 9.1 gives the inflation rates in the year to April 2022, and also for two relevant two-year periods, for all the countries mentioned in this paragraph and the previous one. Bailey may have wanted his listeners at the 16 May 2022 evidence session to believe that ubiquitous upward pressures on inflation had affected all countries equally, so that the UK had not had a particularly bad experience. Table 9.1 demolishes that notion.

The differences in inflation experience argue that national determinants, not global, dominate for individual countries. Few economists would dispute the proposition over the long term. (See section VI of Chapter 1 for more on the subject.) If this were not true, one would have to ask why the Bank of England was made accountable for UK inflation when it was granted operational independence in 1997. One might also wonder how it had been relatively successful for a generation.

Let it be conceded that Bailey's appeal to worldwide forces to exonerate the Bank of England opens up a large issue, the explanation of international differences in inflation. Here movements in exchange rates are fundamental. Notoriously, in recent years Venezuela has suffered wild hyperinflation and

Table 9.1 Inflation, and changes in inflation, in leading nations at the time of Covid

-	Consumer price inflation in the year to April 2022, i.e. last data when Bailey gave evidence to Treasury Committee	Increase % in consumer prices in two years to end-2020	Increase % in consumer prices in two years to end-2022	Increase in consumer inflation between two-year periods (percentage points)
UK	7.8	1.9	16.5	14.6
Eurozone	7.4	1.1	14.6	13.6
USA	8.2	3.7	14.1	10.4
Canada	7.7	3.0	11.4	8.4
Japan	2.4	−0.4	4.8	5.2
Switzerland	2.5	−0.7	4.4	5.1
China	2.1	4.0	3.3	−0.7
India	6.3	13.7	11.4	−2.3

Source: Federal Reserve Bank of St Louis database, national agencies and author's calculations.

the value of its currency, the bolivar, has collapsed. An economist committed to a cost-accountancy approach to inflation could assert that almost 100 per cent of the increase in prices was due to the external shock of currency depreciation. The currency depreciation could in turn be put down to malign and wicked external agents, such as black market speculators and people in hostile foreign embassies. In other words, none of the fantastically high inflation rates recorded in Venezuela in the last decade would be attributed to the multiple expansions of the central bank balance sheet, and none of the gangsters "governing" Venezuela would be criticized for the debauching of their nation's currency. This may sound silly, but in the Weimar hyperinflation of 1923 the German authorities blamed foreign bankers and speculators – not too much printing of notes by the Reichsbank – for their currency's woes.[1]

Notice, finally, that Bailey was in distinguished company – the company indeed of a Nobel laureate – in appealing to worldwide forces to say that the policy-making fraternity was "not guilty" for the inflation of the early 2020s. In late 2021 Paul Krugman wanted to acquit the Federal Reserve in the same terms. On 12 November he argued in his *New York Times* column that, "The important point [in the then emerging debate on inflation] is that we've seen broadly similar inflation surges in many countries, which tells you that what's happening in the United States isn't mainly about policy."[2] As this section has shown, Krugman's claim was merely wrong. All the world's countries were affected by the global energy and commodity price movements of 2021 and early 2022, but inflation rates differed between them, as did the increases in inflation relative to pre-Covid levels.

III.

The second criticism of Bailey's position is that it missed the cyclical context in which the inflation upturn had happened, and the consequent undoubted connection between asset inflation and inflation at factory-gates and the retail level. Rises and falls in inflation have been common in the UK, as in all nations, in the industrial era. Almost invariably the cyclical ebb and flow of demand have been basic forces at work. A standard pattern in the UK's stop-go cycles of the 1950s and 1960s, and in its boom-bust cycles in the 1970s and 1980s, was that strong advances in key asset prices – particularly share prices, and the prices of residential and commercial property – accompanied the boom. The high prices of financial assets and real estate then stimulated investment, while positive so-called "wealth effects" (as people felt better-off) boosted consumption. Only when extra demand led to strains on capacity and shortages of labour did the price gains spread from assets to goods and services. In other words, a familiar sequence of events was for asset price inflation to be followed by inflation in goods and services. A theory of asset price inflation

needs to be integrated into and made consistent with a theory of inflation as measured by consumer price indices and the like.

Covid-19 had strange and unfamiliar effects on economies, complicating interpretation of the conjunctural situation. Official restrictions on inter-personal contact – with lockdowns, social distancing and so on – caused output to crash in the middle quarters of 2020. Although output bounced back vigorously in 2021, economists were unsure of exactly how to judge demand and output relative to the landmarks of the usual business cycle.[3] However, an inescapable feature of late 2020 and early 2021 – especially in the USA, but also in other major nations – was extreme buoyancy of the stock market and frothiness in other asset markets, including houses. A section of the last chapter was devoted to UK asset prices in late 2020 and 2021, and there is no need to repeat in detail the key points here. Let us recall that, for example, the Nationwide Building Society data showed that the increase in house prices in the two years from the start of Covid was a multiple – five times that – of the increase in the previous two Covid-free years.

The discussion can now be brought back to the Bank of England and its Governor. Some economists would claim that the Covid-related business cycle had many characteristics in common with those from which the UK suffered in the four unstable decades of the stop-go and boom-bust cycles. If so, the rapid inflation in goods and services being reported in May 2022 ought to have been viewed against the background of rapid inflation in assets in late 2020 and 2021. But it would be preposterous for Andrew Bailey to say that his external shocks (notably in oil and gas prices) were responsible for rises in the UK stock market and the prices of Britain's already-built homes. Many of these homes dated from more than 50 or 100 years ago, and some of them from an era when coal was the only fossil fuel. A reasonable hypothesis is that the prices of assets and the prices of goods and services are related over the long run. But a cost-accountancy approach to the prices of long-lived assets, of assets that today's generation has inherited from the past, is patently daft.

Table 9.2 House price inflation in England and Wales, 2018–2024

Two years to ↓	England	Wales	City of Westminster	Cornwall	Pembrokeshire
March 2020	3.6	8.5	−4.8	4.0	10.0
March 2022	15.7	21.1	9.0	23.1	22.9
March 2024	1.8	5.2	–3.7	2.0	3.3

Note: Table shows % changes in house prices, as measured by 'All properties' series, in two-year periods, using monthly values prepared by HM Land Registry.

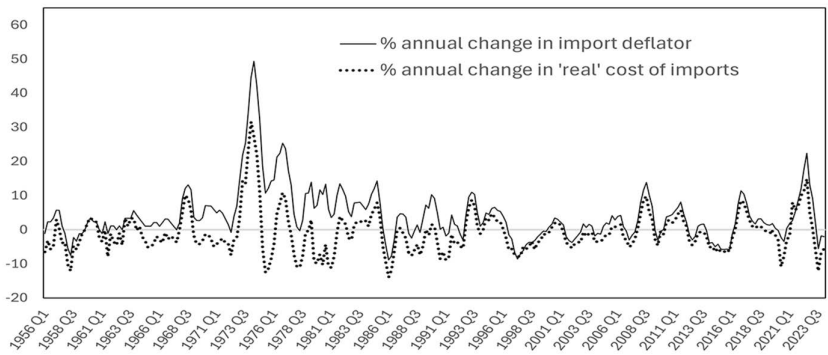
Table 9.2 shows that house price inflation was *higher* in the two years most affected by Covid – the two years to March 2022 – than in the two years before or after. House price gains in Cornwall and Pembrokeshire – far from the claustrophobic lockdowns in Britain's big cities – were dramatic for some quarters after the start of the Covid epidemic. Whether the Bank of England likes it or not, rocketing house prices in these areas were part of the UK's inflation narrative. Could Mr Bailey and his colleagues offer a worthwhile analysis? Could they elucidate a link between, on the one hand, regional house prices in their own country over a two-year period from spring 2020 and, on the other, allegedly "unprecedented" increases in energy prices that started to become noticeable only late in 2021, a surge in gas prices beginning in March 2022, "apocalyptic" wheat shortages due to a war that began in late February 2022 and an intensified outbreak of Covid during the summer of 2022 in an Asian country thousands of miles away?

IV.

Plainly, in the 2020s the timelines between the UK's asset price increases and Bailey's cost shocks from abroad did not coincide. But Bailey's evidence failed in a more fundamental respect. It was selective in its handling of facts and much more alarmist than justified by the data. External cost shocks certainly were a feature of late 2021 and 2022, but they were neither "unprecedented" nor of sufficient persistence to form a major part of the UK's inflation story in the 2020s.

In an assessment of whole-economy inflation, observers should look at the prices of *all* imports, not just the prices of a few imports which grab the headlines for a matter of weeks. Of course, in May 2022 Bailey did not have the import price numbers in the national accounts for the second quarter of 2022. Moreover, he might have taken his main task in his presentation to parliament as being not to tell the exact truth, but to defend the organization he led. But the UK's import price deflator for the key period is now available and must come first in any serious analysis. Figure 9.1 shows two series, both of quarterly data from the ONS. The first is for the annual per cent increase in the import price deflator back to 1956 and the second is for this deflator after further adjustment by the GDP deflator. The second series could be seen as a measure of import prices in real terms, since the GDP deflator is an indicator of overall inflation. The chart ends in the first quarter of 2024.

Evidently, the import price increase in 2022 was *not* unprecedented. It was large and striking, but it was overshadowed by the events of 1973 and 1974. To recall, 1973 was the year of the first oil price shock, as the Arab members of the Organization of Petroleum Exporting Countries (OPEC) placed an embargo on oil exports to any country which had supported Israel in the



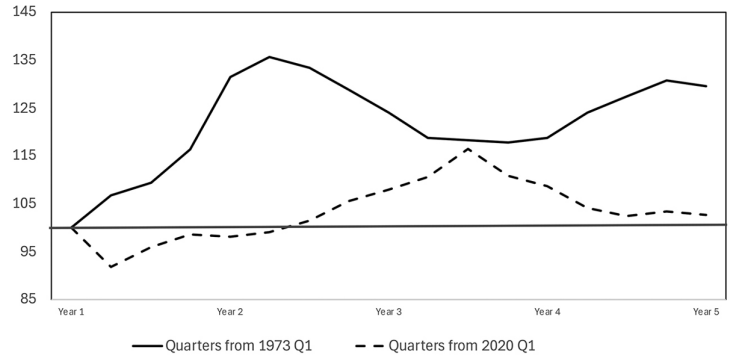
Source: Data are quarterly and from national accounts (ONS) (2019 = 100); see main text for details.

Figure 9.1 The UK's import costs from the mid-1950s

Yom Kippur War. In the year to the first quarter of 1974, the UK's import price deflator soared by 44.6 per cent. This was virtually double the increase in the year to the third quarter of 2022, which was 22.4 per cent. In real terms, which might be seen as approximating the hit to living standards, the difference between the shock in the 1970s and that in 2022 was even greater. After adjusting for the increase in the GDP deflator, the real price of imports in the year to Q1 1974 climbed by almost 32 per cent, whereas the corresponding figure in 2022 was under 15 per cent. To repeat, the import price increase in 2022 was *not* unprecedented.

Further, the 2022 shock was briefer than its predecessor in 1973 and 1974. In the 1970s, import prices rose relentlessly year after year. The import deflator (2019 = 100) took a value of 14.8 in Q1 1973; the number rose to 21.4 (+44.6 per cent) two years later, 36.3 (+145.3 per cent) five years later, and 56.1 (+279.1 per cent) a decade later. By contrast, import prices have *fallen* since 2022. (In Q1 2024, the import deflator was 120.7, over 4 per cent *lower* than the number of 126.2 in Q3 2022.)

Another significant point is that, in real terms, the 2022 shock was minor compared with that in the 1970s. The two lines in Figure 9.2 represent the real cost of imports, calculated on the same basis as above (that is, with adjustment of nominal values by the GDP deflator), for two periods of four years and one quarter, from Q1 1973 to Q1 1977, and from Q1 2020 to Q1 2024. The value of 100 is the real cost of imports in the first quarter in both periods. The damage to living standards was plainly much greater in the mid-1970s than in the



Note: For explanation, see main text. 1st quarter rebased in both periods = 100.
Source: Data same as in Figure 9.1.

Figure 9.2 *Real cost of import price shocks – comparing the mid-1970s with Covid*

Covid period. In the Covid period, that damage lasted a bit more than a year, but hardly any longer. By the start of 2024, the real cost of imports was similar to that four years earlier, as the Covid medical emergency was announced. The difference from the mid-1970s was stark. For all of 1974, 1975 and 1976, the real cost of UK imports was more than 20 per cent up on early 1973, and at times it was over 30 per cent higher.

The signature item in 2022's energy price shock was a jump in gas prices. Soon after the start of the Ukraine War in late February that year, Russia's President Putin decided "to play the gas card". In September, Gazprom suspended exports to Western Europe via its gas pipelines, in retaliation for European countries imposing sanctions on Russia because of the invasion of Ukraine. Given the inelasticity of both the supply of and demand for gas in the short run, the gas price rose several-fold. The wider significance was magnified because in the UK electricity prices were based on the marginal price of gas. But it turned out that Putin had miscalculated. A worldwide market in natural gas had come into existence in previous years, due to a boom in trade in liquefied natural gas carried in ocean-going tankers. The gas price came down sharply in 2023. A sense of perspective comes from noticing that, in the years just before 2022, Europe's nominal GDP was over $18,000 billion, whereas the values of *all* Russia's gas exports in 2019, 2020 and 2021 were $41.6 billion, $25.3 billion and $55.5 billion, respectively. The gas price scare

of 2022 was a genuine shock, but it was small beer compared with the oil price surge from 1973 due to OPEC's geopolitical belligerence.

Bailey's use of words like "unprecedented" and "apocalyptic" in his May 2022 evidence to the Treasury Committee was unnecessary and disproportionate. An important corrective is to compare changes in the UK's GDP deflator and import price deflator over the Covid period and to update the discussion for the latest data, that is, to cover most of the early 2020s. In the two years from Q1 2020, the GDP deflator went up by 5.5 per cent, while the import deflator rose by 27.6 per cent. On the face of it, higher import costs were a significant aspect of the UK inflation problem at that stage, in spring 2022. But over the next two years, import prices dropped, whereas UK domestic inflation was brisk. In the four years from Q1 2020 to Q1 2024, the increases in the GDP deflator and the import deflator were much the same at 19.7 per cent and 22.0 per cent, respectively. If import price shocks were truly the cause of 80 per cent of UK inflation in these years, why was this not more evident in the data? Bailey had much exaggerated the external shocks, presumably to deflect blame for the inflation overshoot from the Bank of England.

V.

Inflation can be analysed by means of monetary or non-monetary theories. The Bank of England's cost-accountancy approach to inflation is definitely non-monetary in character. The discussion above has shown the Bank's application of it in the Covid period to have been incomplete and inaccurate, and – because it misses so much – it has to be viewed as unsatisfactory in this context. An utterly different account of the latest inflation episode, which turned on the behaviour of the quantity of money, was developed in Chapter 8.

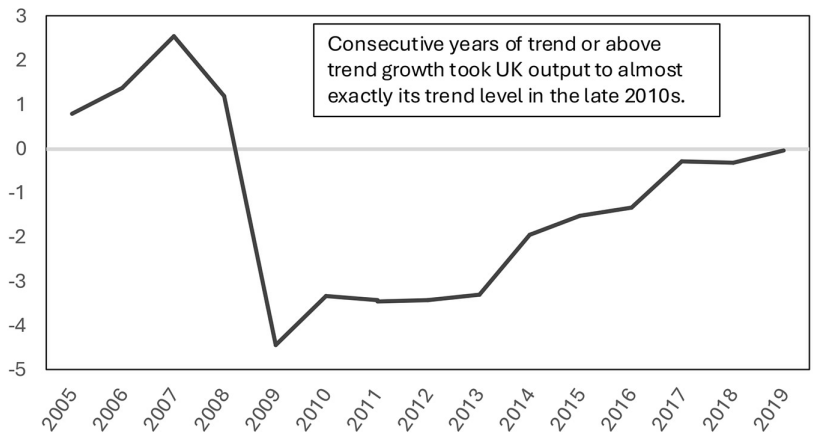
A vital step in the argument was to demonstrate the contrast between the patterns of money growth before and after the Covid medical emergency. The Bank of England has routinely, consistently and for many years denigrated monetarism and Milton Friedman.[4] Notably, Ben Broadbent – appointed Deputy Governor with responsibility for monetary policy for a ten-year term in July 2014 – was blunt in his rejection of quantity-theoretic ideas.[5] On one occasion, when asked at a Bank of England seminar about recent money growth developments, he dismissed the questioner as coming from the Palaeolithic era. All the same, as remarked in Chapter 8, the decisions the Bank took in the 2010s did result in outcomes close to Friedman's money target recommendation. In the decade to the end of 2019, the compound annual rate of increase in M4x was 3.8 per cent and money growth was mostly stable from year to year.

Also, as remarked in Chapter 8, low and stable money growth succeeded in delivering on-target inflation at an average figure of 2.0 per cent in the decade to December 2019, and on-target inflation was accompanied by moderate

and steady increases in demand and output. Further, the increases in demand and output were of such steadiness that the UK did have a reasonable economic recovery from the Great Recession. In the late 2010s, data from the International Monetary Fund indicate that output was almost precisely at its trend figure. (See Figure 9.3. Output is at trend when the output gap is zero.)

But the benign performance of the 2010s – a period termed the Great Stabilization in the last chapter – was shattered by the policy response to Covid-19. Like most other leading central banks, the Bank of England interpreted the medical emergency as likely to lead to numerous corporate bankruptcies in such sectors as travel, hospitality (hotels and restaurants), aviation, and cruise shipping. Heavy loan losses might be suffered by the banks, recalling the trauma of the Great Recession of 2008 and 2009. The Bank of England therefore embarked on large-scale asset purchases (or "quantitative easing"), regardless of the effect of these purchases on the quantity of money. As we have seen, money growth exploded. In retrospect, it is clear that top central bank officials overstated the disinflationary risks of Covid-19 and grossly underestimated the inflationary dangers of their response to it. Chapter 8 argued that the UK's money growth explosion signalled the end of the Great Stabilization and inaugurated a Great Destabilization.

An earlier programme of QE had started in spring 2009 and was widely credited with having prevented the Great Recession (of 2008 and 2009) from



Source: Data are annual and from the IMF.

Figure 9.3 Output gap in the UK as a % of potential output

evolving into a disaster on the scale of the USA's Great Depression in the early 1930s. Many economists had learnt their subject from Samuelson's textbook, with its encomiums on fiscal policy and aspersions on the quantity theory of money, as discussed above on pp. 13–14 in the Introduction, and p. 41 and p. 51 in Chapter 1. Although they may have been baffled by the exact mechanisms at work in the QE rescue effort, a majority agreed on the beneficence of QE as a method of combating disinflation.

The bewilderment about QE was nicely captured in a wisecrack from Ben Bernanke, as chairman of the Federal Reserve, at a 2014 press conference. He caused laughter by observing that "QE works in practice, but not in theory". In fact, when QE involves central bank purchases of assets from non-banks, it is effective because

- it increases the quantity of money, broadly defined;
- such increases in the quantity of money raise equilibrium national income and output more or less proportionately (if with qualifications for such processes as "financialization", discussed in Chapters 1, 4 and 6), a feature in modern economies which becomes apparent in the data over the medium and long runs (see Chapters 1, 4, 6 and 10 of this book); and
- in the short run, the money injection boosts asset prices and aggregate demand in real terms, and hence output and employment (also as in Chapter 1).

But, in the 20 or so years before the Covid pandemic, central banks had forgotten about monetary economics in the sense of the economics of the quantity of money. Bernanke's wisecrack about QE, Broadbent's sneer at the antiquity of the quantity theory and Bailey's resort to a cost-accountancy analysis of inflation were products of a systematic and pervasive amnesia.

VI.

A monetary analysis of inflation has three clear advantages over the cost-accountancy approach favoured by the Bank of England. First, it can be fitted into a discussion of exchange rates and the international pattern of inflation. According to standard theory, if too much money is created in one country relative to others, its exchange rate should fall and the adverse impact on the cost of imports becomes part of the inflation process. This argument is overwhelming in hyperinflationary settings. But it remains persuasive in more normal conditions, even though exchange rates are buffeted around by all sorts of erratic influences and their fluctuations are often difficult to understand. Second, money is relevant to movements in asset prices as well as the prices

of goods and services, while – inexorably – asset price inflation is connected with inflation in goods and services. Finally, despite the controversies which beset the quantity theory of money, the proportionality postulate is both the heart of traditional monetary economics and a serviceable approximation to reality which helps in the calibration of policy. Crucially, in the form of broad-money monetarism, the quantity theory tells policy-makers how large central bank asset purchases (from non-banks) or sales (to non-banks) need to be in order to aim at a particular rate of change in nominal national income. To the extent that central banks take decisions by defining monetary policy in terms of interest rates, and only in terms of interest rates, they miss the guidance on this issue which comes from quantity-theoretic analysis.

A reference was made at the start of this chapter to the Bernanke–Blanchard model of inflation. Sent to the *American Economic Review* in 2023 for eventual publication, versions of it were widely circulated over the next few months, and a working paper was published by the Hutchins Center in May 2024.[6] The model contains four equations which, to quote the abstract, are

> intended to capture the joint dynamics of consumer prices, wages, and short- and long-run inflation expectations, conditional on the shocks to inflation (from energy prices, food prices, and sectoral shortages) and on the degree of tightness in the labour market.

As no money aggregate figures in the model's construction, it is entirely non-monetary. But the problem is worse than that, as no linkage is made to monetary policy at all, not even to monetary policy in the sense of interest rates. By implication, the inflation of the early 2020s cannot be blamed – by any clear and measurable channel – on how policy was conducted. Bernanke and Blanchard say that ten central banks "expressed interest in using our model to study the recent inflation in their own economies, and we agreed to do a joint project". Cynics might remark that central banks' readiness to sponsor the research on the Bernanke–Blanchard model is unsurprising. The two authors indeed remark, "A side effect of the project was to demonstrate the benefits of central bank cooperation and of looking at inflation through similar lenses and learning from each other. Several central banks have adopted the Bernanke–Blanchard model as part of their forecasting framework."

The model has two equations to represent labour market pressures on inflation. In one of them wage inflation depends partly on price inflation, and in the other price inflation depends partly on wage inflation. As is well-known and was recognized earlier in this chapter, prices and wage costs are connected by an identity, and it would be hardly unexpected if well-fitting equations with significant coefficients could be estimated. If a series is regressed on itself, the

coefficient of determination is one. An immaculate equation is generated, but that adds nothing to understanding the phenomena under discussion.

Two equations on inflation expectations are also estimated, with expectations being moulded by lagged values of expectations and current inflation. In a period of stable inflation (such as the 2010s), it is obvious that actual and expected inflation will be similar. A regression of actual inflation on expected inflation would inevitably produce a high-quality equation, which might persuade some economists that expected inflation *causes* actual inflation. Others (including the author) would be suspicious, particularly if they believe inflation to have monetary causes. Anyhow, like the wage and price equations, the equations on inflation expectations might be viewed as too self-referential. Their apparent validation by the data is therefore uninteresting.[7]

The Bernanke–Blanchard model does incorporate lags, but they are short compared with the two- to four-year lags, which were proposed in Chapters 1 and 4 above to connect changes in broad money and nominal national income. If in real-world policy-making a dependent variable is determined by the value of an independent variable six months or a year earlier, the shortness of the lag undermines the exercise's usefulness. Given the delays in the preparation of official statistics, the policy-maker may have to insert values of the independent variable in order for the forecast to work. But these values may be mere guesses, with the result that a so-called "forecast" is only as good as the guesses. Olivier Blanchard's view in April 2020 on the medium-term inflation prospect was quoted above on p. 123. To say that this view amounted to non-monetary "nowcasting" may seem harsh, but it cannot be overlooked that Blanchard was thoroughly wrong in that April 2020 assessment. He was not alone with his poor forecast, as far too many economists at that time made even more preposterous statements about the medium-term inflation prospect. This book has argued that the problem was that all of them paid no attention to money growth trends.

In their paper, Bernanke and Blanchard apply their framework to a number of countries, although the USA was the first to be analysed. They conclude,

> Relative price shocks and sectoral shortages drove the initial surge in inflation, but as these effects have reversed, tight labour markets in most (although not all) countries [became] a relatively more important factor. Despite the broad similarities to the US story, the details—for example, the relative importance of energy shocks, price shocks, and shortages in driving inflation—differ by country.

Are these sentences anything more than a description of inflation symptoms in different countries? Like most other leading contemporary American economists, Bernanke and Blanchard are silent on a potential monetary influence on inflation. They therefore cannot comment on the monetary causation of

inflation differences across space, although – as was shown in section VI of Chapter 1 – the evidence for a monetary explanation of such differences is persuasive over the medium term.

The two authors advert occasionally in their 2023 paper to fiscal policy as having an effect on aggregate demand, but fiscal policy – like interest rates – is not part of the model. Their model therefore cannot analyse the role of different countries' fiscal policies in their inflation processes. As the model does not incorporate interest rates or the quantity of money, it cannot in fact investigate *any* link between policy decisions and inflation. This aspect of the model might appeal to central bankers and other policy-makers, as its inability to connect policy and inflation may seem to excuse them from blame for much above-target inflation. Too much inflation is always the result of those unforeseeable "shocks", isn't it?

NOTES

1. Constantino Bresciani-Turroni, *The Economics of Inflation* (London: George Allen & Unwin, 1937, translated by Millicent Sayers from the original Italian book published in 1931). See, particularly, chapter VIII on 'Social influences of the inflation'.
2. Paul Krugman, 'Wonking out: how global is inflation?', column in *The New York Times*, 12 November 2021.
3. Technically, it was difficult to estimate the "output gap", a concept which plays a major role in New Keynesian analyses of inflation. See footnote 79 to Chapter 1 for more on this idea.
4. Forrest Capie, *The Bank of England: 1950s to 1979* (Cambridge: Cambridge University Press, 2011), *passim*, but see p. 474 for mockery of Milton Friedman at the Bank of England in the late 1960s.
5. Some years before Broadbent's appointment to the Bank of England, he and the author had a debate on money and inflation. On 14 May 2008 the Society of Business Economics organized a meeting in London with a motion under discussion of 'Money should be the cornerstone of central bank decision-taking?'. Broadbent – then a senior economist at Goldman Sachs – argued against the motion, whereas the author argued for it.
6. Ben Bernanke and Olivier Blanchard, 'An analysis of pandemic-era inflation in 11 economies', *Hutchins Center on Fiscal and Monetary Policy* working paper no. 91 (Washington: Brookings Institution, 2024).
7. For a paper which disentangles monetary effects on inflation from those of expectations, see Kent Matthews and Kian Ong, 'Is inflation caused by deteriorating inflation expectations or excessive monetary growth?', *Journal of Economic Affairs*, vol. 42, no. 2, 2022, pp. 259–74.

10. Money in the Covid-related business cycle: an analytical narrative and key evidence

This book has developed a version of the quantity theory of money which pivots on what Keynes termed in his *General Theory* "the fundamental proposition of monetary economics". More specifically, the values of national income and wealth are in equilibrium, and hence determined, only when a key monetary condition holds. The condition is that the private sector's money-holding agents – aware of the prices and quantities of the goods, services, and assets prevailing with the particular values of national income and wealth – willingly hold the quantity of money created by the banking system. With those prices and quantities, and those values of national income and wealth, they do not want to hold either less or more money. The economy is in monetary equilibrium.

If the agents instead have excess money, they take steps to bring back equilibrium, and these steps raise prices and quantities; if they have deficient money, they again carry out transactions, with the effect of lowering prices and quantities. As sections IV to VIII of Chapter 1 showed, the quantity-theory tradition has a well-organized account of the so-called "transmission mechanism". Despite the bluster against the quantity theory of money in the Samuelson textbook, there is no opaque "black box" at the theory's analytical core.

Admittedly, when the economy is hit by a severe shock to monetary equilibrium – of the kind administered by governments and central banks in 2020 and 2021, and particularly in spring and summer 2020 – the recovery of equilibrium may take time. But ample evidence is available from real-world data that, over periods of several years, changes in nominal national income reflect – above all – changes in the quantity of money, broadly defined. The smallness of changes in the ratio of money to national income (or "the income velocity of money") is to be attributed to the underlying stability of agents' demand-to-hold money balances (or their "money demand functions"). Chapter 4 suggested that, in most medium and long runs, and in most (or perhaps all) countries, two empirical points were valid. First, changes in the income

velocity of money had the property of stationarity around low mean values of those changes, and, second, after a shock to velocity, it may take as long as four or five years before monetary equilibrium is restored. In the restored equilibrium, the income velocity of money may not be identical to what it was some years earlier. But agents' decisions and behaviour should take it close to earlier values. To repeat, the rough similarity of the values can be attributed to the underlying stability of agents' demand to hold money balances.

Differences between the past and present values of velocity in these exercises should be explicable by economic variables, that is, for example, by changes in the own rate of return on money or in such considerations as innovations in payments technology. Sure enough, the data may allow more than one interpretation of events. But big shocks to the quantity of money, or its rate of growth, result in macroeconomic upheaval of one kind or another. Sharp accelerations in money growth lead to more inflation, whereas collapses in the quantity of money risk deflation and mass unemployment.

At the time of writing (October 2024), it is over four years since the money explosion of spring and summer 2020. On this basis, a long-enough interval of time has elapsed to prepare data for changes in the income velocity of money in leading economies during the Covid-affected and post-Covid years, and to check whether they are consistent with broad money monetarism. Attention here is concentrated on the USA, the Eurozone and the UK, but that is not to discourage comparable analyses in other jurisdictions and countries. After all, supporters of the quantity theory of money believe it to be an always-and-everywhere theory and invite analysis of money data in every country.

Chapter 5 included material sent out from the Institute of International Monetary Research in a special email on 6 April 2020, where the author articulated his concern over medium-term inflation prospects, particularly in the USA. He said that one message from "the latest money data" in spring 2020 was "that – at some point in the next two/three years – the growth rate of US nominal GDP will accelerate towards a figure in the teens per cent". Moreover, again to quote, as "the trend growth rate of real output is not much more than 3 per cent a year, a big resurgence in inflation is implied by our analysis". The inflation surge could still be prevented, but "the only way" would be "for the Fed not just to end its current stance as ready financier of the government deficit, but to withdraw the money stimulus (that is, to cause the quantity of money to fall by the 'excess over normal growth' now being recorded". In a presidential election year, that seemed very unlikely, and it did not happen.

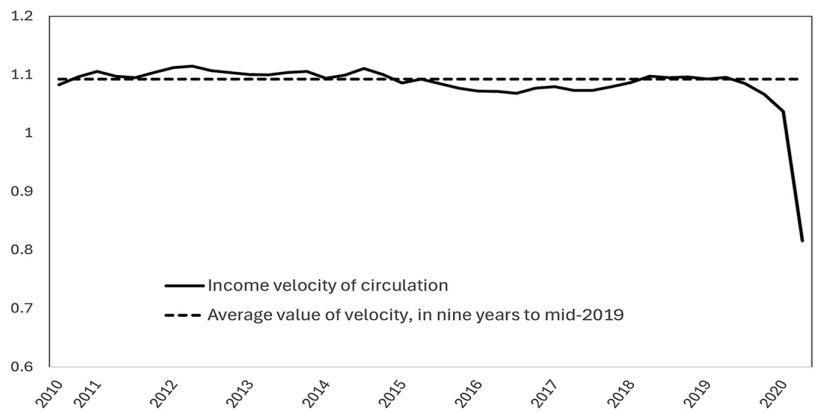
The author's remarks in 2020 argue for the facts on the annual changes in nominal GDP and broad money over the four years to autumn 2024, to be organized and presented. That is the agenda for the USA in the next section, while sections II and III cover the Eurozone and the UK, respectively. Developments in the Eurozone and the UK occurred in political and policy-making contexts

different from the USA's, but – as will emerge – similar relationships held between money and nominal GDP.

I.

Figure 10.1 starts the discussion of the USA. It shows the behaviour of the income velocity of M3 broad money in the decade to mid-2020. The growth rates of money and nominal GDP were quite stable at a low compound rate of 3.8 per cent and 4.0 per cent, respectively, in the nine years to mid-2019, and – as the figure shows – the velocity of money was also stable at an average value of almost 1.1. A modest upturn in money growth began in spring 2019, with this having no connection to Covid-19. The upturn was followed in spring 2020 by the money growth explosion which has been highlighted in this book, while nominal GDP fell sharply because of the hit to the economy from the Covid emergency. Velocity crashed to just under 0.8 in mid-2020.

The author expected velocity to return, over the next several quarters, towards a value similar to that in the previous decade, almost certainly to over 1.0 and perhaps even reaching or exceeding 1.1. A change in velocity occurs – as a matter of definition – when nominal GDP increases at a faster rate than the quantity of money. The quantity-theoretic framework explains why the author *both* expected the annual increase in nominal GDP to climb



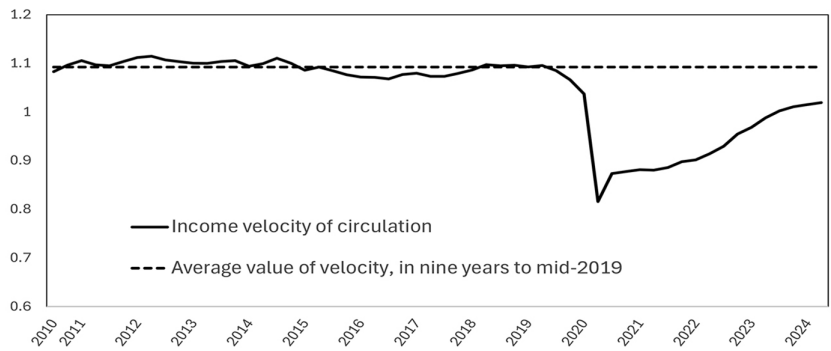
Note: Final quarter is 2020 second quarter.
Source: M3 data from Shadow Government Statistics, GDP from website of Federal Reserve Bank of St. Louis, and author's calculations.

Figure 10.1 Income velocity of M3 broad money in the USA, 2010–20

towards the teens per cent *and* warned that, without an abrupt change in the rate of money growth (from very high double-digit numbers to low numbers or even contraction), an inflation surge was very likely.

Figure 10.2 presents the actual behaviour of the income velocity of broad money to mid-2024, that is, in the four years from its nadir at the end of the second quarter of 2020. The main point is clear: a significant reversion to the pre-Covid mean did happen. Unsurprisingly, the largest single change was in the third quarter of 2020, as Covid-related restrictions were eased and nominal GDP bounced back. Behaviour over the next few quarters – that is, 2020 Q4 and all the quarters in 2021 – was perhaps unexpected in one way, in that the reversion to the pre-Covid mean proceeded at a slower pace in this period than in 2022 and 2023. But, as Chapter 7 discussed, late 2020 and early 2021 were characterized by buoyancy in asset prices. It was only in late 2021 that asset price strength spilt over into product and labour markets. Velocity recovered briskly in 2022 and early 2023, partly because of faster increases in the prices of goods and services which constituted national output.

From early 2022, US monetary policy changed radically. As mentioned in Chapter 5, Paul Krugman and his Team Transitory associates hoped through late 2021 that inflation would lose momentum. Instead, it picked up speed. The Fed's first hike in its funds rate was on 16 March, from between zero and 0.25 per cent to between 0.25 per cent and 0.5 per cent. The Fed funds rate went up another ten times, peaking at over 5.25 per cent in July 2023. The rise in



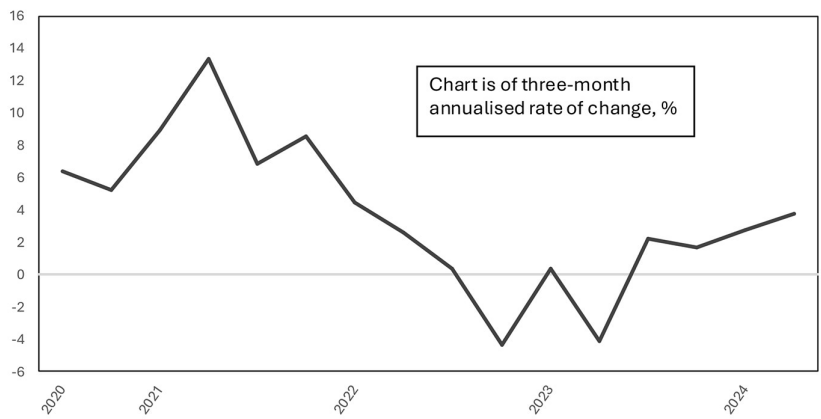
Note: Final value is 2024 second quarter.
Source: See Figure 10.1 source.

Figure 10.2 Income velocity of M3 broad money in the USA, 2010–24

interest rates choked off mortgage demand and slowed the rate of growth of money. By then the money explosion of 2020 lay, very definitely, in the past.

But also important to the financial scene was that the Federal Reserve decided to sell off some of the securities it had acquired. These securities were both Treasury securities and mortgage-backed securities with a high credit rating. The Fed's total holdings of the two types of paper peaked at $8,502 billion on 13 April 2022. In summer 2022 this total fell only slowly, but in late 2022 and throughout 2023 the pace of reduction increased. From late 2022 to mid-2024, the Fed allowed its stock of securities to drop typically by over $200 billion a quarter, largely through redemptions. Whereas the Fed's asset purchases (or "quantitative easing") tended to add to money growth, reductions in its asset pile (or "quantitative tightening") had the opposite effect. (They reduced money growth relative to what it would otherwise have been. Non-bank issuers of the bonds made payments from bank deposits to redeem the securities held by the Fed, as the bonds matured. Bank deposits – which are money – therefore went down.)

In its various commentaries and announcements, the Fed said nothing about the impact of the rise in interest rates and its QT operations on the quantity of money. Nevertheless, that impact was profound. Figure 10.3 brings out the sudden and quite drastic shift in spring 2022, from monetary expansion to the stagnation of the quantity of money. Indeed, for much of 2023, the quantity of money was falling. In the two years to March 2022, US M3 broad money



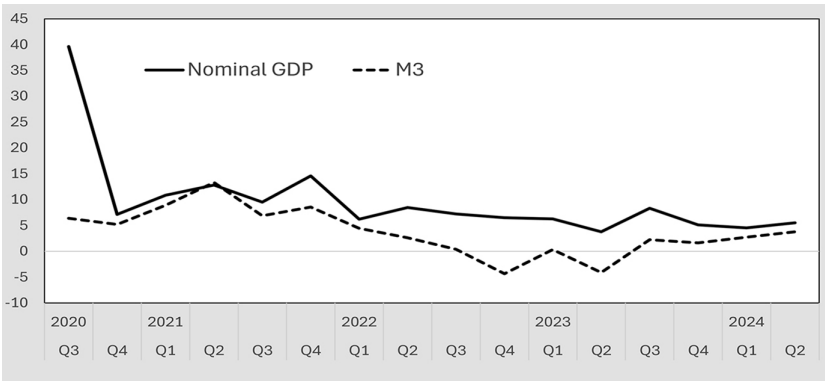
Source: M3 data are from Shadow Government Statistics.

Figure 10.3 Check to money growth in the USA from spring 2022

climbed by 28.8 per cent; in the following two years, to March 2024, it did not change at all.[1] See the Appendix to Chapter 6, on pp. 187–9, for more on this topic.

If nominal GDP growth continues and the quantity of money is unchanged, money's velocity is increasing by definition. The halt to money growth from early 2022 therefore fitted in with the author's surmise that velocity would rise in the early 2020s, as it headed back towards the pre-Covid norm. Figure 10.4 combines the money change numbers in Figure 10.3 with the quarterly changes (on the same basis, at an annualized per cent rate) for nominal GDP. The salient feature here is that – with one minor exception – *every* quarter from Q3 2020 to Q2 2024 recorded a change in nominal GDP *above* the change in the quantity of money. (The one exception was in Q2 2021, which had nominal GDP and money rising at annualized rates of 12.8 per cent and 13.3 per cent, respectively.) The quantity-theoretic interpretation is that the ratio of money to GDP in mid-2020 – after the Fed's actions which had so drastically boosted the money supply, whether they were meant to or not – was extreme. Indeed, it was so extreme that in the succeeding almost four-year period people and companies behaved in such a way that nominal GDP rose relentlessly, almost without intermission, at a faster rate than the quantity of money.

In late March/early April 2020, the author made remarks on the future trajectory of broad money velocity in the USA and the wider implications of that conjecture, including the very high likelihood of an inflation flare-up. The reader can now decide on the validity, or invalidity, of the conjecture, and of the reasoning behind it. Admittedly, in spring 2020, no one knew exactly the



Source: See Figure 10.1 source.

Figure 10.4 Nominal GDP and broad money in the USA since mid-2020

prospective path of the quantity of money. Let it be conceded that the author did not expect the sharpness of the money slowdown reported from spring 2022. Let it also be conceded that, even in late 2024, velocity had not fully returned to the pre-Covid average of the 2010s. A possible explanation is that interest rates in general moved upwards in tandem with the Fed funds rate. As such a high proportion of bank deposits pay interest nowadays, interest-bearing balances became more attractive relative to other assets through late 2022 and all of 2023. By extension, the desired ratio of broad money to nominal GDP also rose. That would agree with a fall in equilibrium velocity compared with the 2010s, but the explanation is rather *ad hoc*.

II.

The standard pattern in the modern world is that most nations have their own government, central bank and currency. In other terms, nations have their own currency and do not share it with others. The Eurozone is an exceptional monetary jurisdiction, in that its central bank, the European Central Bank, issues a currency that is used in 20 countries. Given that the Eurozone has these 20 member states, disagreements about policy – plus many strains between individuals and institutions – would be expected. That has in fact been the experience since the single European currency was created in 1999.[2] On the whole, the northern members – Germany, the Netherlands and Finland, for example – have preferred fiscal and monetary conservatism, whereas others in the so-called PIIGS or GIIPS group (Portugal, Italy, Ireland, Greece and Spain) were notorious in the early 2010s for their large budget deficits and the dependence of their banking systems on loans from the European Central Bank (ECB) to fund their assets.

However, a rare consensus emerged in the early months of the Covid-19 pandemic. Representatives from all of the then 19 member states agreed that monetary policy must combat the deflationary risks posed by the medical emergency.[3] For example, Isabel Schnabel – an economist appointed to the ECB's Governing Council on 1 January 2020 and its most senior German member apart from the Bundesbank's own representative (Jens Weidman) – was pragmatic in her attitude towards the crisis. She was widely seen as a "moderate" in the various doctrinal disputes that afflict modern macroeconomics.[4] She emphasized the need to support economic activity, rather than reiterating the usual German hostility to debt, borrowing and inflation.

In a speech on 27 June 2020 to the Petersberger Sommerdialog, held in Frankfurt, she mentioned the ECB's "pandemic emergency purchase programme" (or PEPP), which was the Eurozone's version of quantitative easing. The size of the programme had just been increased from €600 billion to €1,350 billion. In addition, the ECB would allow commercial banks to borrow from it

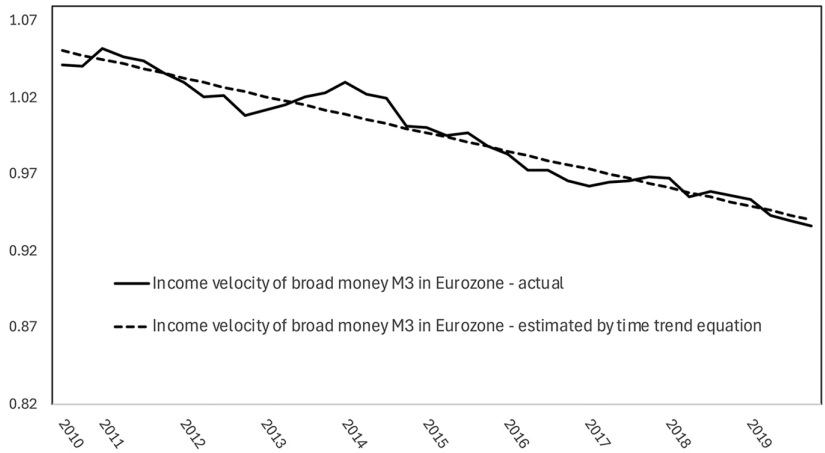
by means of so-called "long-term refinancing operations". In the four months to June 2020, the M3 measure of broad money increased by 5.6 per cent or at an annualized rate of 17.8 per cent. This was the fastest M3 increase in a four-month period in the history of the single currency. The annual rate of increase reached 12.5 per cent in January 2021. As noticed also in Chapter 6, this was almost the fastest pace of expansion in a one-year period since the euro had come into existence.

Most European countries imposed lockdowns, as well as other restrictions on movement and production. This contributed to the global plunge in spring 2020 in the demand for energy. As in other parts of the world, the fall in oil prices was so large as to prompt forecasts of persistent deflation. In her Frankfurt speech on 27 June, Schnabel said that

> Inflation could remain at close to 0 per cent well into the next year, and even negative inflation rates are possible … [C]ore inflation, which excludes food and energy prices, will remain below projections from us as recently as March, and will do so for a very long time … The Governing Council of the ECB unanimously agreed [at its latest meeting, on 3–4 June] that the danger of such low inflation taking hold and leading to lower wages, growth and investment was too high.

Schnabel insisted that the ECB's response to the medical emergency was "necessary, suitable and proportionate". On 2 July 2020, as the money explosion was at its peak, Schnabel gave a presentation to the Berlin Economic Roundtable which built on the 27 June speech.[5] One slide was titled 'Marked weakening of inflation over the medium term' and envisaged that the annual increase in Eurozone consumer prices would be close to 1.0 per cent at the end of 2021 and 1.2 per cent at the end of 2022.

An obvious tension had emerged between a rise in inflation threatened by the money growth numbers and the relentless disinflation "for a very long time" envisaged by Schnabel. As in the USA and other countries, events and policy decisions had set up an interesting test of competing economic theories. In analysing the data over the next few quarters it is important to be aware that in the 2010s the ratio of money to national income had been on a consistent upwards trend in the Eurozone, with the "financialization" thesis mentioned in Chapters 1, 4 and 6 at least one possible explanation.[6] Figure 10.5 shows the pattern of money's velocity associated with that trend, to the end of 2019. On the assumption that the fall in velocity represented underlying and continuing behaviour, an extrapolation for the next few years argues that the equilibrium level of velocity in the mid-2020s should fall further. In fact, the time trend equation behind Figure 10.5 points to values for velocity at mid-2020 and mid-2024 of just above 0.93 and slightly under 0.89, respectively.[7] What in fact happened to broad money velocity in the Covid period?

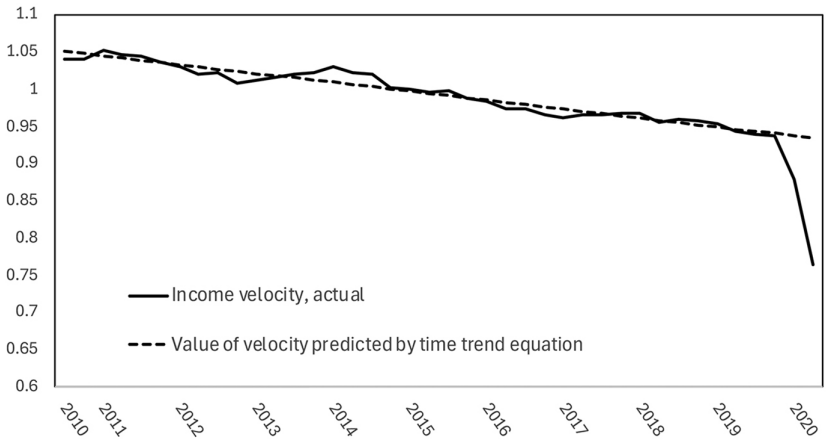


Sources: European Central Bank for M3 and GDP data, and author's calculations.

Figure 10.5 Income velocity of M3 broad money in the Eurozone before Covid-19

The next picture is Figure 10.6, which shows the plunge in velocity in early 2020 because of the jump in broad money organized by the ECB and compares that plunge with the fall consistent with its previous trend. Visual inspection is sufficient to establish that something drastic happened towards the end of the period. Actual velocity at Q2 2024 undershot by over 18 per cent the level of velocity implied by the time trend equation; the largest previous shortfall, in the 2010s, had been a mere 1.5 per cent (in late 2012). Clearly, the Eurozone economy had excess money balances, like the American economy and many others at that time. However, the excess was less pronounced than in the USA, where the velocity shortfall was almost 30 per cent.

Symptoms of excess money became evident in house price movements across the Eurozone in early 2021.[8] According to an index prepared by Eurostat, Eurozone house prices increased in the two years to the end of 2019 typically by 4½ per cent a year. But by late 2020, this was edging up, with quarterly increases of closer to 1½ per cent implying annualized rates of advance of 6 per cent or more. The uptick in house price inflation occurred – as in other countries – despite the negative impact of Covid on consumer confidence. By spring 2021, housing markets across the Eurozone's member states experienced almost boom conditions. In the two middle quarters of 2021, the Eurostat index went up by 6.0 per cent, with the annualized rate of increase



Sources: See Figure 10.5 source.

Figure 10.6 *Income velocity of Eurozone M3 broad money, showing the 2020 anomaly*

reaching 12.5 per cent. But Schnabel and other ECB officials remained anxious that Europe did not have enough inflation. In a speech on 26 February 2021, Schnabel remarked that

> Years of subdued price pressures have raised the spectre of low inflation becoming entrenched in people's expectations. Considering that financial markets believe that real interest rates will remain in negative territory for the foreseeable future, private investors appear to harbour serious doubts about the capacity of the euro area economy to chart a sustainable path towards higher nominal growth.

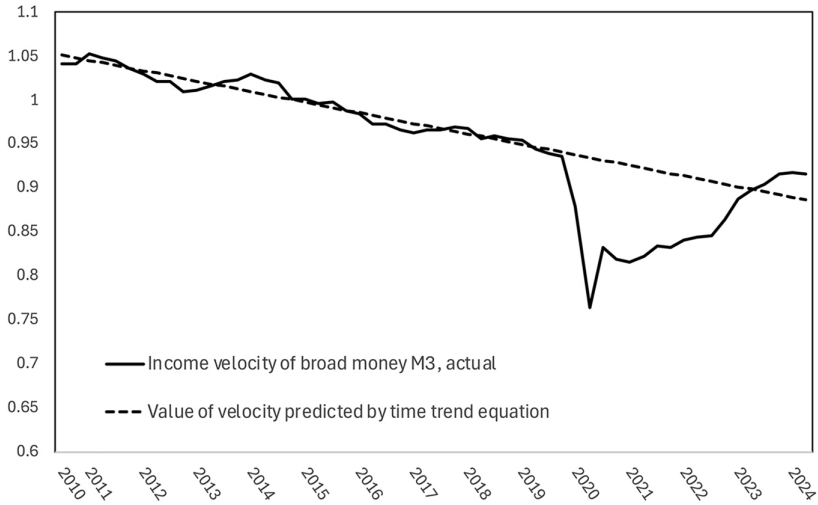
On 14 July, now speaking at an event hosted by the Peterson Institute for International Economics, her view was that the Eurozone had suffered "a long period of low price pressures, and years of repeated overprediction of the future path of inflation". The pessimism engendered by this period required, in her judgement, that "higher inflation prospects need to be visibly reflected in actual underlying inflation dynamics before they warrant a more fundamental reassessment of the medium-term inflation outlook".[9] In short, she wanted more inflation!

In the eight months to February 2022, the Eurozone's consumer price index rose by 3.8 per cent, with the implied annualized rate of increase no less than 5.7 per cent. This was just ahead of Russia's invasion of Ukraine and may have

been the sort of underlying "inflation dynamics" which Schnabel was seeking. But on 22 February 2022, the Russian invasion was accompanied by shock damage to energy prices. In the eight months from February 2022 to October 2022, the consumer price index climbed by 8.3 per cent, with an implied annualized rate of increase of 12.7 per cent. The annual rate of increase for October was 10.6 per cent, the highest figure in the Eurozone's history. The number was almost nine times that foreseen by Schnabel in her Berlin presentation just over two years earlier. No one wanted inflation dynamics of this vigour, and the ECB's top economists and executives took care to deflect criticism by blaming Putin and external shocks for the setback.

As elsewhere, oil and gas prices could indeed account – in an arithmetical sense – for much of the overall Eurozone increase in prices in late 2022 and early 2023. But, also as elsewhere, oil and gas prices then weakened. Anyhow, the ECB realized, somewhat later than other leading central banks, that monetary policy needed to be tighter. Its main refinancing rate was zero per cent all through the early Covid period, having been at this level since March 2016. But it went up to ½ per cent in July 2022 and kept on rising to 4½ per cent in September 2023. High money growth persisted for longer than in the USA, although a slowdown was evident from early 2022. From summer 2022, the quantity of money contracted for about a year; from summer 2023, it started to increase again, rather hesitantly, at annualized rates in the low single digits.

In the two years to January 2022, Eurozone M3 advanced by 19.6 per cent. By contrast, in the following eight months to September 2022, it went up by a further 4.0 per cent (that is, at an annualized rate of 6.0 per cent), while in September 2024, it was only 2.3 per cent above its value two years earlier. So the pace of money growth collapsed by almost 90 per cent when compared with 2020 and 2021. Not surprisingly, rates of increase in nominal GDP were above those in M3 broad money in 2022 and 2023 as the quantity of money stagnated. Figure 10.7 shows the behaviour of Eurozone velocity to mid-2024. In one respect, the chart has the same look and feel as Figure 10.2 for the USA, with velocity rising from mid-2020 and doing so more in 2023 than in 2021. But the similarities should not be pressed too far. As in the USA, velocity at mid-2024 had not fully returned to where it was before Covid. But, in contrast to the USA, it had more than recovered the previous trend line. The dominant behaviour from mid-2020 was for increases in nominal GDP to run ahead of those in broad money, that is, for velocity to rise. However, of the 16 quarters to mid-2024 four recorded smaller rates of increase in nominal GDP than in the quantity of money. Figure 10.8 corresponds to Figure 10.4 for the USA, and shows these four quarters (Q4 2020, Q1 2021, Q4 2021 and Q2 2024).



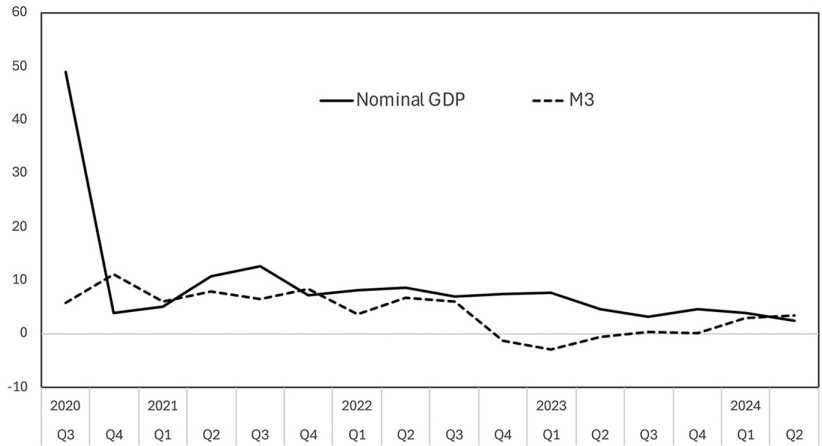
Sources: See Figure 10.5 source.

Figure 10.7 *Income velocity of Eurozone M3 broad money, in the 2010s and the Covid-affected early 2020s*

III.

Our final velocity analysis relates to the UK. As noted in Chapter 4, central banks' top officials – like their economist colleagues – were in contact with each other in the weeks and months following the announcements of medical emergencies in early 2020. They tended to take measures similar in kind to each other, even if the scale of the operations varied. As Chapter 8 contained much of the material relevant to the UK, another narrative of key decisions is unnecessary. Figure 10.9 on p. 253 has the same format as Figure 10.1 for the USA.

The average value of M4x velocity in the ten years 2010 to 2019 inclusive was 1.02, with the Q4 2019 figure – just before Covid-19 – for M4x velocity being almost exactly that number at 1.01.[10] The virtual equivalence of the two numbers agrees with the suggestions in Chapter 8 (on p. 210) and Chapter 9 (on p. 235) that the UK was close to monetary equilibrium in 2019. But – with nominal GDP falling in early 2020 and broad money boosted by the first round of Bank of England asset purchases – velocity slumped to under 0.78 at Q2



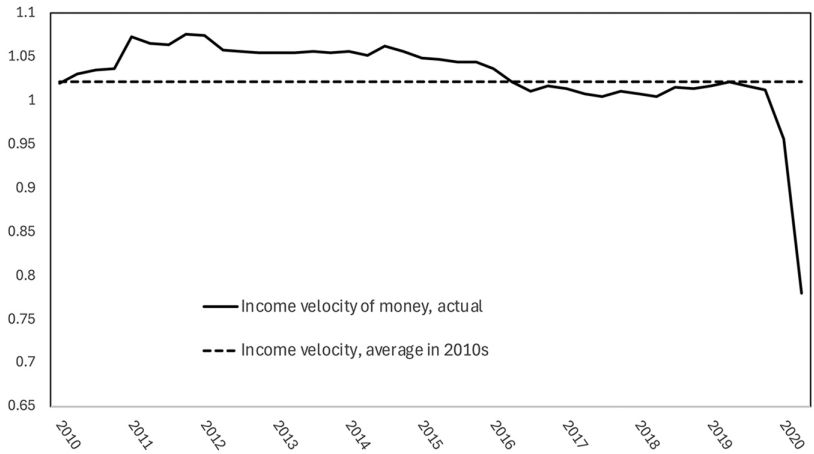
Source: See Figure 10.5 source.

Figure 10.8 *Nominal GDP and broad money in the Eurozone since mid-2020*

2020. This was down almost 23 per cent from Q4 2019 and indicated a severe monetary disequilibrium.

Chapter 4 argued that experience from the UK's business cycles of the 1970s and 1980s justified a claim that – once the economy had been shocked into a big monetary disequilibrium – the return to equilibrium might take four or more years. Figure 10.10 presents the UK's broad money velocity, now looking at the longer period 2010 to mid-2024. Clearly, velocity had by mid-2024 almost reverted to its average value in the 2010s. In mid-2020, velocity was almost 24 per cent beneath that average value; four years later, it was only 3½ per cent beneath it.

The failure to return – exactly and completely – to the average value of the 2020s might be seen as a disappointment. A point made above in the discussion on the USA is worth repeating. The Bank of England appreciated from late 2021 that inflation was not a nine days' wonder or calamity and had to be tackled as a major policy problem. The Bank rate was kept at 5¼ per cent for a year from 3 August 2023, with rates paid on bank deposits adjusting upwards. So deposit rates – which had been nil for several years until early 2022 – were often 3 or 4 per cent in that one-year period, causing the desired ratio of broad money to GDP to increase and equilibrium velocity to fall. That might explain why velocity did not in mid-2024 match the average value of the 2010s.



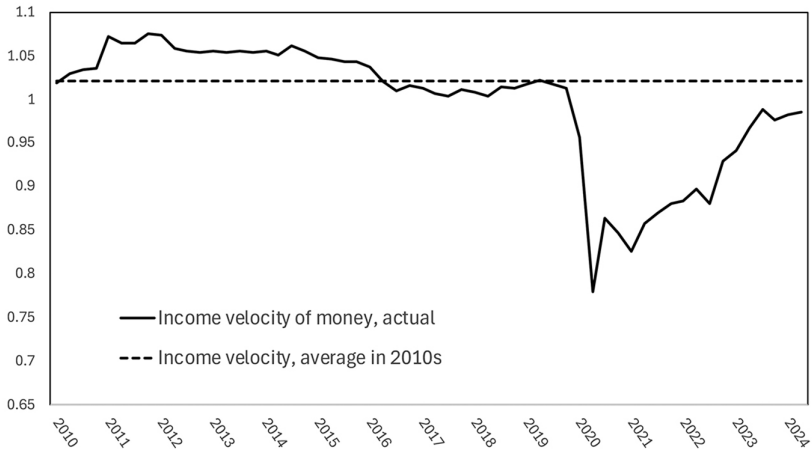
Sources: Bank of England for M4x and Office for National Statistics for GDP, and author's calculations.

Figure 10.9 Income velocity of M4x broad money in the UK, 2010–20

Figure 10.11 serves the same purpose for the UK as Figures 10.4 and 10.8 serve for the USA and the Eurozone, respectively. As in those figures, the clear majority of quarterly values from mid-2020 have the rate of increase in nominal GDP above that of the quantity of money. The UK resembles the Eurozone in that four quarters out of 16 do not conform to the general pattern. One of these, Q1 2021, is at least partly attributable to the imposition of a third national lockdown on the UK's society and economy on 6 January 2021. One of the other four quarters, Q4 2020, may have little significance since the previous quarter saw an extraordinarily large surge in nominal GDP (of almost 60 per cent) and some of that surge was given back in the year's final quarter. As with the USA and the Eurozone, the dominant behaviour from mid-2020 was for increases in nominal GDP to run ahead of those in broad money and hence for velocity to rise.

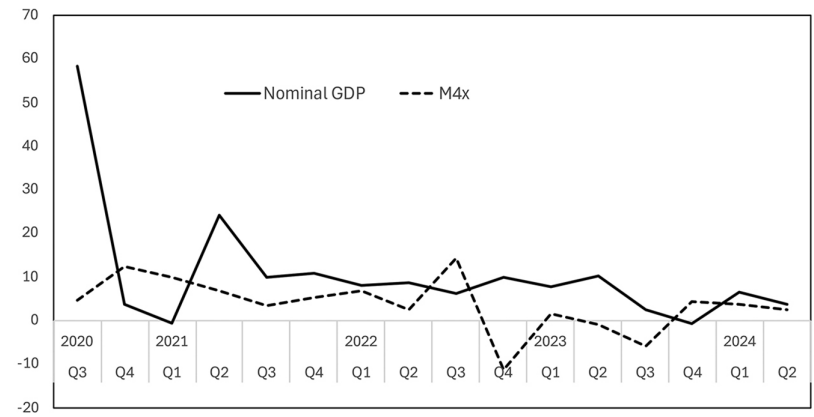
IV.

Chapter 4 proposed that, when multi-decadal series of data are examined, a structural feature of contemporary economies is that the change in velocity has the property of stationarity. An implication is that, when a large change in velocity in one direction occurs, an offsetting change in velocity in the



Source: See Figure 10.9 source.

Figure 10.10 Income velocity of M4x broad money in the UK, 2010–24



Source: See Figure 10.9 source.

Figure 10.11 Nominal GDP and broad money in the UK from mid-2020

other direction, probably similar in size, is to be expected over the next few years. These swings in velocity reflect the stability of agents' money-holding behaviour, a key element in the modern quantity theory of money, as it was restated by Milton Friedman in 1956. The author of this book was alert enough in spring 2020 to see that a major swing to monetary expansion was to be observed in leading economies, including the USA, the Eurozone and the UK. The Covid-19 pandemic provided policy-makers with the justification – or perhaps the pretext – for this expansion.

Given his quantity-theoretic commitments, the author had little option but to forecast an inflation flare-up in the early 2020s. In view of the lags, the expectation was that the flare-up would become evident in late 2021 or later rather than immediately. Nevertheless, the relationships at work were seen as sufficiently powerful that higher inflation was inevitable unless the explosion in money growth were countered quickly by an implosion in the quantity of money, which was similar in size. In the event, money growth slowed markedly in the USA, the Eurozone and the UK in 2022, and all three jurisdictions had a period of about a year in which the quantity of money was static or even falling. Nevertheless, the impetus to extra inflation from the excess money growth of 2020 and 2021 was strong enough that worries about above-target inflation survived into 2024.

The review of evidence in the last few pages has acknowledged that the rise in velocity from mid-2020 was not monotonic. A few quarters in the four years to 2024 did see falling velocity. However, one method of presenting the facts would be to look at the four annual periods from mid-2020 in the three places under consideration. That is done in Figure 10.12. *In every one-year period from mid-2020, in all three jurisdictions, the velocity of money increased.* It would hardly be possible to obtain better confirmation of the essential correctness of the author's conjecture – made in spring 2020 – about a prospective inflation flare-up.

The author viewed his inflation forecasts in 2020 as merely an application of standard macroeconomic theory, although cynics might remark that the so-called "discipline" of academic economics is in such a mess that the meaning of the phrase "standard macroeconomic theory" is moot. A large number of influential economists – notably a group with mostly Keynesian sympathies at the USA's Ivy League universities – brushed aside forecasts of the kind made by the author, and they ignored both him and the monetary statistics of the Covid period. As has been shown in this book, their prognostications in 2020, and at least the first half of 2021, tended to be warnings about a prospective long period of disinflation.

The group included, for example, Ben Bernanke of Princeton University, who had been chairman of the Federal Reserve from 2006 to 2014; Olivier Blanchard of the Massachusetts Institute of Technology and chief economist

		Velocity, actual in quarter	*Change in velocity on year earlier, %*	Did velocity increase in the year?
USA	Q2 2020	0.82		
	Q2 2021	0.88	+7.9	✓
	Q2 2022	0.91	+3.8	✓
	Q2 2023	0.99	+8.1	✓
	Q2 2024	1.02	+3.2	✓
Eurozone	Q2 2020	0.76		
	Q2 2021	0.82	+7.6	✓
	Q2 2022	0.84	+2.7	✓
	Q2 2023	0.9	+6.4	✓
	Q2 2024	0.92	+1.9	✓
UK	Q2 2020	0.78		
	Q2 2021	0.86	+9.9	✓
	Q2 2022	0.9	+4.6	✓
	Q2 2023	0.97	+7.8	✓
	Q2 2024	0.99	+1.9	✓

Figure 10.12 *The behaviour of broad money velocity in the four years from mid-2020*

at the International Monetary Fund from 2008 to 2015; Paul Krugman, also of Princeton, with his internationally acclaimed column in the *New York Times*; Jo Stiglitz of Columbia and chief economist at the World Bank from 1997 to 2000; and Larry Summers of Harvard, who had been US Secretary of the Treasury at the end of the Clinton presidency. They have all been mentioned at various points in this book, with quotations from them about future inflation or disinflation. All too often, these quotations proved wrong and in some cases were embarrassingly so. (Summers is a partial exception, although he made a forecasting "blooper" too.[11] Note that Bernanke, Krugman and Stiglitz are Nobel laureates.)

The comment just made about these economists' forecasting record might appear needlessly critical and negative, or even unkind. However, the author is not alone in offering such comments. The Introduction to this book began with quotations from a January 2022 essay by Jason Furman about economists' "dismal performance" and "collective failure" in under-estimating inflation in the Covid period. Furman, an adviser to Democratic President Obama, is well-known to all of the economists mentioned in the last paragraph.

To be clear, the Ivy League notables were far from alone in the views they took. Thousands of other economists, of less salience and distinction, also believed that the Covid-19 medical emergency would inflict years of semi-depression on the world's capitalist democracies. In an article in the winter 2024 issue of *The International Economy*, Willem Buiter and Ebrahim Rahbari quoted recent remarks from the Fed chair, Jay Powell, on economic forecasts. Powell paraphrased Winston Churchill, calling forecasters "a humble lot, with much to be humble about". He may have become weary with having to apologize for the Fed's very wrong view on inflation in 2020 and 2021. But Buiter and Rahbari said that "central banks' inflation forecasts are no worse, and may be somewhat better, than private sector forecasts on average."[12]

The pricing of government bonds in 2020 and 2021 reflected a widely held consensus in which economists' virtual unanimity on the disinflationary outlook was a powerful influence. As was shown in section VIII of Chapter 1, the notion of "rational expectations" may prove hollow, and it did so in the Covid-related cyclical episode. According to at least some versions of rational expectations theorizing, forward inflation perspectives are related to the behaviour of one or another money aggregate. But hardly any financial market participants looked at any such aggregate in what was, arguably, the critical period in spring and summer 2020.

Much larger questions are raised by the unsatisfactory forecasting outcomes, in the Covid period, from the bodies of macroeconomic thought to which so many distinguished academics pledged their intellectual allegiance. Disquiet about the state of macroeconomics was expressed in a leader in the *Financial Times* on 30 August 2024.[13] Citing a study by four economists in American and Chinese universities, the leader referred to a "a 'high and rising' concentration of Nobel Prize winners in a handful of top US universities", and worried about "other signs of economics turning into an elite closed shop".[14] It alleged that the a case could be made that the subject was suffering from "narrow gatekeeping and a steep hierarchy of prestige group think overseen by a self-perpetuating priesthood". Indeed, the *Financial Times* wondered whether economics was in need of intellectual trustbusting.

In a column for the *New York Times* on 21 July 2022, Krugman appeared to be open and honest in a *mea culpa* about inflation. He noted that – unlike some other economists – he had been relaxed about inflation in early 2021 when Jo Biden's American Rescue Plan, with a reported fiscal cost of $1,900 billion, was being enacted. He then admitted that, "As it turned out … that was a very bad call." He nevertheless insisted that the divergence of views was not between "opposing economic ideologies". In his opinion, "all the prominent players [in the debate on the Biden package] … were Keynesian economists, with more or less centre-left political leanings". Further, according to Krugman, "we all had similar views … about how the economy works". More

precisely, everyone thought that budget deficits stimulated demand and that "a stronger economy with a lower unemployment rate would … have a higher inflation rate".[15]

The trouble here is two-fold. First, the debate on the Biden package – between Krugman and the arch-Keynesians, on the one hand, and the more flexible Keynesians like Larry Summers, on the other, between (as Krugman put it) Team Relaxed and Team Inflation – was indeed among economists with much the same approach to macroeconomic analysis. All of them had absorbed the Samuelson textbook as undergraduates and hence took fiscal policy as the pre-eminent branch of macroeconomic policy. But this pre-eminence is open to question and at least some economists, including the author, regard Samuelsonian economics with great suspicion. Krugman is a witty and readable columnist, and may try to sideline his opponents with the sort of badinage (on "monetary cockroaches") quoted in Chapter 1. But that is an evasion which lowers the tone of public debate about major policy issues. Several top economists in the USA do not belong to the political centre-left, and do not agree that fiscal policy should be accorded so much attention and respect.[16]

No money aggregate appears in Krugman's thinking, despite the evidence put together, for example, throughout this chapter and in section VI in Chapter 1. On the face of it, Krugman's world is rather odd. In that world not only has the quantity theory of money been the victim of cancel culture, but large bodies of statistics prepared by central banks (on commercial banks' balance sheets and their deposit liabilities, among other subjects) are to be boycotted. Krugman may shrug off the criticism, but this book has shown that – because its author in 2020 followed those statistics carefully and on a weekly basis – his warnings on American inflation were almost a year *before* the Keynesians' debate on the Biden package.

Secondly, Krugman and many other Keynesians interpret inflation in terms of labour market tightness, and only in such terms. But is the relationship between labour market pressures and inflation strong enough to bear the weight placed on it in his and other Keynesian work? The 2020s have undoubtedly upset the large numbers of economists who share (or once shared) Krugman's attitude here. Not to put too fine a point on it, the economists in question include all of the Ivy League group mentioned above. This is not the place for a lengthy review of the literature on the Phillips curve, but sceptics about its usefulness cannot overlook the plethora of articles about its ever-changing shape.

In the 1980s and 1990s, following Friedman and Phelps, the increasingly accepted view was that the Phillips curve had to be expectations-augmented and so was vertical in the long run. But one dissident argued that the Phillips curve was horizontal, at least in the short run.[17] In the 2010s and in many countries, enough evidence of the insensitivity to wages to changes in unemployment had

emerged for some authorities to propose a flattening of the Phillips curve.[18] More recently, one author put forward the notion of an inverted Phillips curve, and combined it with the striking if somewhat counter-intuitive suggestion that "interest rate cuts lower labour supply and are contractionary [*sic*]".[19] Another contribution appeared first under the aegis of the venerated American research sponsor and organizer, the National Bureau of Economic Research. It claimed that "a slanted-L curve is well-suited to represent the non-linearity of the celebrated Phillips curve".[20] So we have a vertical "curve", a horizontal "curve", a flattening "curve", an inverted "curve" and a slanted-L "curve", as well as a profession which apparently believes – along with other imaginative geometry – that a curve can be a curve, and both vertical and horizontal.

At a December 2019 press conference, Jay Powell was asked about a possible "disconnect" between unemployment and inflation. His reply was that the connection had in recent decades become "weaker and weaker and weaker to the point where it's a faint heartbeat that you can hear now". Further, the weakening was partly due to the success of monetary policy, as he saw it at the time. In his judgement, inflation expectations had become "so settled" that it was such expectations "we think drives inflation". Earlier in 2019, at a February presentation, James Bullard, the president of the St Louis Fed, said that US policy-makers had long relied on the Phillips curve, but that the relationship had "broken down during the last two decades".[21]

Quite apart from the debatable quality of the link between unemployment and inflation, a recurrent feature of business cycles is that the labour market lags behind demand and output, and demand and output in turn lag behind asset markets and developments in the banking system. Particularly important – in the author's view – are developments in the banking system bearing on the rate of growth of the quantity of money, broadly defined. If central banks insist on putting the labour market at the heart of inflation forecasting, they will be caught out time and again. The lags are so short that they will have to forecast unemployment, vacancies and the like in the next two to three quarters, if they are to have any extra insight into inflation in – say – a year from now. But short-term "forecasts" of these labour market variables amount to "nowcasting" and are often no better than guesses.

As this book nears its conclusion, the discussion recalls its opening paragraphs. Everyone agrees that the inflation forecasting fiasco of the early 2020s must not be repeated. Non-economists interested in economic policy have every right to feel let down. It is entirely legitimate for them to ask questions about the intellectual background to economists' "dismal performance" and "collective failure" on inflation in the Covid period. This final chapter has shown how – just as the author expected in spring 2020 – a sharp rise in the velocity of money would, over the next few years, result in significantly more inflation in three of the world's leading economies. He was well-aware in 2020

that the lags between money and inflation might be long and variable, but – in his view – the wider relationship between money and inflation had certainly not broken down. Indeed, it was the lagged character of inflation's response to changes in money growth which made analysis of banking and money so necessary and worthwhile.

Economists have spent too much of their research time in the twenty-first century on the workings of the labour market and the foibles of three-equation New Keynesianism. The version of the quantity theory of money set out in this book focuses on broad money and emphasizes the importance of money to all asset prices, not just the price of bonds. It owes much to Milton Friedman. But it also recalls many of Keynes' best ideas, particularly the ideas he had before *The General Theory*. Moreover, broad-money monetarism differs in key respects from both Friedman's positions and the larger Chicago School monetary tradition.

In recent decades, central banks have stopped referring to the quantity of money in their policy briefings and economic commentary. The silence on money may have accurately reflected what top central bankers believed, but what they believed has proved false. They should now show intellectual humility and flexibility of mind, and accept that other people think differently from them and may be right. In particular, they must restore references to money aggregates in their research and policy statements, as if it really were true that "money matters". The quantity of money must be on the central bank dashboard. If it is not there, central bankers will be as ignorant and dangerous as people who drive cars without looking at the speedometer.[22]

NOTES

1. The M3 numbers behind Figure 10.3 are from Shadow Government Statistics. The value of M3 in March 2022 was $27,911 billion and on March 2024 it was $27,910 billion.
2. Many books have been written on the stresses and strains in the Eurozone. For an example, see Roger Bootle, *The Trouble with Europe* (London and Boston: Nicholas Brealey Publishing, 2014).
3. Note that Croatia adopted the euro on 1 January 2023, increasing the number of member countries from 19 to 20.
4. Martin Arnold and Tobias Buck, 'Germany set to appoint Isabel Schnabel to ECB board', *Financial Times*, 22 October 2019.
5. Schnabel's 27 June speech was entitled, 'The ECB's monetary policy during the coronavirus crisis – necessary, suitable and proportionate'. The speech is available at the ECB website on https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200627~6009be389f.en.html. Schnabel's 2 July 2020 presentation is available at https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200702_1~977101f696.en.pdf

6. Something similar had been evident in the first decade of the euro's existence. See Tim Congdon and Juan Castañeda, 'Have central banks forgotten about money?: the case of the European Central Bank, 1999–2014', pp. 101–29, in Tim Congdon (ed.), *Money in the Great Recession* (Cheltenham, UK, and Northampton, USA: Edward Elgar Publishing, 2017), with pp. 104–8 being particularly relevant.
7. The equation was estimated on quarterly data for velocity from 2010 to 2019, with the best-fitting equation being V = 1.05 − 0.00299T, where V is velocity and T is time. The r^2 for the equation was 0.94, with the *t* statistic on the time term coefficient at −24.7. In other words, the time trend equation predicted that velocity would fall by 1.2 per cent a year.
8. In May 2016 the European Parliament and Council had passed a regulation calling on Eurostat, the EU's statistical agency, to prepare house price indices for the Eurozone and its members, and the Eurostat index is the one used here. The basic act providing for the compilation of the house price index (HPI) and the owner-occupied housing price index (OOHPI) is the *European Parliament and Council Regulation (EU) 2016/792* of 11 May 2016.
9. Schnabel's speech of 26 February 2021, entitled 'Unconventional fiscal and monetary policy at the zero lower bound' is available at https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210226~ff6ad267d4.en.html, and that for 14 July 2021, 'A new strategy for a new world', at https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210714~0d62f657bc.en.html
10. Like the Eurozone, the monetary data for the UK showed a trend for declining velocity in much of the late twentieth century. The author's judgement – which may be wrong – is that the downward trend stopped with the Great Recession, because the tighter regulation of banks reduced competition between them, cut profits and deterred innovation. A time trend equation for UK velocity was not estimated for the purposes of this chapter.
11. In a speech in London on 21 June 2022, Summers was very pessimistic about the cost – in terms of recession and extra unemployment – required to reduce US inflation. Specifically, he said five years of an unemployment rate of 6 per cent – or a year with an unemployment rate of 10 per cent – to bring inflation back to its target figure of about 2 per cent. In the event, inflation fell to under 3 per cent by late 2023 without a recession, while in the period from June 2022 to then the unemployment rate never went above 4 per cent. Although justified by academic research on the Phillips curve, Summers turned out to be completely wrong with his recession warning. See, for an example of the resulting criticism, Ryan Cooper, 'Why were inflation hawks wrong', at *The American Prospect* website, 7 February 2024, https://prospect.org/economy/2024-02-07-why-were-inflation-hawks-wrong/
12. Willem Buiter and Ebrahim Rahbari, 'A humble lot', *The International Economy* (published in Washington, DC), winter 2024 issue, pp. 48–9.
13. 'Is economics in need of trustbusting?', leader in *Financial Times* of 30 August 2024.

14. Richard Freeman and others, 'High and rising institutional concentration of award-winning economists', mimeo, 25 June 2024, available at https://conference.nber.org/conf_papers/f204525.pdf
15. Paul Krugman, 'I was wrong about inflation', *New York Times*, 21 July 2022.
16. Robert Barro, 'Government spending is no free lunch', *Wall Street Journal*, 22 January 2009. The Barro proposition in the article was, "peacetime fiscal multipliers are essentially zero".
17. Robert Gordon, 'Prices in 1970: the horizontal Phillips curve?', *Brookings Papers on Economic Activity* (Baltimore: Johns Hopkins University Press), no. 3 (1970), pp. 449–58.
18. Kristie Engemann, 'What is the Phillips curve (and why has it flattened)?', 14 January 2020, Open Vault blog at the website for the Federal Reserve Bank of St Louis, at https://www.stlouisfed.org/open-vault/2020/january/what-is-phillips-curve-why-flattened
19. Charles Dennery, 'Monopsony with nominal rigidities: an inverted Phillips curve', *Economics Letters* (Science Direct: Elsevier), vol. 191, June 2020.
20. Pierpaolo Benigno and Gauti Eggertsson, 'The slanted-L Phillips curve', *American Economic Association: Papers and Proceedings*, vol. 114, 2024, pp. 84–9. The paper had previously appeared as the National Bureau of Economic Research's working paper no. 32172.
21. The quotations are from Kristie Engemann, 'What is the Phillips curve (and why has it flattened)?', 14 January 2020, Open Vault blog at the website for the Federal Reserve Bank of St Louis, at https://www.stlouisfed.org/open-vault/2020/january/what-is-phillips-curve-why-flattened
22. This paragraph is the same as that at the end of the author's 2023 pamphlet, *Inflation: Why has it come back? And what can be done?*, for the London think tank, Politeia.

Index

100 per cent cash reserves 40, 80, 88, 91–2, 97, 104, 145, 162

Abrams, Burton 186
absolute liquidity preferences 12–13, 69, 104, 116
academic economics 255
accelerationist hypothesis 142
accounting frameworks 34–5
actual inflation 66–7, 143, 238
adjustment process 100, 111, 113
Adrian, Tobias 124, 146
advocacy of monetary stability 27
aggregate/aggregation 17
  demand 35–6, 139, 144, 181–2, 201–2, 239
  money 114–15
  structure of models 17
Akerlof, George 105
ambiguity 27, 29
American Economic Association (AEA) 205 *see* American Economic Association (AEA)
animal spirits 73, 105
annual inflation rates 159
annual money growth 2, 156, 158, 160, 180
assets 29, 102
  alternative 128
  in bonds 109
  equilibrium value of 110
  inflation 229
  market 60, 64, 66, 70, 115, 188, 222
  prices 28, 41, 63–8, 71, 73–4, 100, 104, 140–41, 144, 214, 216, 229–31, 236–7
  purchases 7, 210–11
  see also non-money assets
autonomous demand 136
autonomous expenditure 73–4, 136
available for sale securities 188

Bailey, Andrew 16, 143, 220–21, 225–8, 230, 234, 236
balance of payments 129, 140
balance-sheet
  anxieties 183–4
  developments 106–7
bank/banking 33, 35, 60, 153, 160, 179
  assets 14, 153
  attitudes 95
  borrowing 46–7
  capital and risk appetites 89
  characteristics 92
  credit 14–15, 47–8
  customers 155
  debt 47–8
  deposits 29–30, 91, 244
  habit 59
  institutional structure for 92
  lending 129
  liabilities of 14, 126, 153
  loans 14
  money and 10
  nitty-gritty operation of 88–9
  rate 9–10, 41–3, 101, 115, 124, 133, 182, 202, 212, 218–19, 221
  securities from 90
  system 172
  see also central banks
Bank for International Settlements 124, 164
Bank of England 37, 89, 124–5, 129, 137–40, 145–7, 210–11, 213–16, 218, 220, 222, 228, 230–31, 234–5, 252
  asset purchases 210–12
  cost-accountancy approach to inflation 234
  criticism of 146

forecasting procedures 225
see also bank/banking
Bank's Monetary Policy Committee 210–11
Basel rules 162
base multiplier 34–5, 90–92, 95, 101, 164
Bernanke, Ben 15, 124–6, 137–8, 146–7, 164, 225, 238–9, 255
Bernanke-Blanchard inflation model 227, 237–9
Biden, Joe 200, 205, 257
black boxes 41–2, 164–5, 240
Blanchard, Olivier 123, 125, 146, 225, 238–9, 255
Blinder, Alan 15
Bodin, Jean 26
bond 105
assets in 109
issuers 184
market 70
prices 52
value of 9, 68–9
yields 12, 51, 54, 70–71, 105, 107
boom-bust 229–30
boundary problem 7–8, 30
Bretton Woods system 129
Broadbent, Ben 145, 234, 236
broad money 30, 33, 57, 131, 176–7, 197, 242–3, 245–6, 251, 253, 260
growth rate of 209
income velocity of 243, 252–3
monetarism 6, 66, 94, 133, 202
positive impact on 195
promotion of 93
ratio of 176
velocity 177–8, 247–8, 256
budget deficits 162, 187, 204
Buiter, Willem 257
Bullard, James 259
business
cycle 67–8
equity 51

Cambridge School 36, 40
Cantillon, Richard 41
capital gains 53, 184
capitalism 46, 91
capital markets 15, 48, 103, 124
CARES Act *see* Coronavirus Aid, Relief, and Economic Security Act (CARES Act)
CARES legislation 196
Carstens, Agustín 124–5, 146
cash reserve 29, 33–4, 88–92, 94–5, 98, 158, 161, 195
cash-to-asset ratios 183
Castañeda, Juan 2
CBI survey 217–18
Central Banking journal 225
central banks 10, 34, 72, 95, 114–16, 140, 155, 169, 181–2, 235–7, 246, 257
asset purchases 147
complacency 214
monetarist critique of 147
national income forecasting in 142
cheque-book money 33
Chicago School 3, 27, 94–5, 233, 260
Churchill, Winston 257
Clarida, Richard 124, 142, 146, 171, 199
Clougherty, Tom 2
Cochrane, John 202–3, 205–6
collective failure 1, 256, 259
commercial and industrial loans 161
commercial banks 33–4, 44, 101, 157, 162, 185, 195
deposits by 33–4
liabilities of 44
commercial property 140, 229
commodity
market 28, 61, 66
prices 41–2, 229
common sense grounds 62
company balance sheets 45–6
comparative-static adjustment 111
competition between banks 133
conspiracy theorizing 94
consumer inflation 1, 90, 134, 165, 212
consumer price 66
index 197, 203, 218, 229, 250
inflation 180
consumer spending 61, 106–7, 184
contemporary macroeconomics 6, 202
Coronavirus Aid, Relief, and Economic Security Act (CARES Act) 158
corporate
balance sheets 45–6
bond 65, 107, 113, 210–11
equity 12, 37–8, 50, 108, 140–41

fund-raising 216
investment 107, 116
profits 49
cost of equity 107
Covid-19 145, 169, 179–80, 184–5, 216, 230
broad money velocity 247–8
budget deficit 202
business cycle 27–8, 53, 61, 63–4, 66–9, 71, 137–8, 141, 144–5, 164, 241–60
consequences of 168
crisis 163
economic effects of 166
economies during 241
energy prices 226
import price deflator 234
meant for inflation 146
medical emergency 5–6, 193–4, 233, 256–7
policy-making in 201
related business cycle 27
restrictions 243
spread of 215
US unemployment 171
credit
based accounts 15
booms 129
conditions 43
counterparts 34–5
demand 15
lines 161, 195–6
linked transactions 48
spreads 43
worthiness 35–6
creditism 15, 17, 47, 164
creditist thinking 16
currency
depreciation 229
value of 228–9
see also money
Currie, Laughlin 14
cyclical instability 28, 59, 74, 130

debt/debtism 164
interest 219
securities 39
deflation 145, 168, 247
demand
determination of 182
for money 32, 104, 128
and supply curves 39
to-hold-money function 43
Depository Institutions Deregulation and Monetary Control Act 93
deposits 29, 33, 153, 172
liabilities 45
types of 93–4
direct central bank financing 158
direct effects 51
discretionary fiscal policy 209
discretionary stimulus 203
disequilibrium 42, 127, 144
disinflationary shock 213
dismal performance 1, 3, 12, 256
Dodd-Frank legislation 176
domestic financial sector 113, 175
Donald Patinkin 44–6
double-digit inflation 145–6, 197–8, 212, 214, 216
double-entry book-keeping 46
Dowd, Kevin 220
DSGE model 137–8, 144

ECB *see* European Central Bank (ECB)
econometric work 135
economic/economy 30, 143, 197, 240
general equilibrium of 111
knowledge, demand for 13
monetary equilibrium 40
policy response 159
structural attribute of 140
theory 227
employment 67
energy prices 159, 163, 209, 226, 230, 233, 237, 247, 250
equation of exchange 26–7, 30–32, 127
equilibrium 126, 144, 182–3
behaviour 128–9
national income 153
partial 111
pricing 103
return to 129
equities 9, 107, 113, 116
excess demand for 111
markets 51, 114–15, 154
prices of 112, 139
valuation of 116
European Central Bank (ECB) 89, 124, 212, 246–8

European currency 89, 169, 246
Eurostat index 248–9
Eurozone 241–2, 246, 248, 250, 252–3, 255
  consumer prices 247
  income velocity of 249–51
  nominal GDP and broad money in 251–2
excess money 63–4
  holdings 61
  symptoms of 248
exhaustion of monetary policy 162
"exogenous" monetary shock 110
expenditures 29, 203
  "autonomous" and "induced" 73
  level of 40
  money-holders' decisions on 29–30

federal deficit 162, 193–6, 206
Federal Open Market Committee (FOMC) meeting 1, 185–6
Federal Reserve 65, 124, 166, 171, 175, 194–5
  asset purchases 94, 196, 198, 244
  economists 198
  funds rate 93
fiat money 33–4
final demand producer price index 197–8
financial/financialization 59, 72, 128, 175–6
  assets 175, 229
  flows 36
  institutions 173
  markets 155, 194
  sector money 175–6, 183
  transactions 57, 128
Financial Times 213
fiscal deficit 123, 205
fiscal policy 156, 194, 201–3, 205
  discretionary 209
  encomiums on 236
fiscal theory 205–6
Fisher, Irving 26, 111
Fisher equation 26–7
fixed-income assets 141
fixed-interest securities 69
FOMC meeting *see* Federal Open Market Committee (FOMC) meeting
food prices 220, 226, 237
forecasting model 126, 138, 144
fountain-pen money 33
Fox, Liam 220
free-market capitalism 13, 27
Friedman, Benjamin 15
Friedman, Milton 11, 26, 33, 41–4, 46, 48, 51, 55–6, 88, 92, 95, 101, 109, 126, 128–9, 164, 172–3, 181, 184, 234, 258
  attributes of money demand functions 88–9
  "blooper" on inflation 7
  properties of money demand function 3
FTSE 100 index 214–15
fund-raising 184
Furman, Jason 1, 256

Galí, Jordo 142
GDP *see* gross domestic product (GDP)
general equilibrium 111–12, 137
The General Theory 8–9, 100, 103, 107, 116, 137–8, 142, 240, 260
Gertler, Mark 142
Goodhart, Charles 10
Gordon, Robert
  The American Business Cycle 174
government
  bonds 257
  debt 48
Great Depression 171, 174–5, 236
Great Destabilization 220, 235
Great Inflation 147, 151, 158, 180
Great Recession 92–3, 155, 173, 179, 181, 193, 195, 198
Great Stabilization 164, 209–10, 220, 235
gross domestic fixed capital formation 64
gross domestic product (GDP) 2, 5, 49
  deflator 232
  nominal 50, 57
  ratio of money to 189
gross household wealth 37
Gurley, John 44–5

Haldane, Andrew 124, 145, 214, 221–2
Halligan, Liam 7
Hayek, Friedrich 92
Heath-Barber boom 139–40

helicopter money 33
Hicks, John 8–9, 38–9, 45
Hofmann, Boris 10
holdings of equities 108
Hoover Institution at Stanford 7, 202
"hotch-potch" price index 40
households 39, 48, 61, 105, 143
  behaviour 61
  decisions 52
  equilibrium desire 110
  money 59, 63–4
  savings behaviour 36
  sector 56–7, 62
  wealth 38, 106, 116
House of Commons Committee 226
House of Lords' Economic Affairs Committee 16
houses/housing 140
  markets 64–5
  ownership 103
  prices of 49, 62, 64, 139, 143, 215, 230–31
Hume, David 41
hyperinflation 200–201, 229
hypothetical business cycle 69

IEA *see* Institute of Economic Affairs (IEA)
IMF *see* International Monetary Fund (IMF)
import price shocks 233
income
  expenditure flow 28, 30, 65, 68, 73
  streams 50
  and variable-income assets 50
  velocity 32, 40, 59, 109, 127, 131–2, 175–7, 241–3, 248–9, 253–4
individual cash balances 42
induced expenditure 73
industrial circulation 30–31, 54
inflation/inflationary 3, 7, 56, 67–9, 130, 137, 140, 143, 156, 158–9, 168, 171, 193, 198–200, 204–5, 209–10, 214, 218, 226–7, 237, 241, 255–6, 258–60
  actual rate of 70
  alarmist view on 94
  analysis of 188
  antidote to 144–5
  assessment of 225
  beneath-target 213
  business cycle and 125
  changes in 228
  collective failure on 259
  complacency on 156
  consequences 1
  cost-accountancy 144, 226, 228–9, 236
  damage 154
  determination of 66
  differences in 228
  "dismal performance" in 18
  dynamics 249–50
  expectations of 70, 107, 238
  forecasting 166, 255, 259
  on labour market 222
  marked acceleration in 5
  mea culpa about 257
  medium-term 241
  monetary analysis of 236
  monetary view of 144–5
  money growth and 156
  and nominal GDP 129–30
  nominal national income and 171–2
  on-target 220, 234–5
  perspectives 257
  pressures 203
  price level and 72
  problem 124
  process 236
  rates of 3, 55–6, 227–8
  rise in 200
  semi-structural model 225
  severe 94
  stable 238
  target system 218
  theory of 221
  timeline of 203
information bearing 181
innovations in payments technology 241
inside money 46
Institute of Economic Affairs (IEA) 2, 213
Institute of International Monetary Research 1–2, 16, 57, 153–4, 221, 241
inter-bank settlement 35
interest-bearing assets 46
interest rates 11–12, 18, 51, 90, 124, 237

International Center for Monetary and Banking Studies 124
International Monetary Fund (IMF) 34, 71, 123–4, 156, 193, 203
inventory accumulation 181–2
investors/investment
  bankers 73
  banks 65
  decisions 105
  expectations 69
  grade debt 184
  panel 71
  portfolios 48, 52, 108
IS/LM approach 6, 8–11

Japan 170, 227

Kaldor, Nicholas 46
  objection to monetarism 46
  polemics 47
Kamall, Syed 2
Kennedy, John 198
keyboard money 33
Keynes, John Maynard 5, 14, 26, 32, 36–7, 39, 45, 55, 104–5, 110
  absolute liquidity preference 13
  advocacy of public works 12–13
  bond yield 9
  contribution to macroeconomic theory 12
  distinction 30
  financial circulation 47
  General Theory 8–9, 100, 103, 107, 116, 137, 142, 240
  liquidity preference theory 12, 52, 115–16
  macroeconomics 138
  magnum opus 8
  Treatise on Money 108
Keynesian/Keynesianism 5–6, 222
  approach 144
  income-expenditure modelling 136–7, 142
  macroeconomics 54, 136
  Revolution 72, 209
  textbooks 60
King, Mervyn 221
Kolmogorov-Smirnov test 133–5
Krugman, Paul 58, 94, 141, 229, 257–8
Kwarteng, Kwasi 219–20
Kydland, Fynn 137

labour markets 66, 142, 243, 259–60
  inflation on 222
  shortages of 229
  tightness 258
labour shortages 217
Lane, Philip 124
Lankester, Tim 5
legal fictions 45
Leijonhufvud, Axel 17–18
liabilities 101–2
life insurance
  companies 106
  policies 37–8, 62
  products 48
liquid assets 30, 45, 109, 213–14
  balances 213
  changes in 109
liquidity 38–9, 173
  preference theory 12, 52, 68, 72, 103–5, 116
  premium 38
  transformation 45
  trap 13, 100, 104
"lives *vs.* livelihoods" dilemma 165
LM curve 9, 103
loan assets 113
lockdowns 155, 168, 179, 230–31, 247, 253
long-dated assets 10

Mackintosh, James 199–200
macroeconomics 5, 141, 153, 163, 257
  analysis 9, 27, 44, 52, 198
  equilibrium 173
  forecasting 126, 146, 216
  ideas for 37
  interest-rate-only 144
  models 17
  outcomes 3, 114–15
  policy 258
  prognosis 153, 188
  stimulus 200
  variables 6
market
  capitalism 202
  forces 90
  practitioners 71
Marshall, Alfred 36–9, 138

Marx, Karl 46
Mayer, Thomas 95
McCallum, Ben 91
mean-reversion 126, 130, 135, 138, 151, 181–2
mean-reverting behaviour 2
mechanical proportional relationship 144
medical emergency 52, 184, 193, 197, 233–5, 246–7, 256–7
medium-term inflation 238, 241, 249
Meltzer, Allan 94–5, 172
merit of definiteness 55
microeconomics 37
Mill, John Stuart 43
Minford, Patrick 219
mitigation 163–4
modern economy 4, 9, 27, 35, 38, 100, 105, 116, 143, 236
monetary equilibrium 4, 60, 65, 126, 139, 193, 197, 241, 251
  definition of 32–3
  restoration of 67
monetary/monetarism 7, 26, 47, 88, 93, 132–3, 209, 234
  base 7, 29–30, 69, 80, 89–91, 95, 101, 164, 198
  broad-money 94
  critics of 93
  definition of 95
  disequilibrium 4, 39–40, 43, 61, 126–7, 129, 139, 183, 251–2
  economics 9, 46, 48, 72
  financing 2, 16, 155–6, 162, 165, 169
  influences, neglect of 125
  instability 178
  phenomenon 103
  resurrection of 199
  shock 60
  situation 34–5
  transmission mechanism 32–3, 93
  types of 6–7
monetary policy 12, 54, 100–101, 104–5, 116, 137–8, 147, 156, 163, 194, 220
  aspect of 147
  decision-making 138
  exhaustion 116
  lynchpin of 115
  transmission mechanism of 47
Monetary Policy Committee (MPC) 16, 145, 212–13, 221
monetary theory 5, 181, 198
  fundamental proposition of 185
  of nominal national income 125
money 103–4, 107, 175, 199, 259–60
  acceleration 169
  actual quantity of 47
  balances 46, 127, 132, 172, 177, 183, 185, 215, 240–41
  and banking 10
  changes in 221
  concept of 92
  consequences of 178
  creation of 27, 34
  cyclical behaviour of 113
  data 155
  demands 3, 27, 41, 88, 128, 133
  equities interaction channel 113
  exclusion of 16
  explosion 1–2, 94, 182, 185, 196
  institutional structure for 92
  into-money transactions 172–3
  measure of 30, 164
  medium-term relationship 162–3
  nominal aggregate quantity of 44
  omission of 139
  ownership 103
  quantity of 10, 12, 69, 100, 154
  stimulus 159, 161, 241
  stock determination 92
  supply explosion 215
  to-assets ratio 111
  total amount of 37
  transmission mechanism 56
  in transmission mechanism 51
  velocity of 133, 242
  see also broad money; narrow money
money growth 6, 60–61, 71, 73, 126, 145–7, 154, 170–71, 180, 187–9, 193–4, 197, 205, 244
  accelerations/decelerations in 114, 155, 161
  annual rates of 155–6, 197
  behaviour of 6
  changes in 140
  double-digit rate of 133–4
  and inflation 58
  in leading nations 169
  rates 140, 165
  volatility 193
money-holdings 44, 109, 112

behaviour 68, 136, 176
preferences 175, 181
mortgage-backed securities 196, 243–4
MPC *see* Monetary Policy Committee (MPC)
M.V = P.T Fisher equation 29

narrow money 6–7, 30, 93–4
national income 173, 240
credit-based account of 47
determination of 8, 15–16, 40, 47–8, 59, 73, 144, 181
equilibrium levels of 40
and expenditure 55
and output 60
terms of 31
national wealth 102, 173, 214
Nelson, Edward 10, 55
New Keynesianism 9–10, 15–16, 66, 142–4, 164, 170–71, 221, 260
references to 147
three-equation model of 101
nominal GDP 130, 133–4, 140, 144, 160, 175, 205, 241, 250–51, 253
growth 193–4, 245–6
medium-term relationship 162–3
moderate rate of increase in 206
nominal national income 47, 68, 172, 174–5
non-bank
financial institutions 61
financial intermediaries 100
individuals 36
private sector 110
public 34
noncash payments systems 31
non-corporate business equity 50
non-household money 63
abundance of 67
growth rates of 64
non-housing capital expenditure 45
non-interest-bearing money 172
non-liquid assets 103
non-money assets 30, 37–8, 102, 173

on-target inflation 220
OPEC *see* Organization of Petroleum Exporting Countries (OPEC)
Organisation for Economic Co-operation and Development 123
Organization of Petroleum Exporting Countries (OPEC) 231–2
output gap 55, 60, 66–7, 235

partial equilibrium 111
pathbreaking 44
Patinkin, Donald 44–5
payments infrastructure 45
pension funds 62, 106
Peterson Institute for International Economics 249
Peyton Place of macroeconomics 187
Phelps, Edmund 258
Phillips curve 66, 142, 258–9
Pill, Huw 10, 142, 221
policy
announcements 123–4
calibration of 237
decisions and inflation 239
makers 174
making attitudes 155–6
oriented macroeconomic analysis 6
portfolios
money-holders' decisions on 29–30
rebalancing channel 100, 112–13
post-pandemic adjustment 185
Powell, Jay 165, 199
Prescott, Edward 137
prices
of bonds 102–3
deflator 231
of goods and services 230
inflation 248
upward pressures on 65–6
private
economic activity 40
sector 45, 182
product markets 66, 170
proportionality hypothesis 43, 181
Prospect magazine 186
public
anxiety 215
economic activity 40
expenditure 35–6

QE *see* quantitative easing (QE)
QT *see* quantitative tightening (QT)
quantitative easing (QE) 113, 143, 169, 184, 194, 235–6
announcements 115

bewilderment about 236
operations 195
quantitative tightening (QT) 143, 244
quantity of money 4, 29, 35–6, 42–3, 47, 54, 68, 102–3, 110, 114–16, 125–7, 143, 147, 158–9, 164, 166, 182, 202, 213–14, 220, 222, 240, 242, 244–5, 259
active role for 138–9
changes in 34, 43, 48–51, 137
demand-determined 90
determination of 90–91, 95
direct control over 101
initial exogenous shock to 112
in modern conditions 32–3
quantity theory 27, 32, 41, 52, 57, 92, 127, 132, 177
analysis 183
commitments 255
doctrine 43–4
monetary economics 123–4
of money 4, 26, 59, 71–2, 74, 88, 109, 145–6, 164–5, 171, 185, 236–7
M.V = P.T approach to 36
notices 40
opponents of 182
propositions of 74
reasoning 181
restatement of 44
thinking 28, 140
transmission mechanisms 28, 59
validity of 89
version of 153
Quarles, Randal 195
quoted equities 49, 59–60

Rahbari, Ebrahim 257
rate of inflation 55–6, 66, 71
rate of interest 8–10, 12, 42–3, 51–2, 68–9, 72, 84, 103, 115–16, 142, 202
rational expectations 69, 164, 257
real business cycle theory 137, 164
real estate 4, 9, 12, 28, 54, 65, 102, 104–5, 107, 113, 115–16, 141, 202, 229
real-world economies 17
recession 154, 188–9
Reichsbank 229
relative prices 220, 238
representative capitalist economy 57
residential housing 51, 141, 214
residential real estate 12, 202
restriction, forms of 168
reverse causation 47
Robertson, Dennis 12–13, 116
Royal Institution of Chartered Surveyors 215
Russia, gas exports 233–4

Sachs, Goldman 65
Samuelson, Paul 13, 41, 141, 164–5, 240, 258
Economics: An Introductory Analysis 136
Sargent, Tom 205–6
Saunders, Michael 212
savings
deposits 104
institutions 183
Schnabel, Isabel 246–7, 249–50
Schwartz, Anna 11, 89, 92, 126, 172–3
securities 103–4, 110
self-isolation 168
severe inflation 94
Shadow Government Statistics 173–4
Shadow Monetary Policy Committee (SMPC) 213, 222
shareholders 48–9, 89
share prices 65
Shaw, Edward 44–6
Shiller, Robert 141
Animal Spirits 105
Sims, Christopher 205–6
Skidelsky, Robert 5, 27
small businesses 51
Smallwood, Christopher 139
social distancing 168, 230
socialism 91
"solid" investors 39
Sommerdialog, Petersberger 246
Soviet five-year plans 13–14
Soviet Union, communist economy of 13–14
speculative asset markets 141
standards
income-expenditure model 137
macroeconomic theory 255
macro-modelling 144
monetary economics 164
stationary series 144

statistical distribution 125, 133, 177
steady-state equilibrium 67
Stiglitz, Jo 182, 255–6
stock markets 37–8, 64, 67, 105, 141, 143, 165, 185, 188, 195, 214–15
stop-go cycles 230
Stracca, Livio 11
subsidiaries 62–3
Summers, Larry 200–202, 255–6
supply
  and demand 43, 226–7
  shock 226–7
  side disruption 154
Switzerland 170, 227

taxation 219
tax cuts 219
Taylor, John 142
Taylor rule 91, 142–4
team transitor 156, 243
Tenreyro, Silvana 41–3, 51–2, 213, 221
Thornton, Henry 52
three-equation model 11, 143
Tobin, James 17–18
total assets 109, 113
trade credit 15
transactions 26, 30, 140–41
  "potential convenience" in 38
  technology 34
  value of 46–7
  velocity of money 31
  version 30–32
transition period 111–12
transmission mechanism 16, 33, 41–2, 51–2, 54–5, 93–4, 100, 164, 172, 240
Treasury 166
  bills 162
  bonds 106
  Committee 234
  securities 244
Truss, Liz 219

UK
  asset prices 230
  broad money 131–5, 161
  business cycles 138, 252
  double-digit inflation 214
  economic recovery from Great Recession 235
  economy 124
  import costs 231–2
  income velocity of broad money 252–4
  inflation 130, 210, 234
  monetary management in 210
  nominal GDP 131, 253–4
  output gap in 235
  policy-makers 209–10
  share prices 214–15
  society and economy 253
Ukraine 226
unemployment 66, 170–71, 188–9, 259
United Kingdom's Financial Services Authority 115

vaccine availability 156
variable-income assets 4, 48–52, 68, 104
velocity 32, 132, 182
  analysis 251
  annual change in 134
  of broad money 179–80
  of circulation 2, 26, 32, 40, 109–10, 125, 127, 130–31, 160, 175–8, 181–2, 184, 210
  extreme decline in 179
  of money 242
  offsetting change in 253
Venezuela, inflation rates 229
visual inspection 177–9
Volcker, Paul 90, 175
Vox CEPR Policy Portal 123

wages 66
  inflation 217–18, 237
  unit 68–9
Wall Street Journal, The 200
wealth effects 64, 216, 229
whole-economy inflation 231
Wicksell, Knut 41–4, 47–8, 51
Wilkins, Carolyn 124
Williams, John 199
Woodford, Michael 41, 51–2
World Economics journal 2

zombie ideas 58