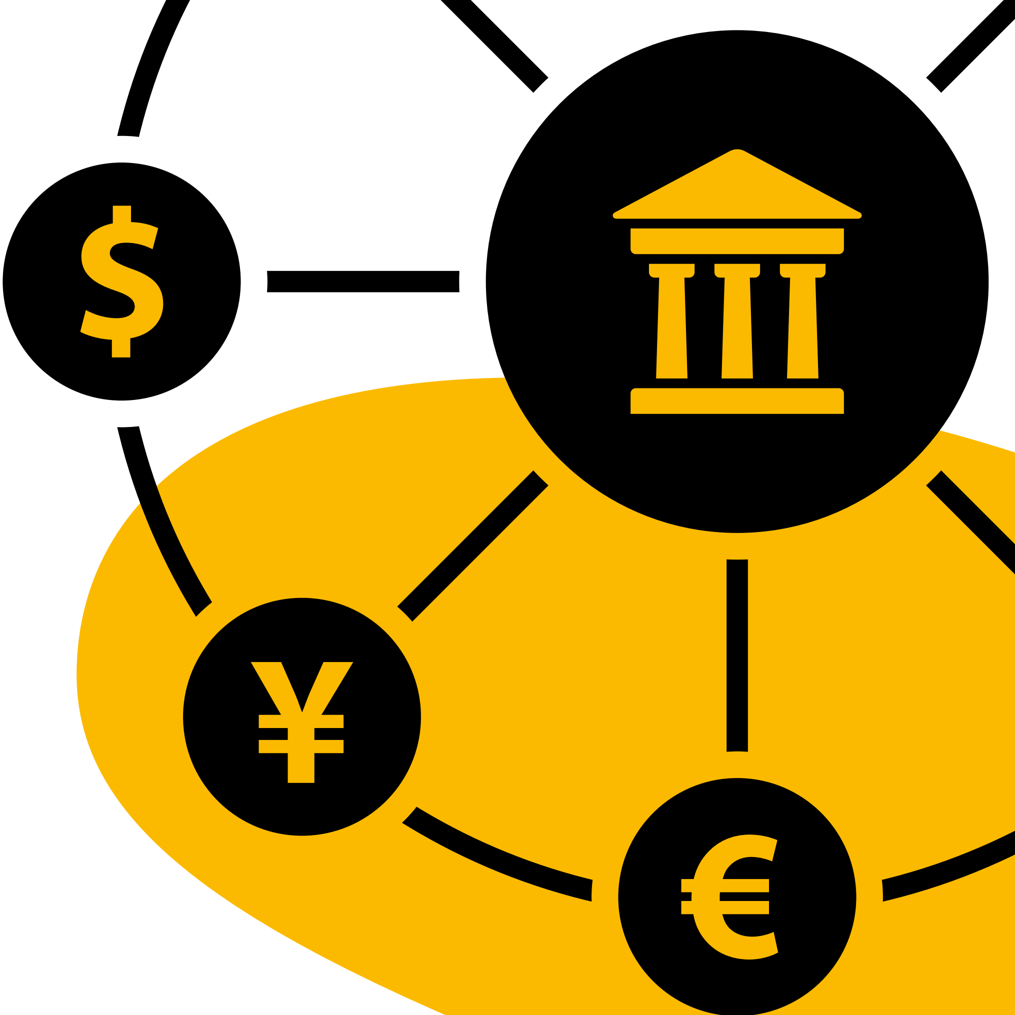

NILS HERGER

UNDERSTANDING CENTRAL BANKS

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Translation from the German language edition:
Wie funktionieren Zentralbanken? Geld- und Währungspolitik verstehen by Nils Herger

ISBN 978-3-030-05161-7 ISBN 978-3-030-05162-4 (eBook)
https://doi.org/10.1007/978-3-030-05162-4

Library of Congress Control Number: 2019931850

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

To Hua

Preface

Because central banks are responsible for setting monetary policy, they are regularly the subject of public debates. During serious economic crises, which can be manifested in, for example, high levels of inflation, turmoil in the international monetary system, or systemic financial instability, monetary issues can even dominate the economic-policy agenda. However, broader audiences may not always understand the mechanisms by which a central bank influences economic outcomes. For example, such readers may ask how a central bank adjusts the money supply? Via which channels does monetary policy affect key economic variables, such as inflation and employment? Why is a central bank's independence important? What are the advantages and disadvantages of common currencies? How can central banks deal with financial and banking crises? How do ancient metallic currencies and modern fiat-money systems differ? Were past monetary systems more stable than their modern counterparts? This book was written to answer such questions for a broad readership using nontechnical language.

This book is based on an earlier German version entitled *Wie funktionieren Zentralbanken?—Geld- und Währungspolitik verstehen* (ISBN: 978-3-658-07875-1). However, rather than providing a word-for-word translation of the original, I have decided to adapt and update the discussion and to use suitable examples for the international readership, for which *Understanding central banks* was written. In particular, Chap. 2 includes a more extensive discussion of the global financial crisis, Chap. 3 discusses the money-and-credit multiplication process in more detail, and Chap. 6 provides more background material on the differences and similarities between Keynesians and Monetarists regarding the role of central banks in the broad economy. Nevertheless, reflecting the positive feedback that *Wie funktionieren Zentralbanken?* received, the main structure of the text and the arrangement of the chapters have been preserved. In any case, I hope that the English edition of this book will help readers to better understand the world of central banking.

Gerzensee, Switzerland Nils Herger
October 2018

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1

Introduction

There have been three great inventions since the beginning of time: fire, the wheel, and central banking. Will Rogers (American comedian, 1879–1935)[1]

1.1 What Is a Central Bank?

Will Rogers, the speaker of the opening quote, was a widely adored comedian and successful Hollywood actor before he died in a tragic plane crash in 1935. To this day, his words ridiculing the historical significance of central banking amid the economic troubles of the 1930s have remained popular with the guardians of the currency, a group of men and women not otherwise known for their sense of humour. Nevertheless, regardless of whether we consider the Great Depression, or the current period, central banks indeed wield great influence over a country's monetary, financial, and economic conditions. Concretely, ordinary purchases are often made in cash, which includes banknotes issued by the central bank. Even as more and more economic transactions are settled electronically, they require a sophisticated payment infrastructure which is supervised, or even partly managed, by the central bank. In addition to organising the payment system, monetary authorities—to introduce an alternative expression for the central bank—are also responsible for setting monetary policy. In doing so, they have typically retained a remarkable degree of independence from direct government interference despite the broad

[1] Origin of quote unknown.

N. Herger, *Understanding Central Banks*, https://doi.org/10.1007/978-3-030-05162-4_1

economic effects that may result from their decisions and interventions. At first glance, monetary policy seems to be of minor importance to the average citizen. However, as with other triumphs of civilisation, such as the supply of electricity or the management of mass-transportation systems, the crucial role of a well-functioning monetary system is only clear in the case of failure, or an outright breakdown. In monetary affairs, such adverse events are manifested in various forms of crises, during which instability within the financial or banking system or pervasive levels of inflation can have far-reaching effects. In this regard, it is important to recognise that good monetary policy can prevent, or alleviate, such crises, but that bad monetary policy can also be the main culprit behind economic turmoil. History provides many examples for both scenarios.

In very rough terms, the economic importance of central banks is based on their privilege to issue currency, that is, officially recognised forms of money.[2] The way in which the currency is arranged in a given country has large implications for its monetary and financial system. In particular, the terms and conditions under which central-bank money is provided affects the domestic level of interest rates and, hence, the price of borrowing and lending, with profound effects on the total amount of money and credit in circulation. Ultimately, via these and other channels, the kind of monetary policy pursued by the central bank can affect macroeconomic outcomes such as the level of unemployment and inflation.

Given the crucial role of monetary policy in modern economies, it is not surprising that central banks are regularly in the headlines. Especially in times of economic and financial turmoil, the corresponding political debates can be fierce and sometimes become emotional or even hostile. Nevertheless, the broader public may often find it difficult to understand how the central bank's decisions affect economic outcomes. Instead of providing detailed explanations, the public debate often incorporates vague statements. For example, it is commonly said that the central bank is 'pumping liquidity into the system' or 'printing money' to describe expansionary monetary-policy interventions. Against this background, this book was written to shed light on the interactions between central banks and other parts of the economy. The reader is not expected to be familiar with the technical aspects of economic analysis, let alone macroeconomic models.

[2]Note that particularly in the United States, the term 'currency' is often used in the narrower sense of banknotes (or 'currency notes') and coins. The following discussion uses 'currency' in a broader sense that includes the reserves held by financial institutions in their accounts at the central bank. Physical forms of currency, e.g. banknotes and coins, are henceforth referred to as 'cash'.

As a first step towards understanding, note that the central banks of different countries are referred to by different names. In a few cases, such as the 'European Central Bank' (ECB) or the 'Hong Kong Monetary Authority', the terminologies introduced above appear directly in the names of central banks. However, owing to the historical significance of managing and providing reserves, the term 'reserve bank' is used in Australia, India, New Zealand, South Africa, and the United States with the 'Federal Reserve System' (or, briefly, the 'Fed'). In Germany, the 'Bundesbank' replaced the former 'Reichsbank' after the Second World War. To this day, the Swedish central bank is called 'Riksbank'. Austria and Switzerland call their monetary authority the 'Nationalbank', or national bank. In England, France, Italy, and Japan, the authority responsible for the conduct of monetary policy uses the name of the country; these authorities are called the Bank of England, Banque de France, Banca d'Italia, and Bank of Japan, respectively. This naming is potentially confusing since the Bank of America, the Deutsche Bank, or the Bank of China are not central, but commercial banks. As you are probably about to ask yourself that question, the central bank of the Middle Kingdom is instead called the 'People's Bank of China'. Regardless of the terminology used, the term 'central bank' refers to a financial institution—nowadays often under the public law—with the preeminent responsibility of formulating and implementing the monetary policy of a currency area (typically a country). A central bank wields influence because it has been granted a monopoly over the issuance of currency, which implies that its main liabilities (banknotes and bank reserves) serve as the purest form of money. By managing these liabilities via monetary-policy instruments, such as repurchase agreements or open-market operations, central banks can regulate interest-rate levels and, in turn, control the amount of money and credit circulating through the economy. Modern central banks ultimately aim to ameliorate macroeconomic outcomes by, for example, keeping the price level stable (preserving the purchasing power of the currency) and smoothing the business cycle. Furthermore, central banks also play a leading role in safeguarding the stability of the financial system by traditionally acting as lenders of last resort for the banking sector. Finally, their miscellaneous activities can include acting as bankers for the government, issuing banknotes, managing a country's international reserves, supervising commercial banks and determining their capital requirements, supervising and managing parts of the payment system and the financial-market infrastructure, and providing consumer protection regarding monetary and financial matters.

To provide a rough overview of the topics covered in this book, the next section endeavours to highlight some of the major connections between the central bank and other parts of the economy.

1.2 The Central Bank, the Economy, and the Outline of This Book

As a monetary authority, the central bank is primarily connected with the wider economy via several classes of broad monetary transactions. Figure 1.1 depicts some of these transactions involving firms, households, commercial banks, financial markets, foreign countries, and the government. At this stage, it is unnecessary to go into the details; this illustration merely serves as preparation for the more in-depth discussions in the subsequent chapters of this book.

As shown in the bottom part of Fig. 1.1, economic transactions commonly result from private domestic consumption, that is households purchasing goods and services from firms (or companies) which, in turn, employ labour and capital within the production process. As compensation, firms pay incomes to households in the form of wages and disbursed profits. This interaction between households and firms represents a rudimentary version of the so-called 'circular flow of income and spending', which connects different parts of the economy. More sophisticated versions of this model account for additional aspects of the economy, such as the international sector. In

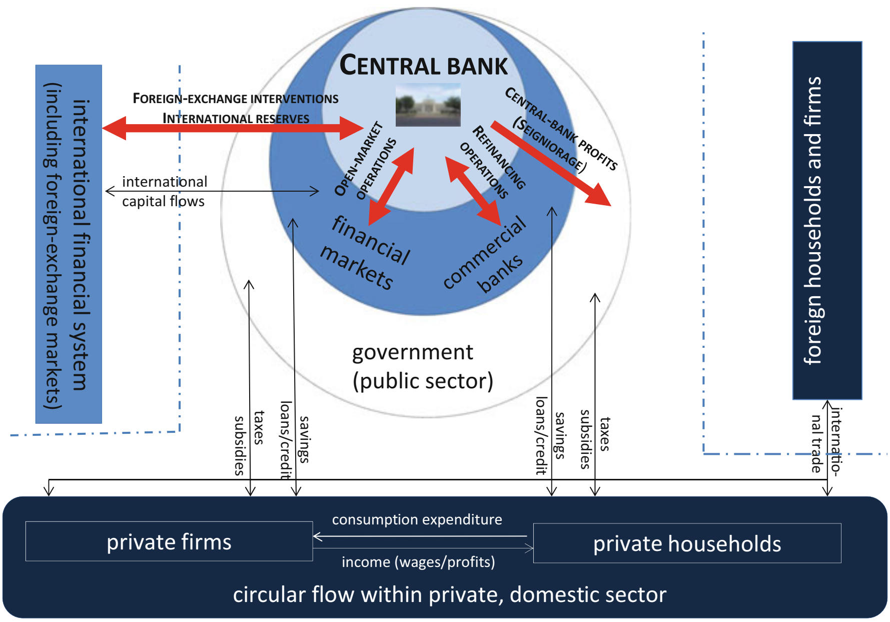


Fig. 1.1 Overview of the interactions between the central bank and the economy

particular, private consumption and production involve not only domestic markets but also foreign firms and households, which gives rise to exports and imports of goods and services. Furthermore, along with the private sector, the public sector accounts for a major share of modern economic activity. Governments collect taxes from firms and households to offer public services, and make financial transfers. Finally, the financial system in general, and commercial banks in particular, collect savings and provide various forms of loans and credit to households, firms, and the government. In doing so, financial firms typically adopt an intermediary position between lenders and borrowers. Financial transactions can also involve foreign countries leading to international flows of capital and money.

Figure 1.1 depicts income and spending in terms of monetary flows. However, just as, for example, the legal system and established business procedures underpin commercial contracts, pecuniary transactions rely on a set of formal rules and informal customs which shape the monetary framework. Thus, many questions arise. Should a country have its own currency? Is it sensible to fix the external value of a currency—that is, the exchange rate—to the value of a precious metal, such as gold? Should the currency be issued by several competing commercial banks, or by only one designated central bank? Should the central bank be a private or public institution? What are the main goals of monetary policy? Are restrictions on international capital flows necessary? Some of these questions may seem strange in the modern era, as almost all countries have their own central bank, precious metals have long been demonetised, monetary policy mainly aims to preserve the purchasing power of fiat money, and capital can move more or less freely across borders. It is therefore, perhaps, surprising to hear that these questions have been answered quite differently in the past. To understand the similarities and differences between current and former monetary frameworks, Chap. 2 of this book looks back on the historical development of central banking across the past centuries. Furthermore, most of the above-mentioned questions touch on an overarching topic, namely, the definition of money. It is immediately clear why this definition matters to the monetary authority, but the answer is anything but straightforward. Hence, Chap. 3 focuses on understanding what money really is.

It is impossible to maintain the purchasing power of a currency without controlling the amount of money in circulation. When private or public agents oversupply money, an economy will soon suffer from inflation and, in extreme cases, a currency collapse. Historical examples of severe monetary turmoil, which have occasionally resulted in episodes of hyperinflation, suggest that such a scenario is more than a mere theoretical possibility. Therefore, adequate management of the money supply lies at the heart of modern central banking. The bold arrows connecting the inner circles of Fig. 1.1 suggest that currency is not usually distributed directly to households and firms. Instead, central bank refinancing operations are typically conducted with commercial banks. In practice, this implies that they have central-bank accounts with so-called 'reserves'. Conversely, firms and households hold their accounts at commercial, or retail, banks. The private banking sector is also largely responsible for the final distribution of banknotes and coins via a network of branches and cash machines. Furthermore, by buying and selling government bonds or other securities, central banks undertake direct financial-market interventions. Since these transactions occur in the open market, they are called 'open-market operations'. Finally, direct interventions can also occur on the foreign-exchange market, as when a monetary authority buys or sells its own currency against foreign currency. Such interventions are typically made to influence the exchange rate. Taken together, these various transaction classes reflect the most commonly applied monetary-policy instruments (or tools). Chapter 4 discusses these instruments.

By its very name, a central bank adopts a central position within the financial system. Most importantly, changes in the so-called 'base interest rate' charged on bank-reserve holdings can send shock waves not only across the average level of interest rates, but also other terms and conditions on a broad range of loans and credit. Because cash and bank reserves serve as ultimate means of payment, the central bank holds a unique position to create 'liquidity'. This ability becomes crucial, when the trust in private alternatives to officially recognised forms of money, such as demand deposits (checkable accounts), has been undermined by scandals within the banking and financial industry. In this case, central banks traditionally act as lenders of last resort to commercial banks confronted with a liquidity shortages and, hence, preserve the stability of the financial system. Chapter 5 discusses these financial-stability issues in greater detail.

The effects of monetary interventions are by no means limited to the financial system. Rather, they can affect most parts of the economy. The above-mentioned connection between the base interest rate and the provision of loans and credit to the private sector already encapsulates this idea. It is easy to pursue this notion further, as the total amount of loans and credit impinges on aggregate investment and consumption levels. This mechanism is just one example of the effect of central-bank decisions on the real side of the economy, which includes, for example, the business cycle and unemployment. Of course, monetary policy matters even more for the nominal side, which represents economic phenomena in terms of monetary variables. It is indeed intuitive that the amount of money in circulation and the average price level have a close connection. When the money supply increases, but the output of goods and services remains constant, a monetary overhang arises. Firms eventually respond to this overhang with across-the-board price increases. Based on the same concept as filling up a balloon with air, an ongoing increase, or 'blowing up', of the average price level is called 'inflation', whereas the opposite is called 'deflation'. The manifold monetary effects on the economy provide the basis for using—and also abusing—the complex interrelationships between nominal and real economic variables for political purposes. The term 'monetary policy' refers to such efforts and actions by central banks and governments to influence macroeconomic outcomes (e.g. economic output, employment, inflation, etc.) by manipulating monetary variables, such as interest rates, the supply of money, credit conditions, and exchange rates. Chapter 6 deals with monetary policy.

Owing to their comprehensive role in stabilising the financial and economic environment, modern central banks form an integral part of the political system and, hence, are to some degree connected with their governments (see the outer circle of Fig. 1.1). As mentioned above, the public privilege to issue currency provides a stepping-stone for setting monetary policy. However, in exchange for this right to issue a country's currency, central banks have traditionally helped to raise funds for the government. To this day, the monopoly profits from issuing officially recognised forms of money provide a source of public revenue and, therefore, give rise to potential conflicts between fiscal and monetary authorities. The connection between fiscal and monetary policy is by no means one-sided, as, for example, excessive levels of public debt and even sovereign defaults have historically led to some of the most severe cases of monetary turmoil. Similarly, thorny interrelationships arise due to trade-offs between the short- and long-term effects of monetary policy. Since prices and wages typically do not react instantaneously to changes in the economic environment, it is plausible that monetary impulses exhibit only gradual effects on inflation. However, central-bank interventions tend to have short-lived, but rather instantaneous effects on real economic phenomena such as the level of employment. The interaction between fiscal and monetary policy as well as the different nominal and real effects of monetary policy across different time horizons pose major challenges for central banks wishing to preserve the purchasing power of the currency (in terms of keeping inflation low and stable). Chapter 7 discusses these challenges as well as the role of central-bank independence as a potential remedy.

As illustrated by the left part of Fig. 1.1, central-bank interventions can also involve the international financial system and, specifically, take place on the foreign-exchange market. Although these interventions primarily affect the conditions of the international financial system—particularly the exchange rate—sooner or later they will also manifest themselves more broadly in cross-border flows of goods, services, and capital. To cite the best-known example, a currency devaluation tends to provide a temporary boost to the domestic economy because exports become relatively cheaper in terms of foreign currency units, whereas imports tend to become relatively more expensive in terms of domestic currency units. The importance of exchange-rate fluctuations depends crucially on the international monetary system and the exchange-rate regime adopted by a given country. Ignoring nuance for the moment, a country can essentially choose between a floating or fixed exchange-rate system. Under the former system, foreign-exchange interventions occur only occasionally, whereas, under the latter system, the central bank routinely buys and sells its currency against a foreign anchor currency at a preannounced rate. Chapter 8 describes the primary aspects of international monetary policy by discussing the economic effects of various exchange-rate regimes, the role of international reserves, and the advantages and disadvantages of a common currency.

Finally, Chap. 9 provides some concluding remarks and discusses the current and future roles of central banks.

Further Reading

Introductory textbooks on economics deal with the very basics of money and central banking. A widely popular example is Mankiw, N. Gregory, 2018: *Principles of Economics*, Cengage Learning.

Most central banks provide background material on their activities. These various web-resources and brochures focus on the monetary-policy framework of the corresponding country.

2

A Brief History of Central Banks

The bank hath benefit of interest on all moneys which it creates out of nothing.
William Paterson (Co-founder of the Bank of England, 1658–1719)[1]

2.1 Origins of Central Banks

Owing to the numerous innovations in money and banking as well as the political and economic developments over the last few centuries, the role of central banks has changed enormously throughout their history. Hence, to better understand the tools and goals of modern central banks, it is perhaps useful to look back on their history. Doing so not only provides some rather entertaining stories, but also reveals the sources of ongoing monetary-policy debates, broadens the understanding of the current interrelationships between central and commercial banks, and clarifies the similarities and differences between current and former monetary systems. In general, it is often difficult to appreciate the key issues in central banking when their historical background is ignored.

The oldest central banks arose from early European experiences with paper money during the seventeenth and eighteenth centuries. At that time, Europe not only developed innovative insurance products and established primitive versions of public bond and stock markets, but also experimented with various

[1]The origin of this quote is unclear. It is said to be from the prospectus for the Bank of England.

N. Herger, *Understanding Central Banks*, https://doi.org/10.1007/978-3-030-05162-4_2

schemes for issuing banknotes.[2] The aims of these schemes were to provide an alternative means of payment to coins, and to raise funds for the government. Whereas some schemes, such as the French 'Banque Royale', quickly ended in financial fiascos, others provided the nuclei for some of the oldest central banks in the world, including the Swedish Riksbank (founded in 1668) and the Bank of England (founded in 1694).[3] However, when these time-honoured institutions were founded, they had little in common with modern monetary authorities, but rather were established as private enterprises to obtain official charters to issue banknotes. As the introductory quote indicates, the privilege of issuing state-backed paper money was lucrative, as alternative means of payment, such as dispatching coins, could be costly, and the direct transfer of book money between bank accounts was only available to a small number of wealthy merchants. The state benefited from private note-issuing schemes by collecting taxes in exchange for granting this privilege. Since public indebtedness often became a pressing issue in times of military conflict, it is perhaps not surprising that the Riksbank and the Bank of England were founded shortly after the Second Northern War (1655–1660) involving Sweden and during the Nine Years' War (1688–1697) involving England, respectively.

In many places, note issuing was not monopolised by a publicly supported bank until well into the nineteenth century. In Europe, some embryonic versions of banknotes had instead emerged as by-products of private businesses dealing with precious metals or other pecuniary assets. Probably the best-known example of such a business is the goldsmiths, who had the knowledge, experience, and capacity to store gold and silverware. Some goldsmiths realised that they could offer the public the service to safeguard valuables. To confirm deposits, receipts promising to pay the bearer the amount of gold or silver that had been taken into custody were commonly issued. Eventually, these

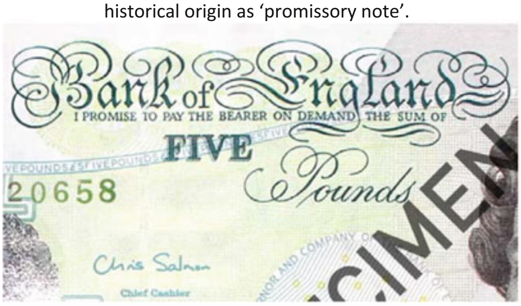
[2] Note that paper money was not invented in Europe, but rather had already appeared centuries before in China (see Sect. 3.2).

[3] The Banque Royale is one of the earliest examples of a central note-issuing bank. In particular, in 1716, King Louis XV of France granted the Scottish economist and gambler John Law de Lauriston a charter to set up a bank, based on which he created an empire of merchant monopolies in France and overseas. A few years later, Law acquired also a monopoly to issue banknotes, which he used without restraint. Around the year 1720, the newly printed paper money created a massive bubble in the share prices of Laws' merchant society, the 'Mississippi Companie'. When this bubble burst, both the Banque Royale, under a massive amount of debt, and Law, under the psychological stress, collapsed. After the crash, the French economy was left with large amounts of worthless paper money. Arguably, due to this catastrophic experience with new forms of money, France became hostile towards financial modernisation for decades or even centuries. Indeed, the Banque de France was only founded in 1800 to restore monetary order, which had been undermined by another chaotic experiment with paper money, the so-called 'Assignats' issued during the aftermath of the French Revolution of 1789. For details see: Murphy, Antoin E., 1997: *John Law Economic Theorist and Policy-maker*, Clarendon Press.

'promissory notes' began to represent a convenient means for large payments, avoiding, for example, the hassle and risk of dispatching coins. After all, as long as these notes were fully convertible into a monetary metal that formed the backbone of the currency system, there was no reason to treat them differently from the same amount of coins. Some modern banknotes carry relics of their historical origins. For example, Fig. 2.1 illustrates that the inscription 'I promise to pay the bearer on demand the sum of . . . pounds', which is still imprinted on modern sterling notes, originally referred to a claim on a certain amount of gold. Of course, under today's fiat-money system (see Chap. 3), the

Banknote of the Bank of England issued in 1811 with a nominal value of two pounds. The 'promise to pay on demand the sum of two pounds' is confirmed by the signature of the cashier.

Modern pound note whose inscription bears witness to the historical origin as 'promissory note'.



Signature of the treasurer on the US dollar. Banknotes are "legal tender".

Fig. 2.1 Banknotes now and then. Images: Bank of England and Federal Reserve System