

Dieter Gerdesmeier Leo Th. Schrutt

Central Banks and Financial Markets



Frankfurt School
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1. Introduction and Motivation

Financial markets are changing at an incredible pace. New products come up, alternative pricing schemes are developed, financial crises seem to come and go. It, therefore, seems advisable to have a closer look at the conventional wisdom of financial markets and investment and to see, whether it still applies.

This book is constructed as a sequence of different parts and modules which, in principle, should allow the reader to digest it according to his or her preferences. Part I is meant to lay the foundations for the subsequent chapters by introducing the salient ingredients of the financial system and its main institutions.

Part II continues by providing an overview over some useful tools and key financial concepts, before proceeding with some considerations on portfolio theory.

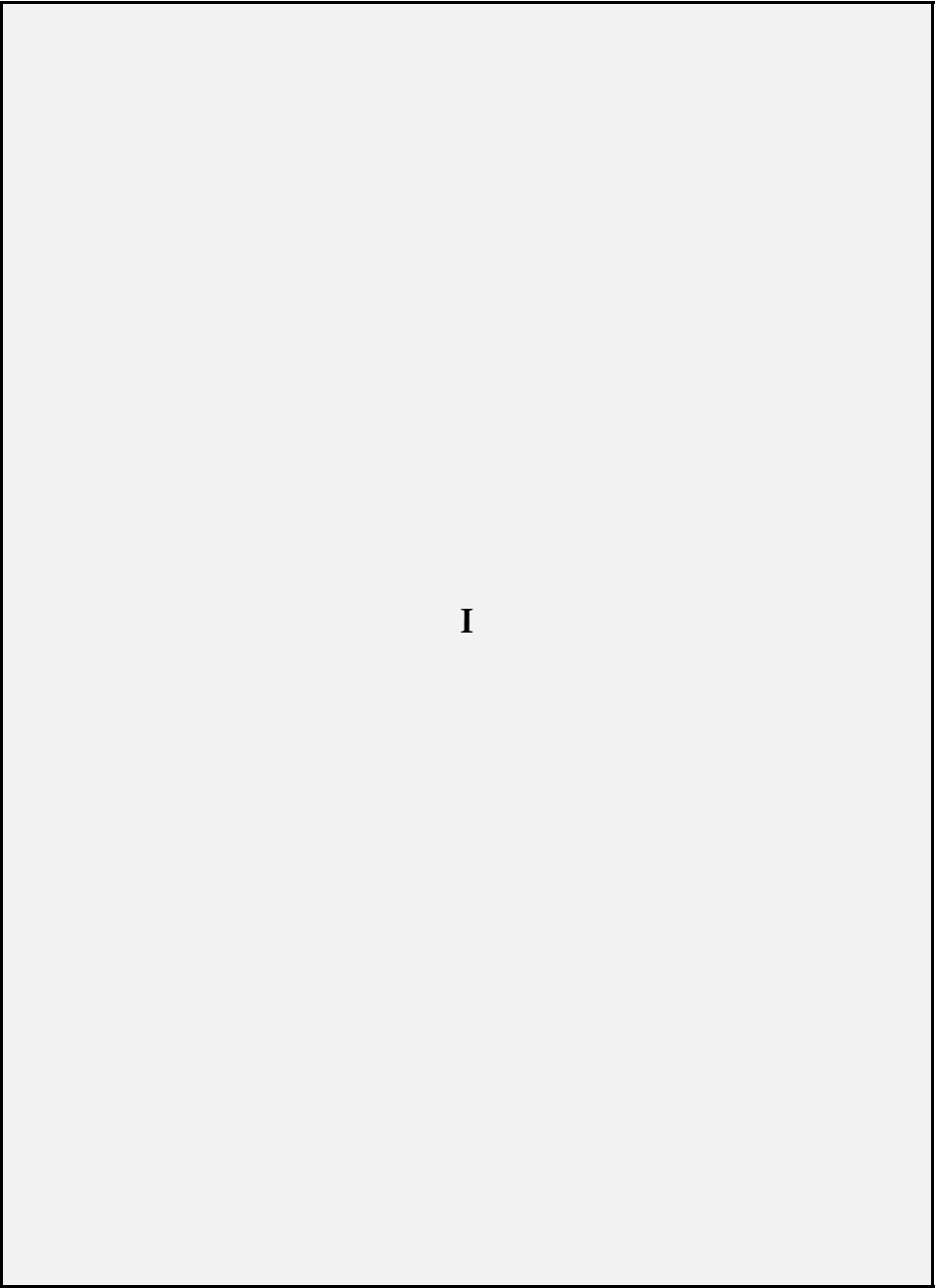
Part III changes the focus on various financial markets and their basic functioning. Bond and stock markets as well as exchange rate markets and option markets are analysed in more detail.

Part IV extends the previous considerations by some additional financial issues, such as cost of capital aspects and the waves of mergers and acquisitions that can be observed from time to time. These issues are of relevance for the later chapters.

Part V enters the world of commercial banks and central banking. To begin with, the debate about efficient markets and behavioural aspects is touched upon. Subsequently, some information problems in financial markets are highlighted. Moreover, the business model of commercial banks and the related strengths and weaknesses are analysed. Afterwards, the ECB, its monetary policy strategy and its monetary policy instruments are explained in more detail. Moreover, the recent period of unconventional monetary is addressed.

Part VI changes subject by turning the attention to financial crises and financial stability issues. More particularly, the debates about systemic risks and early warning indicator models are briefly summarised. Finally, the key features of the banking union in Europe are elaborated on more extensively.

Numerous real-world examples illustrate the relevance of the theoretical considerations. We would like to thank Ansgar Belke, Gundars Davidsons, Thomas Jost, Peeter Luikmel, Gilles Noblet, Thorsten Polleit, Barbara Roffia, Lorenz Schumann, Joerg Stephan and Frank Smets for useful discussions and suggestions on various parts of the book. It goes without saying that the remaining errors are our responsibility. We are also indebted to the editors from Bookboon.com for the permission to use of parts of the chapter on monetary policy in a slightly modified version from a previous book. It goes without saying that all remaining errors are our responsibility.



I

2. Financial Markets

2.1 Learning Objectives

In this starting chapter, we take a first look at the financial system, its role and its main functions.

2.2 The Financial System

It is a widely acknowledged fact that the financial system - consisting of financial markets and financial intermediaries - performs a vital function for modern economies. This is mainly due to its most important role and function: in fact, the financial system channels funds from those, having a surplus to those, who are net spenders. Expressed in other words, the financial system enables net savers to lend funds to net borrowers.

In a broad sense, therefore, the financial system allows for the existence of inter-temporal phenomena, such as the exchange of current against future income and the transformation of savings into investment. Against this background, a well-developed financial system contributes to higher income, more employment and better living standards. It is fair to say, however, that the financial system has occasionally also contributed to the emergence of financial crises that had far-reaching and long-lasting effects not only on the financial system itself, but also on the real economy.

2.3 Functions of the Financial System

The key functions of the financial system are illustrated schematically in the chart below.

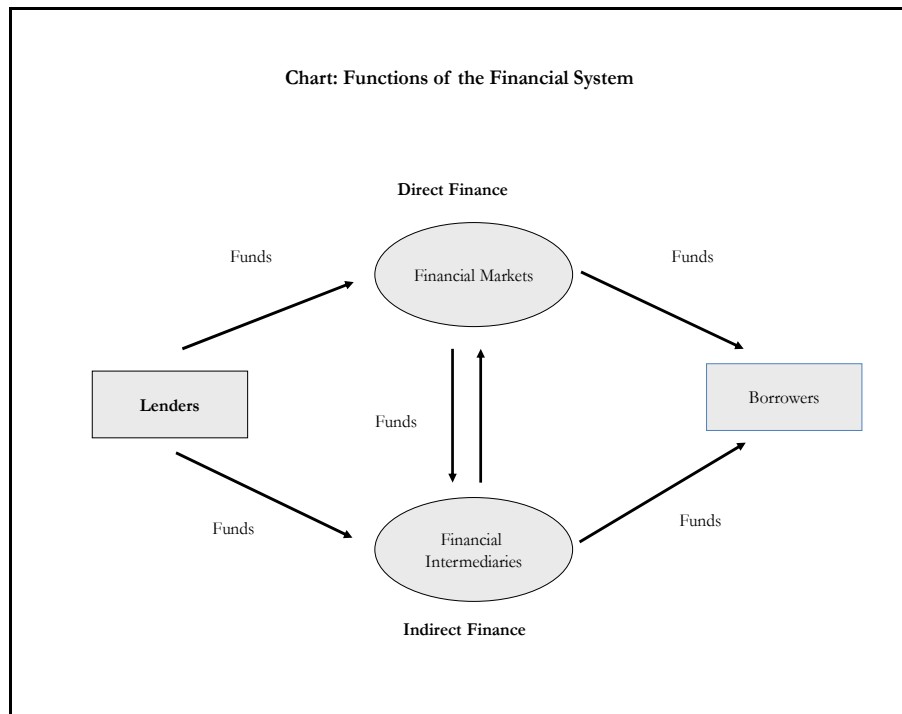
A closer look at the data then reveals that it is mostly households that act as lenders but, occasionally, also firms and governments channel funds into the market. By contrast, typically firms and the government can be found on the borrowing side, but occasionally also households and non-residents borrow to finance, for instance, their consumption or their real estate projects. Seen from an international point of view, also foreigners inject excess funds into or borrow excess funds from the system.¹

2.4 Types of Markets

In the academic literature, financial markets have been classified across various dimensions.²

Generally speaking, a first distinction refers to the underlying product and, consequently, markets for physical assets and markets for financial assets can be distinguished. While physical assets comprise products such as, for instance, real estate property or commodities, financial markets deal with instruments, such as bonds, stocks or the so-called "derivatives".

A second distinction refers to the actual date of exchange. In this respect, spot markets, where assets are traded and delivered immediately (i.e. "on the spot", usually between one or two business days) and futures markets (where assets are bought or sold at some future date, i.e. for "future delivery") have to be mentioned.³



Another distinction relates to the question whether the financial transaction represents the first purchase of a new security that has never been issued before or, rather, the trade of a security previously issued. This criterion marks the difference between "primary" and "secondary" markets; markets that are in reality usually closely interlinked. It is important to stress that primary markets are the markets in which, for instance, corporations raise new capital. Consequently, the corporation selling the newly created stock or "going public" receives the proceeds from the sale in a primary market transaction. By contrast, secondary markets are markets in which the existing, already outstanding securities are traded among investors. Since the firm, whose securities are being traded, is not involved in this secondary market transaction, it does not receive any funds from such a sale. Secondary markets can, in principle, take two generic forms. In the context of "organised exchanges", buyers and sellers of securities meet in a central location or conduct trades via an electronic system (so-called "exchange-traded markets"). In case of an "over-the-counter" ("OTC") market, dealers at different locations stand ready to buy and sell securities over the counter. A closer look at the

data shows that the volume of trading in secondary markets is usually higher than in primary markets.

If the original maturity of the financial contract is in the focus, a distinction between original maturities of less than one year and those of one year or more can be drawn. Accordingly, "money markets" and "capital markets" can be separated. Money markets denote markets for short-term highly liquid debt securities and it is fair to say that they are quite "special" in many ways. To begin with, they are typically (wholesale) inter-bank markets, where transactions are quite large. Moreover, central banks are able to influence the conditions on the money markets to a considerable degree by means of their monetary policy operations.⁴ By contrast, capital markets represent markets for intermediate or long-term debt and corporate stocks.

A final, commonly-used classification relates to the way, funds can be obtained in a financial market (i.e. "equity" or "debt market"). Two principal alternatives exist. Issuing a debt instrument is probably the most common way, but also issuing equity (such as, for instance, common stock) is possible. From a financial perspective, the main difference between equity and debt refers to the fact that equity does not have to be repaid, whereas debt represents a financial claim, which usually has to be repaid (in specific amounts and at a pre-defined interest rate). In reality, however, this distinction has over time become somehow blurred since a variety of mixed forms do exist, such as, for instance, "convertibles" (i.e. securities that allow their holders to convert their position in bonds or preferred stocks into that of a common equity holder at an agreed price).

A number of other classifications seem plausible, but this preliminary breakdown might be sufficient to convey a first impression on the variety of financial markets. It is also worth noting at this stage already that the precise borderlines among financial markets are in reality often somehow blurred and, therefore, should not be taken at face value.

Moreover, it should be mentioned already at this stage that the expression "markets" is deliberately used in plural form. This is due to the fact that in modern economies, a large number of different (and often highly specialized) markets exist in parallel, each of them usually focusing on a somewhat different segment or type of financial instrument and often also on different types of customers.

2.5 Direct and Indirect Finance

The deliberations outlined above lead us to another important distinction. In principle, lenders can take up funds from borrowers via two routes. In case of a direct connection, where debtors borrow funds directly from lenders without using the services of financial intermediaries, this can be labelled as "direct finance" or "market-based finance". An example could be an "initial public offering" ("IPO"), where a company or corporation raises investment capital by offering its stock to the public for the first time. Expressed in other words, the corporation offers its securities to savers, who in turn provide the firm with the money it needs.

Key Messages for the Reader

We can summarise some key messages of these sections as follows:

- A well-functioning financial system is vital for any modern economy. Notwithstanding their importance, financial markets occasionally cause serious disruptions to the financial system and to the real economy.
- Modern economies witness a wide variety of financial markets, dealing with different niches, segments, and also types of financial instruments.
- In today's modern financial systems, financial markets and financial intermediaries are strongly interlinked and, consequently, funds flow in both directions.

If by contrast, a third party (i.e. a financial intermediary) gets involved in the process of obtaining funds, an "indirect finance" or "bank-based finance" takes place. In this case, an intermediary stands between the borrower and the lender. An example could be the case, where a commercial bank collects the money from savers and, then, uses it to purchase and hold businesses' securities. Without going too far at this stage, intermediaries can be seen as providing key services for savers and borrowers, namely they allow for risk-sharing, they increase liquidity and share information that can prove very useful for investors. In today's modern financial systems, financial markets and financial intermediaries are strongly interlinked and, consequently, funds can flow in both directions.

2.6 Financial Integration

Finally, it is worth noting that, over the last decades, financial markets have been subject to a process of increasing financial integration. The latter term usually describes the process of financial markets in an economy becoming more closely linked with those in other economies, thus generally implying an increase in capital flows and a tendency for prices and returns on traded financial assets in different countries to equalise.

Key Terms for Review

Borrowers, lenders, physical and financial markets, spot and futures markets, primary and secondary markets, debt and equity markets, market-based and bank-based finance, financial integration.

Key Problems for Review

- What are the main functions of a financial system?
- What is the difference between physical and financial asset markets?
- What is the difference between physical and financial asset markets?
- What is the difference between spot and futures markets?
- What is the difference between primary and secondary markets?
- Which other classifications do you know?
- What is the difference between market-based and bank-based finance?

3. Financial Market Participants

3.1 Learning Objectives

In this chapter, we review some financial market participants, their roles and their business models. Thereafter, we look at some key players in more detail.

3.2 Financial Institutions

Today's highly-developed financial systems can be characterised by the rather complex interactions of various financial market participants. There are a number of financial institutions active in the market and it is worth reviewing them in more detail.

Perhaps the most important financial institutions are commercial banks. Expressed in simple terms, these are financial institutions that accept deposits from savers and grant loans to customers, such as households and firms. It goes without saying that - under normal circumstances - the commercial bank will pay a lower interest rate for the deposits than it charges for the loans, in order to earn a profit.

Just like commercial banks, credit unions aim at granting credit but - in contrast to other financial market participants - they perform this service exclusively for their members. The latter is due to the fact that, in a legal sense, they are financial cooperatives that are created, owned and operated by their members.⁵

The business model of investment banks differs significantly from the one of traditional commercial banks. Investment banks offer a variety of services to their customers, such as the underwriting of debt and equity offerings, acting as an intermediary between the issuers of securities and the investors, providing market-maker services, initiating mergers and other corporate reorganizations and acting as a broker for larger institutional clients. It is worth noting that investment banks are subject to less regulation than commercial banks, an issue that will be taken up in later chapters.⁶

Savings and loan associations (S&Ls) generally collect the funds of a large number of small savers and, subsequently, lend these funds in the form of mortgages and other loans to home buyers and other types of borrowers.

Insurance companies are - exactly as the name says - financial institutions that specialize in insuring their customers against certain risks, such as, for instance, accident, illness, or fire damages. The insurance industry includes two broad segments, namely life insurance companies and property and casualty companies. While the former protect households against disability, retirement or death of the insured person, the latter protect clients against risks, such as for instance illness, theft, fire, accidents or natural disasters. Broadly speaking, insurance companies are able to provide such services as they are in a position to predict (on the basis of statistical methods and using the "law of large numbers"), how often the event will on average materialize, so that by collecting sufficient premiums from a large number of clients, they can "pool the risk" and ensure the respective payments. In later chapters, we will take a closer look into the

business model of the insurance industry and we will need to approach phenomena such “adverse selection” and “moral hazard”.

Mutual funds are financial intermediaries that collect money from savers and then use these funds to generate diversified and professionally-managed portfolio of financial assets that might consist of stocks, bonds, mortgages or money market securities. In doing so, they allow private investors to build up portfolio and risk diversification at relatively low costs.⁷

Money market funds invest exclusively in high-quality and low-risk short-term assets, such as for instance, short-term government bonds and commercial paper. These funds have become very popular over time and, at times, recorded quite considerable inflows. Consequently, they have become serious competitors to traditional commercial banks in light of the fact that they provide savers with a valuable alternative to traditional commercial bank checking and savings accounts, which typically pay a lower rate of interest.

Venture capital funds are specialized in the financing of start-up firms. More concretely, they raise funds from investors and provide these funds to small start-up firms that are perceived as having a considerable long-term growth potential, for instance in the high-technology sector. Such start-up firms often lack access to other forms of financing from financial markets and, therefore, welcome this kind of support. The latter, however, comes at a price. In order to secure its interests, a venture capital firm - having taken a large ownership in the start-up firm - often delegates one of its own employees into the board of directors of the start-up.

Hedge funds can be defined as potentially highly-leveraged private investment funds that could follow a wide range of investment strategies using large amounts of money with the aim of achieving high absolute rates of return.⁸

Last but not least, central banks represent the country’s monetary authorities, i.e. those institutions that are responsible for policies that affect a country’s supply of money and credit. Without going too much into detail at this stage, central bank use their monetary policy tools to affect short-term interest rates and the so-called “monetary base” in order to reach the policy goals often assigned to central banks by law. In stark contrast to other market participants, central banks are not primarily profit-seeking institutions. In fact, central banks have sometimes incurred quite substantial losses in order to protect the country from even less favourable outcomes.

3.3 Commercial Banks

Banks play a vital role in modern financial markets. From a purely financial perspective, they hold a bridge function between savers and borrowers. More concretely, the primary role of banks is to take funds (i.e. "deposits") from those having a financial surplus, to pool these funds and to lend them to those, who have a financial deficit. Expressed in other words, banks act as intermediaries between depositors (who lend money to the bank) and borrowers (to whom the bank lends money). In this respect, a variety of economic entities can act as depositors, among them households, firms, and governments. Similarly, all the aforementioned entities can of course appear as borrowers.

It is worth mentioning that banks usually pay an interest rate on deposits and charge an interest rate on loans. In normal times, banks pay depositors less than they receive from borrowers and that difference contributes a substantial share to bank's income. It is also important to note that banks - when doing business - make use of the so-called "maturity transformation", i.e. they use shorter-term deposits to provide longer-term loans or, equivalently, they convert short-term liabilities (deposits) into long-term assets (loans).

While traditional deposits contribute substantially to the overall funding of banks, other sources of funding are also available and often used. Among them are the direct borrowing in money and capital markets, but also the issuance of securities (such as, for instance, bonds or commercial paper) and the lending of own securities against cash - a transaction often called a repurchase agreement ("repo"). Another very popular way of funding is the process of "securitisation", in which banks package the loans they have on their books into a security and sell the latter to the market.

Besides, banks also play a vital role in the payments system that is they help to transfer funds within the sectors of the domestic economy, but also within the international sphere. Such payments systems can easily amount to rather complex networks involving local, national, and international banks, and often also central banks and private clearing facilities participate therein. It is widely undisputed that an efficient and well-operating payment system contributes positively to a sound economic international sphere.

What is less widely known is the fact that banks can create money. This is done in a process called "multiple money creation". They also play a key role in the monetary policy transmission mechanism. And, finally, banks have been often been a source of instability themselves. Systemic banking crises have often led to substantial losses and high costs for many economies.⁹ It is exactly for this reason that most countries have decided to make banks subject to regulation.¹⁰ As a rule, banks are subject to the regulation laws and the supervisory activities by their home country, but in case of international activities, they may also be further regulated by the respective host country. Broadly speaking, regulators have been assigned broad powers to intervene in troubled banks to minimize disruptions.

As we shall see in later chapters in more detail, regulators have taken a rather encompassing perspective and, therefore, regulatory provisions refer to a broad set of risks, among them bank's exposure, credit risks, market risks, liquidity risks and, more generally, to overall solvency risk.

3.4 Shadow Banks

Other key players in the markets are shadow banks. The expression "shadow bank" was apparently coined by the US-economist Paul McCulley in a speech given in 2007 at the annual financial symposium hosted by the Kansas City Federal Reserve Bank in Jackson Hole (Wyoming).¹¹ At the time, Paul McCulley used this expression to describe US non-bank financial institutions that engage in maturity transformation without being subject to regulation. More precisely, while shadow banks - just as traditional commercial banks - heavily rely on maturity transformation (using mostly short-term deposits to fund longer-term loans), they are not subject to traditional bank regulation

and, as such, they cannot - as banks can - borrow in an emergency from the central bank. Since a long time, regulators have taken note of the growing importance of such institutions and are continuously looking for ways to make them subject to regulatory constraints. As we shall see in later chapters in more detail, the recent financial crisis has demonstrated in an impressive way the systematic importance of such entities and, hence, the need for regulation.

3.5 Central Banks

Central banks are not an innovation of modern days. The table below illustrates this by providing an overview of central banking institutions established prior to the twentieth century and their original date of founding.

Table: Central Banking Institutions
(and founding year)

Bank	Founded
Sveriges Riksbank	1668
Bank of England	1694
Banque de France	1800
Bank of Finland	1811
Nederlandsche Bank	1814
Austrian National Bank	1816
Norges Bank	1816
Danmarks Nationalbank	1818
Banco de Portugal	1846
Belgian National Bank	1850
Banco de España	1874
Reichsbank	1876
Bank of Japan	1882
Banca D' Italia	1893

Source: Capié, Goodhart and Schnadt (1994).

Most central banks have been granted the sole rights to print and distribute currency notes. The latter are considered as legal tender which means that they are the only legally accepted form of money. In a broader sense, the central banks are the ones deciding about the quantity of money and credit that circulates within the economy at any time.

Many central banks also take a stance on financial stability in the sense of taking a close look at the actions of commercial banks. Most of them do so by making it

mandatory for commercial banks to hold a certain percentage of their deposits with the central bank, but also by supervising the financial system. Finally, almost all central banks must be considered as “lender of last resort” for the commercial banking system. This is due to the fact that in case of liquidity problems and a related bank run, it is almost impossible for an individual bank to survive. In order to avoid the emergence of a systemic crisis, the central bank can intervene and restore confidence, thus keeping the system alive.

What are the key variables on the radar screen of central banks? A key expression in the communication of central banks is the word “inflation”. Inflation derives from the Latin expression “inflare”, which means “to swell” or “to increase abnormally”. Although different definitions of inflation exist, most economists would probably agree that inflation corresponds to a (more or less) continuous increase in the economy’s general price level which, consequently, leads to an ongoing loss of the purchasing power of money. As such, inflation expresses how much more expensive the relevant set of goods and services has become over a certain period (most commonly a year).

Key Messages for the Reader

We can summarise some key messages of these sections as follows:

- Today’s highly developed financial systems are characterised by the rather complex interactions of various financial market participants. Among the most important are commercial banks, shadow banks and central banks.
- Commercial banks traditionally hold a bridge function between savers and borrowers and, therefore, play a vital role in most economies. In light of this important role, most countries have decided to make banks subject to regulation.
- Central banks must be seen as key players in financial markets, not least owing to the fact that they are the issuers of the only legally accepted form of money. In fulfilling their mandates, central banks continuously monitor and assess a variety of key economic variables.

While inflation mirrors the internal value of money, the external value of money is reflected in the “exchange rate”. The exchange rate is usually defined as the amount of another nation’s money that residents of a country can obtain in exchange for a unit of their own money. For instance, on 11 December 2018, euro area residents could roughly obtain \$ 1.14 for one euro.

The “Gross Domestic Product” (“GDP”), another variable that is closely monitored by all central banks, corresponds to the market value of economic production of a particular country during a specified period. Without going too far at this early stage, a high GDP growth is often regarded as a measure of economic welfare and an indicator of the standard of living in a country, but as we will see at a later stage, there may be problems with this view.

Another key variable that central banks keep under close scrutiny is the so-called "output gap". In essence, this term describes the difference between what an economy is producing and what it could produce. In this context, the economy's potential refers to the maximum amount of goods and services that can be produced in an economy when it runs at full production capacity. As a consequence, a positive output gap indicates that actual output exceeds its full capacity equivalent, which implies that firms and workers operate far above their most efficient capacity to meet the demand for their products. By contrast, in case of a negative output gap, the economy operates far below its full capacity, implying that there is that spare capacity (or, equivalently "slack") in the economy due to weak demand. In both cases, an economy must be seen as running at an inefficient pace - either overworking or underworking its resources.

From the perspective of a central bank, there is an additional point of relevance. Potential output is widely seen as the level of output at which neither upward nor downward pressures for prices tend to materialize. All else equal, a positive output gap will indicate rising price pressures (due to demand pressures), whereas the opposite will happen in case of a negative output gap. Against this background, the output gap constitutes a very useful summary measure for supply and demand pressures and, thus, reveals a picture about the state of the real side of the economy as well as about the corresponding price pressures.

Quantifying the output gap often proves to be quite a difficult task. This is due to the fact that - unlike actual output - potential output and, thus, also the output gap cannot be observed directly and, therefore, need to be estimated. In this respect, one approach involves the specification and estimation of a production function, which basically links an economy's output to various input factors (such as, for instance, labour and capital). Over recent years, however, statistical techniques that allow separating between shorter-term cyclical variations and the longer-term trend have been widely used in the literature. Among other measures, the Hodrick-Prescott filter has become very popular, although this method is not without caveats.¹² One major shortcoming in this area consists of the fact that estimating a trend is particularly difficult at the end of the sample. The latter point in time is, however, the period that is of highest interest for the policy-maker. In other words: the estimate is fraught with most uncertainty at the point in time of greatest interest.

As we shall see in later chapters in more detail, "interest rates" play a pivotal role in modern market economies. To begin with, they represent the price of money and provide important information about the borrowing costs and financial investment opportunities. Somehow related to this, they also ensure that capital is allocated to its most productive use. Finally, they play a decisive role in determining the state and the level of economic activity.

A further key variable that usually receives a lot of attention in the public is the "unemployment rate". Unemployment exists, if people are willing to work, but are unable to find a job at the existing wage. Unemployment is usually expressed in terms of the unemployment rate which corresponds to the number of jobless individuals, who are actively looking for work divided by total employment plus unemployment.

The "government deficit" ("surplus") represents a key measure of a country's fiscal policy stance as it shows by how much public sector expenses fall below (exceed) tax revenues. Similarly, the government debt reflects, in a nutshell, the sum of the public