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CAPITAL AND CAPITALISM

**THE ROLE OF ECONOMIC CALCULATION
IN THE MARKET ECONOMY**

Eduard Braun



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Capital and Capitalism

Capitalism is an economic system where almost all production and trade activities are organised by enterprises whose purpose is to maximise the return on the capital that has been invested in them. Economists, however, have almost universally defined capital in a way that makes it impossible for them to analyse important practical and societal aspects of the economic calculations of capital-based enterprises in capitalism.

In contrast, this book develops a theory of capital that is, at the same time, a theory of capitalism. Based on the definition of capital provided by the Historical and Institutional Schools, and later developed by Carl Menger and Ludwig von Mises, the theory of capital in this book takes account of the term “capital” as understood and used in actual business life. A theory of capital that is successful in explaining the rationale of economic calculations of profit-oriented enterprises in the market economy will necessarily also explain how the societal production process is organised in capitalism. Starting from the positive analysis of capital and capitalism, the book discusses the fair value and shareholder value revolutions of recent decades. These approaches, sometimes summarised under the label of “value-orientation,” have introduced theoretical neoclassical equilibrium concepts into the practice of enterprises in capitalism. The book argues that this has led to paradoxical and unsustainable results. It does not make sense to reform the institutions of economic calculation on the basis of a theory that does not, in any significant way, deal with these institutions.

The book will be of great interest to readers in the areas of Austrian economics, institutional economics, history of economic thought, varieties of capitalism, and financial accounting.

Eduard Braun holds a PhD from the University of Angers (France) and is an associate professor of economics at Clausthal University of Technology (Germany). He has published numerous peer-reviewed articles on financial accounting and the economic theory of capital. His interdisciplinary research combines insights from the Austrian and Institutionalist Schools of economics to better understand the institutions that are fundamental to capitalist societies. A key aim of his work is to ground the theory of capital in the realities of business life, moving beyond abstract concepts and models.

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Dedicated to my parents

Johann Braun (1946–2023)

Ursula Braun



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Preface

Karl Marx and Ludwig von Mises are usually considered to be intellectual antagonists. Rightly so. The former ranks as the founder of scientific socialism and one of the foremost critics of capitalism. The latter counts as one of the most important defenders of capitalism, the “last knight of liberalism” ([Hülsmann 2007](#)), and has arguably been the most effective scientific critic of socialism.

However, in this book, I will focus on something that these two antagonistic figures have in common. When it comes to their respective theories of capital, both are outliers in economic science. For both Marx and Mises, a proper theory of capital is the key to understanding capitalism. Both agree that CAPITAL-ism has to be analysed as an economic system where capital plays the central role. Marx famously developed his theory of capital in the three-volume treatise *Das Kapital*. Mises’s take on capital theory can be found in his opus magnum *Human Action* ([Mises 1949](#)), whose core – parts III and IV ([Salerno 1999](#): 35) – is dedicated to economic calculation and capital accounting and their role in organising the production processes and market exchanges in capitalist societies.

Of course, Marx and Mises did not propose exactly the same theory of capital. If so, they would not have come to diametrically opposed interpretations of capitalism. For Marx, capital is a means by which capitalists, i.e., the owners of capital, exploit workers. The existence of capital and its concentration in private hands is the cause of the immiseration of the masses under capitalism. For Mises, in contrast, capital is a central term in the economic calculations of enterprises and, as such, allows for the rational and efficient allocation of scarce resources in society. It is the cause of the wealth of capitalist nations, including workers.

Despite these contradictory conclusions, Marx’s and Mises’s theories of capital have a lot in common. In particular, the two authors do not define capital as something physical, as a factor of production of some sort. Likewise, they do not define capital as mere money or financial funds. By declining these two definitions, Marx and Mises differ not only from the mainstream of economic science. Even some heterodox schools of thought, including large parts of Mises’s own affiliation, namely the Austrian School of economics, disagree with them in this regard.

For Marx and Mises, capital can be defined neither physically nor as mere money. Instead, capital circulates and, while doing so, can adopt various forms,

both physical and intangible. Marx (1887) condensed the idea of the circulation of capital to the famous formula

Money – Commodity – Money'

or

M – C – M'

Capital usually starts out as money invested in a business; then the business purchases certain commodities with the money so that its capital is now embodied in these commodities; finally, usually after some production or transformation process, the commodities are sold again for money. While circulating, the capital of a regular business may take the form of machines, tools, and buildings; however, it may also take the form of land, securities, patents, or certain rights; or it may be on a bank account or even as cash in a safe in the business office. Mises (1949: 262) does not use the Marxian formulas, but his definition of capital is very similar in that it includes both money and all sorts of commodities, according to the decisions of the business's managers.

What I do in this book is link to Marx and Mises (and, of course, other authors writing in the same spirit) and provide a theory of capital that is, at the same time, a theory of capitalism. The book explains capitalism from an economic perspective. In order to do so, I investigate the role of capital in capitalist societies. That is why the book has mainly become a book about capital but is still, and to the same degree, a book about capitalism.

While writing the book, I did my very best not to wear blinkers and to incorporate and digest all contributions to the relationship between capital and capitalism that I could lay my hands on, irrespective of scientific affiliation or political convictions. In particular, despite writing in the tradition of the Austrian School of economics, I paid attention not only to Marx and other socialists but also to the economists of the Historical and Institutionalist Schools. These are clear antagonists of the Austrian School as well, although more on methodological than on ideological grounds. When it comes to capital, however, many of them had and have the intuition that it must be analysed as one (if not the) defining feature of capitalism.

The present book should not be understood as an ideological or dogmatic defence of or attack on capitalism, but an attempt to understand and explain it. True, in order to do so, the book has to abstract from many problems that actually or supposedly haunt capitalist societies, be it the trend towards evermore inequality (Piketty 2014), its very success that undermines the social institutions which protect it (Schumpeter [1942] 2008), or the rampant state interventionism that influences market outcomes in various ways (Rothbard ([1962] 2009). Instead, I narrow my exposition of the problems of capitalism down to those that relate directly to capital and the economic calculations of business enterprises. In recent decades, financial accounting and corporate governance have been revolutionised by the trend towards value-orientation. Fair value accounting and shareholder value

maximisation are on the way to becoming the state of the art. I demonstrate that this development jeopardises the working of the market processes that capitalist societies rely on.

The book should be of interest to everyone who is dissatisfied with the way economists deal with capital and capital theory. Actually, the so-called neoclassical approaches to capital contribute only marginally to an understanding of capitalism. No matter whether we look at growth theory, general equilibrium theory, or finance, neoclassical economists rarely ask for the meaning and role of capital in actual business life in capitalist societies. Instead, they comprehend and define capital as an equilibrium concept that fits into their respective models.

I want to be clear from the beginning. It has become a popular sport among heterodox economists to bash neoclassical economists for their unrealistic models and heroic assumptions. I am not participating in this trend. True, I am highly critical of some aspects of the neoclassical tradition. However, I am perfectly aware that there are good methodological reasons for creating the neoclassical models and the corresponding equilibrium concepts. I cannot blame a model that is not supposed to explain capitalism for not doing so. Still, since the neoclassical theories of capital do not explain the role of capital in capitalism, they must be complemented with a theory that does so and deals with the capitalist institutions and the market processes that are necessary to understand capital (Otte 2015: 208 f.). Otherwise, there is no theory that policymakers could build on when it comes to preserving or reforming these institutions. As I will demonstrate in this book, this lack of theory has become an increasingly severe problem in recent decades.

This book is the outcome of an intellectual journey that has lasted for more than 15 years. Naturally, some of the results have been published before. The shameless amount of self-citations is thought to refer the reader to these earlier works where I sometimes deal with the respective problems in more detail or from a different perspective. However, I have written the book anew from scratch in order to create a coherent picture of the problems at hand and their solutions. In this process, I had many aha moments that I would not have had if I had continued writing stand-alone journal articles. It is a bit of a shame that academia does not encourage the writing of books anymore. On the other hand, it is still possible to make the personal choice not to follow trends one does not like. You are currently reading the result of such a choice.

Nothing is truer than the old saying that we are standing on the shoulders of giants. If authors of scientific books like this one were honest, their acknowledgements would be mostly to old or dead people. In my case, most of my inspiration came from economists who published in the 19th and 20th centuries. It is in their writings that I found valid starting points for analysing the role of economic calculation in capitalist societies and the current trend towards fair value accounting and shareholder value maximisation. Their influence is documented throughout the book.

While writing this book, I have been encouraged and supported, both intellectually and morally, by several friends and colleagues. Some of them know exactly what they contributed, others may be less aware of their influence. In alphabetical order, I am deeply grateful to Mathias Erlei (1963–2019), Florian Follert, Geoffrey

M. Hodgson, Jörg Guido Hülsmann, Peter Lewin, Maximilian Reimer, and Michael Weber.

Scientists could not stand on the shoulders of giants if it were not for their environment that allows them to invest massive amounts of time in focusing on particular problems. Over the last 18 years, I have worked for several professors who generously provided me with the possibility to do so: Johann Graf Lambsdorff, Mathias Erlei, Christoph Bühren, and Fabian Paetzel. Last but not least, I am blessed with my caring and understanding wife Brigitta who continues to make our claustral life in Clausthal a pure joy for me.

*Clausthal-Zellerfeld,
October 2025*



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Introduction

What does it mean when we add an “-ism” to otherwise ordinary words; when we extend the word alcohol to alcohol-ism, the word race to rac-ism, social to social-ism, or capital to capital-ism? From the examples, we can see that the suffix “-ism” is used in various ways. As the first two words show, it can be used to describe abnormal medical conditions or the unfair treatment of a particular group of people. In the case of social-ism and capital-ism, the suffix indicates that we are dealing with belief systems and/or economic systems. Whatever the terms “social” and “capital” mean, as “isms” they have become the basis of distinct systems, doctrines, or practices. In the logic of language, capital-ism is characterised by the important role that capital plays in it.

Given the close linguistic relationship between the words “capital” and “capital-ism,” we could be led to expect that economists have by now clarified the conceptual relationship between the two terms. What exactly is the role that capital plays in market economies that makes it appear reasonable and meaningful to call them “capital-ist” societies? By answering this question, economists would contribute to our understanding of both capital and capitalism. So far, however, they have not really done so.

Even the Austrian School of economics, the most libertarian school of economic thought, housing some of the most ardent defenders of capitalism, has not managed to come to an agreement on an approach to capital theory that is, as such, also an explanation of how capitalism works. Surprisingly, central contributors to the Austrian theory of capital define capital in a way that has nothing at all to do with capitalism and therefore cannot help us understand this system. Eugen von Böhm-Bawerk, arguably the most influential and defining capital theorist of the school, stated explicitly that, in his terminology, capital has nothing to do with capitalism. By capital, he understood roughly raw materials, tools, and machinery, that is, so-called intermediate goods. Yet these are components of almost all production processes and are certainly not specific or fundamental to capitalism. Böhm-Bawerk even used the adjectives “capitalist” and “capitalistic” in a way that is not at all connected to capitalism ([Mueller 2024](#): 73):

The expression Capitalist Production is generally used in one of two senses. It designates either a production which avails itself of the assistance of concrete

2 Capital and Capitalism

capital (raw materials, tools, machinery, etc.), or a production carried on for the behoof and under the control of private capitalist undertakers. The one is not by any means coincident with the other. *I always use the expression in the former of these two meanings.*

(Böhm-Bawerk 1891: 22, n. 1, emphasis added)

Surprisingly, Friedrich von Hayek, who was much more concerned than Böhm-Bawerk with promoting capitalism as an economic system, adopted the latter's terminology. For Hayek (1935: 42), the terms "capital" and even "capitalistic" refer to the intermediate stages in the production process, not to capitalism as an economic system:

As the average time interval between the application of the original means of production and the completion of the consumers' goods increases, production becomes more capitalistic, and vice versa.

When Böhm-Bawerk and Hayek spoke about capitalist or capitalistic production, they did not refer to "production carried on for the behoof and under the control of private capitalist undertakers." Their theory of capital has no connection to the private enterprise system of capitalism.

Also later on, the Austrian theory of capital has basically been kept separated from the theory of capitalism (Braun 2024). Following the example of Murray Rothbard ([1962] 2009) and particularly Ludwig Lachmann (1978), capital is for the most part defined as a conglomerate or structure of intermediate goods, sometimes also called capital goods. It would only be a slight exaggeration to say that to the present day, the Austrian theory of capital is mostly a theory about physical intermediate goods – a universal phenomenon common to all economic systems – and not about capital understood as a crucial or even defining component of capitalism.

To be sure, it is not only a feature of the Austrian School that economists do not link the terms "capital" and "capitalism". To give a prominent example, every student of economics will confirm that in mainstream macroeconomics – particularly in growth theory – capital is treated as a factor of production, as a material input variable. Understood as a factor of production, however, capital is not in any way specific to capitalism. As if to prove this point, the standard production functions of growth theory, including capital as a factor of production, have without second thought been applied to explain output growth (or its retardation) in post-war Soviet industry (Berliner 1964; Desai 1985; Bergson 1989). Apparently, growth theorists think that capital, in the meaning they give to the term, does not have more to do with capitalism than with socialism. Accordingly, their theory of capital does not – and is not meant to – explain the functioning of capitalism.

I do not overplay my hand when I say that the theory of capital is rarely understood as a theory that could or should explain capitalism. In fact, it appears that the issue has faded even further into the background since the fall of the Berlin Wall, because after that event, the conflict between the two systems of capitalism and socialism became almost pointless to economists (Menges and Thiede 2023: 455 f.).

I wrote the present book because I consider this state of capital theory far from being satisfactory. I am of the opinion that an economic theory of capital must not be without any connection to the economic system of capitalism. To the contrary, the term capital “goes to the fundamentals of the functioning of the ‘capitalist economy’” (Lewin and Cachanosky 2018: 423). It is fraudulent labelling when economists claim to have a theory of capital but then only discuss the role of production factors or intermediate goods in production processes. That is not what people have in mind when politicians complain about “capital exploiting labour” or when they hear business people speak about “capital investment” or “capital shortage” – and with good reason (Weber [1922] 1968: 94 ff.). On this, I heartily agree with Carl Menger (1888: 2), the founder of the Austrian School, who wrote that economists should not redefine popular terms. He stated that it is

a mistake that cannot be disapproved of enough when a science [...] denotes completely new concepts by words that, in common parlance, already describe a fundamentally different category of phenomena – a category that is also important for the respective discipline – correctly and properly.

Menger added that the practitioners of capitalism, the business people and lawyers, do not think of capital as intermediate goods. They use the term capital “to describe neither raw materials, nor auxiliary materials for technical production, nor commercial goods, machines, buildings and the like” (Menger 1888: 37, transl. in Braun 2020b: 561). Instead, capital must be treated as the (or at least one) fundamental and specific feature of business activities in capitalism. In the present book, I propose a way to link the two terms. I present a theory of capital that is, as such and at the same time, a theory of capitalism.

The book consists basically of two parts. In Chapters 1 to 4, it presents a positive theory of capital. It rejects the idea that capital is a factor of production or a conglomerate of intermediate goods. The theory is inspired by the contributions of the Historical and Institutionalist Schools of economics, particularly the recent works of Geoffrey Hodgson (2014, 2015a). A second basis of the theory is the works of the Austrian economists Carl Menger (1888), Ludwig von Mises (1949; 1951), Frank Fetter (1977), George Reisman (1996), and my co-authors Peter Lewin and Nicolas Cachanosky (2019, 2021). These authors deviate from their peers in the Austrian School in that they recognise that capital is a phenomenon that is historically specific to capitalist societies. Some of them, e.g., Fetter, willingly acknowledge the affinity between their concept of capital and the one by the Historical and Institutionalist Schools (McCaffrey 2019: 482). Following the mentioned scholars, the book accepts and adopts the terminology of actual business life: The term capital stems from the economic calculations of business enterprises that try to make monetary profits from their market operations. The capital of a business consists of acquisitive sums of money that have been invested in assets, be they land, tools, buildings, cash, claims, or whatever.

The theory of capital presented in Chapters 1 to 4 presupposes a number of institutions. Apparently, capital in actual business life is closely linked to the existence

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of private property, money, markets, business enterprises, and their economic calculations. In other words, the theory of capital presupposes the existence of capitalist institutions, or better, it is a theory of these institutions. This appears to be also the opinion of Mises ([Lewin and Cachanosky 2019](#): 45). Other than most Austrian School capital theorists, he stated that it is a “confusion” to think that capital is present in “Robinson Crusoe’s involuntary hermitage” or in “a socialist society”. To the contrary, the

concept of capital cannot be separated from the context of monetary calculation and from the social structure of a market economy in which alone monetary calculation is possible.

([Mises 1949](#): 262)

Interestingly, Mises’s approach to capital and economic calculation is more closely related to that of the Historical and Institutionalist Schools than most current adherents of either the Austrian or the Historical School are aware of. In fact, several early members of the Historical School even anticipated Mises’s argument against the possibility of rational economic calculation under socialism ([Hodgson 2010](#); [Braun 2016](#), [2023a](#)). It is not difficult to understand why this was the case. In its institutional approach to the theory of capital, the Historical School dealt with the specific problems that arise in capitalist societies where profit-oriented, privately owned enterprises produce and sell goods and services more or less for the single purpose of making profits on their capital. It is no wonder that the Historical School economists’ preoccupation with the historically specific institutions of capitalist societies led them to a good understanding of the difficulties that arise when these institutional preconditions are missing – as in socialist societies.

In order to explain the role of capital in capitalist societies, I have to delve deeply into the monetary calculations of profit-oriented business enterprises. I develop my positive theory of capital in the following way. In [Chapter 1](#), I present the problem to which capital is the real-life answer. The problem is the complexity of the division of labour in modern societies. Leonard [Read \(1958\)](#) has illustrated it in a very catchy way in his story “I, Pencil.” In order that we can hold a product as simple as a functioning pencil in our hand, thousands or even millions of different resources and workers from all over the world have to be coordinated. As an illustration of this complexity, I introduce and explain the concept of the structure of production, well known to Austrian economists.

[Chapter 1](#) also shows that the complexity of the division of labour, despite being at the origin of economics as a science, does not at all loom large in the body of economics taught at modern universities. The structure of production is rarely mentioned, and the question of how it becomes organised and attuned to the needs of consumers does not appear to be important in any way. Economists, when they present their models of how the economy works, tacitly assume that this central problem has already been solved.

In [Chapter 2](#), I define capital and demonstrate how capital, as a phenomenon of actual business life, contributes to the solution of the mentioned problem. Business

enterprises that try to make a profit on their capital are the places where the complexity of production processes is reduced to a simple arithmetic problem. Whereas the structure of production is complicated and multidimensional, business enterprises operating and producing along the structure of production have a one-dimensional goal. They want to make as high a return on their capital as possible. In this regard, in their economic calculations, basically two numbers matter: the capital invested in their assets and the profit they make. Divide one by the other, and you basically have the return.

The reduction of the complexity of the structure of production to this one-dimensional problem is possible because of the capitalist institutions of money, the market, and the business enterprise. In their capacity as investments of capital, denominated in money, the assets of an enterprise are homogeneous, at least from the subjective point of view of the enterprise. The assets can thus be added together, forming a number for the entire invested capital of the enterprise. They can then be contrasted with the profits made by the enterprise, in this way generating a figure that informs us about its financial performance.

Chapter 2 deals with the particular capitalist institutions that are the preconditions for the existence and prominent role of capital in market economies. It focuses on the enterprise since an understanding of the enterprise involves an understanding of markets, money, and private property as well, at least insofar as they are important for the existence of capital. The enterprise overwhelmingly buys its assets and sells its products for *money on markets*. In its *economic calculations*, the assets appear as homogeneous *capital* and are contrasted with the profits (or losses) generated through market operations. The enterprise is where the capitalist institutions meet and, in their combination, give birth to the concept of capital.

On an individual level, the single enterprise brings its input factors down to one common denominator – money. It brings some subjective order and organisation into the small section of the structure of production that it oversees. I do not explain in Chapter 2 how economic calculation helps to bring order into the entire structure of production. Before this task can be accomplished, it is necessary to go into some details of the economic calculations of business enterprises. For that purpose, Chapter 3 makes a distinction, rarely noticed by economists, between retrospective and prospective economic calculations. Both are important when it comes to explaining how capital is allocated in the economy.

There are several different kinds of information that the management needs in order to gear an enterprise in a profitable direction. First, it wants to know whether the enterprise actually makes a profit. An important role of financial accounting is to determine the profits and losses of past actions – therefore the term “retrospective” calculation. Has the invested capital earned a return, and if so, how large has it been? That is an important question when it comes to paying out dividends, rewarding management, or reinvesting freed-up capital.

Prospective calculations are also highly important. Where should the enterprise invest its capital? Usually, a number of investment projects are possible. Which option is the best? These questions are dealt with in investment appraisal or valuation. Given the expected cash flows and the expected risks, enterprises calculate the net

present value of the various projects and compare them to each other. Depending on the time and risk preferences of their owners or shareholders, they will select the project that promises to deliver the best outcome.

Based on the discussion in [Chapters 2 and 3](#), [Chapter 4](#) explains how the economic calculations of all profit-oriented enterprises together organise the vast and complex structure of production. It is the last step in the development of the positive theory of capital presented in this book. The chapter supports Werner [Sombart's \(1919\)](#) and Max Weber's ([\[1922\] 1968](#)) important thesis that economic calculation plays a crucial role in capitalist societies and therefore counters [Yamey's \(1949, 1964\)](#) famous critique of these authors.

From a societal perspective, the particular function of retrospective calculation is the alignment of enterprises toward consumer demand. Each individual enterprise blends in with the structure of production by buying and selling on the market in its attempts to make a return on their capital. What counts in this are basically the input and output prices the enterprise faces on the market. It invests its capital in certain input factors, and if its retrospective calculations show that it makes a sufficient return, it will probably stay in business, expand, or even attract competitors. If it makes no or even a negative return, it may downsize or shut down. Since all enterprises act in this way, resources are directed towards production processes where returns on capital are high and removed from processes where returns are low. In short, retrospective calculation determines (positive or negative) profits, and the latter attract or scare away capital. Profits can usually be made where the enterprises in the production chain are ultimately compensated by consumers. In this way, the structure of production in its entirety adapts to consumer demand. Retrospective calculation has an equilibrating and stabilising effect.

Prospective calculation is the counterpart to retrospective calculation. Market societies are not only characterised by their ability to coordinate the division of labour on a massive, sometimes worldwide scale and to align it to consumer demand. They are also known for their growth and fast technological progress. Entrepreneurs constantly destroy the prevailing state of affairs and introduce new products, new technologies, and new production or organisation methods. From a societal perspective, the function of prospective calculation is to support this process of creative destruction and to help generate progress and growth. It shows entrepreneurs and managers where and how the existing structure of production can be reconstructed so that there is a chance of earning a high return on capital by satisfying consumers in a way that was not possible or even unthinkable before.

In the second part of the book ([Chapters 5 and 6](#)), I discuss practical problems that emerged and grew in capitalist societies since the 1970s. Both retrospective and prospective calculations have been reformed considerably by the introduction of new methods of financial accounting and corporate governance. These innovations go by the names of “fair value accounting” and “shareholder value maximisation.” In my opinion, this so-called “value-orientation” jeopardises the important functions of economic calculation in capitalist societies. Fair value accounting interferes with the equilibrating effect of retrospective calculation and the shareholder value paradigm induces short-termism and inconsistencies in prospective calculation.

As I see it, the fundamental problem behind the tendency towards value-orientation in economic calculation is that its proponents do not really understand the important role economic calculation plays in the economy. The theory of capital presented in [Chapters 1 to 4](#) is supposed to be just that: a theory of how the economic calculations of capital-based and profit-oriented enterprises help to organise the market process so that it is both stable and innovative. Mainstream economics, on the other hand, does not cover any of this in depth. Neither is it interested in the market as an ongoing process nor does it care about the institutions in which the market process is embedded. Money, real-life markets, and business enterprises are stepchildren of mainstream economics at best.

Nonetheless, despite the fact that neoclassical economics is not meant to deal with or explain the role of institutions in the market process, its equilibrium concepts have served as a theoretical basis for reforming those institutions. Economic policymakers have put the fox in charge of the henhouse when they thought neoclassical equilibrium theories were capable of improving the institutions of economic calculation.

[Chapters 5 and 6](#) discuss the problems that arise from the recent reforms of economic calculation. In [Chapter 5](#), I present the theoretical background of value-orientation. As part of a discussion of the *homo economicus* concept, I explain that neoclassical economics does not deal with market processes and their institutional preconditions. Rather, it takes these phenomena for granted and deals mostly with hypothetical situations where the market processes have attained a final state of rest, i.e., equilibrium. To be sure, this is a perfectly fine method that is necessary in comparative static analysis. If we want to know how certain events affect prices and quantities, we must not look at prices and quantities at arbitrary points in time. We must isolate the event in thought models and imagine that all relevant processes caused by it have come to an end. Only then can we tell the effect the event potentially has on the market. *Homo economicus* is a methodological shortcut whose purpose is to help economists determine the equilibrium without having to resort to a detailed analysis of the underlying institutions and processes.

Given their focus on comparative static analysis, over the years, neoclassical economists have detected numerous relationships that hold in equilibrium situations. Many of them revolve around finance and the capital market and are therefore directly related to our topic of capital and economic calculation. According to the Fisher separation theorem, for example, in equilibrium, investors make their investment decisions independent of their time preferences. According to the Tobin separation theorem, in equilibrium, investors choose their investment portfolio independent of their risk preferences. Furthermore, the Modigliani–Miller irrelevance theorems state that, in equilibrium, the value of a company is independent of the way it is financed. Based on these and other theorems, neoclassical economists have established the idea that, in equilibrium, goods are priced according to the present value of the cash flows they are expected to generate in the future. In equilibrium, prices are not the transitory

results of ever-changing supply and demand conditions, but represent the correct, objective, or true *value* of goods.

For lack of a better alternative, this hypothetical identity of prices and values that only holds in equilibrium has served as a theoretical basis for reforms that try to implement value-orientation in economic calculation. [Chapter 6](#) discusses the most important developments in this regard. What has happened is that actual real-life prices have come to be interpreted as reflecting the true or “fair” value of goods. I argue that this is mainly due to the concept of economic income, i.e., the income concept endorsed by neoclassical economists such as Irving Fisher and John Hicks. Given the idea that actual prices reflect “fair” values, the age-old business practice of reporting the historical costs of assets appears to be outdated and uninformative. Allegedly, financial reporting is based on much more accurate information when enterprises are made to report the *current* market prices – the fair values – of their assets and liabilities, not their *historical* costs.

My criticism of fair value accounting is that it tacitly and unknowingly presupposes the working of the market process and the capitalist institutions it is embedded in. As I have shown in [Chapter 4](#), the tendency towards equilibrium, i.e., towards a situation where prices equal “fair” values, is generated by business enterprises that determine their profits by means of *retrospective* calculations using historical costs. By demanding enterprises to switch to fair value accounting and abandon historical cost accounting, policymakers and financial reporting standard setters jeopardise the very process that makes prices tend towards fair values in the first place. They do not have a theory of how the market process works and the role that economic calculation plays in it. They only have a theory about the characteristics of equilibrium prices. Nonetheless, they use the latter in order to reform the institutions of economic calculation that the whole system they take for granted relies on.

Another area where value-orientation has impacted business practice is the so-called maximisation of shareholder value in corporate governance. Since prices are supposed to reflect the correct value of goods, share prices allegedly reflect the correct value of companies for their shareholders. Accordingly, maximising share prices has become a major objective for business management. The objective is no longer to generate money surpluses but value surpluses, where value surpluses are measured on the basis of current market prices.

I argue that the orientation towards shareholder value maximisation interferes with the working of the market process as well. The point is that if share prices really reflected the correct values of companies, there would be no room left for any meaningful entrepreneurial activity. All possibilities for profitable investment would already have been exploited by definition. However, if share prices do not reflect correct values, maximising those prices does not necessarily mean that the value of the company is maximised as well. In fact, there are certain instruments, such as share buybacks, that could be said to increase the share price but may at the same time decrease the value of the company. Therefore, in an environment where prices do not reflect correct values, shareholder value maximisation is in danger of inducing short-termism or even paradoxical behaviour in management.

I would like to conclude the introduction by saying that, in substance, economic calculation is an interdisciplinary subject. It is not only central to business administration, but also to economics – even if most economists are not aware of this. The interdisciplinarity of the topic has made it difficult for me to master all relevant aspects in every detail, and it may also make the book challenging for readers who are not well-versed in both disciplines. However, it is necessary that economists find ways to deal with economic calculation and the underlying institutions. Otherwise, there is no guarantee that even well-intentioned reforms will not end up destabilising the economic system we live in.

1 Capital in conventional economic theory

1.1 The complexity of the modern production process

The structure of production

Gummi bears are my favourite candy. Do you know how they are produced? Let us have a brief glance at the list of ingredients of a bag of gummi bears. The list reveals about 30 ingredients: glucose syrup, sugar, gelatine, several kinds of fruit juice, acidifier, carnauba wax, and others. However, as an enthusiast of fruit gum who is also an economist, I know pretty well that the list is in no way comprehensive for understanding how gummi bears are produced. It may contain all the ingredients, but certainly not all the goods and materials that were necessary to put the gummi bears into the store where I buy them. First, the bears come in handy bags. These bags have to be produced as well. Numerous materials have to be processed to make them. Second, the list of ingredients does not mention the machines, tools, and factory buildings that were employed in the production of both the bears and the bags, not to mention the many different kinds of physical, intellectual, and administrative labour.

However, even if we include these goods and services, we still do not have a comprehensive overview of the complexities of the production of gummi bears. If we step back a little, we see that some of the ingredients and materials, and all of the tools and machines have to be produced themselves. They are what is sometimes called “produced means of production.” In order to manufacture fruit juice, for example, you need not only farmland and water but also fertiliser, machines, and insecticides. The more we think about it, the more complex the matter becomes. Most of the inputs for fruit juice are produced means of production themselves. Further “ingredients” are necessary to produce those. And, as anyone can see, the story does not end there. If we think it through, almost the entire world economy is involved in the production of gummi bears. Can you think of any industry that is not directly or indirectly relevant? Even an apparently far-fetched sector such as the aerospace industry does its part. After all, this industry contributes to the navigation of ships, planes, and trucks – and is transportation not very important for any product, and therefore also for gummi bears?

What I have presented in the last two paragraphs is a short and condensed version of Leonard [Read's \(1958\)](#) famous essay “I, Pencil.” Read demonstrated vividly

that the production of even such a simple good as a pencil is highly complicated. All things considered, millions of human beings have a hand in its creation. Read's (1958: 32) pencil brags that its production is so complicated that "not a single person on the face of this earth knows how to make me."

The stories of the gummi bears and the pencil are of course illustrations of the wonders of the division of labour that have occupied economists at least since the time of Adam Smith. The latter started his famous book on the "Wealth of Nations" with a discussion of the division of labour. A pin factory can produce so many more pins if the whole work of pin-making is not carried out by only one person but divided into a number of branches, each performed by different hands (Smith 1776: bk. I, ch. I).

For Smith, the division of labour was important because he considered it the main source of economic progress or growth (Meier 1994: 10). If all workers specialise in a certain task, they (1) become better at it, (2) save time because they do not have to switch tasks throughout the day, and (3) are able to use machines. Therefore, the division of labour "occasions, in every art, a proportionable increase of the productive powers of labour" (Smith 1776: bk. I, ch. I).

The division of the production process into several tasks and steps has been at the centre of attention of several important economists, and they did not stop at the *division of labour*. The physiocrat Anne Robert Jacques Turgot, for example, writing at the same time as Adam Smith, applied a similar idea to the production factor of land. Not every piece of land is capable of producing everything, Turgot ([1770] 1911: 4) wrote, and therefore experience would teach farmers to specialise in certain fruits or livestock and to trade their produce for whatever they need. In other words, Turgot stressed the importance of the *division of land*.

Carl Menger, writing in the 19th century, referred to the way Adam Smith had explained the division of labour and argued that Smith's version falls short. Labour is not only divided horizontally, as within a single pin factory, but also vertically through time. According to Menger ([1871] 2007: 73), considerable progress in welfare is only brought about if the division of labour is extended to what he called the goods of higher orders. For progress to appear, it is important that not all workers produce consumer goods, that is, goods of the first order. Some should produce in roundabout ways of production and make input (higher-order goods) for those workers who produce the consumer goods. For Eugen von Böhm-Bawerk, Ludwig Lachmann, and other economists of the Austrian School of Economics, these roundabout ways of production and the division of labour through time relate directly to the production factor *capital*. When capital (in this sense) accumulates, there takes place a specialisation of individual capital items that Lachmann (1978: 79) called and Bylund (2016: 27) still calls *division of capital* (Lewin 2011: 145).

Please note that, in the literature just mentioned, capital is considered to be a factor of production: it signifies the produced means of production. It is not defined in the way business does it, as indicated in the introduction. The term capital will occupy us throughout the book. We will see below that Lachmann's use of the term as a factor of production is questionable. Be that as it may, the brief, foregoing

discussion shows that *the relevance of the three production factors labour, land, and produced means of production for economic progress is not confined to their mere availability as homogeneous quantities. Each factor consists of countless persons or items, and each of these has particular characteristics, capabilities, and constraints.*

Several members of the Austrian School have illustrated the idea of the complexity of the production process by what is often called “the structure of production” (Böhm-Bawerk 1891; Strigl [1934] 2000; Rothbard [1962] 2009; Garrison 2001; Fillieule 2007; Skousen 2007; Hülsmann 2011; Mayer 2018). The idea of this structure has been pictured in different ways, and each of them has its particular merits. For the purpose of the present book, I draw on an updated version of a figure used in Braun (2017: 312). Figure 1.1 shows, first, that the production process of any product takes place in several stages. Before we can make the product, we have to produce the producer goods 1 and 2. In order to produce producer goods 1 and 2, we need producer goods 3 to 6, and so on. Second, Figure 1.1 demonstrates that the production process takes place in time. From a technological standpoint, it is necessary that the different stages of the production process follow each other and pass off in chronological order. Third, Figure 1.1 is open-ended on the left, thus conveying the idea that modern production processes do not really have a beginning. When did the production process start for the bag of gummi bears I am holding in my hands right now? When the machines were built that were used in its production, or the machines that were used to build these machines, or the machines that helped to build the machines that helped to build the machines? As I said above, more or less the entire economy participates in the production of gummi bears. Figure 1.1 depicts the complexity of this issue by indicating that the process fans out the more we move away from the stage of the final product.

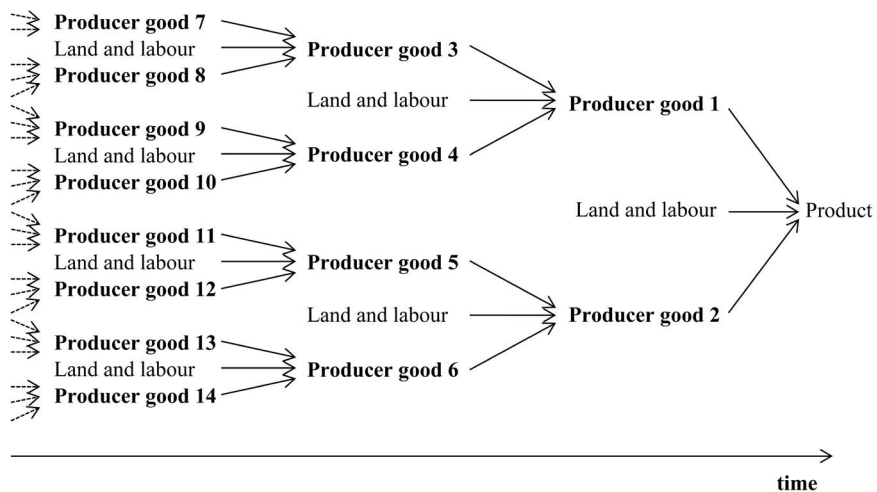


Figure 1.1 The structure of production

Figure 1.1 is of course a simple and abstract version of the structure of production. It assumes that each good is produced, at least directly, with the help of only two producer goods, and when it comes to land and labour, the figure does not even differentiate at all. Remember that the list of ingredients of a simple product, such as gummi bears, already contains 30 ingredients, not counting the tools and machines. As it is impossible to depict such a high number of producer goods in a neat figure, let alone over several stages, we have to confine ourselves to Figure 1.1. We must keep in mind, however, that reality is much more complicated. To illustrate this point: The administration of the socialist German Democratic Republic (East Germany), dissolved in 1990, had to coordinate 82 million items in its central plans, not counting the workers (Grossekettler et al. 2005: 128).

Another difficulty not depicted in Figure 1.1 is the fact that, usually, each producer good and each “unit” of land and labour could be used for several different purposes. Gelatine, for example, does not have to be used to produce gummi bears. It could also be sold as gelatine proper or be employed in making certain cakes, cookies, dips, and the like.

Any economic system that achieves a certain degree of the division of labour, land, and produced means of production, has to deal with the complexity of the structure of production. Obviously, not only capitalist economies, but also the ancient world and the Middle Ages had to be very careful not to misallocate the available means of production, and the same holds for any kind of socialist system. They must all aspire to economise their resources and allocate them to the most important uses. Times are rare, to say the least, when resources can be wasted on a large scale without a negative effect on the welfare of the population.

In fact, reality is so complicated that the organisation of the societal production process and the allocation of the available resources to the myriad of different possibilities appear to some to be an outright miracle. “The economic miracle of the much discussed division of labour – by which means is it accomplished” (Schäffle 1870: 105)? The complexity of the division of labour in modern societies and the difficulty of managing it have been at the heart of the socialist calculation debate, one of the most important and interesting economic debates of the 20th century. Ludwig von Mises ([1920] 2012) kicked it off by arguing that the modern societal production processes are so complex that they cannot be organised rationally by a central office or planning board. Therefore, he concluded, socialism is impossible. It fails in its attempts to efficiently allocate the millions and billions of producer goods and workers that characterise modern economies. His point was that socialist planning boards do not have a common yardstick at the ready that would help them to reduce the desirability of goods and services to a single dimension. Without a common denominator, it is not possible to compare goods with regard to their utility for society and, therefore, to decide between different possible production lines and methods on a rational basis. Socialism would not be able to surmount the immense associated knowledge and calculation problems. Market economies, Mises argued, do have such a yardstick. Since there is private property in the means of production, there can be markets for them where their prices are established. These market prices are denominated in money, and therefore money can serve

as a yardstick in the economic calculations of private business enterprises (Hoppe 1996: 143; Braun 2023a).

Mises's opponents in the socialist calculation debate argued that socialism would actually be able to solve the problem even without private property and proper markets (Boettke and Vaughn 2002: 159). However, they conceded that the complexity of the production process constitutes an important and difficult problem for socialist societies. The socialist Oskar Lange proposed that a statue of Mises ought to occupy an honourable place in the great hall of socialism for pointing out the challenge to socialists (Hülsmann 2007: 787).

To the present day, even left-leaning economists concede that Mises and later Friedrich von Hayek brought up a painful subject for socialists (Hodgson 1998). After all, Mises argued that the rational organisation of modern production processes requires the market and private property rights in the means of production. The complexity of the structure of production was understood as an argument for the market economy and against socialism.

The division of labour and the structure of production in growth theory

Economists continue to pay lip service to the importance of the division of labour and the role of the market in solving the problem. To give a prominent example, Nobel laureate Milton Friedman and his wife Rose refer enthusiastically to Leonard Read's story "I, Pencil." For them, the story was a powerful illustration of the merits of a de-centralised market economy:

It is even more astounding that the pencil was ever produced. No one sitting in a central office gave orders to these thousands of people. No military police enforced the orders that were not given. These people live in many lands, speak different languages, practice different religions, may even hate one another – yet none of these differences prevented them from cooperating to produce a pencil. How did it happen? Adam Smith gave us the answer two hundred years ago.

(Friedman and Friedman 1990: 13)

This quote stems from the book *Free to Choose*, which is one of Friedman's popular writings. However, a brief glance at the syllabus of current students of economics reveals that the quote does not have much to do with what is taught at universities. Given that Adam Smith considered the division of labour to be the decisive factor for explaining the formation of wealth, we would think that it is central to growth theory. Yet the division of labour and the complexity of the structure of production do not matter much, if at all, in textbooks and other works on these topics.

In writings on the history of growth or development economics, we sometimes find a discussion of Adam Smith's idea that the division of labour is crucial for development. Meier (2005: 20), for example, uses Smith's discussion in order to illustrate two problems that growing economies face. The division of labour is

limited, first, by “the extent of the market,” and second, by “the supply of capital.” From these two problems, Meier argues, follow the classical recipes for increasing the wealth of nations: international trade so that the extent of the market increases, and saving so that the supply of capital increases.

Saving and international trade are of course evergreens in discussions on economic theory and policy. Yet, the division of labour or of the other factors of production has lost its appeal – its role is rarely discussed in detail. To provide a representative example, [Campante et al. \(2021: 10 f.\)](#), in their lengthy discussion of economic growth, do not mention the division of labour once. Without further explanation, they introduce two input factors: physical capital, K , and labour, L (see also [Jones and Vollrath 2024: 19 f.](#)). Land is usually missing in modern textbooks because economists ceased to regard it as a relevant factor of production in the 20th century ([Hamilton 1955: 78](#); [Ashraf and Weil 2025: 63 f.](#)). Now, if we call the flow of output Y , we get the production function

$$Y = F(K, L) \quad (1)$$

In growth theory, capital is usually defined as a factor of production ([Suntum 1988: 1](#)). [Ashraf and Weil \(2025: 621\)](#) define it as the “tools that workers have at their disposal to produce goods and services.” If we differentiate Y with respect to K or L , the first derivatives are positive. The economy grows if the quantities of either (physical) capital or labour increase. Unfortunately, it is impossible to depict the complexities of the production structure or the division of labour by means of such simple formulas ([Sachs 2003: xvii](#); [Yang 2003: 8 f.](#); [Klein 2008: 184](#); [Foss and Klein 2012: 107 f.](#)). Of course, [Campante et al. \(2021\)](#) do not leave it at this simple model. They add several factors in order to make the model more realistic. Among other things, they incorporate human capital, technological progress, and knowledge. However, Campante et al. do not explain how the quantities of physical capital, human capital, labour, etc., come about and how they are measured. As our discussion of [Figure 1.1](#) demonstrates, the structure of production is complicated and consists of countless heterogeneous persons and items. The whole problem of bringing order to this chaos and organising the production process is ignored once we assume that there is a homogeneous production factor called (physical) capital and another one called labour.

For the sake of completeness: [Campante et al. \(2021: 62\)](#) do mention “Adam Smith’s benefits of specialisation.” In the respective section, they discuss the claim that “specialisation increases productivity.” However, they do not disaggregate the production factors and explain their composition as the result of specialisation. Instead, they introduce specialisation into their model only *ex post* and do not deal with the question of how the specialisation comes about.

[Campante et al. \(2021\)](#), [Jones and Vollrath \(2024\)](#), [Ashraf and Weil \(2025\)](#), and most other textbooks on macroeconomics and growth theory, take the division of labour for granted. When they speak about the production factors of labour and capital, they implicitly assume that the available workers and producer goods are automatically allocated to those places in the economy where they are

needed the most. They do not consider the complexity of the modern production process to be a problem that requires discussion. What Adam Smith and Milton Friedman (the latter at least in his popular writings) regarded as the main reason for economic growth – the division of labour – modern textbooks on macroeconomics and growth appear to take as a matter of course.

The division of labour and the structure of production in microeconomics

True, you could argue with [Hahn \(1975: 363\)](#) that textbooks are not the frontier of knowledge and that we should not put too much emphasis on what they say. [Felipe and McCombie \(2013: 1 f.\)](#) address this argument. First, textbooks are quite significant as they inculcate students into the prevailing paradigm. Second, Felipe and McCombie demonstrate that the aggregate production function as depicted in formula (1) does not only play an important role in textbooks but also in numerous theoretical and empirical research papers (see also [Hausman 1981: 4](#); [Machaj 2017: 41](#)). Particularly the Cobb-Douglas and the constant elasticity of substitution (CES) production functions are more than mere teaching concepts. The popular dynamic stochastic general equilibrium (DSGE) approach assumes that economies can be suitably modelled based on a Clark-Solow type aggregate production function with aggregate capital ([Rosser 2020: 421 f.](#)).

What Hahn had in mind, though, was that the criticism according to which economists ignore the complexity of the production process does not affect modern general equilibrium theory. After all, this theory does not rest on the idea that production processes employ homogeneous factors of production. Instead, they employ so-called Arrow-Debreu commodities, that is, goods and services with a specific place and date of delivery ([Fratini 2020a: 102](#)). For example, they do not contain any form of capital that reduces the complexity of the production structure to a homogeneous jelly. In the words of [Bliss \(2005: xii\)](#), a “general equilibrium model of capital does not require aggregation.” Hahn could have added that even Paul Samuelson and Robert Solow, as long as they were not concerned with growth theory and the aggregate production function, argued that capital theory deals with heterogeneous physical capital goods ([Hausman 1981: 84](#)).

Now, we could perhaps content ourselves with a state of affairs where macroeconomics and growth theory take the existence of homogeneous production factors for granted and ignore their composition. They are allowed to assume the rational composition of these aggregates, we could say, because it is the task of general equilibrium theory or microeconomics to explain how the allocation of individual inputs and outputs comes about in the economy.

However, this argument would only have some merit if microeconomics actually explained how and under which conditions the allocation of goods, services, and production factors is organised rationally. If this were the case, growth theorists could apply their models wherever the necessary conditions are met in real life. Yet, this is exactly what microeconomics does not do. Microeconomics, especially in its neoclassical variant, taught at most universities, sidesteps this issue. Instead of presenting and discussing the complexity of the production process,

neoclassical price theorists assume that no task is too complex for the economic agents in their models.

It is the whole point of the famous assumption of *Homo Economicus* that economists want to build deductively valid models or theories about human action, but do not want to discuss how and under which institutional preconditions human action actually conforms to the rules of deductive logic. Instead, they assume that the economic agents themselves are fully informed and perfectly rational (Braun 2021a). In this way, the complexity of the structure of production and the division of labour cease to be relevant problems. *Homo Economicus* solves them by means of knowing everything and being a perfect calculator.

A good example for this is Milton Friedman's book on price theory. While Friedman (1976: 279) notes that it is problematic to define profits as a return on a production factor called capital, he (1976: 283) goes on to define capital as "stocks of productive resources." Then he treats it like a factor of production that has a "marginal productivity of capital" (Friedman 1976: 310). However, he does not deal with the question of how the productive resources are coordinated so that they can be treated as a homogeneous factor having a marginal productivity in the first place.

Accordingly, the division of labour is not problematised even in microeconomics. The consumers decide on their consumption and their preferred amount of labour time based on their consumption function. The enterprises decide on the amount and composition of output based on their production function. As all agents are assumed to be *Homines Economici*, they can easily calculate and achieve the final equilibrium solution – the reconciliation of the consumption and production functions. No further explanation is considered necessary to explain how the modern production process is coordinated. According to the logic of the models, it is simply a consequence of the assumed superhuman abilities of economic agents (see also Section 5.1).

1.2 Capital as a factor of production

The requirements for defining capital as a factor of production

Students of economics are rarely confronted with the complexity of the modern societal production process and, consequently, neither with the available institutional solution possibilities. Economic calculation and the role of capital in it are not part of courses on economics. Instead, capital appears mostly as a homogeneous factor of production. We have seen in Section 1.1 that this definition of capital does not lend itself to analysing the complexity of the structure of production.

Where, however, did the idea come from that capital is a factor of production? When economists started to think more deeply about the distribution of national income among the citizens of a nation, they realised that there are more or less three categories of income: wages, rent, and interest. (Let us ignore entrepreneurial profits for now.) Almost anybody's income belonged to one or several of these categories. The classical economists concluded that each category of income relates to one factor of production, that is, they thought that income was paid as

remuneration for certain technical contributions to the production process. Already Adam Smith juxtaposed labour with wages, capital (or stock) with interest, and land with rents (Fratini forthcoming). Later, Jean Baptiste Say maintained a strict parallelism between the three types of earnings and the three factors of production (Hennings 1990a: 113). John Bates Clark (1891: 313) famously expressed the parallelism between production and distribution in a market economy by saying that “what a social class gets is, under natural law, what it contributes to the general output of industry.”

It is important to understand that this claim – that capital is a factor of production and interest its remuneration – was very important for many economists for political reasons. Throughout history, the legitimacy of interest has been doubted again and again, among others by Aristotle, the medieval church, and the socialists. These authors and institutions denied that interest is remuneration for a productive contribution of a production factor. For Aristotle (1932: 1258 b), interest was usury. Usury is “most reasonably detested,” as it is “increasing our fortune by money itself.” As money cannot breed money, however, interest must be a gain got by greed, abuse, or injustice, not by any productive activity. The medieval canonists and early scholastics added some arguments, but otherwise followed Aristotle (Böhm-Bawerk 1890: 21–24).

Marx (1887) also denied that interest was paid for a productive contribution. For him, interest was unearned income. He developed his exploitation theory in order to demonstrate that interest is nothing but the value taken away from workers. According to this theory, the owners of capital are able to retain a part of the produce of labour – the surplus value – not because they themselves or their capital produce this value, but because they have appropriated the means of production. In other words, Marx and many socialists saw interest as the result of a power relationship.

Most non-socialist economists rejected these ideas and theories. They tried to refute them by showing that interest was *earned* income that reflects the productive contributions of the production factor called capital (Petri 2004: 16; Bryer 2013: 593; Fratini forthcoming: 2). They attempted to approve and justify the distributive process in the competitive order both ethically and economically (Davenport 1913: 140). Clark (1899: 4) pointed out explicitly that his attempt to prove that “products and shares do thus coincide” was supposed to invalidate socialist arguments:

The indictment that hangs over society is that of ‘exploiting labor.’ ‘Workmen’ it is said, ‘are regularly robbed of what they produce. This is done within the forms of law, and by the natural working of competition.’ If this charge were proved, every right-minded man should become a socialist; and his zeal in transforming the industrial system would then measure and express his sense of justice. If we are to test the charge, however, we must enter the realm of production. We must resolve the product of social industry into its component elements, in order to see whether the natural effect of competition is or is not to give to each producer the amount of wealth that he specifically brings into existence.

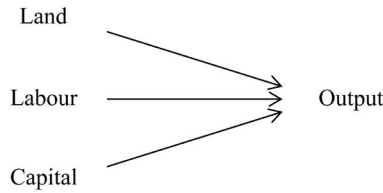


Figure 1.2 The three factors of production contributing to output on equal footing

For Clark and his followers, all three factors were on equal footing (Hausman 1981: 33; Hennings 1990a: 116). They were combined in the production process and, in this way, they produced output (Figure 1.2).

As remuneration for their productive services, the owners of land, labour, and capital receive rent, wages, and interest. These incomes are determined simultaneously (Petri 2004: 10). Distribution was thought to reflect the contributions to production (Figure 1.3). In marginalist economics à la Clark, interest is the remuneration of the production factor capital (Fratini 2020b: 41; Zolea 2022: 125).

As plausible as that sounds, the idea that capital is a factor of production on equal footing with land and labour causes many problems. In the end, as we will see, these problems led most economists to treat the complex structure of heterogeneous producer goods as a homogeneous quantity called K , as depicted in formula (1).

What caused the trouble was that if economists want to define capital as a production factor that earns income, they are confronted with three important requirements:

Requirement 1: They must define capital as something physical that actually contributes technically to the production of output.

Requirement 2: They must define capital in a way that makes it quantifiable or measurable. Otherwise, they could not tell how a change in the amount of capital affects output – and what would be the point of a production factor if its contribution to output is unmeasurable and therefore unknowable?

Requirement 3: If they do not want to ignore the empirical world entirely, they must make allowance for the observation that the rate of return on capital tends

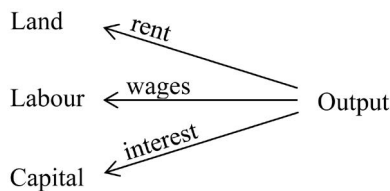


Figure 1.3 The simultaneous remuneration of the three factors of production

to be the same for all assets, all sectors, all industries, and, at least to a certain extent, even all countries. This phenomenon is specific to capital. There is no overall rate of wages that states the income of labour as a percentage of labour, nor is there a rate of rent. Only the return on capital is usually presented as a percentage share of capital.

It appears that conforming to these three requirements at the same time would be squaring the circle. It is no wonder that economists were not able to find an agreement on a proper and unambiguous definition of physical capital (Suntum 2005: 62). It turns out that their definitions each focus on one of these requirements and neglect or violate one or two of the other ones. Under these circumstances, caused by economists' attempts to define capital as a factor of production, endless and unsolvable debates about the nature of capital were almost inevitable.

Capital as something physical or material

Particularly in the 19th century, many economists made the famous argument according to which owners of capital earn interest as a reward for abstinence or waiting (Hennings 1990c). According to the classical wages fund theory, the owners of capital advance means of subsistence to the workers, so that the workers are able to consume instantly while the capital owners have to wait until the product is sold on the market (Braun 2014). There were some ambiguities in this approach when it comes to terminology. For example, Böhm-Bawerk (1891) used the term capital to denote both the wages or subsistence fund and the intermediate goods that could be produced by workers because they were supported out of this fund. In any way, it was argued that (physical) capital makes roundabout ways of production possible and, as more roundabout ways were said to be more productive, lays the foundations for economic growth. This was the most important attempt to define capital as a physical means of production. It was thought to fulfil requirement 1 – the technical productivity of capital.

This idea of capital was also considered to invalidate the socialist claim that capital exploits labour (Bryer 2013: 607 f.). However, it was widely contested at the time and ultimately rejected by the mainstream of economic science (Hennings 1990a: 115). Böhm-Bawerk and his followers were not able to present a convincing way of measuring capital (requirement 2) in the way they defined it. They tried to use the roundaboutness of production processes as a measure of capital, but their attempts failed. It is easy to see why. As we discussed in section 1.1, almost the entire economy participates in the production of even simple goods such as gummi bears or pencils. Since it is impossible to determine a starting point of these production processes, it is also impossible to measure the length or the average length of the production period (Steindl 1937; Hennings 1990b: 234).

As a reaction to the failure of meeting requirement 2, many economists who stressed the importance of requirement 1 – the productivity of (physical) capital – gave up the idea that production and distribution go hand in hand. Two groups of economists in particular ceased to treat capital as a homogeneous factor of

production that earns interest. First, many followers of Böhm-Bawerk in the Austrian School continued to focus on the heterogeneous nature of produced means of production or, as they often call them, capital goods. Therefore, they gave up the claim that capital was a homogeneous factor of production that fulfilled the three requirements mentioned above. Particularly, the connection between capital and interest was cut. [Lachmann \(1978: 74\)](#), one of the most important theorists in this tradition, wrote pointedly in his book on capital that “we are not interested in interest as such.” Furthermore, [Lachmann \(1978: 43\)](#) mentioned the term “factor of production” only once, and then in connection with labour, not with capital. Likewise, [Foss and Klein \(2012: 237\)](#) do not consider capital to be a “factor of production per se,” and neither do they discuss the interest rate in their book. The goal of these authors and others (e.g. [Harper and Endres 2008](#)) is to illustrate the complexities of the structure of production and to explain the role of the entrepreneur in bringing order to the chaos ([Foss and Klein 2012: 21](#); [Braun 2017: 314 ff.](#)).

The other group of economists that ceased to treat capital as a homogeneous factor of production are general equilibrium theorists who write in the tradition of Walras, Arrow, and Debreu. Walras differed from other economists of his time because of his attempt to treat the various kinds of capital goods each as separate factors of production ([Garegnani 1990: 2](#)). Also in the later Arrow-Debreu framework, production processes do without homogeneous factors of production. Instead, as we have already seen in [section 1.1](#), all inputs are considered as individual Arrow-Debreu commodities which have a specific place and date of delivery. Accordingly, the rate of interest is not understood as the earnings of a homogeneous entity called capital. As the Arrow-Debreu models accept the heterogeneity of capital goods, there is not one rate of interest, but many so-called “own-rates of interest” – for each good one rate of interest ([Rogers 1989: 45](#); [Fratini 2020a: 102](#); [Fratini 2020b: 42](#)). These own-rates could only become equal, [Bliss \(1990: 151\)](#) explains, if we assumed constancy of relative prices. This, however, is empirically irrelevant. In fact, according to [Hausman \(1981: 89\)](#),

the general equilibrium solution is completely independent of the rate of interest and asserts nothing explicit about it. The rate of interest has no role whatsoever in the general equilibrium solution.

[Petri \(2004\)](#) demonstrates in great detail in his book that the general equilibrium approach, since it gives up the idea of a common or uniform rate of interest, cannot be used to underpin the empirical work done on the basis of the aggregate production function. The relationship between capital as a homogeneous factor of production and interest as its remuneration is not consistent with the own-rates of interest used in general equilibrium theory. You cannot have both at the same time.

As I see it, there is nothing to say against the Austrian and general equilibrium approaches to heterogeneous physical capital per se. In fact, they stress the complexity of the structure of production and the division of labour, and therefore I will employ numerous of their findings throughout the book. However, something we would better understand is that by adopting the view that capital theory

is concerned with *illustrating* the complexities of the production process, these economists ignore important phenomena that are associated with capital in real life. Most importantly, they do not have much to say about the way capital is or could be measured (requirement 2) or about the interest rate on capital and its uniformity (requirement 3). In the words of Hausman (1981: 87), “models apparently without any relevance to the phenomena of capital and interest become [...] the key to capital theory!” How is it that, in everyday business life, interest or the rate of return is stated as a percentage share of capital, and that this rate tends to be the same throughout the economy or even large parts of the world? Abandoning the possibility to comment on these issues appears to me to be a price that is very high for a theorist of capital.

Capital as a fund of value

Aside from the general equilibrium approach, neoclassical economists, following the lead of John Bates Clark, focus on requirement 2. Clark wanted capital to serve as a factor of production in his theory of marginal productivity. For him, capital was to be on equal footing with land and labour (Hennings 1990a: 115 f.). He wanted to show that the income earned by capital corresponds to the marginal contribution of capital to output. Production and distribution should go hand in hand (Machaj 2017: 38). For this reason, capital had to be conceptualised as a homogeneous quantity that could be measured and aggregated.

Clark came to meet this requirement in the following way. He agreed with Böhm-Bawerk that capital is a heterogeneous collection of specific capital goods (Cohen 2008: 153). Yet, Clark argued that by measuring capital goods according to their *value*, we are able to add them up so that they form a meaningful quantity. And indeed, no matter how heterogeneous capital goods are, we can easily add up their “values” to a homogeneous quantity and call it capital. A refrigerator and a dust mop are very different things from a technological point of view, but you can easily add up the sums of money that you paid for them or that you expect from selling them. Clark took this idea from observing business life. A manufacturer, Clark (1888: 10) explained, thinks of capital as “an abstract fund, the destiny of which is to migrate through an endless series of outward forms.” This abstract fund of value was the relevant aspect of capital for Clark (1894: 66) since he called it “true capital.”

Clark tried to meet the other requirements as well. Requirement 3 was no problem. Since he defined capital as a fund of value, he could express interest as a percentage share of this value. Furthermore, since Clark (1899: 118) considered the fund of value to be “perfectly mobile,” he could explain how capital always flows to the most profitable opportunities so that competition erases all differences in returns and brings them down to a homogenous rate of interest.

In order to meet requirement 1, Clark employed a trick. Although he propagated the idea that true capital was a fund of value, he maintained the proposition that this fund consists of concrete capital goods, i.e., “of instruments of production, and these are always concrete and material” (Clark 1899: 116). These

capital goods – the physical aspect of capital, so to speak – are productive, and therefore capital itself has the power to create products (Machaj 2017: 6, 10).

The laws of matter, in short, make capital productive. [...] Paying interest is buying the product of capital, as paying wages is buying the product of labor. The power of capital to create the product is, then, the basis of interest.
(Clark 1899: 135)

In this way, Clark appeared to have squared the circle. He defined capital as a physical factor of production since it was embodied in concrete capital goods. At the same time, true capital was the value of these capital goods and could therefore be measured and aggregated. Last, not least, he was able to express the return on capital as a uniform percentage share since capital, in his approach, was a perfectly mobile fund of value.

Clark's approach to capital was attacked by Böhm-Bawerk in the first and by Hayek in the second of the three major controversies on capital in the history of economic thought. In the second debate, it was Frank Knight who advocated Clark's concept where capital is both technically productive and a homogeneous fund of value at the same time (Cohen 2003). Both Böhm-Bawerk and Hayek rejected Clark's and Knight's definition of (true) capital as a homogeneous and mobile fund of value and emphasised the importance of heterogeneous capital goods and the period of production (Cohen 2003: 470). However, both controversies ended without clearing the issue. No side was able to convince the other one.

Only in the third major debate on capital, usually referred to as the Cambridge capital controversy, Joan Robinson, Piero Sraffa, and their followers were able to point out the flaws of the neoclassical approach convincingly. Robinson (1953/54: 81) wanted to know: If we have a look at a typical production function, such as shown in formula (1) above, in what units is capital or K measured? As Cohen (2014: 1503) explains, Robinson asked if this "capital" is financial capital or physical capital equipment, and if it is equipment, is it measured by cost of production or discounted future earnings.

This was a very good question. The problem that Robinson identified early on was that capital, if we regard it as a factor of production, must be quantifiable not only in its capacity as a value magnitude. If capital equipment were to co-determine the amount of output and therefore the amount of interest it earned, capital had to be measured somehow as physical equipment. Its quantity must somehow represent the productive contribution coming from it (Fratini forthcoming: 4). In Harcourt's (1972: 4) words, aggregate capital had to be defined "in terms of its own technical unit." Otherwise, the production function would not be able to connect the quantity of physical equipment to the quantity of physical output, and differentiating the function would not result in interest.

In order to understand this argument, we have to dig a little deeper. After Clark, neoclassical economists circumvented any problems that may arise from, on the one hand, defining capital as something physical and heterogeneous, and, on the other, measuring it in terms of value. To reconcile these two aspects of their capital

concept, they made the simplifying assumption that there is only one commodity in their models or, equivalently, that physical capital can instantaneously and costlessly change its form (Petri 2004: 27; Cohen and Harcourt 2005: xli). That is the solution of the neoclassical economists to the measurement of capital as a factor of production was to think of capital as homogeneous not only as a fund of value, but also as physical equipment. Robinson (1970: 311 f.) complained that “in the neoclassical concept of capital all the man-made factors are boiled into one.” This factor, “though made of one physical substance,” is endowed with the capacity to embody various techniques of production, and a change of technique can be made simply by squeezing it up or spreading it out instantaneously and without cost.

What Robinson and Piero Sraffa (1960) showed in the Cambridge capital controversy was that relaxing the assumption that capital equipment is homogeneous *physically* invalidates the proposition that physical capital can be measured as a homogeneous quantity of value. Once heterogeneous capital goods are introduced, measuring and aggregating capital in value terms no longer provides a meaningful measure of capital as a factor of production. It does not tell us anything about the size or productivity of physical capital (Harcourt 1972: 37; Cohen and Harcourt 2003: 201). To value heterogeneous capital goods independently of their physical characteristics, however, is tantamount to a circular argument. Originally, Knut Wicksell (1934: 149) had expressed the corresponding problems. After Hayek (1941: 143) had mentioned them as well, Robinson and Sraffa developed the argument further in their attacks on the aggregate production function: If neoclassical economists want to measure the quantity of capital by aggregating the value of capital goods, they have to assume a given rate of interest. This is so, no matter whether they deduce the present value of capital goods from past costs or from discounted future benefits. In either case, the rate of interest is necessary to determine the value of capital goods. Interest is part of the costs that go into the production of capital goods, and it is necessary for discounting future benefits to their present value. The quantity of capital, measured as a value, depends on the rate of interest. The neoclassical production function, however, has it the other way around. It was designed to show how the interest rate depends on the quantity of capital. Wicksell, Robinson, and Sraffa demonstrated that the interest rate and the quantity of capital were mutually dependent. The production function implied circular reasoning (Rogers 1989: 31).

For our purposes, the Cambridge capital controversy demonstrated that mainstream neoclassical economics struggles with the complexity of the societal production process. It ignores the heterogeneity of capital goods in its definitions of capital, but then runs into difficulties when it comes to explaining and determining the quantity of capital thus defined. Paul Samuelson (1966) admitted that the mentioned paradoxes exist. Outside of one-commodity models, they may occur on a regular basis, and therefore they jeopardise our ability to measure the quantity of capital (Cohen and Harcourt 2003: 206). Yet, despite Samuelson’s admission, neoclassical economists continue to employ one-commodity models in their empirical work as if nothing had happened (Cohen and Harcourt 2003: 209) and, as demonstrated in Section 1.1, textbooks pass on the homogeneous concept of physical capital from generation to generation.

2 Capital in actual business life

2.1 Capital as in “capital”-ism

Capital and profit

In [Section 1.2](#), I have shown that John B. Clark was eager to oppose Marx’s claim that the return on capital retained by capitalists is unearned income based on the exploitation of the working class. [Clark’s \(1899\)](#) work was an attempt to resolve the product of social industry into its component elements and demonstrate that, in a market economy, each producer receives the amount of wealth that he specifically brings into existence. In this, interest was justified by maintaining that capital was a factor of production. Clark feared that if economists were not able to prove the direct connection between distribution and production with regard to capital, socialists would (then rightly) gain the upper hand.

By defining capital as a homogeneous and measurable factor of production, however, Clark and the neoclassical proponents of the aggregate production function ignore the complexity of the structure of production presented in [Section 1.1](#). We have seen that the Cambridge capital controversy revealed the problems of this definition. In this chapter, I present an alternative approach to capital. Business people do not think of capital as a factor of production. For them, it is an important element of their economic calculations and a term that has nothing to do with the physical characteristics of producer goods. In fact, we will see that the term is closely related to the way entrepreneurs help to solve the complexity issue in capitalist societies.

In [Section 1.2](#), we have deferred the distinction between interest and profits for later discussion. Now that we deal with the role of capital in capitalist societies, it is necessary to introduce the term “profit.” Usually, economists deal with profits in the same way as with the other categories of income: They assume that there must be a factor of production that generates this kind of income. If capital generates interest, and interest is not the same as profits, profits must flow from another factor. Economists have consequently come up with the idea that there must be a *fourth factor of production* next to land, labour, and physical capital. This factor they called entrepreneurship ([Baumol 2010](#): 188; [Estill and Means 2019](#): 37). Entrepreneurs contribute certain activities or faculties to the production process, and the profits they make reflect these contributions.

The introduction of the entrepreneur as a factor of production that generates profits makes the limits of the neoclassical approach particularly obvious. The underlying idea, namely that society is divided into several classes that are characterised by the way they earn income, is certainly not without basis. One could say that these classes are *homogeneous* concerning the category of income they receive. However, transferring the homogeneity of income flows to some supposed factors of production and assuming that there is one homogeneous factor earning rent, one homogeneous factor earning wages, one homogeneous factor earning interest, and another one earning profit has concealed the fact that the so-called “factors” are not on a par with each other. *Arguing in this way ignores the institutional realities of capitalist societies.*

This is particularly true for the relationship between capital on the one hand, and land and labour on the other hand, once we consider the role of the entrepreneur. When we look at the empirical world and at actual production processes, we can see that the term capital, as used by entrepreneurs, does not describe characteristics of the production process. Entrepreneurs do not consider capital to be a technical input to production. Capital is not meant to generate an income by means of its physical productivity. Instead, for them, capital is necessary to purchase input (Schumpeter 1934: 167; Reisman 1996: 479). *Capital buys the factors of production; it is not one of them* (Leitner 1926: 148). Entrepreneurs or managers invest capital in order to make profits. In their calculations, they relate their profits to the capital they have invested. In the institutional framework of capitalist societies as we observe them, *profits are a return on capital*. Profits vary with the size of capital (Reisman 1996: 482), and even entrepreneurs themselves relate and impute profits to capital, not somehow to a factor called entrepreneurship.

A neglected approach to capital

Usually, economists focus on (and distinguish between) two different approaches to capital. Cohen (2008: 153) speaks of the “dual nature of capital,” and Hicks (1974: 309) claims that, when it comes to capital, the distinction between the two approaches divides economics, ancient and modern, into two camps: the “fundists” and the “materialists.” I have presented each approach in Section 1.2. Both of these camps define capital as a factor of production, but they emphasise one of the requirements for such a definition to the relative neglect of the others.

Most economists ignore that there is a third approach to capital. This approach discards the idea that capital is a factor of production. Instead, it focuses on what we have called requirement 3 – the empirical observation that the rate of interest on capital tends to be the same for all assets, all sectors, and all industries. As indicated above, capital in this sense is a term that stems from business practice and acknowledges the institutional framework of capitalist societies. Loosely speaking, it is a magnitude in the economic calculation of entrepreneurs that keeps track of the money that has been invested in the enterprise. In this and the following subsections, I will flesh out this preliminary definition. In the remainder of the current subsection, I will give some historical background. Afterwards, I will give a precise definition.

We can demonstrate that economists actually neglect this third approach by taking a brief look at the three-volume collection of seminal papers on capital theory in [Bliss et al. \(2005\)](#). Only 2 of the 71 contributions to the collection, namely [Schumpeter \(2005\)](#) and [Veblen \(2005\)](#), can be associated with the third approach of capital. However, [Veblen \(2005\)](#) contains only six pages about capital, and a meagre two pages about Veblen's positive approach, and the passage by [Schumpeter \(2005\)](#) is poorly chosen. Instead of picking the third chapter of [Schumpeter \(1934\)](#), where Schumpeter defines capital, [Bliss et al. \(2005\)](#) decided to include [chapter 5](#) that deals with Schumpeter's peculiar approach to the interest phenomenon. We could be tempted to add [Marx \(2005\)](#) to this short list, but the text chosen by [Bliss et al. \(2005\)](#) is ambiguous. In it, Marx defines capital as both a factor of production and a social relationship.

Hodgson ([2014: 1069](#)) shows, however, that next to Schumpeter and Veblen, such important figures as Werner Sombart, Max Weber, Frank Fetter, John Hobson, and Alfred Mitchell Innes belong to the same tradition. We could add numerous scholars, most of them related to the Historical School of economics. In the following list, I only mention individuals who were well-known and recognised at their time: Albert [Schäffle \(1870\)](#), Richard [Hildebrand \(1883\)](#), Lorenz von [Stein \(1887\)](#), Rudolf [Stolzmann \(1909\)](#), Wilhelm [Lexis \(1910\)](#), Max Weber ([\[1922\] 1968](#)), Robert [Liefmann \(1923\)](#), Friedrich von [Kleinwächter \(1923\)](#), Alfred Amonn ([1927](#)), Otto von [Zwiedineck-Südenhorst \(1930\)](#), and Hans [Ritschl \(1948\)](#).

The Austrian economists Carl Menger and Ludwig von Mises contributed to this approach as well. This point deserves a brief explanation. Interestingly, the Austrian School of Economics, known for its theory of capital, actually houses several different approaches to capital ([Braun 2020a; 2024](#)). The one where capital is related to the roundaboutness of production processes has faded into the background (but see [Huerta de Soto 2024: II, ch. 6](#)). However, many Austrians still define capital in a materialist or physical way. When it comes to describing the structure of production – sometimes also called the “capital structure” ([Lachmann 1978](#)) – they understand capital as consisting of numerous and heterogeneous capital goods ([Foss and Klein 2012](#)). In other words, they use capital as a term that describes the complexity of the production process; as a term that describes a problem that needs to be solved, most notably by the alert entrepreneur whose task it is to combine the different producer goods such that they generate output that satisfies consumer demand ([Bylund 2022: 60 ff.](#)). This approach is the one that is usually called the “Austrian” theory of capital. It traces back to Menger's ([\[1871\] 2007](#)) distinction between goods of lower and higher orders and [Böhm-Bawerk's \(1891\)](#) attempts to explain the interest phenomenon partly as an outflow of the temporal structure of the production process ([Braun 2024](#)).

[Menger \(1888\)](#) and [Mises \(1949; 1951\)](#) deviated from this line and joined the list of economists who propagated the third approach, where capital is defined as a monetary magnitude in the economic calculations of business enterprises ([Braun 2015; Braun et al. 2016; Lewin and Cachanosky 2019: 42; Braun 2020b](#)). The Historical and Austrian School authors on this list did not primarily try to define capital such that it fitted into the mould of marginal utility or productivity theories or comparable theories

(Weber [1922] 1968: 92). Instead, they observed the world around them and realised that capital is a term that stems from the institutional framework of capitalism. In capitalism, the allocation of goods and the distribution of income are largely accomplished by business enterprises. They purchase the different input factors, combine them in the production process, and sell them to their customers. As a part of these processes, they pay wages to workers, rent to landowners, and interest to their creditors. They do all this in order to earn profits for their owners or shareholders. In capitalism, the production process, including the allocation of goods and the distribution of income, is embedded in the profit-seeking calculations of business enterprises.

From the perspective of these enterprises, capital is the foundation of their operations. Without capital, they cannot operate. Usually, the capital is provided to them by their owners, shareholders, or lenders in the form of money. They invest it in purchasing services and assets in the hope that, in the end, a positive residual, that is, profit, remains. In business life, capital is a monetary figure that enterprises track in their economic calculations – even after they have spent the money – in order to determine whether they have made a profit. Enterprises are only successful if they earn more than what was invested in them, that is, if they generate a positive return on their capital. Profit, then, is the “excess of receipts from the sale of products over the money costs of producing them” (Reisman 1996: 478).

To repeat, capital as I present it here is inextricably linked with capitalist institutions. It assumes and is part of the institutional framework that we associate with capitalism (Hodgson 2015a). This distinguishes the view of capital that is prevalent in business life from the others that define capital as a factor of production or as a conglomerate of physical producer goods. “Capital goods” such as tools and intermediate products are not specific to capitalism. The isolated Robinson Crusoe employs produced means of production, too, and so do socialist societies. However, if we think of capital as money invested by business enterprises for purchasing input, we define it as a historically specific phenomenon (Hodgson 2015b). Capital in this sense belongs to the world where business enterprises invest money in order to obtain property rights in the means of production by purchasing or borrowing them on the market and selling or lending their product for profit.

The definition of capital and the complexity problem

I am going to develop the third approach to capital in detail in this book. In this approach, the term “capital” does not *describe* the complexities of the production structure – as is the case when economists define capital as a structure of heterogeneous capital goods. To the contrary, it is a tool that helps to *solve* them. This becomes particularly obvious in the works of the Austrian economists who endorse this approach: Carl Menger, Ludwig von Mises, and George Reisman.

Menger’s (1888) starting point was his criticism of economists who define terms such as capital without reference to the way these terms are used in real life. Menger (1888: 6) wrote that “no science, least of all a science like economics which deals with phenomena of everyday life, has the right to [...] arbitrarily redefine popular terms.” Menger (1888) went on to criticise the artificial definitions of capital by other economists. He vehemently opposed all attempts to define capital as a factor

of production (Braun 2015: 84–89). Instead, he opted for a definition of capital that is guided by the way everyday life employs the term.

In everyday life, according to Menger, capital is not considered as a factor of production. The physical or technical composition and capabilities of goods have nothing to do with the question of whether they are capital or not. The decisive point is that capital is a term that stems from the economic calculations of business enterprises:

The real[istic] concept of capital includes business assets, whatever their technical nature may be, inasmuch as their monetary value is the object of our economic calculation – that is to say, if they represent an acquisitive sum of money.

(Menger 1888: 40; translated in Braun 2020b: 563)

Following Menger (1888), Mises (1951: 123) asked what significance is attached to the term capital in business practice. He agreed that the concept of capital is derived from the economic calculation of business enterprises. Mises (1949: 262) defined capital as

the sum of the money equivalent of all assets minus the sum of the money equivalent of all liabilities as dedicated at a definite date to the conduct of the operations of a definite business unit. It does not matter in what these assets may consist, whether they are pieces of land, buildings, equipment, tools, goods of any kind and order, claims, receivables, cash, or whatever.

Reisman (1996: 445) clarifies the difference between goods that are capital and goods that are not capital. The distinction has nothing to do with their physical characteristics. It is “exclusively one of the purposes for which the goods are purchased.”

The roast beef purchased by a restaurant and the washing machine purchased by a laundromat are both capital goods [= business assets in Reisman’s terminology]. Exactly the same kind of roast beef and washing machine purchased by a housewife are consumers’ goods.

(Reisman 1996: 445)

Mises’s (1951) discussion explains why this notion of capital is part of the solution to the complexities of modern-day production processes: In order to orient their actions within the complicated structure of production, business enterprises have to be able to evaluate and calculate their success. This is made possible by means of economic calculation. In the words of Mises (1951: 123), capital

serves to bring the original properties of a concern under one denomination, whether they consisted of money or were only expressed in money. The object of its computations is to enable us to ascertain how much the value of this property has altered in the course of business operations. The concept of capital is derived from economic calculation.

Far from being a production factor or a heterogeneous structure of goods of any kind, capital is a constitutive element of the economic calculation of businesses. In these calculations, businesses reduce the heterogeneity of their assets by expressing them homogeneously as money figures.

The prerequisite of economic calculation is of course the existence of market prices denominated in money (Littleton 1953: 9; Jankovic and Block 2019: 367). It is the market that brings all inputs and outputs used by businesses down to one common denominator (Huerta de Soto 2024: I, 227).

The thousands of goods that are the object of exchange exist, so to speak, only in the form of prices, they can be broken down into arbitrarily small parts in terms of calculation, they become calculable goods. They are stripped of all individuality and can now be operated with in all four types of calculation.

(Rieger 1928: 8)

Business enterprises are then able to aggregate the prices of their assets, calculate their profits or, as the case may be, other magnitudes (Kosiol 1976: 51). The physical complexity of the production process itself is not reduced in this way, of course. Capital, in the just defined sense, is not identical with the homogeneous and perfectly mobile production factor called capital that pervades growth theory (see Section 1.2). The physical assets of an enterprise cannot somehow be aggregated themselves, let alone the physical assets of all enterprises in the economy taken together. The assets are still heterogeneous physically, and the structure of production is still as complex as before. *The individual enterprise can only aggregate the monetary costs or, depending on the purpose of the calculation, other monetary equivalents of its assets.* The homogeneity of capital, expressed in the money equivalents of business assets, is subjective (Leitner 1926: 38). It only relates to the respective business enterprise that owns or uses these assets.

It is important to add that the individual enterprise is only one small island in this complex structure. It arranges and co-ordinates a small portion of the countless producer goods in a way that is supposed to generate profit. Only the interactions of all enterprises together on the market, each calculating in money and trying to make profits, provide an economy-wide solution for the complexity issue that we will discuss in Chapter 4.

From here onwards, whenever I speak of capital without qualification, I mean acquisitive sums of money that are invested in assets of a business, be they land, tools, building, cash, claims, or whatever (see also Weber [1922] 1968: 91). Unlike Mises, and in accordance with Lewin and Cachanosky (2019: 45), I do not confine the term capital to equity capital (assets minus liabilities), but to all assets of a business. In this, I follow common parlance that speaks of liabilities as debt capital or borrowed capital. In my terminology, the capital of a business enterprise thus consists of *equity capital* and *debt capital* and therefore includes the monetary equivalent of all assets of a business.

A good way to illustrate this concept of capital is by having a look at the balance sheet of an ordinary business enterprise (Figure 2.1). The assets side contains the

Assets		Liabilities	
land	10,000	equity capital	50,000
buildings	40,000		
equipment	10,000		
inventory	5,000		
accounts receivable	20,000	debt capital	37,000
cash	2,000		
total assets	87,000	total liabilities	87,000

Figure 2.1 Balance sheet of a business enterprise

numerous and heterogeneous assets owned by the enterprise. This side shows the items that the enterprise has invested its capital in with the objective of generating income, the concrete “materialisation” of capital (Vickers 1968: 39). The liabilities side contains the sources or the “origin” of this capital (Kosiol 1964: 13; 1976: 97; Perridon et al. 2022: 7). Some of it has been borrowed, either as loans from banks or in exchange for bonds sold on the capital market. The rest of the capital belongs to the owners or the shareholders of the business, depending on the legal nature of the enterprise.

Notably, the assets and the liabilities have all been assigned a monetary figure. They are homogeneous in that what counts in the balance sheet is not their physical properties but their monetary significance for the enterprise. It is in this monetary sense that the assets and the liabilities sides must necessarily be of the same size. To repeat, the enterprise has invested its capital, whose origins are shown on the liabilities side, in specific assets that are depicted on the assets side. The assets and the liabilities sides of the balance sheet depict two sides of the same coin: the capital of the enterprise in terms of its origins (liabilities side) and in terms of its current use (assets side).

Capital, the firm, and the market

If we want to understand the term capital as we see it in actual business practice in capitalist societies, we have to deal with a number of institutions (Boettke 1998: 134 f.; Huerta de Soto 2024: I, ch. 22). Obviously, capital presupposes the existence of *money* and of *business enterprises*. These two institutions, for their part, do not make much sense without *markets* where enterprises can trade inputs and outputs for money. Markets, in turn, presuppose the *rule of law*, in particular the freedom from feudalistic or tribal duties and bonds, and the possibility of acquiring *private property* in both the means of production and the products. To repeat, capital in the above sense is historically specific. It is directly related to the capitalist institutions (Hodgson 2015a).

It is not my intention to cover all the mentioned institutions in detail in this book. However, two institutions are of particular importance when it comes to understanding the role of capital in actual business life: the market and the firm or enterprise. Much has been written about the nature of the firm and its relationship to the market, particularly since the rediscovery of Ronald Coase's (1937) seminal contribution in the second half of the 20th century. I am not going to review the vast literature on this topic. Suffice it to point out a characteristic shortcoming of many approaches to the firm. Already Coase (1937: 388, emphasis added) assumed that firms and markets are "*alternative methods of co-ordinating production.*" Either markets or firms. In principle, "production could be carried on without any organisation at all" (Coase 1937: 388) or it could be "carried on by one big firm" (Coase 1937: 394). The reason why we still see both markets and firms in real life, according to Coase, is that both institutions are characterised by specific costs. The growth of markets goes along with increasing market transaction costs, and the growth of firms with increasing managerial transaction costs. Overall transaction costs, then, are optimal when production is co-ordinated not by either firms or markets, but by a combination of both.

Williamson (1985: 186) uttered the idea that, if there were no transaction costs, no firms would exist and the division of labour would be organised via "market contracting." He expressed this thought by famously stating that "in the beginning there were markets." That is to say, in the beginning, production took place without any kind of firm. The idea that markets and firms are alternative methods of co-ordinating production is still very popular in the literature. To give a current example, in his theory of the firm, Bylund (2016) treats firms and markets as separate and independent institutions. Bylund (2016: 8, emphasis added) starts with an "economic model of the market as an elaborate yet dynamic system of production *without firms.*" Bylund (2016: 21, emphasis added), in his own words, lets "the *firmless market process* play out." Only in later chapters does he formally introduce the firm.

In Bylund's approach, it becomes obvious that Coase's and Williamson's basic claim, according to which markets and firms are alternative institutions, is highly problematic. For if we look closely, even Bylund's model, created explicitly to depict "firmless" markets, actually contains what must be called firms or enterprises. In Bylund's (2016: 21) decentralised and firmless markets, there are still actors who "procure inputs and sell produced outputs." Yet, Bylund (2016: 27) does not call these actors entrepreneurs or firms, but labour workers:

Any labour worker who produces an intermediate stage is dependent both on the producer of the previous stage for supplying their input, on any producer of necessary tools to assist in production, and on the producer of the subsequent stage for demanding and procuring their output.

Bylund's labour workers (or producers) buy input and sell output. Actually, this does not sound like actual labour workers who, as we know, use to provide services in exchange for contracted wages (Frankel et al. 2024: 111). It sounds like sole traders with small businesses who assume market risks in order to obtain profits. Producers who make productive expenditures in order to obtain an income are not

workers. Reisman (1996: 478), for example, calls them capitalists. At one place, Bylund (2016: 58, emphasis added) actually writes that “workers eager to increase the return of their labour may seek to compete for a share of the *profits*.” The existence of profit-oriented actors who buy in order to sell begs the question if entrepreneurs and firms are not already present implicitly long before Bylund introduces them explicitly in later chapters of his book. In fact, it appears as if the whole output in Bylund’s model of the firmless market is produced within sole-trading firms.

Bylund’s model demonstrates unintentionally an important point made by Herbert Simon (1997). The market is not a stand-alone institution that is somehow able to produce or organise production on its own. Rather, almost all production processes take place within firms (Reisman 1996: 462). Even if we assume a situation where all enterprises are sole-trading firms without employees, still most (non-human) resources in the economy would be processed and allocated by these firms. In the terms of Mises (1949: 288), the “specific entrepreneurial function consists in determining the employment of the factors of production. The entrepreneur is the man who dedicates them to special purposes.” Nota bene: The entrepreneur, not the market! In Lewin’s (2011: 177) words, the “market economy owes its success to the business firm.”

But let us drop the assumption of sole-trading firms. If a mythical visitor from Mars approached the Earth from space, Simon wrote, equipped with a telescope that reveals social structures, he would realise that almost all of the inhabitants would be employees, hence inside the firm boundaries. “Organizations would be the dominant feature of the landscape” (Simon 1997: 27). (Certainly, some of these organisations would not be firms but families or tribes, but, as opposed to firms, these do usually not produce in order to sell for profit, so that the market has no direct role in their productive activities either.)

In capitalism, production takes place in profit-oriented entities – call them enterprises or firms – and is therefore guided by the profit motive. We can actually define the enterprise as an entity whose purpose is to generate profits for its owners or shareholders based on the capital that has been invested in it (Hoffmann 1932: 10). Weber ([1922] 1968: 96) explicitly stressed the link between the enterprise and capital accounting. These entities are supposed to generate an income from buying input at low prices and selling output at higher prices (Boulding 1955: 491). Since the enterprise can only generate profit via market exchanges, the economic actions of enterprises start and end with money (Fettel 1951: 514). Karl Marx proposed an ingenious formula to illustrate the logic of the production process in capitalism. He described the acquisitive activities of the capitalist enterprise in the following way:

Money – Commodity – Money’

or even shorter:

M – C – M’

The formula M-C-M’ depicts the logic of an enterprise that tries to make profit. According to Marx (1859: 102), the formula describes the “current form of

bourgeois production.” Like capital, therefore, the enterprise is historically specific (Schäfer 1980: 82). The business enterprise is an entity that is set up by its founder or founders so that it generates profit. For business enterprises, therefore, the goal of the production process is not to produce products but to make profit. “Industry is carried on for the sake of business, and not conversely” (Veblen 1958: 19). Money is only spent on commodities to make more money, i.e., in terms of the formula, to make Money' or M' (Marx 1859: 102). In this, the legal nature of the enterprise and the number of its owners or shareholders do not matter (Rieger 1928: 99). It is well possible to imagine an enterprise without an entrepreneur, but not an entrepreneur without an enterprise (Walther 1953: 2). The business enterprise is present whenever an agent acts according to the logic M-C-M'.

The Marx-Sombart separation of the enterprise and the entrepreneur

It is well known that Marx (1887) distinguished between the logic of business action under capitalism (M-C-M') and the logic of pre-capitalist action. For the latter, he coined the formula Commodity – Money – Commodity' or C-M-C'. According to Marx (1887), in pre-capitalist times, the purpose of trade was not to make money or to increase one's capital without limits, but to exchange production surpluses on the market in order to obtain those goods and services (i.e., commodities) that one was in personal need of.

Werner Sombart elaborated on the distinction between M-C-M' and C-M-C' in some detail. However, for him, C-M-C' does not describe action in pre-capitalist times. Rather, C-M-C' describes the way consumers think and act. From the consumers' point of view, money is not an end, but a means. In the end, they are interested in the commodities they can obtain for their money (C') and the services or goods they have to forgo for that purpose (C). When it comes to C-M-C', therefore, no rational economic calculation is necessary or possible. Consumers decide on the basis of their personal and subjective preferences. Business actions, on the other hand, start and end with Money or M. They are amenable to rational economic calculation. For Sombart, therefore, it is the possibility of rational economic calculation that *separates* the sphere of the business enterprise from the sphere of personal consumption of entrepreneurs and capital providers. In other words, *the enterprise as a separate entity is constituted by economic calculation* (Leitner 1926: 221).

Sombart started from the idea that business enterprises are founded by entrepreneurs so that they earn a monetary return on their capital. Independent of their personal wishes or preferences, entrepreneurs and capital providers want their enterprises to act rationally and generate as much profit as possible. Sombart argued that there is an institutionalised separation between the personal sphere of the business owners or entrepreneurs and the sphere of the business enterprise. Since Sombart (1919) is not well-known nowadays, I quote several interesting passages at some length:

If we ask what distinguishes the capitalist enterprise as an organisation of property, as which we shall attempt to appreciate it here, from other, especially pre-capitalist, forms of economic activity, what gives it its special character, what is new about it that is introduced into the organisation of

economic activity, the answer will not be difficult: it is the independence of the business that takes place in it, that is to say: the elevation of an independent economic organism above and beyond the individual economic agents, the combination of all business processes that take place alongside and in succession in an economy into a conceptual unit, which then itself appears as the bearer of the individual economic acts and leads its own life that outlasts the lives of the individuals. [...]

Economic relations were thus detached from anything personal; they were given a life of their own. The individual economic acts were no longer related to a particular person, but to an abstract entity filled with a purely economic spirit, to itself as a whole, as it were: the property relations were depersonalised, objectified [...].

But we can see that this independence of the business is in fact the essence of the capitalist enterprise (as an organisation of property) as soon as we realise that this was the only way to create an economic form in which the ideas inherent in the capitalist economic system could be realised.

Only in such a mechanism of acquisition detached from the individual, as is the capitalist enterprise, could the principle of acquisition achieve unhindered activity. Only the objectification of economic acts makes it possible to orientate them solely towards profit without any consideration of other interests, and the independence of business creates a free path for the boundless pursuit of profit.

(Sombart 1919: 101 f.)

Sombart stressed the role of economic calculation in separating the rational sphere of the enterprise and the personal sphere of the entrepreneur in considerable detail (see also Weber [1922] 1968: 98; Leitner 1926: 24 f.; Littleton 1953: 25; Kosiol 1976: 49). For Sombart, double-entry bookkeeping plays the central role:

The idea of acquisition is developed in double-entry bookkeeping to the extent that it realises the final separation of the sum of money invested 'for acquisition,' i.e. to make a profit, from all natural purposes of subsistence. In double-entry bookkeeping, there is only one purpose: the increase of a purely quantitatively recorded amount of value. Whoever immerses himself in double-entry bookkeeping forgets all qualities of goods and services, forgets all organic limitations of the principle of covering needs, and fills himself with the single idea of acquisition: he cannot do otherwise if he wants to find his way in this system: he must not see boots or cargoes of ships, not flour or cotton, but only amounts of value that increase or decrease.

(Sombart 1919: 119 f.)

We have established that the essence of the capitalist enterprise as an organisation of assets must be seen in the independence of the business. And systematic bookkeeping makes an outstanding contribution to this independence of the business.

It achieves this independence in two ways: firstly, by detaching the accounts and thus the management from the person of the entrepreneur and organising them according to purely factual aspects. The accounting process is objectified and mechanised. Objectivised: in that the procedure becomes a general, average, usual one, independent of the personal contingency of the manager, so that it is now comprehensible to everyone, whoever may use it. [...]

But more: double-entry bookkeeping not only objectifies the calculation, it also mechanises it. Once the start has been made, the accounting can be continued in a very specific direction. [...]

If, as a result, the management of the business has ceased to be a highly personal one, the objective order of the business is now (positively) substituted for the personal management: the business faces the entrepreneur as an independent entity, which is moved according to its own internal laws. In a double sense again: (1) in so far as the business, represented by the capital, itself appears as a unity, which, as we know, is produced by the insertion into the system of accounts; (2) but in so far as it is clearly shown that this unity of the business is not derived from the person of the entrepreneur, who rather faces his capital as a creditor.

This independence of the business by means of accounting is the very essence of double-entry bookkeeping and has often been emphasised as such. [...]

‘Entrepreneurs and companies are separated from each other by double-entry bookkeeping’: this really gets to the heart of the matter.

(Sombart 1919: 122 f.)

Sombart (1919: 124) even added that he does “not understand how one can say anything sensible at all about capitalist economies without making this separation of entrepreneur and enterprise the starting point of one’s consideration.” We will refer to this Marx–Sombart separation again in [Chapter 5](#). To me, Sombart clearly anticipated several important theorems of modern finance theory, particularly the famous Fisher separation.

However, while Irving Fisher and his modern followers derived their theorems from heroic neoclassical assumptions such as “perfect” capital markets and homogeneous expectations of all investors, Sombart came to his conclusions from observing entrepreneurial activities in the institutional environment of capitalist societies. He wanted to understand how capitalism works and what role capital plays in it. He argued that economic calculation separates the capital-based enterprise from the personal preferences of the providers of capital and therefore makes possible the rational conduct of the enterprise, focusing on quantifiable magnitudes such as input and output prices, capital, and profits. I have already dealt with the very same separation in [Braun \(2014: 111 ff.\)](#), using the terms “business sphere” and “consumption sphere.” [Braun \(2014\)](#) provides further references, but does not apply the separation to the same problems as I do in this book.

Capitalism

If we associate the enterprise with the formula $M-C-M'$, it appears that we have to conclude that the enterprise as such antedates modern capitalism by many centuries. We know that already in antiquity there were merchants who specialised in long-distance trading and bought commodities in one harbour or city in order to sell them in another one. The ancient Silk Road is a well-known example of this (Peters 2021).

However, it is important to understand that, similar to the market, the enterprise makes no sense as a stand-alone institution. The formula $M-C-M'$ is only meaningful insofar as there is a market environment and the other capitalist institutions are present. The mentioned merchants traded between limited local markets where they were able to purchase and sell commodities for money. As we have seen above, the market and the business enterprise are not two *independent* and *alternative* institutions. They are *interdependent*. Both ancient merchants and current profit-oriented enterprises, buying low and selling high, presuppose the existence of markets where they can purchase inputs and sell their output. The business enterprise does not make sense without some kind of capitalist environment. Accordingly, some commentators argue that the ancient Silk Road does not antedate capitalism or the capitalist enterprise. Rather, this Road attests “to the very early beginnings of capitalism as a form of merchant capitalism” (Peters 2021: 955 f.). This implies that capitalism is present whenever and wherever there are profit-oriented enterprises that try to make a return on their capital.

In my point of view, this terminology is not very helpful. An “ism” is a system. In feudal societies, there have definitely been some traces of markets, particularly in medieval towns and in the periodic fairs. However, we would rather call the prevailing system “feudalism,” not “capitalism,” as long as the production process is *mainly* embedded in reciprocal legal and military obligations of the nobility, the clergy, and the peasantry. It only makes sense to speak of capital-*ism* when capital is so prevalent in economic life that it has become *the rule* that goods and services are provided by business enterprises that try to earn a return on their capital. In this case, we can rightfully speak of an “-ism.”

In the terminology that I recommend, the term capitalism derives from the term capital. The existence of capital requires certain institutions, namely private property, money, business enterprises, markets, and economic calculation. Throughout this book, I call these institutions “capitalist institutions.” However, I would restrict the use of the very term “capitalism” to societies where the main body of production processes is accomplished in enterprises and the main share of output is traded on markets. So, whereas we are able to observe and define capital pretty precisely, this is not the case with capitalism. It is not possible to tell exactly when it was *the rule* that we receive *the main share* or *body* of our goods and services from profit-oriented business enterprises.

This is not surprising. In the same way, it is difficult to tell when and where exactly socialism begins. All real-life socialist societies had or have some rudiments of capitalist institutions in place, be they money, markets, or private property. Likewise, there are some socialist elements in the production processes of even the

most capitalist societies, such as families, communes, or state ownership. When we classify certain societies or practices with capitalism and others with socialism, it is, to a certain degree, not precise language, but a social convention. The road that I took in this book in order to explain *capitalism*, therefore, is the best one can do in my opinion: I analyse the role and function of *capital* in the economy in depth. In this way, the book also improves our understanding of what is usually understood by the term “capitalism,” if only indirectly.

2.2 Capital in the productive activities of enterprises

Capital and the factors of production

The concept of capital presented in this book takes into consideration that both markets and enterprises are necessary elements of the institutional framework of capitalism. The term capital is wedded to this institutional framework. As we have seen above, capital in this sense is the sum of the money equivalent of all assets dedicated to the conduct of the operations of a definite business unit. This is consistent with historical experience. Already in the commercial city-states of Italy of the 13th century, capital was understood as the money capital of a firm or of a merchant devoted to investment (Levy 2017: 488).

From a financial perspective, capital is what constitutes the enterprise. As we have seen, Werner Sombart (1919: 119) explained that it is one of the main purposes of double-entry bookkeeping to create the capitalist enterprise by separating capital from the rest of the wealth of the owners or shareholders. By means of accounting, the enterprise assumes a separate existence and becomes an entity which emerges as a subject conducting individual economic acts and which leads a separate life, outlasting the life of individuals (Sombart 1919: 101). What keeps capital and the enterprise together, or rather, what creates both of them, is economic calculation. Mises (1949: 231) and Weber ([1922] 1968: 90 ff.) spoke of “capital accounting,” but today we would use the term “financial accounting.”

In the following, I will discuss the role of capital in the production process. We will see that, in a certain sense, capital is what helps to co-ordinate enterprises and the market. In order to understand the role of capital, we start from Marx’s formula $M-C-M'$. The purpose of enterprises is to make money from purchasing and selling commodities on the market. The operations of the business enterprise are supposed to create an amount of money (Money' or M') that is higher than the original amount of money (Money or M).

It is important to stress that the operations of enterprises start and end with money (Schäfer 1980: 27) and that, therefore, the economic calculations of enterprises are actually monetary calculations. As I showed at length in my book *Finance Behind the Veil of Money* (Braun 2014), money is the good that grants access to consumption goods in capitalist societies. Apart from rare exceptions, all persons need money in order to make a living. Therefore, not only wages, rents, and interest but also social welfare benefits and weekly allowances for children are paid out in money. It is the one good in capitalist societies that you can use, at least

in principle, to buy all available commodities. Since everyone wants and needs money in capitalism, and since markets are typically operating on a monetary basis anyway, including the markets for input, the relevant costs of enterprises are in the form of money as well. Wages, rents, and asset prices – all are denominated in money. Likewise, enterprises sell their products on markets and therefore receive their revenues in the form of money. Furthermore, the owners or shareholders of enterprises strive for monetary income as well, like everybody else. It is no wonder, then, why the economic calculations of enterprises are actually monetary calculations (Kosiol 1964: 105) – at least as long as the monetary system functions and the monetary unit is stable (Bagus et al. 2014: 510). By calculation in monetary terms, enterprises calculate in terms of the good that everybody wants and needs.

That enterprises calculate in monetary terms and try to maximise their monetary profits has consequences for the production process that can be illustrated by means of Figure 2.2 (adapted from Zwiedineck-Südenhorst (1930: 1069)). Zwiedineck-Südenhorst expanded on Marx's basic formula and showed how the production process in capitalism is embedded in the economic calculations of enterprises. The figure illustrates that the transformation of land, labour, and produced means of production is subject to the profit-seeking considerations of business enterprises.

Enterprises invest money in land, labour, and produced means of production which they buy on the market (Reisman 1996: 298). They organise the combination of these inputs in their productive activities in order to produce products or output. Then they try to sell the output on the market for more money than it cost them to purchase the input. The difference between the revenues and the expenses is their profit (or their loss).

The term capital is not explicitly present in Figure 2.2, but Zwiedineck-Südenhorst (1930) and Marx (1907) called the depicted processes “the circulation of capital.” From the point of view of the business enterprise, what happens in Figure 2.2 is that its capital circulates through the production process. At the outset, its capital takes the form of money. By purchasing input, the business invests its capital in land, labour, and produced means of production. (It may also invest in financial products or any other goods, but Zwiedineck-Südenhorst kept it simple.) At this stage, capital takes the form of the inputs the enterprise happens to own. After it has accomplished the production process, its capital is embodied in the products. By selling its products, the business turns its capital into money again, hoping that it has generated a surplus or profit.

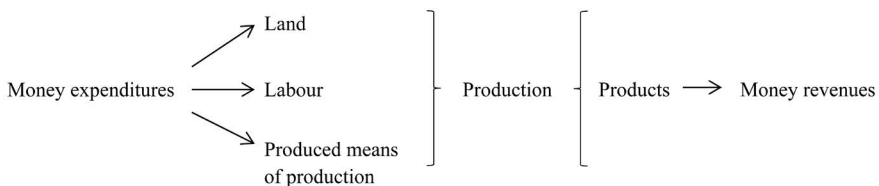


Figure 2.2 The circulation of capital

It is important to understand that the enterprise is able to combine the heterogeneous factors in a profitable way because it is able to base itself on monetary calculation. From the perspective of the profit-oriented enterprise, the various factors of production are relevant as expenditures and are therefore denominated in money. They can be added up and compared to the actual or expected sales revenues.

Here it becomes obvious why capital is not and cannot be identical with produced means of production. Capital is neither a heterogeneous conglomerate of produced means of production nor a homogeneous fund of produced means of production. Businesses invest capital not only in purchasing produced means of production but also in cash, land and labour or even in immaterial assets such as securities, patents, claims, and other rights (Davenport 1913: 160). When (and if) they turn their inputs into output, the output is still part of their capital. The sums of money that have been invested in the enterprise remain capital as long as they are employed acquisitively, no matter which shape they assume. They cease to be capital either when they are written off, for example, in case of wear and tear, malinvestments, or defective production, or when they are paid out as dividends to shareholders or withdrawn by the owners.

It also becomes clear why capital is not in any way on equal footing with land and labour. Unlike land and labour, capital does not produce anything. Rather, business enterprises use capital to *purchase* (or *borrow*) land and labour (among other things). Without the business enterprise using its capital for purchasing and combining the factors of production, produced means of production would merely be “old iron,” land would be “nature that takes its course,” and labour would be “cluttering people” (Plenge 1926: 121). It is capital that purchases land, labour, and other tangible or intangible assets and puts them under the united control of an enterprise. In the words of Plenge (1926: 121):

Capital, i.e., money that is utilised on the market to make more money, has [...] the function of combining the forces of production in the manner wished for by the organising agent [i.e., the enterprise].

Debt capital, equity capital, interest, and profit

At this point, it also becomes necessary to distinguish between debt capital and equity capital. Zwiedineck-Südenhorst’s figure (Figure 2.2) does not do so. It contains revenues and expenditures, but it does not contain any hint of whether these result in interest, profit, or both, and if the latter, in what proportions. Therefore, I redesign Zwiedineck-Südenhorst’s figure in Figure 2.3 and supplement it with the distinction between interest and profit.

The enterprise does not only have to pay the price of the assets (including land) it purchases, the rent of the assets (including land) it borrows, and the wages of its hired labourers but it also has to pay interest for the funds it has raised from banks or other creditors (Reisman 1996: 483). From the perspective of the enterprise, interest is not income but costs. Interest is a contractual income that the enterprise

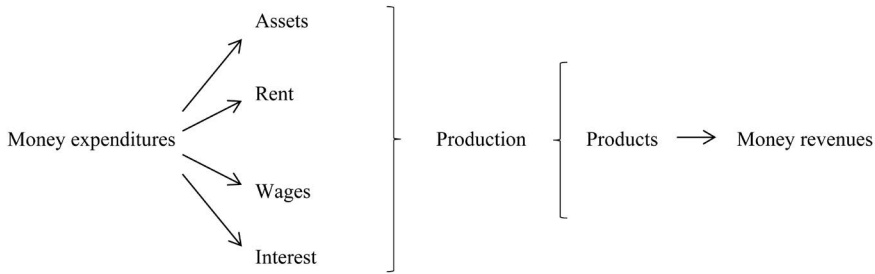


Figure 2.3 The circulation of capital including interest on debt capital

has to *pay* for the use of its debt capital (Fetter 1915: 319). Profit, on the other hand, is not an expenditure in the monetary calculations of the enterprise. Rather, it is the residual of revenues and expenditures, where the expenditures contain interest payments to the lenders of debt capital. This residual is not a contractual income (Fetter 1915: 320), of course, and it is attributed to the owners of the equity capital invested in the enterprise (Reisman 1996: 186).

We will discuss the *rate* of return on equity (ROE) capital and its relationship to the *rate* of interest in Section 4.2. Suffice it here to remark that, obviously, interest and profit are not in any way independent of each other. Debt and equity capital stem from the same source of funds. The owner of financial funds may invest them in business enterprises directly as equity capital or lend them as debt capital. The relative magnitude of interest and (expected) profits will strongly influence this decision. Relatively high interest rates will incentivise investments in debt capital, and consequently there will be a tendency to lower interest rates and adjust them to the prevailing expected average rate of profits, and vice versa.

From these considerations, it becomes clearer why it does not make sense to distinguish between the two alleged production factors, entrepreneurship and capital. As we have seen in Section 2.1, economists traditionally distinguished between the factors of production land, labour, and (physical) capital. Land was supposed to earn rent, labour wages, and (physical) capital interest. Since this triad left no room for an empirically important fourth category of income, namely profit, they added a fourth factor of production, namely entrepreneurship.

However, now we see that both profit and interest go to owners of capital. Interest is the contractual income of the lenders of debt capital, profit is the residual income of the providers of equity capital, determined by economic calculations (Hoffmann 1932: 16 f.).

To repeat, in actual business life, capital is a term that is used by business enterprises in their calculations. They call the funds with which they start business “capital,” a term that includes equity and debt capital. Then they trace the fortune of their capital throughout their production, trading, or speculative activities. At regular intervals, they assess the success of these activities by deducting their current expenditures, including interest on debt capital, from their current revenues and relating the net result to their capital. If they relate the net results to their equity

capital, they speak of ROE, if they relate it to the entire capital of the enterprise (debt plus equity capital), they speak of return on invested capital (ROIC).

The uncertainty of producing for the market and the factors of production

Obviously, an enterprise that tries to make profits on the basis of the formula $M-C-M'$ has to cope with uncertainty in its operations. Between the expenditures M and the revenues M' , usually some time elapses. In case of investments in equipment, years may pass before revenues flow in – if they flow in at all. In short, future cash flows are uncertain. One never knows if the market really wants what one offers.

At this point, we have to clarify a general point: the relationship between uncertainty and capital. In fact, the uncertainty of producing for the market is directly related to equity capital. Actually, equity capital bears this uncertainty. This point is often overlooked because economists usually assume that it is economic agents called “entrepreneurs” who bear uncertainty. Particularly, Frank Knight (1921) and Ludwig von Mises (1949) made this argument. It is the core of their famous theories of the entrepreneur. Their (correct) starting point was that, *ex ante*, future revenues, future expenses, and their relationship to each other are unknown and, accordingly, uncertain. It is therefore necessary that someone or something undertakes this uncertainty, otherwise nobody would produce output for the market. Following the example of many other economists, however, Knight and Mises tried to find a concept that captures the idea of an uncertainty-bearing agent or entity but still fits into the universal and ahistorical models of economics (Braun 2022a: 748). For them, the uncertainty-bearing agent was the “entrepreneur.” They defined the entrepreneur in a universal way, as an agent who is on the same level as the factors of production, or, in the words of Baumol (2010: 188), a “fourth factor of production.”

In the remainder of this subsection, I am going to demonstrate that Knight and Mises implicitly admitted that it is not “the entrepreneur” who bears uncertainty, but ultimately the capital of the business enterprise.

Mises introduced the entrepreneur in order to isolate the element of uncertainty in all human actions. In Mises (1949: 254), the term entrepreneur refers to “acting man exclusively seen from the aspect of the uncertainty inherent in every action.” Frank Knight was a little more precise. Although Knight (1921: 236 f.), like Mises, considered uncertainty to be prevalent in all human actions, his entrepreneur does not bear *all* uncertainty in the economy. Rather his entrepreneur deals only with a specific form of uncertainty, namely the uncertainty of producing for the market (Knight 1921: 241).

Neither Mises nor Knight analysed the role of monetary calculation when it comes to the uncertainty of producing for the market. As I have shown in Braun (2022a), Mises and Knight overlooked the important role of capital and monetary calculation in entrepreneurship because they tried to construct a “pure” entrepreneur that was independent of the other factors of production, land, labour, and (physical) capital. In particular, this “pure” entrepreneur was supposed to have no funds, that is, not own any capital. Mises (1949: 254) emphasised explicitly that

the pure entrepreneur “does not own capital” and “remains propertyless” over the course of the production process. Likewise, Knight (1921: 299 f.) conceded the possibility, though “rare and improbable,” of a pure and property-less entrepreneur who contributes nothing but the responsibility for the ultimate decisions to the production process. As Klein (2010: 97) notes, Israel Kirzner followed Mises and also assumed that the entrepreneur does not own capital.

Mises and Knight did not see that what is put at risk in entrepreneurial undertakings is the capital of the enterprise. (In unlimited companies, also the personal wealth of the proprietor(s) may be exposed to this risk.) Implicitly, however, Mises acknowledged the importance of capital for the entrepreneurial function. According to Mises (1949: 255), the pure entrepreneur is not only the agent dealing with uncertainty but also the one who “earns profit or suffers loss.” Loss, however, can obviously not fall onto anyone who is property-less (Reisman 1996: 187). Mises (1949: 254) himself added that losses only affect the entrepreneur insofar as he owns funds; otherwise, the losses “fall upon the lending capitalists.” Mises (1949: 254) even went so far as to admit that his pure entrepreneur is actually “an employee of the capitalists.” Mises’s construction of the pure and property-less entrepreneur is, in other words, *not* exposed to uncertainty. It is the owners of equity capital who are exposed to it in the first place since losses are first and foremost borne by the equity capital of the enterprise (Walther 1953: 2; Reisman 1996: 186). In the case of bankruptcy, if the equity capital does not cover all the losses, other stakeholders, like lenders, may have to bear a part of the losses as well, but certainly not actors who do not own anything.

The point is, as we have seen in Figures 2.2 and 2.3, that within the enterprise, everything is paid for by capital. Except for the profits, the income payments of all stakeholders – wages, rent, and interest – are paid *ex ante* out of the capital of the enterprise. There must first be Money to purchase assets and services so that, usually at a later point in time, Money’ can be earned. It is this Money (or its owners) that bears the uncertainty of possibly not being recovered in later market transactions. To be more precise, the owners of the equity capital bear this uncertainty. Depending on the form of enterprise, the owners of equity are either personally liable or only to the extent of their capital contribution.

It is not the “entrepreneur,” it is the enterprise, representing its owners and shareholders, that bears the uncertainty that arises because it advances its capital in the form of income payments and therefore provides (relative) certainty for others. This point becomes obvious in Knight’s (1921: 271 ff.) discussion of the non-contractual character of profit. Profit is a residual income, calculated, in principle, as the difference between revenues and expenditures. The size of this residual is not and cannot be fixed in advance. In contrast, wages, interest, and rent are contractual incomes. Their recipients do not have to produce for an uncertain market. They receive a fixed remuneration, independently of the ultimate outcome, from an enterprise.

This does not mean that recipients of contractual income are free from uncertainty. Their contracts might be unexpectedly terminated, not renewed, or subject to default by the employing enterprise. Most notably, the providers of debt capital bear the market risk to a secondary degree (in case of bankruptcy). Moreover, there

are various types of wage agreements. Some guarantee fixed hourly or daily wages, while others base pay on piecework. The latter results in a far less predictable income stream for the workers. Nevertheless, as long as the contracts remain in force, recipients of fixed remuneration are shielded from the uncertainty inherent in producing for the market, which would otherwise expose them to potential losses. Insofar as an enterprise pays contractual income – such as wages, rent, and interest – it assumes uncertainty on behalf of others by providing a form of certainty that would not otherwise exist.

This idea can also be expressed by stating that enterprises provide factor-owners with a form of insurance by paying them a periodic income that is, at least to some extent, independent of production outcomes (Streller 1926: 176). In our formula Money – Commodity – Money', the Money (the costs) is advanced by the enterprise to the factor owners (or to other enterprises) at a time where the amount of the Money' (the revenues) is still uncertain. In this way, enterprises make possible the very existence of classes of wage, rent, and interest earners (Reisman 1996: 463). This idea was stressed by the classical economists in their wages fund theory but was forgotten by economists after the marginal revolution (Reisman 1996: 474; Braun and Howden 2017). To be precise, enterprises do not bear a universal form of uncertainty, but a specific type that arises only in the context of production for the market. In order to assume this risk, they must be backed by capital from which income can be paid without any guarantee of later recovery.

The heterogeneity of assets and the homogeneity of capital

We can depict the circulation of capital (see Figures 2.2 and 2.3) also by showing how the assets on the asset side of the balance sheet change constantly. At the beginning, that is, on the left side of Figure 2.4, the asset side only shows cash. Then it shows, successively, the inputs, the output, and then cash again. If cash' in the T-account on the right exceeds cash in the T-account on the left, the enterprise has made a profit (unless the increase in cash stems from external funds raised).

Figure 2.4 is obviously a simplification. It assumes that the enterprise starts and ends with only cash on the asset side of the balance sheet. Furthermore, the enterprise owns neither cash nor any claims or other intangible assets during the production process. I have chosen to include Figure 2.4 nonetheless in order to create a parallel to Figures 2.2 and 2.3. On the asset side, you can see the assets that the capital of the enterprise is invested in at each stage.

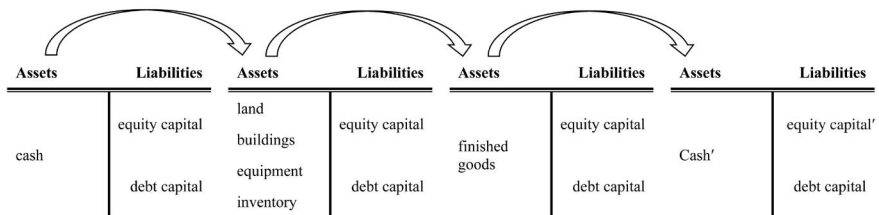


Figure 2.4 The circulation of capital on the balance sheet of a business enterprise

Figure 2.4 differs from Figures 2.2 and 2.3 in that it does not appear to contain labour or wages. As we have seen in Figures 2.2 and 2.3, enterprises use some of their capital to purchase labour services. Labour is missing on the balance sheets, of course, because Western societies abolished slavery in the 19th century, at the latest. Enterprises do not own workers anymore, and therefore workers do not appear as assets on the balance sheet. They cannot be capitalised. However, enterprises do pay wages to workers and the necessary funds stem from the liabilities side of the balance sheet (Vickers 1968: 105). They are paid out of capital. Furthermore, many products of labour actually appear on the balance sheet, as you can see in the third T-account from the left (Leitner 1926: 69). Products or finished goods are congealed labour, as Marx (1887) put it, and as such, labour can be capitalised. The book value of a bag of gummi bears on the asset side of an enterprise “contains” the costs – the wages – of the labour that was necessary to create it (Kosiol 1964: 87).

Figure 2.4 nicely illustrates the heterogeneity of the assets of an enterprise. A typical manufacturing enterprise owns various tools, buildings, estates, and other physical goods. These items are in no way homogeneous when it comes to their size, their weight, or any other physical measure. It is impossible to add them up physically in any meaningful way. We have seen in Section 1.2 that the Cambridge capital controversy ended with the neoclassical side accepting the fact that it is not possible to measure capital physically.

On the other hand, however, these assets are homogeneous – at least in a certain sense – *from the point of view of the financial interests of the enterprise*. After all, the assets side and the liabilities side are always in balance. They are of equal size. Figure 2.1 shows what that means. The assets and liabilities of an enterprise are homogeneous in that they are assigned monetary book values. In this way, enterprises can and actually do aggregate and compare the otherwise heterogeneous items on their balance sheet and perform economic calculations with them. For example, the enterprise prepares its balance sheet such that, at any moment in time, the sum of the book values of the assets is equal to the sum of the book values of the liabilities.

To illustrate this point, let us have a closer look at Figure 2.1. The enterprise owns various assets with a total book value of 87,000 euros. On the liabilities side, we see that it owes 37,000 euros to its creditors. From this, the enterprise can calculate that its current equity capital amounts to 50,000 euros. Equity capital is a mathematically determined residual that results from deducting debts from total assets owned (Leitner 1926: 37).

From this perspective, it appears as if John Bates Clark (1899) was right all along with his claim that capital consists of heterogeneous producer goods but can be measured in monetary units. And indeed, it cannot be denied that in actual business life, capital has both characteristics. However, Clark and later neoclassical economists also claimed that capital is a factor of production whose marginal productivity can be determined. This cannot be done.

Let us, for a moment, delay the question of what book values are and whether they somehow reflect a true or at least meaningful value of assets and liabilities. Even independent of this issue, it is not possible to extract the quantity of capital, understood as a factor of production, from business balance sheets.

Adherents to the view that capital is a quantifiable factor of production could argue, first, that it is possible to add up the book values of the assets on the assets side of all balance sheets in the economy and thereby to measure the amount of capital as a factor of production. This would fail, however, because there are many assets in balance sheets that cannot be counted as physical means of production. As we see in [Figure 2.1](#), intangible goods such as cash and accounts receivable (and, in some cases, patents and goodwill) can be assets, too. They would have to be deducted from the quantity of capital (as a production factor) because they do not contribute to physical production. Furthermore, some assets in balance sheets may be able to serve production in the future, but they do not now and it is not sure if they ever will. Think of lorries in the hands of a car dealer. They are business capital for the car dealer, but they only become means of production if another enterprise such as a logistics company purchases them and uses them productively. Can we be certain that this will happen? No! Not only may the lorries be unsaleable but it is also possible that private motorists decide to buy and drive some of them. In this case, these lorries are consumer goods and not means of production. Given the partly intangible, partly uncertain nature of business assets, it is impossible to measure physical capital or capital as a factor of production from the asset side of business balance sheets.

Since it is impossible to measure capital as a factor of production from the assets side, one could come up, second, with the idea of adding up the equity capital on the liabilities side of all balance sheets in the economy. In this way, one could argue, we would cancel out all debts on the liabilities side and, therefore, as their counterpart, all claims on the assets side, leaving only physical assets on the assets side. This does not work out, either. The assets side contains more intangible assets than only claims. Think of patents and goodwill. Furthermore, some obligations do not have a counterpart in other enterprises' balance sheets. Not all debts on the liabilities side are towards other businesses, and not all claims on the assets side are accounts receivable from other businesses. Often, enterprises lend to or borrow from non-enterprises such as private consumers or family members. Consequently, deducting debt capital from the liabilities side does not cancel out all claims, let alone all intangible assets. Last but not least, we have seen in the last paragraph that not all assets that appear to be means of production from a technological point of view are actually used in this way.

Although it is true that capital takes the form of all sorts of heterogeneous assets, some of them physical and productive, and although it is true that businesses assign book values to these assets so that they become homogeneous and subject to economic calculations, capital as found in business life cannot be used as a proxy for a factor of production of any sort. As we will see in the following chapters, the book values have nothing to do with physical productivity. Their purpose is to enable and facilitate the retrospective and prospective calculations of enterprises, not to measure the productivity of assets.

3 Economic calculation

3.1 Retrospective economic calculation

The distinction between retrospective and prospective calculations

Although private property, money, the rule of law, and other institutions are certainly necessary for the existence of capital and capitalism ([Mises 1949: 230](#)), in this book, I concentrate on the enterprise and the market. I have defined capital and explained its overall role in the enterprise in [Chapter 2](#). In this chapter, I focus on certain details of the economic calculations of enterprises that are relevant to understanding their role in the market economy. In [Chapter 4](#), I will demonstrate how calculating enterprises are coordinated on the market and solve the complexity issue presented in [Chapter 1](#).

In [Chapter 2](#), the book values of the assets in the balance sheet were mentioned several times. The nature and role of book values are very important, and how they are to be determined is a much-debated issue. [Littleton \(1935\)](#) summarised the problem at hand in the title of his paper: “Value or Cost.” According to [Littleton \(1935: 269\)](#),

[c]ost was the only basis considered in early accounting because the function of bookkeeping did not extend beyond an accurate recording of the receipts and disbursements of goods, services or money.

“Cost” is the path that we have been following so far. The formula $M - C - M'$ and the [Figure 2.2](#) relate to actual and realised monetary magnitudes: Money or M relates to the actual costs paid by the enterprise, M' or Money' to the actual revenues flowing to the enterprise. Profit is conceptualised as the difference between money revenues and money costs. No values or valuations are involved in this story ([Frankel et al. 2024: 122](#)). Adherents of the approach that Littleton calls “Cost” argue that accountants should put the costs of assets into the balance sheet. The book values of assets should basically be their historical costs. Financial accounting, in this view, is retrospective calculation.

There is, however, another tradition that Littleton summarises by the term “value.” Adherents of this approach claim that book values should reflect the

current market prices of the assets or, what is more or less the same, their *fair value*. One reason why I wrote this book is that I wanted to dig deeper into this question. In particular, I wanted to understand and explain the rationale of both historical cost accounting and fair value accounting from an economic perspective.

I save the discussion of fair value accounting and related subjects, such as the shareholder value maximisation concept, for [Chapters 5 and 6](#). We will see that this tradition does not really distinguish between retrospective and prospective calculations. It claims that the calculation of the results of past actions and the valuation of options for future actions can be based on the same magnitudes: current market prices. In my opinion, this view does not dovetail with the market process and has a rather destabilising effect on the economy.

If I compare, in this book, two different ways of determining book values, it should be clear that this can only be done on an abstract level. By making this comparison, we have to ignore the fact that the underlying systems of economic calculation do not exist in pure form in real life, are sometimes inconsistent, and overlap on some issues ([Ijiri 1967](#): 98). Still, there is a fundamental difference between the two systems “Value or Cost,” and in order to demonstrate this, I have to condense the many rules each calculation regime consists of into their decisive and distinctive basic idea so that we get the pure or “ideal typical” forms of the respective systems ([Müller 2014](#): 540).

In the present chapter, I continue the discussion of the approach that Littleton laconically called “cost.” In this line of thought, there is a clear distinction between retrospective and prospective economic calculations. The former is mostly concerned with documenting past actions of the enterprise and calculating their periodical financial outcome ([Kosiol 1964](#): 11). Since retrospective calculations are based on actual and realised expenditures and actual and realised revenues made by the calculating enterprise, they are, as far as possible, objective calculations. A profit determined in this way is supposed to be an actual monetary residual, of which the enterprise can now decide how to use it.

Since the purpose of prospective calculations is to prepare business decisions by the enterprise, most notably investment decisions, they cannot be based on past transactions and historical costs. As the future is uncertain, prospective calculations cannot be based on objective reality. They rely on subjective estimates, appraisals, or valuations that are supposed to help the enterprise make rational decisions. Both the variables that enter the calculations and the resulting valuations are necessarily subjective. The distinction between retrospective and prospective calculations is thus in the nature of things. We can see and touch the results of past transactions, but we can only speculate about the transactions that may or may not occur in the future.

Depreciations, indirect costs, and the calculation of profits

If we want to understand the approach that claims that book values should be based on historical costs, it is necessary to explain why we need balance sheets in the first place. After all, if the purpose of enterprises is to make money, why do they have

to make up the balance and determine the book values of their assets, their debts, and their equity? Would it not be enough to stay with the simple formula $M-C-M'$ and compare the Money' that an enterprise has generated over its lifetime with the Money that had been invested in it? This calculation would be very easy and, as [Rieger \(1928\)](#) stressed, absolutely correct. A look at [Figures 2.2](#) and [2.3](#) seems to confirm this point. Why bother with listing and evaluating all sorts of assets if we could just compare "Money revenues" with "Money expenditures?"

By extension, we could ask why we need the term capital. Could we not just make up a simple income statement where we compare the expenditures with the revenues? Why do enterprises bother to determine the amount of their capital? After all, the computation Money' minus Money does not appear to necessitate any further tools or concepts except for some basic bookkeeping.

It is important to understand that the whole edifice of financial accounting, including balance sheets and the determination of capital, becomes necessary once enterprises last longer than a few months or years. As long as enterprises were just one-time adventures, such as in early modern times when merchants joined together and sent cargo ships to foreign places, there was no need to prepare annual balance sheets ([Littleton 1953](#): 57). When and if the ships came back, the merchants liquidated the enterprise, repaired the ship, and divided the profits. In cases such as these, an income statement that contrasts the original expenditures with the ultimate revenues suffices.

Things change when enterprises are set up as going concerns without a definite date of liquidation. In modern capitalism, this is the rule. Some business ventures last longer than a human life. The Daimler-Benz corporation, for example, dates back to the 19th century. Most stakeholders of an enterprise are unable or unwilling to wait for their share in the profits until the enterprise is eventually liquidated. Not only the owners or shareholders, who live off dividends but also employees whose wages include bonuses have an interest in knowing the financial performance of their enterprise on a regular basis. Furthermore, managers need to know constantly how their departments perform both in an absolute sense and compared to other departments in order to make rational business decisions ([Kosiol 1964](#): 19). Finally, shareholders rely on periodic accounting performance measures as an indicator in deciding how much to pay managers in wages and whether to allow the same managers to continue stewarding their company ([Frankel et al. 2024](#): 5).

That is why going concerns started to report on their financial performance periodically, developed sophisticated methods of cost accounting, and set up yearly balance sheets ([Littleton 1953](#): 30). When it comes to cost accounting, one of the long-standing difficulties has been the allocation of indirect or overhead costs. The enterprise has to assign "indirect costs for purposes of departmental profitability analysis" ([Taylor 2000](#): 4). In order to find out whether the production of a certain kind of gummi bears is profitable, I not only have to know the revenues they create but also the specific expenses that were necessary to produce them. Since there are many costs in any enterprise that cannot be imputed directly to individual products, such as expenditures on insurance, administration, or rent for the business space, they have to be imputed indirectly. [Taylor \(2000\)](#) argues that cost accounting is

indispensable for determining and attributing profits correctly to those products and departments that caused them. But he also demonstrates that the process of developing proper methods of cost accounting is not easy and is still going on.

When it comes to the balance sheet, it is important to understand, as Eugen Schmalenbach ([1919] 1959) and Littleton (1953) have worked out, that the annual reports with their balance sheets are only auxiliary constructions. Balance sheets are only means to the end of determining profits. The overall income statement for the entire life of the business, comparing all money expenditures with all money revenues, is still the ideal in accounting. The balance sheet only becomes necessary if we do not want to wait but calculate our income periodically, even before the enterprise is liquidated.

If going concerns want to determine their income periodically every year, the problem arises that large parts of their expenditures during a particular year are on fixed assets. Fixed assets, such as large equipment and buildings, are usually not used up in the fiscal period in which they are acquired. For this reason, it does not make sense to put the expenditures on the purchase of fixed assets into the income statement and match them with the revenues of the current year. The sales of the products that the fixed assets help to produce may range over several years or even decades. If we want to know whether the expenditures on fixed assets were worthwhile, i.e., whether they created profits, we have to match them with the revenues that these fixed assets generate over the years of their employment (Frankel et al. 2024: 12). In actual practice, therefore, the costs of fixed assets are not matched with revenues on the income statement instantly. Instead, they appear on the balance sheet. They are *capitalised*. Accordingly, the balance sheet, which states assets and liabilities, has only a subordinate function, namely as a kind of store for the income statement (Schmalenbach [1919] 1959: 55; Penman 2007: 37; Schildbach 2009: 583). The expenditures on the assets that are depicted on the balance sheet are only imputed to the relevant revenues in the form of depreciations over time. Depreciations transfer the costs of the assets step by step from the balance sheet to the income statement, that is, they allocate past costs to present revenues (Chang 1962: 638; Kosiol 1964: 88; Schäfer 1980: 164).

According to the so-called *revenue-expense approach* to financial accounting, therefore, the assets side of the balance sheet contains the expenditures of the enterprise on assets as far as they have not yet been matched with revenues (Reisman 1996: 449). That is, the assets side shows where the *capital* of the enterprise is currently invested and has not yet been matched to revenues. The revenue-expense approach is the translation of the formula $M-C-M'$ to financial accounting. Chang (1962: 636) described the operations of enterprises as seen from the viewpoint of the revenue-expense approach in a way that clearly reminds one of Zwiedineck-Südenhorst's (1930: 1069) graphical extension of Marx's rather abstract formula:

Money – Buying goods and services – Converting goods and services into new goods and services – Selling new goods and services for more money than originally invested.

The revenue-expense approach relies on age-old accounting rules (Braun 2019, sect. 4.2). In the United States, it reached its epitome with the publication of Paton and Littleton (1940), which also stressed the importance of the income statement and relegated the balance sheet to a peripheral status (Dichev 2008: 455; Matessich 2013: 20).

It follows from the revenue-expense approach and from what has been said so far that book values of assets in balance sheets reflect past expenditures. Book values are not supposed to express the correct or true value of assets or to convey the size of their productive contribution. Assets appear on the balance sheet insofar as the money expended on them has not yet been matched with revenues. Their book value corresponds to these expenditures minus, in case, depreciations. This implies that the book value of a certain asset may vary considerably between enterprises. A ton of coal, physically identical, may have a book value of 130 euros in one enterprise and 100 euros in another one. It depends on the expenditures the respective enterprises had to make for buying or producing the coal and, in case, the depreciation rules applied so far.

By the way, the variance of book values for otherwise identical assets is another reason why we cannot add up assets across enterprises in order to determine the quantity of capital, understood as a factor of production. Capital is a magnitude that is determined not by objective physical characteristics of the assets, but by the economic calculations of a particular and singular enterprise. It is firm-specific and therefore not comparable across firms. In the terms of Liefmann (1916: 328), capital is equal to the sum of expenditures that an enterprise calculates in order to determine its profitability. Capital is “an advancing of costs” (Littleton 1953: 23). In the words of Schumpeter (1934: 179),

[c]apital provides the entrepreneur with the means of production on the market; and it is precisely this amount spent on the purchase of production goods that is also accounted for and used to measure success.

The relationship between capital and income

The economic calculations of enterprises follow the scheme M-C-M' even if their balance sheets at the beginning and the end of typical business years do not only depict money but all sorts of assets. The results of business operations in terms of actual and redeemable money are tracked in the income statement (Figure 3.1).

If products (or other assets) are sold for cash, their book values disappear from the assets side of the balance sheet and appear on the debits side of the income statement as expenses. Likewise, assets that wear off during the year are written down, that is, their book value is reduced in the balance sheet and the amount reduced is transferred as expenses to the income statement. The balance sheet, to repeat, is only a store for the income statement. It contains the expenditures on assets as long as they have not yet been matched with corresponding revenues. In the event that these assets are sold or used, their historical costs, documented in the balance sheet as book values, are partly or entirely transferred to the debits side of

Debits	Credits
expenses	revenues
profit	

Figure 3.1 The income statement

the income statement. The sales revenues, on the other hand, appear on the credits side of the income statement and the cash received appears on the assets side of the balance sheet.

What appears on the income statement, then, are, on the debits side, the costs of the goods that the enterprise sold or wore in the current business year and, on the credits side, the revenues that flowed from the corresponding business activities. In terms of Marx’s formula, one could say that the debits side contains Money and the credits side Money’. If revenues surpass expenses, the residual shows up as profit on the debits side (as in Figure 3.1; see also Baetge et al. 2017: 601). In the reverse case, it appears as a loss on the credits side.

With the help of the income statement from Figure 3.1, we are now able to drop the simplifications that we used in Figures 2.2 and 2.3, and particularly Figure 2.4. It is not necessary to assume that the enterprise starts and ends with only cash on the assets side. Instead, we can have a look at a going concern whose balance sheet contains at any time all sorts of tangible and intangible assets. In Figure 3.2, we see the balance sheet of an enterprise at the beginning (left sheet) and the end (right sheet) of a business year. The book values of all items have changed, which you can see from the inverted commas à la Marx in the right balance sheet. Depending



Assets	Liabilities	Assets	Liabilities
land	debt capital	land'	debt capital'
buildings		buildings'	
equipment		equipment'	
inventory		inventory'	
finished goods	equity capital	finished goods'	equity capital'
receivables		receivables'	
cash		cash'	
total assets	total liabilities	total assets'	total liabilities'

Figure 3.2 The balance sheet of a going concern

on what happened during the year, each item may have increased or decreased for various reasons. That is, we cannot look at the balance sheet and “distinguish cash derived from operating, from borrowing, from investing” (Littleton 1953: 35). Therefore, it would be difficult to determine profit from contrasting the two balance sheets. This is no problem, however, as the relevant expenses and revenues of each transaction have been transferred to the income statement that determines net income, that is, profit or loss (Figure 3.1).

Given this relationship between the balance sheet and the income statement, it is possible to clarify how capital and income interrelate in the economic calculations of enterprises (Littleton 1953: 23). Capital on the liability side of the balance sheet, encompassing debt and equity capital, is equal to the book value of all assets on the assets side. That is, the book value of capital is the sum of all costs that the enterprise has taken upon itself in order to produce profit for its owners or shareholders and that have not yet appeared on the income statement. It is the *Stamm*, the *caput* from which income flows, where income amounts to actual sums of money that owners or shareholders can withdraw from the enterprise without diminishing its capital. As long as income and capital are both denominated in money (Weber [1922] 1968: 87), and as long as the book values of assets relate to historical costs, the relationship between capital and income conveys an impression of how much investment was necessary to create a certain flow of income.

3.2 Prospective economic calculation

Economic calculation and decision-making

Until now, we have covered economic calculation only insofar as it concerns the determination of profits. Accordingly, we dealt with the results of past actions. The revenues and expenses in the income statement and the book values in the balance sheet all document and refer to past flows of money. The only element that may have contained a trace of speculation is the depreciations. To understand this point, let us have a look at durable producer goods such as factory buildings or melting furnaces. As these assets usually serve the enterprise for more than one period, expenditures on them are capitalised and appear on the assets side of the balance sheet. Over the years, these amounts are written off gradually and transferred to the income statement as expenses. However, as we do not know today for how long the factory building or the furnace will serve our enterprise, we are not able to determine the appropriate amount of annual depreciations. Any amortisation rule that we may choose is only approximately correct at best and therefore somewhat speculative. However, business practice has reacted to this problem by developing the principles of prudence and lower of cost or market. In order not to show and distribute excessive profits and, at the same time, not to burden the enterprise with high asset values in future periods, assets are usually written off quickly (Schmalenbach 1926: 178). In this way, business practice makes sure that the unavoidable speculative element of the otherwise retrospective economic calculations of capital and income does not lead to an overestimation of enterprise performance. One could say in other words

that business practice makes sure that the balance sheet only contains facts and not precarious hopes about the future performance of the enterprise.

But even if we ignore this potentially speculative element in retrospective calculations, it is important to stress that they are in no way irrelevant for managerial decision-making. Nothing could be further from the truth. First, profits determined on the basis of past data help going concerns to decide on the amount of funds that are free to be either re-invested in the company or withdrawn or paid out as dividends (Mises 1949: 212; Kosiol 1976: 75; Braun and Follert 2024: 5673). Without retrospective calculations, it would be unclear how much of the capital of the enterprise is free to be incorporated in its prospective calculations. Second, going concerns need to know how far their past decisions were successful and led to profits. Retrospective calculations condense the experience of former years into practical operating figures. Without the knowledge of the success and efficiency of their past decisions, enterprises will have difficulties projecting the success and efficiency of their current options. To give an example, if vegan, melon-flavoured gummi bears turned out to produce serious losses in the foregoing year, this is very important information for decision-making. It may overrule all future-oriented calculations and marketing studies that project high profits for this kind of gummi bears. Therefore, even retrospective economic calculation not only serves the evaluation of past performance but also helps to inform business decisions concerning the future.

However, enterprises do not make decisions based only or mainly on information about past events. They are obviously concerned with their future performance and must therefore ponder the probable future results and consequences of their current options. Before an enterprise is able to “perform” at all, it has to decide where it is to employ its capital. As Schumpeter (1939: 37) wrote, “[e]very businessman realizes that running his plant in the customary way, going through all the motions of daily business routine, is one thing and that setting up the plant or changing its setup is another.” The entrepreneur has to distinguish the remunerative lines of production from the unprofitable ones (Mises 1949: 230). Among the uncountable possibilities to invest capital, the enterprise has to choose those that appear to be particularly promising (Herbener and Rapp 2016: 7 f.). As Mises (1949: 215) noted, in an advanced capitalist economy, this cannot be done without sophisticated tools of economic calculation, either. The task of prospective economic calculation

is to adjust his [man’s] actions as well as possible to his present opinion concerning want-satisfaction in the future. For this purpose acting man needs a method of computation, and computation requires a common denominator to which all items entered are to be referable. The common denominator of economic calculation is money.

Prospective calculation becomes possible for the same reason as the retrospective calculations of capital and income. As enterprises are striving for monetary profits, they are able to reduce all assets and liabilities to the one common denominator of money. It is the one feature of these items that counts for them. So whereas

they match past expenses with past or present revenues in their retrospective calculation, they match expected future expenses with expected future revenues in their forward-looking calculations (Mises 1949: 230).

If we once more draw on the Marxian formula Money – Commodity – Money', retrospective calculation is concerned with the actual Money the enterprise has expended and the actual Money' it has received in the past. The spread it calculates between Money' and Money, that is, its profit, indicates the success of its past performance.

When it comes to prospective calculation, as it is necessary in investment and valuation, the enterprise has to decide between several possibilities of investing Money in order to generate Money'. In Figure 3.3, the enterprise may invest its capital in three different investment projects. Each is characterised by the formula M-C-M', that is, in each case, money has to be expended in order to generate revenues.

The “commodity” in the respective investment projects of Figure 3.3 may stand for actual commodities, as in commodity speculation, for entire production processes, as depicted in Figure 2.2 above, for mere financial assets such as in the investment in stocks or bonds, or for putting money into a bank. What is important from the point of view of the enterprise – and the reason why it needs to carry out economic calculations – is to know as much as possible about the prospects of these projects. Therefore, it needs to know whether the projects will yield profit at all and, if they probably do, how large these profits will be, when they will occur, and what risks and uncertainties will be involved. The enterprise will determine the “net present value” of the projects given the available data and its preferences for time and risk. By reducing the investment projects to a simple, monetary number that comprises the relevant data and preferences, prospective economic calculation provides a basis for decision-making. Usually, this kind of calculation is called “valuation.”

A brief side note on the terminology used in this book: “Present value” refers to the current worth of a future cash flow, discounted at a specific rate. “Net present value” extends this concept by subtracting initial investment costs from the total present value of future cash flows (Fuller 2013: 381). Net present value assesses an investment's profitability, considering both inflows and outflows.

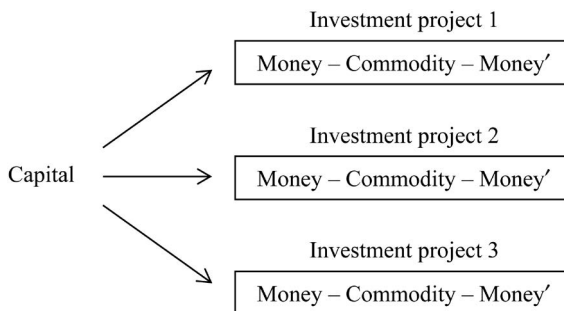


Figure 3.3 Deciding between several investment projects

Valuation and the important role of the rate of interest for debt capital

In prospective calculations, the enterprise does not employ *prices* that actually occurred in past transactions, but so-called *values*. These values concern future events that, for obvious reasons, are still uncertain in the present. As opposed to prices, values cannot be simply observed and noted down. They have to be appraised by the enterprise itself. The task of economic calculation in this respect is to determine the values of the different opportunities for action in due consideration of the goals and preferences of the enterprises’ owners or shareholders. On the basis of these valuations, the enterprise is able to decide between several investment projects on a rational basis.

The starting point of valuation is the consideration of the investor’s subjective decision field and his individual target system. The decision field considers the means of the enterprise that performs the valuation. According to [Olbrich et al. \(2015: 4\)](#), the subjective decision field “includes the actual endowment with goods and the subject’s overall opportunities to buy or sell goods in order to correspond to actual conditions of scarcity.” The individual target system reveals the will or ends of the enterprise or rather of its owners or managers. In particular, time preferences for consumption must be considered, including abstention from current consumption in favour of future consumption ([Olbrich et al. 2015: 3](#)). Based on these considerations, a decision value is calculated as the present value of the expected future net payment streams, that is, of future revenues and future expenses the investor expects from the investment, discounted by a certain rate of return, be it the rate provided by the best alternative use ([Follert 2023: sect. 2.1](#)) or the market interest rate ([Keane 1976](#)). The

decision value is the marginal value or concession limit of a subject in a particular decision problem. Otherwise, if a presumptive buyer (seller) is able to obtain a transaction price below (above) his decision value, he will gain wealth. As a result, the decision value is of central importance for a decision-maker. If this value is not known, a rational decision is impossible.

([Olbrich et al. 2015: 5](#))

The expected future payment streams of investment projects may look as in [Figure 3.4](#). The enterprise has 1,000 euros of liquid capital that it wants to invest. Given its current situation, three projects are open for investment. Each requires

	t ₀	t ₁	t ₂	t ₃
Investment project 1	-1,000	0	0	1,300
Investment project 2	-1,000	1,100	0	0
Investment project 3	-1,000	400	400	500

Figure 3.4 Expected expenses and revenues of investment projects

expenses of 1,000 in period t_0 and leads to (expected) revenues in the future. As you can see, the absolute amount of revenues and their temporal structure vary. The respective projects may also differ when it comes to the risk and variance of the revenues, but this is not depicted in [Figure 3.4](#).

If we now assume that the enterprise calculates with an interest rate of 10 percent, we obtain the net present values of the three investment projects by discounting the future cash flows to the present and deducting from them the current expenses:

Net present value of investment project 1: -23.29

Net present value of investment project 2: 0.00

Net present value of investment project 3: 69.88

Given the data available to the enterprise, project 3 turns out to be the most attractive one. Be that as it may, the important point is that by determining the net present value of the three investment alternatives in [Figure 3.4](#), economic calculation makes them comparable. They are all reduced to a homogeneous, monetary magnitude that relates to the objective of the enterprise. As the various investment projects have a common denominator, it is possible to make rational investment decisions, preferring those projects that have a higher net present value.

Of course, [Figure 3.4](#) is kept very simple. I have already mentioned that it does not contain risk. Furthermore, usually expenses will not be of the same size in different investment projects. Also, not all expenses will usually occur in period t_0 but will be scattered over the duration of the project. Likewise, some or even all of the revenues may already accrue in period t_0 . The principle, however, remains the same. The task of valuation is to calculate the present value of the expected future cash flows so that the enterprise is able to decide rationally between its investment options.

From the nature of the task of prospective calculation, it follows that its relationship to prices differs fundamentally from that of retrospective calculation. Whereas the latter accepts past prices as facts that it employs in the calculation of book values and profits, the former distrusts prices. When investors think about purchasing an asset (or an entire firm), they do not consider the prices of these assets (or the firm) to reflect their correct value. On the contrary, investors *compare* the market price of an item with the present value of the cash flows that they expect it to generate in the future ([Matschke and Brösel 2021](#): 13). From their perspective, the market price is the result of the valuations of other investors who might have different preferences, goals, information, and market power ([Matschke and Brösel 2021](#): 8).

This present value is an uncertain and subjective magnitude, a value judgement by investors ([Barton 1974](#): 678; [Stout 2016](#): 169; [Obermaier 2019](#): 335). The current market price reflects what is being paid by other investors, given the prevailing supply and demand ([Snively 1969](#): 349 f.). If an investor's prospective calculations determine the present value as being higher than the current market price, he will probably acquire the asset; if he calculates it as lower, he will probably sell it.

It is important to note that the reason why there are market transactions in the first place is that the subjective present values of assets differ from their current market prices. It is actually only because market prices do *not* reflect the “value” of traded goods that investors think that they can profit from buying and/or selling assets at their current market prices. The market is characterised by exchanges in which “it is precisely the *disparity in the* [subjective] *value attached to the objects exchanged* that results in their being exchanged” (Mises 1949: 205, emphasis added). Nobody would start investment projects if they were convinced that the market prices of the necessary input factors plausibly reflect the objective present values of the future cash flows that they will generate in the future.

4 The societal role of capital in capitalism

4.1 The role of retrospective economic calculation: coordination and equilibration

Capital-ism: Economic calculation and the market

So far, our analysis revolved around the Marxian formula $M-C-M'$. Enterprises try to profit from buying low and selling high. In their retrospective economic calculations, they employ monetary figures that stem from their transactions. By means of the tools of financial accounting, they determine their capital and their income and are therefore able to specify their profitability and certain other performance parameters. In their prospective calculations, they determine where they should invest their capital. They assess the expected cash flows of different investment projects and calculate their net present value so that management has a solid basis for making investment decisions.

In capitalist societies, most productive activities take place in enterprises according to the formula $M-C-M'$. Of course, there will always be production going on in private households or in non-profit organisations. However, these are, if not negligible, only islands of non-capitalistic economic styles in a world characterised by profit-oriented businesses. After all, even state-owned enterprises employ the modern tools of financial accounting in order to produce profitably or at least determine their efficiency in monetary terms.

The term “capitalism” reflects very well that capital-based and profit-oriented enterprises determine and guide the allocation, processing, and distribution of commodities in modern market economies. Almost all of the goods we own or use have once or several times appeared on the assets side of business enterprises and have thus been part of these enterprises’ capital. It is mainly profit-oriented enterprises that combine the factors of production and control the production process; it is mainly profit-oriented enterprises that transport commodities to their final destinations; it is mainly profit-oriented enterprises that sell us the goods and services of daily living; and it is mainly profit-oriented enterprises that pay us our wages or other forms of income. Business enterprises and their profit-oriented economic calculations are at the heart of our economic system. *Capitalism is where the utilisation of the resources of society is determined in the name of capital interests.*

At this point, it is important to remember that the institutions of capitalism are not autonomous but interrelate. True, business enterprises are of paramount importance for capitalist societies. Yet, it is very important to understand that, viewed in isolation from other institutions, the economic calculations of enterprises make much less sense, if they make sense at all. Outside the context of markets and the money price system, there is not really a reason to account for capital. We can understand the central role of enterprises only if we realise that they are part of the institutional framework of capitalism.

Importantly, business enterprises and their calculations presuppose the existence of money. Money is the one good that (almost) everyone needs in capitalist societies in order to survive and thrive. That the economic calculations of enterprises are actually monetary calculations can be explained and understood based on this fact (Mises 1949: 209). Making money is a foundational necessity in capitalism. It only makes sense to set up a profit-oriented enterprise that calculates in money because in capitalism all stakeholders of the enterprise – shareholders, debtors, employees, etc. – need and want money to make a living. In societies where many or most people do not receive their income in the form of money – for instance, in the European Middle Ages with its in-kind wages (Claridge et al. 2024) – the business enterprise is not a pervasive phenomenon but mostly restricted to the areas where money is in use, for example, to the towns and fairs.

So far in this book, we have concentrated on individual enterprises. It is not difficult to understand why it makes sense that they try to make money and why they calculate in money. It is necessary from the subjective point of view of their stakeholders who live in capitalist societies. Their need for money appears in the costs of the enterprise, for example, in the form of wages and rents, and in the withdrawals of its owners or shareholders.

The fact that the stakeholders of enterprises need and want money does not explain, however, why the enterprise is an important or helpful institution from a *societal* point of view. Why does it make sense that self-interested, profit-oriented entities determine the utilisation of resources for all of us? So far, we have not explained the rationale of capitalism itself. The argument that each individual enterprise organises the production process inside its boundaries according to the standard of monetary profit does not explain if and why the economy as a whole produces anything useful. Profits are determined mainly by the input and output prices. It is in no way clear that these prices are helpful or relevant when it comes to the economy-wide allocation and use of resources at the hands of enterprises.

This is where another important relationship between enterprises and other capitalist institutions comes into the picture. The numerous business enterprises in capitalist societies not only presuppose the existence of money. They all operate on the *market*. They buy their input and sell their output on the market, they compete with each other on the market, and they acquire financial resources on the market (Leitner 1926: 99). In every nook and cranny, they are connected to the market and, therefore, limited by its terms and conditions.

The market is the institution where the actions of profit-oriented enterprises tend to be aligned with the general interests of society, which means, in economists'

terms, with the interests of consumers. Bernard Mandeville expressed the important role of the market in the catchy subtitle of his famous Fable of the Bees: “Private Vices, Publick Benefits.” The bees in his grumbling hive are sinful and egoistic and engage in squandering. The hive as a whole thrives, however, because as long as the “bees” spend money, producers have full order books. In this way, even

[t]he worst of all the Multitude/
Did something for the Common Good.

(Mandeville 1724: 9).

Mandeville anticipated Adam Smith’s idea of the invisible hand. When Smith formulated his metaphor in his seminal book on the Wealth of Nations, he dropped Mandeville’s focus on immoral consumer behaviour and concentrated on entrepreneurs’ striving for profit, but he retained the general idea (Braun forthcoming b). Public benefits, according to Smith (1776: book 1, ch. 2), do not depend on the “benevolence” of entrepreneurs but on “their regard to their own interest.”

The invisible hand is arguably the most important metaphor in economics. Since the 18th century, the idea that society benefits when business enterprises maximise their profits in a free-market environment has been a foundational proposition in economics. In the words of Adam Smith (1776: book IV, chapter II) himself, each individual “intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.” The market miraculously transforms egoistic behaviour into behaviour that benefits society as a whole. Any current standard microeconomic textbook demonstrates that the idea behind the metaphor continues to guide economic thinking to the present day. Typically, the supply schedule is derived from profit-maximising firms, and the demand schedule is derived from utility-maximising consumers, but the market miraculously achieves that the interactions between these two self-interested groups lead to a world of zero profits and maximised consumer rents (see e.g., Varian 2020).

The invisible hand argument consists of two elements: the egoistic individuals on the one hand and the market that coordinates them, independent of their own intentions, on the other. In the preceding chapters, we had a look at the individuals. When Adam Smith talked about egoistic individuals, he was particularly referring to entrepreneurs who found business enterprises in order to make money. They provide us with our daily necessities, but not because they somehow like us but because they want to employ their capital profitably. The harmonisation of the actions of the various, profit-oriented enterprises with regard to the allocation of the resources in society is what tends to happen on the market – the second element of Smith’s invisible hand argument (Drewes 2019: 93 f.). It is the topic of the present chapter.

The tendency towards equilibrium

The uncertainty that accompanies the market operations of an enterprise (see Section 2.2) has two aspects. First, at any point in time, it is not self-evident whether the enterprise has operated profitably in the past, that is, if it has generated a positive

return on its capital that could be distributed or re-invested. Second, the enterprise has to determine which investment projects are to be started or continued, that is, it has to decide if and where to invest its capital in order to generate profits in the future. Both problems cannot be dealt with rationally without the tools of economic calculation, and it is obvious that both retrospective and prospective calculations are important in this.

But let us return to the problem raised above. The question is why it makes sense that egoistic, profit-oriented business enterprises that only think in money terms determine the allocation of resources and the distribution of income in capitalist societies. Economists argue traditionally that it is the invisible hand of the market that coordinates the actions of enterprises in the best interest of consumers. But how does the market do so and, more importantly for us, what role does economic calculation play in this story?

In the following discussion, I devote considerable space to the discussion of retrospective calculation. One important reason for this is Yamey's (1949; 1964) famous claim that financial accounting has not been too important for the development of capitalism. Yamey explicitly opposed Werner Sombart and downplayed the role of double-entry bookkeeping. His main argument was that historically, balance sheets used retrospective figures, i.e., historical costs, and *for this reason*, accounting cannot have been of much help for business people. Yamey's (1964: 12) main argument is worth quoting at some length:

Thus when the business man expresses himself most emphatically as entrepreneur, he is necessarily without benefit of accounting records pertaining to past events and experiences. It is indeed surprising that the role of accounting calculation should have been underlined by Sombart and others as a partial explanation of economic developments in which departures from customary modes of behaviour and the exercise of entrepreneurship were deemed to be crucial. Insofar as the early centuries of capitalism can be characterised as a period of dynamic change from a static base – itself a dangerous simplification – one would have to discount heavily the contribution made by systematic accounting or accounting calculation.

What I do in the following, therefore, is demonstrate the important role of financial accounting and double-entry bookkeeping in the market process, as hypothesised by social scientists such as “Sombart, Weber, Mises, and Schumpeter” (Waymire and Basu 2007: 18), even if historical costs are used. I am going to argue that the role of retrospective calculation – particularly financial accounting and the income statement – is to create or at least amplify the equilibrative tendencies of the market (Braun and Follert 2024). These tendencies are at the heart of Israel Kirzner's theory of the entrepreneur. According to Kirzner ([1973] 2013), the most important feature of entrepreneurship is the alertness to so far unexploited opportunities to profitable actions (Shaffer et al., 2000: 127). Kirzner emphasises the entrepreneurs' ability to discover profitable opportunities already existing but not detected. Entrepreneurs exploit these opportunities and thus make them disappear.

In more technical language, we could say that the entrepreneur spots disequilibrium and generates a tendency towards equilibrium.

Kirzner, as a member of the Austrian School, starts from Mises who argued that entrepreneurs profit from finding gaps in the price structure. Mises (1949: 353) wrote:

[T]he activities of enterprising men, the promoters and speculators, eager to profit from discrepancies in the price structure, tend toward eradicating such discrepancies and thereby also toward blotting out the sources of entrepreneurial profit and loss.

Kirzner (1997: 68) concurs, arguing that entrepreneurs benefit from disequilibrium situations because these create opportunities for pure profit. The opportunities for pure entrepreneurial profit are created “by temporary absence of full adjustment between input and output markets” (Kirzner 1997: 69).

A very important point in Kirzner’s theory of the entrepreneur is his insistence that entrepreneurial activities tend to bring about equilibrium. Entrepreneurs discover price spreads in the economy and, by exploiting them for profit, reduce these spreads and thereby help to allocate resources better.

The daring, alert entrepreneur [...] buys where prices are “too low” and sells where prices are “too high.” In this way low prices are nudged higher, high prices are nudged lower; price discrepancies are narrowed in the equilibrative direction. Shortages are filled, surpluses are whittled away; quantity gaps tend to be eliminated in the equilibrative direction. [...] [T]his entrepreneurial process cannot guarantee rapid (or slow) convergence to a state of equilibrium. But it does at each moment guarantee profit-incentives tending to nudge the market in what, from the perspective of that moment, must be recognized as the equilibrative direction.

(Kirzner 1997: 70)

It is important to note that financial accounting in the tradition of the revenue-expense approach determines profits in a way that dovetails with Kirzner’s theory of entrepreneurial activities and their equilibrative tendency. As we have seen in Section 3.1, the income statement shows profits whenever and wherever the respective enterprise has detected a price spread and has consequently managed to buy low and sell high. *Financial accounting organises the cash flows entering and leaving the enterprise in such a way that the income statement reflects the extent to which the enterprise has contributed to steering the market towards equilibrium.*

From the point of view of Kirzner’s theory of the entrepreneur, this procedure makes sure that positive profits are only shown when and if the respective enterprise has managed to detect gaps in the price structure. Economic calculation in the form of the revenue-expense approach to financial accounting makes sure that enterprises are rewarded when and if they contribute to creating a tendency towards

equilibrium. The larger the price spread they have detected, the larger is their contribution to equilibration and, likewise, their profit or net income. Profit, as determined by retrospective economic calculation, thus turns out as an important signal for the coordination of human action in capitalist societies (Boettke 1998: 135).

What does this mean? We have seen above that production takes place overwhelmingly within business enterprises. They coordinate the factors of production, allocate resources, and distribute income. However, since they still have to buy and sell input and output on the market, they are severely constrained in their actions. In fact, the market more or less tells them what to do. Through their retrospective calculations, they are able to tell whether the market punishes or rewards them. By determining their profits according to traditional financial accounting, they are incentivised to find gaps in the price structure and thus contribute to a tendency towards equilibrium. In this way, they either produce what the market and, ultimately, the final consumer wants – or they generate losses and ultimately steer towards bankruptcy. It is retrospective calculation that helps to align the complicated structure of production to consumer demand (Boettke 1998: 135).

The enterprise in the market

Production takes place overwhelmingly within business enterprises. They coordinate the factors of production, allocate resources, and distribute income. As we have seen, they do so because they want to make profits. The enterprises themselves, however, are coordinated by the market. By buying low and selling high, they play into the (invisible) hands of the market. They fill the gaps in the price structure.

In this subsection, I am going to show in more detail how the market and financial accounting dovetail in the organisation of the societal production process. The complicated structure of production, presented in Section 1.1, is aligned with consumer demand by enterprises that determine their profits based on classical income statements and compete for these profits with other enterprises on the market.

Obviously, in real life, retrospective economic calculations never occur in isolation from prospective calculations. Before the profit of any undertaking can be determined, it must have been chosen by entrepreneurs or managers, and this decision is commonly based on some kind of valuation. To a certain degree, the purpose of retrospective calculations is to check the validity of the prospective calculations that the business actions were based upon. In order to isolate the role of retrospective accounting, that is, financial accounting according to the revenue-expense approach, I assume in the following that consumer demand and technology are given and do not change. In the next section, this assumption will be dropped. The assumption is useful at this point because what I want to do is to explain the relationship between financial accounting and the tendency towards equilibrium when it comes to the entire structure of production. By assuming that consumer demand and technology are constant, I am able to keep track of this tendency without the constant interruptions that result from changes in consumer demand, innovations, and similar market data.

Of course, this assumption implies that there is no entrepreneurship in the Schumpeterian sense. No enterprise breaks out the factors of production from their

previous uses and dedicates them innovatively to new production processes in order to meet previously entirely unsatisfied or even unknown consumer demand. However, it is important to note that even under this assumption, enterprises are not stuck in their current places in the economy. They may still imitate other, more successful businesses. The point is that through the income statement, financial accounting informs the public about the profits of the respective enterprises. If there should happen to be a higher return on equity (ROE) in certain areas of the economy or through certain (known) technological or organisational arrangements, other enterprises will tend to enter this market or imitate certain features of their successful competitors (Schumpeter [1942] 2008: 90). Profits play an “essential role” in the market economy “by guiding entrepreneurs in their actions” (Huerta de Soto 2024: II, 175). They act like a “magnet” (Huerta de Soto 2024: I, 48). As Vyas (2005) demonstrates, imitation is a viable and successful strategy among actual enterprises.

Let us start our observation of the structure of production by focusing on enterprises that produce consumer goods. It is obvious that these enterprises depend on the consumers if they want to make monetary profits. The left side of Figure 4.1 simplifies, but otherwise replicates Figure 2.3. The enterprise expends its money on wages, rent, and interest ($w + r + i$) and on different assets. It arranges the different input factors in order to produce consumer goods that it sells on the market, thus creating revenues. It is obvious, however, that an enterprise producing consumer goods such as, say, gummi bears is not free to charge any price to consumers. It has to sell the bears on the market, and therefore it is limited by the consumers’ willingness to pay. Only when it succeeds in selling its gummi bears does it receive revenues that it can match with its expenses in order to determine profits. The dashed arrows on the right side show the cash flows from the consumers to our enterprise. Revenues are generated if and when consumers actually pay for the gummi bears provided by the enterprise.

Whereas the enterprise has more or less direct control of the relationships that exist within its boundaries – particularly the combination of input factors – it

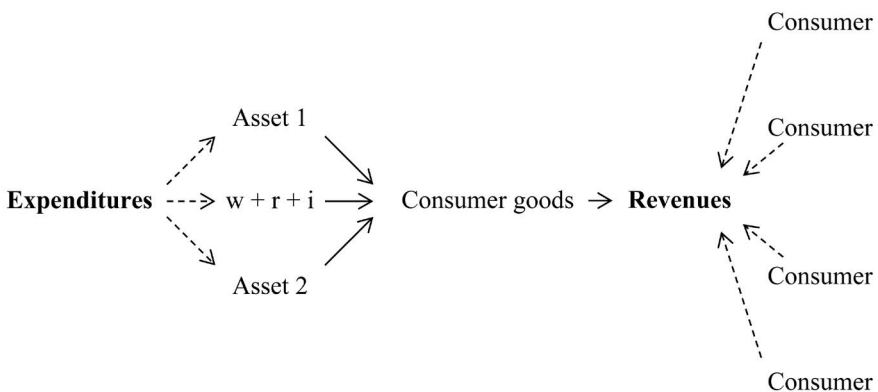


Figure 4.1 The importance of final consumer demand

depends on the whims of the market when it comes to its relationship with its customers. In particular, each customer is free to switch to a competitor or to stop purchasing the product at all. Therefore, the enterprise is not only limited by the demand of the consumers but by its competitors as well that also offer gummi bears or some substitutes.

As long as there is competition, consumers do not have to buy gummi bears from me. They may purchase them from one of my competitors. Figure 4.2 shows that if there are two enterprises offering gummi bears, consumers have the choice of where they want to buy. The enterprises basically compete for the revenues that can be made on the market. As a consequence, they will either improve the quality of their product and their services, if that is possible given the state of technological knowledge, or they will reduce their prices, or both. In any case, the more active the competition, the more incentivised enterprises will be to fulfil consumer demand better or cheaper. Therefore, revenues will tend to decrease and profits will go down.

The enterprise has to please consumers if it wants to make profits. However, the enterprise will also pass on the constraints it suffers from to the suppliers of its inputs. The smaller the output prices become, the smaller profits will become and, accordingly, the smaller the costs that the enterprise will be able to afford if it wants to stay profitable. In order to make profits, it must pay attention to keeping the expenses below the revenues. It is in this way that the market tends to force self-interested and profit-oriented agents to act in the interest of its customers and to pass customer wishes to their suppliers.

However, enterprises are not able to bid down the prices of their input factors at will. Here again, they are limited by the market, i.e., other enterprises. If we remain in our example, the two enterprises in Figure 4.2 not only compete for consumers but they also compete in the buying market for asset 1, asset 2, and land and labour.

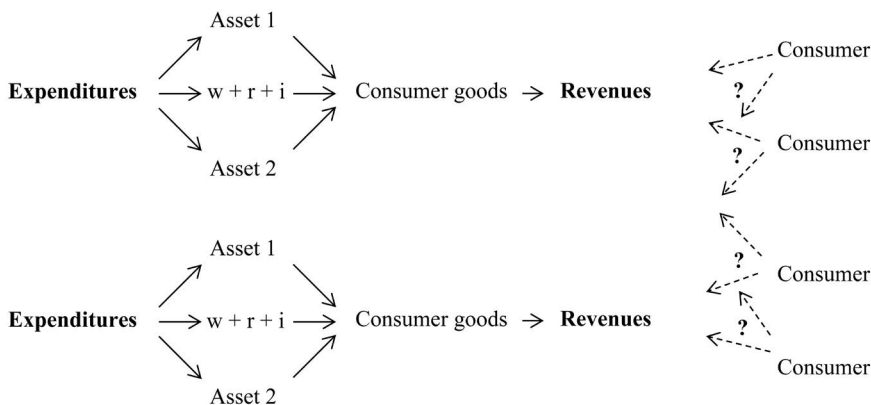


Figure 4.2 Competition for consumer demand

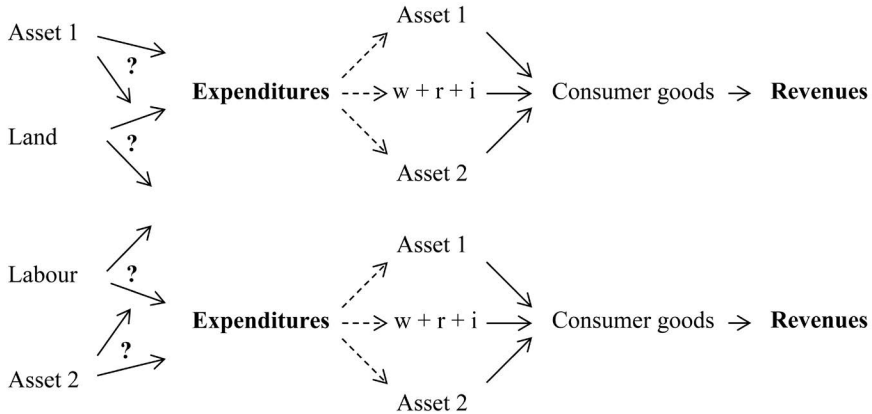


Figure 4.3 Competition for input factors

Figure 4.2 are able to choose between several suppliers of gummi bears, the suppliers of assets, land, and labour are able to choose among several demanders of their goods and services.

Figure 4.3 contains the relationships between the enterprises and the different markets for input factors. The enterprises have to purchase their assets, land, and labour on the market (dashed arrows on the left) and the owners of these factors cede their assets or services to the enterprises (solid arrows on the left). Again, all relationships between the respective enterprises and outward parties are subject to constraints. The factor owners may not want to fall below certain reservation prices, for whatever reason. Furthermore, there will most certainly be competition for the factors. Both enterprises in Figure 4.3 need asset 1, asset 2, land, and labour. The suppliers of these factors can choose to whom they want to sell, and obviously, they will tend to sell to whoever bids more. The terms and conditions for the exchanges between an enterprise and its external suppliers are not determined by itself, but by competition in the market.

The same holds vice versa, of course. Also, the enterprises producing assets 1 and 2, and the owners of land and labour are limited by the market when it comes to selling their goods and services. In the same way as our enterprise in Figure 4.2 was limited by consumer demand and the behaviour of its competitors, more upstream enterprises and other factor owners are limited by the demand of more downstream enterprises and by their competitors.

The market affects the enterprise wherever it embarks in contractual relationships that concern the acquisition or sale of inputs and outputs. There is even more. The amount of expenses that an enterprise may be able to make depends on the market as well, namely the market for capital. Debt capital and, depending on the form of business organisation, equity capital are often acquired on the capital market. In these cases, the enterprise is limited by the market discipline represented by the interest rate, risk premiums, and collateral.

To all intents and purposes, the market surrounds and constrains the enterprise. It may be true that profit-interested business enterprises allocate and distribute societal resources in capitalism. However, they are not in any way free to do whatever they want. The invisible hand of the market forces them to produce goods and services that tend to be in the best interest of consumers. *One could say that in capitalism, capital organises the use of resources but the market determines where capital can be employed profitably.* It is therefore quite apt that the terms “capitalism” and “market economy” are often used synonymously. Each refers to one of the two constituting institutions of this economic system: capital and the market.

The individual enterprise determines its profits by employing the revenue-expense approach. By so doing, it is rewarded for finding gaps in the price structure that allow it to buy low and sell high. High profits attract competition. Through imitation, other enterprises are drawn to the areas of the economy where the consumer demand is not yet entirely satisfied. Enterprises will invest their capital in the profitable lines of business and thus bid down output prices and bid up input prices. They will do so as long as their economic calculations still show a certain amount of profits, that is, as long as expenses are still lower than revenues.

The law of one rate of return

Capital in the sense of the third tradition, presented in the foregoing chapters, is not a factor of production. It cannot be measured meaningfully on an economy-wide level and it cannot be used to illustrate or explain the physical productivity of produced means of production such as tools or machines. However, it lends itself naturally to an explanation of why the rate of return on capital tends to be the same for all assets, all sectors, all industries, and, at least to a certain extent, even all countries. This was requirement 3 in [Section 1.2](#). Whereas there is no overall rate of wages, expressed as a percentage share of labour, nor a rate of rent, expressed as a percentage share of, say, estates, there is a rate of return expressed as a percentage share of capital.

Since most productive activities in capitalism take place within business enterprises, they are subject to the economic calculations of profit-oriented entities – that is, they are supposed to yield a profit. It is the reason why business enterprises engage in the production of goods and services. They want to earn a yield on their capital.

Furthermore, we have seen that, in capitalism, the market constrains business enterprises on all sides and tends to force them to expend their capital in the best interest of consumers. If they want to make a profit, they are not free in their actions but are guided by the invisible hand to those areas in the economy where profits can be made. These areas are those where, eventually, a consumer will purchase the final product and thus provide the justification for the investment. In capitalism, enterprises tend to arrange and synchronise such that they produce what meets a ready sale on the market. It is because they want to maximise the spread between their expenditures and their revenues that they invest their capital in the best interest of consumers.

And here we are at the root of the matter. In the retrospective economic calculations of enterprises, all assets and input factors are relevant only insofar as they are associated with past or current expenses. It is only as expenses that they enter the calculation of profits. In this sense, they are homogeneous. As Mises (1951: 123) said, economic calculation brings “the original properties of a concern under one denomination.” No matter whether an enterprise invests its capital in tangible or intangible assets, no matter whether it purchases land, buildings, vehicles, machines, securities, patents, or labour services – in any case, these investments are expenditures that are supposed to generate revenues (Schumpeter 1934: 166). Some of the expenditures can be imputed to specific products directly, others only indirectly; some end up in the income statement instantly, others are stored in the balance sheet, but they are homogeneous in that they are denominated in money and that enterprises undertake them because they hope that they will yield a profit.

Accountants are able, by means of the tools of economic calculation, to determine not only the profitability of the enterprise as such but also of the various individual expenditures made by the enterprise (Mises 1944: 32). If certain departments, assets, or employees turn out in retrospective calculation to produce no profit or even to generate losses, management may restructure the enterprise or even divest itself of unprofitable assets or persons. Conversely, management will expand outstandingly profitable sections of the enterprise. In this way, otherwise incomparable assets and employees are in competition with each other for funds spent by their enterprise. Naturally, under our assumption that the economic data does not change, capital will flow where it yields higher returns and flee those sections where it yields less or even nothing. Consequently, there will be a tendency for the rate of return to harmonise across the various sections of an enterprise. That is, even within individual business units, there is a tendency for capital to yield a uniform rate of return.

The same logic applies to the economy as a whole. Capital flows where profits can be made and flees from the areas where losses emerge. Of course, many assets cannot move easily from one section of the economy to another. An existing melting furnace cannot be transformed into data processors when the latter happen to be more profitable. However, enterprises can stop spending their liquid capital (or cash) on melting furnaces and instead invest it in the production or acquisition of data processors. Therefore, there is a tendency for enterprises to enter profitable lines of business and to leave unprofitable ones, which causes a convergence of the rates of return (Mueller 1986: 8).

For the “mechanism” that channels capital into the most profitable lines of business, the distinction between equity and debt capital is very important. Interest on debt capital is a contractual income. It is expressed as a fixed percentage rate from the outset (Fetter 1977: 275). Therefore, interest income cannot be increased fundamentally by re-investing debt capital in a different line of business. True, lenders of debt capital will try to lend to enterprises that appear to be capable of servicing their debt and repaying the loan at maturity. In this way, they do have some influence on the allocation of capital. In the end, however, it is enterprises that determine where capital is invested, including both their equity and debt capital. For

them, interest payments on debt capital are costs. They are only willing to borrow debt capital and pay interest because they want to generate profits on their equity capital. Profits, for their part, are not a contractual income. Other than interest on debt capital, they can actually be increased by reallocating capital into different departments within the enterprise or different areas of the economy. Therefore, it is the interests of equity capital, not of debt capital, that determine where capital flows in the economy. Interestingly, even the lenders of debt capital, such as banks, act according to the same principle. By lending capital to businesses, they also want to maximise the return on their proper equity.

Obviously, the owners and managers of equity capital will try to withdraw their funds from less or even unprofitable departments and lines of business and transfer them to above-average profitable places (Boulding 1955: 503). Other things equal, wherever the rate of profit is higher, investors tend to invest additional capital. This tendency will lead “*toward the establishment of a uniform rate of profit on all capital invested in all the different branches of industry*” (Reisman 1996: 172, emphasis in the original).

In order to understand this tendency towards one uniform rate of return on capital, we have to be clear on why exactly we are talking about a “rate” here. When we say that enterprises try to make high profits, we are not only talking about the absolute amount of profits. Sure, *ceteris paribus*, a higher absolute amount of profits is always preferable. However, when it comes to determining which enterprise and which line of business is more profitable, the respective absolute amounts of profits are not very helpful. It is not really meaningful to say that a certain enterprise made a profit of 1 million euros in 2025. Whether that is a good or a bad number depends on the equity that has been invested in the business in order to make this million. If the equity capital of the enterprise is 1 million euros, its ROE is 100 percent. If its equity is 1 billion, its ROE is 0.1 percent, which is a huge difference. If we want to determine where to put our capital, what is important is this percentage number, i.e., the profitability, the profits in relation to the invested equity capital (Leitner 1926: 65; Boulding 1955: 495; Braun forthcoming a).

When it comes to clarifying why it is important to relate profits to equity and therefore focus on the “rate” of profit, we must add that the ROE refers to a specific period of time, commonly one year. We all know this from our bank accounts. An interest rate of two percent is short for two percent *per year* on our savings. A ROE of five percent, then, means that the profit, i.e., the difference between revenues and expenses over one year, amounts to five percent of average equity capital. The ROE in 2025 for a certain enterprise is:

$$ROE = \frac{revenues_{2025} - expenses_{2025}}{average\ equity\ capital_{2025}}$$

Accordingly, there is no tendency towards a uniform absolute amount of profits. Competition will not erase the fact that larger enterprises with more equity will usually make more absolute profits per year than smaller ones. However, competition will have a tendency to eradicate above-average and below-average *rates*

of profit. If it is possible to make 20 percent ROE per year in the semiconductor industry and only 2 percent in the timber industry, capital will leave the latter and flow to the former (Rothbard [1962] 2009: 351). Note that this will happen even if the absolute amount of profit happens to be higher in the enterprises of the timber industry.

Now, what will be the rate of return in equilibrium? According to Mises (1949: 287), “there are neither money profits nor money losses” in equilibrium. However, this does not mean that the ROE will fall to zero. Irrespective of the intensity of competition, the providers of equity capital will not accept going without profit at all. Even in equilibrium, therefore, the ROE will stay above zero. What Mises means is that there will be no income from capital above what he calls “originary interest” (Rothbard [1962] 2009: 734). In brief, originary interest is the equilibrium spread between the prices of output goods and the sum of the prices of the factors of production employed in their production (Braun 2011: 179). According to many economists of the Austrian School, it is a fundamental aspect of human action that originary interest must always stay positive. To put it in a nutshell, people would not act, i.e., they would not incur costs if they did not expect that the results are worth more to them than the costs. Fetter (1977), Mises (1949), Rothbard ([1962] 2009), Hülsmann (2002), Braun (2011), and others have dealt with this issue in depth. In any case, Mises’s statement that there are no profits in equilibrium must not be misunderstood as implying that the ROE would be zero percent. If that were the case, there would be no equity capital in equilibrium. Nobody would provide or invest equity if ROE were zero. Instead, in equilibrium, the ROE is equal to the rate of originary interest, and “the rate of originary interest is the same for all commodities” (Mises 1949: 523).

It seems somehow odd that we have talked about a uniform rate of return without including the interest rate on debt capital. After all, in actual business life as we observe it on a daily basis, there is no such thing as a uniform rate of profit (Rothbard [1962] 2009: 511). Profits oscillate more or less unpredictably and, as we all know, may turn negative for some businesses while they obtain record highs for other businesses at the same time. It is rather on the loan market that we are able to actually observe a pretty uniform rate of return, namely the rate of interest. Why did we not start from this interest rate? In this case, we could have said that equity capital will flee those areas in the economy and those enterprises that produce an ROE below the interest rate and flow to those where the ROE is higher than the interest rate. For example, if the interest rate on debt capital is five percent per year, the providers of equity will want to see an ROE of at least five percent per year. Therefore, they will enter those lines of business where the ROE is still above five percent. Furthermore, they will borrow debt capital at five percent a year and invest it in these lines until ROE is down to five percent as well.

However, as its name indicates, originary interest is prior to the rate of interest determined on the loan market. As I said above, if existing enterprises expand and if other enterprises enter a certain line of business, it is because they want to exploit an above-average ROE. The tendency towards one rate of return is therefore caused by enterprises competing for the best places in the economy to earn profits

on their equity capital. In this process, debt capital is a passive element (Fetter 1915: 312). “The loan market does not determine the rate of interest. It adjusts the rate of interest on loans to the rate of ordinary interest” (Mises 1949: 524).

The reason why we cannot observe a uniform rate of profit in real life, not to mention an adaptation of the interest rate to the rate of profit, is that the market data changes constantly. Every moment, new information, new ideas, and new events influence supply and demand and therefore cause unpredictable price fluctuations. Some enterprises will profit from these changes while others will be impaired. Accordingly, the tendency towards one rate of profit is constantly interrupted. The same is not the case for the rate of interest. It is not that changing market data does not influence the interest rate. It obviously does. As opposed to profit, however, interest is a contractually fixed price. While there is no market that determines the rate of profit, there are markets that determine the rates of interest on the various forms of debt. Therefore, the rates of interest are subject to the law of one price. Even if times are turbulent and market data changes rapidly, the loan market still coordinates supply and demand and determines a uniform rate of interest for each kind of loan or debt instrument. In addition, once an enterprise has raised a credit, the interest rate on it is fixed for a considerable amount of time. Both on the individual and the societal level, the rate of interest is rather uniform and stable.

The reason that we observe a uniform rate of interest but not a uniform rate of profit is therefore that there are markets that determine interest rates but no market that determines the rate of profit on a daily basis. However, under our assumption that market data is constant, a uniform rate of profit will manifest itself eventually. And it is clear that in the market process that brings this rate about, debt capital will flow where it can be employed to increase profits on equity. It is the passive element that follows equity, not the other way around.

The ordering of the structure of production

I have depicted the interplay of profit-oriented enterprises and the market in organising the societal production process in Figure 4.4, adapted from Braun (2017). In this figure, all enterprises determine their profits according to the revenue-expense approach. On the right-hand side, we see an enterprise that sells its product to the final consumers. It does so because it hopes that its revenues will surpass its expenditures. As we have seen above, the price the enterprise can obtain is limited since it competes with other enterprises. (These other enterprises are not part of Figure 4.4 since it would become too complicated otherwise.)

At the other end, the enterprise raises capital (for interest r), purchases the services of labour (for wages w) and various assets (for rent r), and acquires the assets 1 and 2. Its willingness to pay for these input factors is limited by what it can receive as revenues from selling to the final consumers at the prevailing market prices. Furthermore, as other enterprises will compete for these input factors as well, their prices will be bid up. If competition is strong, the amount of total expenses will converge to the amount of total revenues, where the expenses include the cost of debt capital, that is, interest payments.

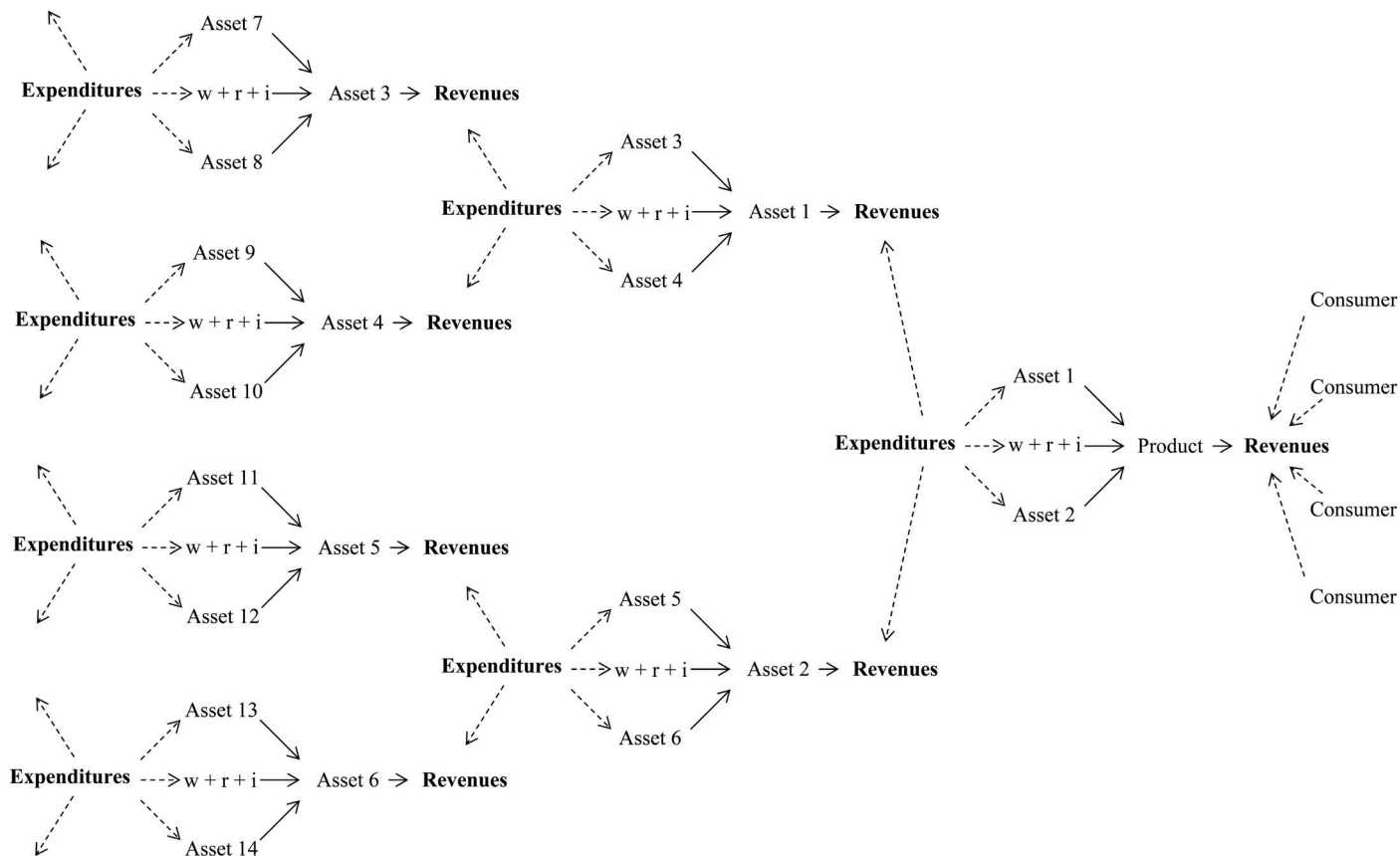


Figure 4.4 The societal production process and the revenue-expense approach

So the enterprise on the right side of [Figure 4.4](#) passes on the final demand to the sellers of assets 1 and 2 and to the owners of land and labour, with due allowance for the cost of capital. Debt capital earns contractual interest and equity capital earns the residual between expenses and revenues, whereby the ROE must usually be at least equal to the prevailing interest rate.

The assets 1 and 2 are produced by two upstream enterprises. The producer of asset 1 employs assets 3 and 4 in addition to land and labour, while the producer of asset 2 employs assets 5 and 6. These enterprises want to make profit as well and hope that their revenues will surpass their expenses. Their willingness to pay for their inputs is therefore limited by the demand of the downstream enterprise. However, like in the case of the enterprise on the right, it competes with other enterprises when it comes to purchasing their input and selling their output. Their revenues will be bid down and their expenditures bid up and their profits tend to diminish. The same holds for the enterprises even more upstream that produce assets 3 to 6. Their willingness to pay and their reservation prices depend on their economic calculations. They want to make profits. Due to market competition, however, the amount of their expenses will approach the amount of their revenues, allowance being made for the cost of capital.

[Figure 4.4](#) does not explicitly depict the market or competition. The dashed arrows, however, signify the market transactions between the various enterprises or between enterprises and consumers. These arrows therefore also indicate where competition tends to erase profit margins and to align the expenses and revenues of the individual enterprises. In this way, the combination of, on the one hand, enterprises that try to profit from buying low and selling high, and, on the other, the market where enterprises compete for profits, tends to arrange the alignment of the production process with the final consumer demand. As if they were guided by an invisible hand, profit-oriented and rationally calculating enterprises pass on the consumer wishes to the ever more upstream producers and, in this way, organise the societal production process in the interest of consumers. In [Reisman's \(1996: 180\)](#) words, "businessmen are made to act virtually as the consumers' agents." It is in this way that we have to take [Mises's \(1949: 217\)](#) statement that "[e]conomic calculation in terms of money prices is the calculation of entrepreneurs producing for the consumers of a market society."

Of course, [Figure 4.4](#) is a simplification. It only depicts one sort of consumer goods and only (some of) those enterprises that are necessary to bring it about. However, the principle remains the same even if we introduce additional consumer goods and additional production chains. In any case, the financial accounting of the individual enterprises tells them whether their capital is invested profitably. The last word on this has the consumer, no matter how far the individual enterprise appears to be away from the consumption stage. The calculating enterprises, trying to produce a high ROE, pass on the wishes of the consumers to the more upstream enterprises and thus align the vast structure of production to consumer demand. At the (imaginary) point where the ROE is the same in each and every enterprise, the structure has adapted to this demand, and we have attained equilibrium.

4.2 The role of prospective economic calculation: progress and innovation

The dynamics of capitalism

Retrospective economic calculation computes positive profit or net income when enterprises fulfil their equilibrative function in the economy. As a consequence, all profit-oriented enterprises together tend to organise the production process in the interest of the final consumer as if they were guided by an invisible hand. To repeat, the enterprises themselves merely try to yield a profit on their capital. By means of the tools of financial accounting, they check whether their revenues surpass their expenses. They relate the calculated profit to their capital in order to measure their profitability. By doing so, they are rewarded for having found gaps in the price structure and reducing them by buying low and selling high. In addition, further capital is drawn to those areas where high profits can be made, contributing to closing the gaps in the price structure.

If enterprises only tried to discover gaps in the price structure, that is, if they only adapted passively to existing consumer demand, profit opportunities would soon vanish. We would come close to an actual equilibrium situation and the economy would freeze. There would be no room for improvement of production processes or consumer satisfaction. In equilibrium, there is no room for innovation. Capitalism would then not be characterised by growth, progress, and innovation. It would be an economic system that got stuck in an ossified structure of production many decades or even centuries ago and that “merely reproduces itself” (Schumpeter 1939: 36).

As a matter of fact, capitalist economy is not and cannot be stationary. Nor is it merely expanding in a steady manner. It is incessantly being revolutionized *from within* by new enterprise, i.e., by the intrusion of new commodities or new methods of production or new commercial opportunities into the industrial structure as it exists at any moment.

(Schumpeter [1942] 2008: 31, emphasis in the original)

According to Schumpeter ([1942] 2008: 81), the dynamics of capitalism is created by innovating entrepreneurs who, by means of the famous “process of creative destruction,” destroy the status quo and try to explore new territory, untested production technologies, unknown methods of management, and unexplored consumer wishes. In the words of Dekker (2018: 187), they “break with the old, instead of improving what already exists.” In order to create space for these innovations, I now drop the assumption of Section 4.1 that consumer demand is constant and that no technological innovations exist.

For Schumpeter ([1942] 2008: 132), entrepreneurs are crucial precisely because they do not accept the status quo or the current state of consumer demand. Instead, they envision and shape the future. In Schumpeter’s (1939: 37) words, entrepreneurs are not relevant insofar as they run their “plant in the customary way, going through all the motions of daily business routine.” The important thing is

“setting up the plant or changing its setup.” Since decisions like these refer “to the future, this implies foresight; and since the fruits of every effort mature in the future, it also implies caring for the future – forethought” (Schumpeter 1939: 53). As Schumpeter (1939: 53) explicitly abandoned the assumption “that people react to existing prices only,” he was well aware “that expectation or anticipation enters the picture, to threaten the existence of our equilibrium tendency.”

One important aspect of entrepreneurship is to decide where to invest, i.e., where to make expenditures. Usually, when expenditures are made, the revenues are still in the future and, accordingly, uncertain. It is when revenues themselves and their relationship to possible expenditures are uncertain that enterprises are forced to undertake prospective calculations and *valuations* of investment projects. It is important to note, however, that in business and asset valuation, presented in Section 3.2, we do not leave the area of monetary calculation, but we enter the specific area of *estimated* money values. The actual purchase or sale of a factory building is objective in the sense that we can observe realised cash flows. Likewise, the expenses and revenues used in financial accounting stem from actual (or almost certain) cash flows. The *valuation* of a factory building before a deal takes place is not objective in the same way. It is (usually) a professional, but still subjective appraisal that may but does not have to lead to actual and observable payments.

The appraisal of investment nonetheless presupposes a common unit so that investment objects can be compared with each other. This is done by calculating the “present value” of the expected future cash flows. As was shown in Section 3.2, the net present value of investment projects is denominated in money, but it is not money. It is a magnitude calculated and expressed in money. If the net present value of an investment option is positive, the investment can be made without (expected) economic disadvantage (Toll and Hering 2017), that is, capital may reasonably be spent on the project. If it were not for these values, management would not have a rational basis for investment decisions.

Valuations play an essential role in the allocation of resources and the distribution of income. From the perspective of the enterprise, it is the purpose of business and asset valuation to determine where the available capital is supposed to flow. If we leave aside enterprises that rely solely on imitating others, expenditures are often the consequence of valuations. From a societal perspective, prospective calculation influences where the available societal resources are invested by determining the amount of money that may reasonably be spent on assets or entire projects.

It is important to understand the role of valuation in the market process. True, profits are traditionally (but see chapter 6) determined on the basis of historical monetary figures, namely actually incurred expenditures and actually received revenues. They are what enterprises try to maximise. However, enterprises do not usually content themselves with passively adapting to given demand. That they care about the uncertain future is not only good for them but also has a function for the economy as a whole.

It is this part of the economic calculations of enterprises – the prospective appraisals of investment projects – that keep the market process going and help to discover and exploit new or so-far unknown possibilities for making profit. It is once again the invisible hand at work: Enterprises constantly make investment decisions

that concern the uncertain future simply because they do not want to drop behind more innovative competitors. That is why they *evaluate* different investment opportunities and determine which one promises to be more profitable. By doing so, they keep the market process going and create innovations and progress from which the entire economy profits. They break production factors out of their current employments and utilise them in new and innovative lines of production.

The use of knowledge in society

The distinction between prices and values is important. Prices are objective insofar as they denote actual market transactions. The present values calculated by enterprises, however, are necessarily subjective and uncertain. We have seen above that the valuations of enterprises are responsible for or are at least the catalysts of the dynamics of capitalism. Prospective calculations are behind the creative destruction of entrepreneurs.

The role of valuation in the dynamics and progress of capitalism helps us add some nuances to Hayek's (1937; 1945) argument about the use of knowledge in society. According to Hayek, all market participants are connected directly or indirectly to each other through the price system. These prices are not exogenously given constants. The market participants influence market prices by means of buying and selling. In this way, they contribute their individual "knowledge of the particular circumstances of time and place" (Hayek 1945: 521). Consequently, the prices reflect the available yet otherwise decentralised knowledge in society (Erlei 2007: 80 f.).

Given that enterprises base their decisions on whether to buy or sell on their prospective calculations, we could state Hayek's point more precisely by saying that enterprises do not merely contribute their decentralised knowledge. The actions of entrepreneurs are not really motivated by what they know. They are motivated by their appraisal of the situation. Only in the case that it makes economic sense from their subjective point of view to purchase or sell a certain good will they actually do so. Of course, their knowledge of the particular circumstances of time and place will play an important role in these decisions. Yet, it is an indirect role. The knowledge that market participants have of their environment, their needs, their faculties, and their other characteristics influence their appraisal of the various goods or assets. It is only via these appraisals that their knowledge influences the market prices, namely when they conduct market transactions as a result of their subjective appraisals. They buy (or sell) only if and when their economic calculations demonstrate that the current market price of an item is lower (or higher) than the present value of the cash flows it is expected to create in the future.

Therefore, professionally conducted investment appraisals not only make better use of the prevailing knowledge in society but also go beyond present knowledge and create a foundation for investment decisions that would otherwise not have existed. The better the methods of calculating expected magnitudes and evaluating risks become, and the more specific, individual, and subjective the circumstances these calculations draw on, the better will market prices tend to reflect the relationship between scarcity and needs in society (Braun 2023b).

Despite Hayek's (1945: 529 f.) criticism of Schumpeter, his approach to the use of decentralised knowledge in society dovetails with Schumpeter's analysis of creative destruction as the function of the entrepreneur. The prices only reflect the decentralised knowledge in society because enterprises use their prospective calculations as a basis for throwing the economy out of its current state and creating new combinations of the factors of production. From a societal perspective, we could say that the purpose of prospective calculation is to interfere with the current price system based on professional appraisals and to implement innovative ideas, and in this way to create progress.

A last point must be mentioned. There is no question that many investment appraisals are not correct, at least *ex post*. That is why some projects end up generating losses instead of profits. In these cases, retrospective calculation reveals that the company's investments did not lead to a better allocation of resources from the point of view of consumers.

Why do economists focus on prospective calculation?

Both in Chapter 3 and in Chapter 4, I dedicated more space to retrospective than to prospective calculation. Why is that? There are two reasons. First, economists usually neglect retrospective calculation or downplay its role in the economy. Mises (1949), for example, although mentioning both kinds of calculation, concentrated on prospective calculation. Therefore, it is not essential to go into too much detail on prospective calculation here. Second, in my opinion, retrospective calculation is crucial for the market process, especially for its equilibrative capacity that is taken for granted by the very same economists who ignore retrospective calculation. Section 4.1 developed my argument in this regard.

In this subsection, I would like to ponder the question of why it is almost exclusively prospective calculation that has captured the attention of economists. The point appears to be that, according to the central concept of opportunity costs, all human decisions concern the future. Bygones, as Jevons (1871) famously argued, are forever bygones. It is worth having a closer look at Mises's rationale for focusing on prospective calculation. According to Mises, economists are concerned with human action and human decision-making. For human actions and decisions, past costs are sunk costs and should not influence the calculations of the decision-makers:

Historians and statisticians content themselves with prices of the past. Practical man looks at the prices of the future, be it only the immediate future of the next hour, day, or month. For him the prices of the past are merely a help in anticipating future prices.

(Mises 1949: 213)

Interestingly, Mises concluded that past prices should not even be important in retrospective calculations. The balance sheet and the income statement should not document past costs or expenses but "the estimated money equivalent of all assets

and liabilities other than cash” (Mises 1949: 214). Mises (1949: 214) argued that the accounting practice of his time, insisting on historical costs as against estimated values, constituted an aberration of the correct way of accounting for past transactions:

However, old business customs and the provisions of commercial law and of the tax laws have brought about a deviation from sound principles of accounting which aim merely at the best attainable degree of correctness.

The reason Mises gives for his criticism of historical cost accounting is the argument presented above: “Practical man,” in his decisions and actions, is not interested in the past but the future. Why then document by-gones?

Not only in his preliminary calculation of the expected outcome of planned action, but no less in his attempts to establish the result of his past transactions, he is primarily concerned with future prices.

(Mises 1949: 213)

It appears that Mises does not really see the point of retrospective calculation. If the balance sheet and the income statement were prepared “correctly,” i.e., according to his point of view, they would not contain past prices but estimated money values. In other words, it would not be retrospective but prospective calculation as well.

I will cover the opposition of neoclassical economists against retrospective calculation in the following chapters. At this juncture, I would like to point out that even Mises (and some other Austrians, see Braun 2019: 9), despite his pioneering contributions to the role of capital and economic calculation in capitalist societies, is not completely innocent when it comes to the substitution of future-oriented fair value accounting for historical cost accounting. Rather, Mises must be counted among those who blurred the distinction between retrospective and prospective accounting and therefore prepared the introduction of fair value accounting. This is documented by the fact that Mises had a great influence on Raymond Chambers. Chambers is sometimes referred to as the father of fair value accounting, although this certainly is an exaggeration (Barlev and Haddad, 2003: 390; Gaffikin 2012). Anyways, Chambers was an influential accounting theorist in the 20th century, strongly putting emphasis on the rationale of fair value accounting. Tellingly, Mises was “one of Chambers’s main sources of inspiration” (Gaffikin 1989: 90). Chambers’s magnum opus, Chambers (1966), quotes Mises more often than any other economist and reminds one of Mises (1949) both because of its deductive approach and its multidisciplinary nature. Furthermore, Chambers’s (1966: 112–115) discussion of income as the change of the *value* of net assets between two points of time is clearly based on Mises (1949).

How retrospective calculation scrutinises prospective calculation

For the purpose of analysis, I have isolated retrospective and prospective calculations and discussed both of them independently. In the actual practice of business

enterprises, however, these two types of economic calculation are not independent. They always come together and complement each other. Their function is to accompany the investment of capital.

From the perspective of the individual enterprise, the role of prospective calculation is to support the decision on where to invest capital; the role of retrospective calculation is to determine the profitability of the capital invested in this way. In fact, retrospective calculation determines if the capital of an enterprise has grown or has diminished. It rewards innovations that have turned out to actually create or increase profits and punishes those that have not. Any innovation that is introduced on the basis of prospective calculation becomes immediately scrutinised by retrospective calculation as soon as the first expenditures are made. Both types of calculation together help enterprises to invest capital where it promises to yield (or has already yielded) a profit and withdraw capital where it promises to generate (or has already generated) losses. To all intents and purposes, therefore, economic calculation is capital calculation or capital accounting.

From a societal perspective, economic calculation helps to allocate capital to those areas of the economy where it is demanded the most. As capital is basically the power to purchase or hold inputs, economic calculation – capital accounting – guides the allocation of scarce resources that serve as inputs of enterprises. As almost all goods go through the balance sheet of one or several enterprises while being produced, this means that economic calculation guides the allocation of almost all resources in society.

In this, retrospective calculation rewards enterprises insofar as they have succeeded in aligning the allocation of scarce resources better to the current wishes of consumers. Prospective calculation, in contrast, does not take the current consumer demand for granted but rather supports enterprises in their attempts to cut new paths and to try out new employments for societal resources. Both functions are important. Without retrospective calculation, enterprises would only encounter a hard reality check when and if they run out of funds. In these cases, most of the resources they employed would be wasted. Without prospective calculations, the economy would freeze and capitalism would lose its dynamic characteristics and its ability to create growing wealth and technological progress. Only if entrepreneurs employ both retrospective and prospective calculation in order to guide their decisions on where to invest capital does the market act as an invisible hand that tends to do both: create growth and allocate resources according to consumer wishes.

Of course, the roles of retrospective and prospective calculations are not as separate in real life as we have assumed in the foregoing sections. Each successful entrepreneurial action is both innovative, seen from the prevailing state of affairs, and equilibrating, seen from the angle of the future state of affairs. The dynamics of capitalism, in other words, is very often at the same time a movement away from one equilibrium and a movement towards another equilibrium. The distinction between prospective and retrospective calculation illustrates this twofold nature of entrepreneurial action. It is necessary to have both of them so that they make sure, within their means, that capitalism remains dynamic *and* stable.

The capital market

Equity capital and debt capital would exist even if there were no developed capital market as we know it today. Even without organised stock and bond markets, entrepreneurs would start businesses, invest their own funds in them, and borrow money from family members or local money lenders. The term “capital” does not necessitate a developed capital market. However, wherever and whenever the societal production process is partly or mostly conducted by capital-based enterprises, some of these enterprises will develop a demand for additional capital, whether they are in financial trouble or want to expand. As soon as businesses receive equity or debt capital from outside sources in return for the promise to pay it back with some extra yield, we can speak of a rudimentary capital market. It may be small, it may be unorganised, it may be local – but where business enterprises borrow money, there is a market for capital.

What is the capital market? Nothing other than the market of purchasing power, the embodiment of those processes through which means of payment come into the hands of entrepreneurs.

(Schumpeter 1934: 177)

The capital market does not differ from other markets. The agents populating it are guided by the same motivation as everywhere else. The enterprises that borrow money are following the formula $M-C-M'$. Based on their prospective economic calculations, they demand debt capital if they expect that the interest rate they have to pay is less than the gross profit they will make. They demand equity capital if they expect that this move will increase the dividends or other benefits of the current owners or shareholders compared to what would have been otherwise. The providers of capital, however, will think in a very similar way. They will only be willing to borrow or invest capital if they consider this to be profitable. As Marx (1887) and Hilferding (1885) stressed, the behaviour of lenders of capital may be described by a formula slightly different from $M-C-M'$. There is no physical production, no tangible commodity involved in their actions. Figures 2.2 and 2.3 could be said to be too complicated for them. They do not purchase means of production and transform them into an output of any kind. What they do can rather be described by the formula Money – Money' or $M-M'$. In other words, they also invest money in order to make more money, but they invest it in financial activities and expect a return from that, without themselves performing any production.

In fact, introducing the capital market does not really add anything new to the story developed in the foregoing chapters. We have seen that under certain institutional pre-conditions, capital tends to flow where it can satisfy consumer demand best and most efficiently. However, when it is possible to trade capital, that is, to lend and borrow it, this tendency becomes considerably stronger and quicker. It becomes quicker because the capital market allocates capital to those enterprises and those industries where high profits are currently made or expected in the future (Franke and Hax 2004: 365). Due to the capital market, it is not necessary that you

found your own business in order to exploit actual or presumed profit opportunities. Instead, you can simply provide capital to an enterprise that is already operating or investing in the respective area. In the easiest case, you purchase stock or bonds on the primary market. In this case, your money flows quickly and directly to the respective enterprise and increases its capital. For the same reason, the capital market will make the tendency to satisfy consumer demand stronger. The point is that the existence of a capital market increases the overall supply of capital. As [Reisman \(1996: 464\)](#) explains, due to the capital market individuals are able to earn a rate of return on their money without having to employ that money in businesses of their own. Therefore, many individuals will invest their savings in businesses who would or could otherwise not have done so. In this way, the capital market makes possible “the existence of the large aggregations of capital necessary for such undertakings as electric utilities, railroads, and, indeed, most large-scale modern industries” ([Reisman 1996: 465](#)).

5 The theoretical foundations of value-orientation

5.1 *Homo economicus*

The institutional preconditions of the tendency towards equilibrium

As if they were guided by an invisible hand, enterprises that try to make a profit on their capital bring order into the structure of production. What they do, of course, is to invest their capital wherever they see or expect differences between money costs and money revenues. From the perspective of the final consumers, positive profits by enterprises imply that the latter have improved the allocation and distribution of resources in society. They have moved resources from occupations where they satisfy consumer demand less efficiently to occupations where they satisfy it more efficiently. The result of their activities is that capital leaves occupations where it earns a low rate of return and flows where it tends to earn a higher rate, in this way generating a tendency towards a uniform rate of return throughout the economy. If no economic data were to change, the economy would actually approach an equilibrium situation where the law of one price holds and where only one uniform or normal rate of return exists. In such a state of equilibrium, no opportunities for supernormal profit would exist and therefore it would be impossible to improve the utilisation of resources from the perspective of the final consumers.

In a state of equilibrium, capital earns a uniform rate of return, no matter whether it has been invested in land, labour, produced means of production, or intangible assets. For the enterprise, the concept of the “factor of production” is irrelevant. Capital is supposed to earn a return, full stop. In this regard, wages, asset prices, rent, and interest are on the same level for enterprises: In their economic calculations, they are all costs denominated in money. In fact, it is economic calculation that makes the factors of production comparable and brings them onto one level. At this level, that is, from the perspective of the business enterprise, what counts is the return that can be made on capital spent on the various factors, and not their physical differences. Capital investment goes right through the so-called factors of production. A euro spent on a farm worker must earn the same return as one spent on a farm tractor, on farmland, or on farming software. If the rates are not equal, for example, because the rate of return on farmland is higher than on tractors, demand for land will increase and demand for tractors will decrease until the rates coincide again.

I repeat this story here in order to remind the reader that the working of the invisible hand, so important for economics, depends on institutional preconditions. Behind the tendency towards equilibrium are enterprises that are able to purchase and sell consumer goods and means of production on markets and calculate their resulting profits or losses in money. Under these institutional circumstances, including money, markets, private property, enterprises, and economic calculation, all commodities can become capital and be managed by enterprises with the objective of generating the highest possible rate of return. In other words, it is the institutional framework of capitalism that makes sure that the societal resources are combined, arranged, and dedicated to a specific societal purpose as described above.

I want to emphasise particularly the role of retrospective calculation. This kind of calculation determines the result of past transactions as a realised monetary magnitude. These realised profits demonstrate where there is still a disequilibrium in the economy, that is, where there are still gaps in the price structure and where, therefore, the rate of return on capital is above normal and where imitating enterprises can put their capital in order to make profits. Therefore, retrospective calculation is a major reason for the tendency towards equilibrium where only one uniform rate of return remains. It is important to keep this in mind in the following deliberations.

Comparative statics

It is of course questionable whether an equilibrium where the rate of profit is actually uniform across departments, enterprises, industries, and nations will ever be achieved (Rothbard [1962] 2009: 625 f.). Consumer preferences and the state of technological knowledge change continuously and in this way change the position of the equilibrium. Furthermore, many profit-seeking enterprises always try to break out of well-worn trails and find new ways to generate profits, in this way disturbing the tendency towards equilibrium. In other words, before enterprises close the gaps in the price structure, other gaps will have occurred or been created elsewhere. In the context of a competitive market economy, therefore, equilibrium is not a term that describes an actual state of the world. It is the imagined outcome or the imagined final state of rest that would result if the tendencies at work could take place without interruptions. A uniform rate of profit is not something that we can observe but would come about if competition between enterprises continued without new data entering the system.

Even though it is only an imagined state of the world, equilibrium has an important function in economic theory. It is a conception that helps economists to arrange their observations of actual markets. In particular, it helps them when it comes to isolating the influence of individual events, i.e., of individual changes in the data, on prices and quantities traded in the market.

There is no means of studying the complex phenomena of action other than first to abstract from change altogether, then to introduce an isolated factor provoking change, and ultimately to analyze its effects under the assumption that other things remain equal.

(Mises 1949: 248 f.)

By concentrating on the states of equilibrium before and after the respective data changes, leaving everything else equal, the comparative statics method demonstrates the effects that these particular changes would have on the market if no other changes occurred. This does not mean that it is necessary that actually no other changes occur in real life. They do and always will. But the effect of those changes must be analysed in the same way, that is, by isolating them and comparing the equilibrium states before and afterwards. When it comes to analyse any real-life situation, what economists have to do is find the relevant parameter changes, trace their effect on the price system individually, and then determine their aggregated impact. For example, if in the gummi bear industry both the demand for gummi bears rises by a certain rate and the cost of gelatine decreases by a certain rate, the economist derives the prospective equilibrium price of gummi bears by isolating the influence of each of these parameter changes on the demand and supply schedules and then adding them up, in due consideration of interdependencies.

Of course, the comparative static method where imaginary equilibria are compared only makes sense when these equilibria have some relevance to the events taking place in real markets. If the tendency of markets to approach equilibria were weak and slow, it would not be of much help to know the equilibria. Considering the endless and constant changes in consumer preferences, firm strategies, and other data, a slight tendency towards a certain state of affairs would be a neglectable force. The reason why the equilibrium concept can serve economists is that the equilibrating tendency of competitive markets in capitalist societies is anything but neglectable. In modern, monetised market economies, there is a strong and constant tendency towards the equilibration of supply and demand. To repeat, in a developed market economy, all inputs and all outputs are denominated in money, and therefore enterprises are easily able to find gaps in the price structure where abnormally high profits can be made. [Kirzner \(2000: 264 f.\)](#) agrees that in the institutional setting of a commercial society, that is, in a market economy with a developed price system where production is accomplished by businesses, markets move rapidly towards equilibrium:

It is markets, under institutional arrangements which include especially the possibility of buying at a low price in order to resell at a higher price, which are responsible for the initiation of those systematic processes of error-correction which we understand as making up the process of equilibration. While interaction between alert human beings can be expected to result in some relevant gradual mutual discovery under any institutional circumstances, the speed of such discovery processes within markets is clearly of an entirely different order of magnitude than is conceivable outside markets.

Although we may never attain an equilibrium situation, the tendency towards equilibrium is strong and quick in capitalism where profit-oriented businesses exploit gaps in the price structure.

It follows that neoclassical economics with its focus on equilibria is not at odds with the Austrian and institutionalist market process point of view presented in this book so far. Rather, what we see is an instance of the intellectual division of labour.

In order to understand the tendency towards equilibrium, it is necessary to analyse market processes and their institutional preconditions, particularly the functional interaction of markets and retrospective economic calculation. Nonetheless, it would be a waste of time and resources if economists reiterated these processes each time they analysed the consequences of particular parameter changes (Kehoe 1989: 76). To exemplify, it is complicated to follow all the processes occurring in the economic system over time resulting from an increase in, say, a consumption tax on candy. The neoclassical toolbox helps us jump directly to the partial or final equilibrium situation where we see the end results of the tax increase isolated from all other events that may occur at the same time and interfere with the relevant processes (Kehoe 1989: 80).

Homo economicus and deductive logic

When economists apply the comparative static method and focus on the analysis of equilibria, they are implicitly assuming the social context and institutions of the market economy. Due to economic calculation, in capitalism, many decisions boil down to making binary choices between different numbers, i.e., prices or values, and it is easy for most people, especially for managers and entrepreneurs, to act well informed and quick within the framework provided by the price system. The tendency towards equilibrium can therefore be assumed to be strong and quick.

It is important to understand that the famous *homo economicus* is basically a sort of personification of this idea. Economists usually do not justify the method of comparative statics and the focus on equilibria by referring to the institutional framework of capitalism. Instead, the faculties that are necessary to find equilibria and bring them about are imputed to the (hypothetical) individuals populating economists' models. These individuals, the *homines economici*, are assumed to be perfectly rational and completely informed. Because of these characteristics, they are able to solve all problems that are posed to them instantaneously and with mathematical precision. Within the logic of neoclassical models, not any institutions, but these supposed superhuman abilities of economic agents are the reason why we can focus on equilibria.

Rightly understood, the assumption of *homo economicus* has nothing to do with the actual or supposed faculties of individuals (Braun 2021a). It is not necessary for the applicability of economic models that actual humans in actual market economies possess these faculties. The neoclassical equilibrium models are still relevant. Assuming *homo economicus* does no harm as long as economists use the concept only to analyse human choices and actions that take place against the backdrop of intact capitalist institutions. This is typically the case. Most of the time, economists analyse (1) market transactions (2) denominated in money between (3) legally separate persons or entities where (4) almost always at least one contract partner is or represents a profit-oriented enterprise that tries to maximise the return on its capital. Under this institutional setup, there is actually a strong tendency towards a final state of affairs that can be modelled and predicted with models that employ the rationality assumption. However, to be sure, this is not due to any kind of

superhuman rationality and information on the side of the market participants, but to the institutional setting. *Homo economicus*, in other words, is not a universally valid assumption about individual behaviour. Rather, it is only applicable where human action takes place under certain institutional preconditions (Braun 2021a). Vernon Smith's (2003) experimental research confirms that even badly informed traders are able to achieve allocative efficiency of almost 100 percent in a proper institutional environment.

For us, it is important that *homo economicus* is directly related to the equilibrium concept. If we assume perfectly rational and informed choices, "we are also, at the same time, assuming the equilibrium state" (Kirzner 2000: 267), the reason being that perfect rationality implies that the world is "in a perennial state of optimality." The *homo economicus* concept is an outflow of economists' concentration on equilibria (Arthur 2010: 153 f.). Economists employ the *homo economicus* assumption when they wish to abstract from the messy processes that appear between different hypothetical equilibria. When they focus on equilibria, they are able to attain analytical solutions for the problems at hand, that is, they are able to use logical deduction in their theories and models about human behaviour. If economists say "I assume that all agents are *homines economici*," or, equivalently, that "all agents act perfectly rational," what they mean is that they deduce the outcome of their model according to established rules of logic (Braun 2021a). The price that economists have to pay for the "simplicity that makes such analytical examination possible" is the assumption that "human behavior [...] can be captured by simple mathematical functions" (Arthur 2010: 154).

Homo economicus, if understood and applied correctly, is a methodological device that allows economists to sidestep the discussion around complicated market processes and their institutional preconditions. By assuming perfectly rational and fully informed market participants, economists do not have to explain why the market works, that is, how it coordinates and equilibrates the plans of millions and billions of people. Instead, they are able to construct models where a certain number of variables influence each other in a predetermined and predictable way. For this analysis, the mechanism that accomplishes the necessary coordination is taken for granted.

It is of course true, as many readers may be inclined to say, that market processes are constantly influenced by *irrational* actions and reactions. However, it is important to understand that this correct observation does not jeopardise the comparative static method. That irrational and uninformed actions occur in market processes does not imply that the same is true for the equilibria. There is no reason to believe that the (theoretical) final results of market processes cannot be determined by rational methods. Economists do not have to consider irrational or erroneous behaviour in this regard.

The rational expectations literature explains why it is possible to ignore irrational behaviour when determining equilibria. According to Muth (1961: 330) and Lucas (1976), it would be very problematic to assume that the market process does not eliminate or correct irrationalities over time. This assumption would imply that policymakers or other outside observers could systematically exploit these

irrationalities. However, it is sloppy reasoning to assume that politicians or their economic advisors are systematically more rational and better informed about market outcomes than the market itself and, furthermore, that firms and other market participants would not adapt their expectations in reaction to political measures that try to exploit (or remedy) these supposed irrationalities.

There is a famous example for this so-called “Lucas critique,” known as the “Phillips curve,” that helps to explain the argument. It is well known that, historically, there has been a strong negative correlation between inflation and unemployment. In times of high inflation, unemployment was low, and vice versa. This observation was explained as a consequence of irrational or ignorant behaviour on the part of workers. According to this explanation, workers suffer from “money illusion.” They were said to be unable to understand that a rise in their money wages is not an increase in their real wages if, at the same time, the absolute level of prices rises as well (Dimand 2023: 295). They presumably could not understand that, in times of inflation, more money does not have to mean more purchasing power. Therefore, the argument runs, they falsely considered rising money wages (inflation) to be rising real wages and increased their supply of labour, in this way reducing unemployment.

In the 1970s, politicians and monetary authorities tried to exploit the alleged irrationality of workers and to use the empirical relationship described by the Phillips curve: They raised inflation in order to lower unemployment. In 1972, eventual German chancellor Helmut Schmidt famously said: “Five percent inflation are more bearable than five percent unemployment” (Ider et al. 2024: 658). However, once authorities attempted to exploit the correlation between inflation and unemployment, it disappeared because the workers and their representatives would not be fooled. They reacted and increased their inflation forecasts. In other words, they formed rational expectations about the future, and the authorities were wrong in assuming that workers would not discover what was in their best interest. As Sinn (2014) pointed out, the assumption of perfect rationality helps in ensuring that policy measures are not justified with human fallibility or irrationality but with the flaws of the institutions and rules that guide human action.

Again, as I see it, the point is not that actual market participants have or gain perfectly rational expectations about the future. The assumption of *homo economicus* and rational expectations makes sense in the context of a monetised market economy. As long as the institutional conditions are met, it is fine to conduct comparative static analyses that focus on equilibria.

The limits of homo economicus

It is of course true that many economists and other social scientists have a different interpretation of *homo economicus*. They consider the concept to be a context-free assumption about the behaviour of individual agents, not limited to the institutional framework of capitalism. For Gordon Tullock, Gary Becker, and many other economists, rational choice appears to be a universal concept, applicable to all human actions, and for them, therefore, many explanations in social science seem to

be reducible to applications of the tools of standard economics (Rosenberg 1979: 514; Brennan and Buchanan 1985: ch. 4; Kirzner 2000: 259). These approaches imply that the application of *homo economicus* does not have institutional preconditions that would restrict its viability to certain historical contexts, like market settings. Accordingly, numerous attempts have been made, sometimes referred to as “economic imperialism,” to apply *homo economicus* outside of economics and the institutional framework of the market economy. Furthermore, many political theorists and game theorists have adopted its use in their own disciplines (Hodgson 1996: 383). Whether addressing family planning, racial discrimination, drug use, suicide, or politics in general, most problems in the social sciences can ostensibly be analysed through the actions and decisions of individual agents, as represented by the economic model of *homo economicus* (Kirchgässner 2008: 11).

In this book, I am not concerned with the explanatory success of economic imperialism. Rather, I would like to point out an important danger that comes along with ignoring the institutional preconditions of *homo economicus*. A severe problem arises when economic models, which are themselves institution-free, are applied to the reform of institutions. Although there are acceptable methodological reasons for disregarding institutions, organisations, and dynamic processes for certain purposes (Braun 2021a), it would be questionable to base reforms of the institutions framing and shaping the market process and the firm on an institution-free economics. There is the risk that, in this way, economists compromise the institutions that economics and our current economic order are based upon (Braun 2021b).

In my opinion, that is exactly what has happened in the areas of financial accounting and corporate governance. In financial accounting, fair value accounting has been introduced and propagated more or less worldwide by international accounting standard setters (Braun 2022b). In corporate governance, the so-called shareholder value maximisation paradigm has won through, and policymakers have implemented several reforms in order to adjust legislation and institutions accordingly (Braun forthcoming b: 2). In Chapter 6, I will analyse these two revolutions in economic calculation.

What I will do in the remainder of the present chapter is explain the rationale behind these reforms in detail. Beginning with the work of Irving Fisher (1930), several important contributions to financial economics have changed the way economists approach the capital market and the role of enterprises therein. Of course, many of the contributions to finance or capital market theory were not or at least not primarily supposed to be normative or to serve as a basis for institutional reforms. Schäfer (2019: 12) argues that Fisher (1930) only wanted to formulate a model and did not want to draw any normative conclusions from it. I personally have a similar impression of Tobin’s (1958) original contribution. Likewise, the scholars behind the capital assets pricing model (CAPM) were basically interested in formulating a “positive microeconomic theory dealing with conditions of risk” (Sharpe 1964: 425), or “the simple logic which leads directly to the determination of explicit equilibrium prices of risk assets traded in competitive markets under idealized conditions” (Lintner 1965: 587), or “a theory of market risk premiums” (Mossin 1966: 768). Other fundamental contributions, however, have clear normative tendencies.

Markowitz (1952: 91), for example, stressed that his approach might be used not only in “theoretical analyses,” but also “in the actual selection of portfolios.”

Be the intentions of these theorists as they may, the results of financial economics have served as a theoretical basis for both fair value accounting and the shareholder value maximisation paradigm. It is the purpose of the next section to illustrate the structure of finance (as a discipline) and its famous theorems. I will focus on its positive, theoretical aspects and ignore the normative conclusions that some of its adherents have drawn. Understood in this way, finance simply applies the comparative static method to the capital market. In [Chapter 6](#), I am going to illustrate how economists have drawn normative conclusions from this theory and how they have, in this way, jeopardised the institutional preconditions of their own theory.

5.2 Finance and its separation theorems

The perfect capital market and the Marx-Sombart separation theorem

In [Section 2.1](#), I have presented what I have called the Marx-Sombart separation theorem. From observing actual capitalist societies, these (and other) economists came to the conclusion that it is helpful to distinguish two spheres of action. Perhaps the catchiest way of picturing this distinction is the two Marxian formulas: Commodity – Money – Commodity’ for action in the consumption sphere, Money – Commodity – Money’ for action in the business sphere. As Werner Sombart explained in detail, the capitalist institutions of economic calculation are the reason why a clear separation between the two spheres is possible:

The idea of acquisition is developed in double-entry bookkeeping to the extent that it realises the final separation of the sum of money invested ‘for acquisition,’ i.e. to make a profit, from all natural purposes of subsistence.

(Sombart 1919: 119)

Modern finance theory comes to very similar separation theorems. However, Marx and Sombart developed their theorem from observation and then analysed in isolation how the separated business sphere works. The present book is an attempt to link to their work and continue the analysis of the role of capital and economic calculation in organising the allocation and distribution of goods in capitalist societies. The imaginary equilibrium where only one rate of return remains is the theoretical end point of this analysis. As we have seen in [Chapter 4](#), it presupposes the existence of a developed framework of capitalist institutions that makes rational economic calculation possible.

Modern finance theorists have a different approach. Consistent with the comparative static method, they focus on equilibria. They are not really interested in understanding the institutional preconditions of the market processes that create a tendency towards equilibrium. They are interested in the imaginary end points of these processes. Finance theorists use their comparative static analyses to predict

the result of parameter changes on the primary capital market, where enterprises sell claims and ownership titles in order to obtain equity or debt capital, and the secondary capital market, where these securities are traded after they have been sold on the primary market. Typically, it is assumed that it is possible to observe the effect of individual parameter changes in isolation and to compare the original equilibrium with the equilibrium that emerges as a result of the respective changes.

In order to be able to do so, economists start from a number of assumptions. The most important one is the existence of a perfect capital market. There is no total agreement in the literature on what exactly a “perfect” capital market is supposed to be, but the following assumptions are certainly the core (Hirshleifer 1958: 330; Miller and Modigliani 1961: 412; Standop 1976: 57; Breuer 2013: 84):

- 1 All market participants act rationally and prefer more money to less money.
- 2 All market participants are risk averse and price takers.
- 3 All market participants have homogeneous expectations.
- 4 Completeness: Every asset in every possible state of the world has a price.
- 5 There is only one rate of interest for all borrowers and lenders.
- 6 There are no information or transaction costs, including taxes.

To say it clearly, capital market theorists start where the theory of capital presented in this book ends: With the assumption of equilibrium. To repeat, this is consistent with comparative statics and the use of *homo economicus*. If we want to isolate the effect of, say, changes in the interest rate or in risk, it would be a waste of time and brainpower if we reiterated all institutions and market processes that bring about the respective changes in the economy.

For our purposes, it is important what exactly the finance theorists deduce from the assumption of a perfect capital market. From a different starting point, they arrive at results that are very similar to the Marx-Sombart separation theorem. According to them, assuming a perfect capital market allows for the separation of investment decisions on the one hand, and the time and risk preferences of investors on the other. Furthermore, they deduce the very important idea that in equilibrium, market prices of assets and firms are equal to the present values of the cash flows they are expected to produce in the future (Lintner 1965: 587). This relationship is supposed to hold not only in a world of certainty, but even when future cash flows are uncertain.

In the following, I will present the main theorems of finance theory. These theorems are the theoretical foundation for value-orientation in both financial accounting and corporate governance. The inherently positive theorems have been used to draw normative conclusions, particularly the introduction of fair value accounting and the propagation of the shareholder value maximisation paradigm.

The no-arbitrage principle under certainty

The rationale of the perfect capital market assumption is the same as the assumption of the *homo economicus*. With Kirzner (2000), finance theorists feel confident that the forces operating on the capital market towards equilibrium are strong enough

to justify the focus on equilibrium situations. The existence of enterprises that try to maximise the return on their capital and that are able to have their calculations performed in no time by powerful microprocessors makes the quick attainment of equilibria a particularly reasonable assumption in this area.

However, the existence of equilibrium on a perfect capital market comes along with certain characteristics that were not understood from the beginning. The problem was the time element. The role and importance of time is much more evident when it comes to shares, bonds, and other credit–debt relationships than with regard to “normal” goods such as shoes or gummi bears. Even in a standard credit relationship, at least one contract partner *necessarily* fulfils their obligations only in the future, that is, at a date different from the date of the conclusion of the contract and from the date of delivery of the services of the other contract partner. And the relationship between time and equilibrium is complicated and certainly not self-evident. What exactly does it imply for credit relationships and the capital market as a whole if the law of one price holds and there are no possibilities for making above-normal profits?

The most fundamental characteristic of the capital market in equilibrium is what has become known as the no-arbitrage principle. This principle is “the cornerstone of modern finance” (Penman 2011: 13).

An arbitrage opportunity is an investment strategy that guarantees a positive payoff in some contingency with no possibility of a negative payoff and with no net investment. [...] A simple example of arbitrage is the opportunity to borrow and lend costlessly at two different fixed rates of interest.

(Dybvig and Ross 1989: 57)

In equilibrium, no arbitrage opportunities exist. This is part of the definition of equilibrium in a perfect market (Varian 1987: 56). The no-arbitrage condition looks similar to the idea that in equilibrium the law of one price holds and the rate of return is uniform in all occupations. In a sense, this is correct. The idea behind the two principles is the same: Both above-normal profits and arbitrage opportunities will be competed away by profit-oriented enterprises or investors. However, Dybvig and Ross (1989: 57) explain that the idea of a uniform rate of profit refers to productive investments, whereas the no-arbitrage condition is applied in financial economics where no production, but rather “simply trading under the price system” is relevant.

In any case, the no-arbitrage condition has the same institutional preconditions as the uniform rate of return. However, Dybvig and Ross (1989: 57) ignore these preconditions and claim that the “absence of arbitrage follows from individual rationality of a single agent.” In other words, they assume that the agents in their models are *homines economici*. As I said above, this is no problem as long as we keep in mind that this assumption is only a methodological makeshift in comparative static analysis and is not supposed to explain how equilibria actually come about.

A number of eminent economists have contributed to specifying the nature of no-arbitrage equilibria on the capital market. One of the first and probably the most important ones was Irving Fisher. In this, he concentrated on a world of certainty.

We will introduce risk below. According to Fisher (1930: 101 f.), the no-arbitrage principle implies that, in equilibrium, there is only one rate of interest on the capital market. In particular, the rate of interest is the same for lenders and borrowers of capital (Breuer 2012: 41 f.).

That equality of course contradicts real-life experience. For normal citizens and enterprises, the interest rate on borrowed money is higher than what they get for lending money on interest (Rudolph 2006: 41). However, Fisher's point is that the difference between the two rates would disappear *in equilibrium* (Emery and Finnerty 1997: 124). After all, the existence of a low lending rate for normal citizens and enterprises implies that there is a counterpart in these transactions (the borrower) who has a low borrowing rate. Likewise, the existence of a high borrowing rate for normal citizens implies that there is a counterpart in these transactions (the lender) who has a high lending rate. These counterparts – let us call them banks – profit from borrowing at low rates and lending at high ones. As long as these two rates differ, the no-arbitrage principle is violated and there is an opportunity for competing banks or other financial service providers to enter the market and make profits by exploiting these differences. Competition will bring about a uniform rate of interest for both borrowing and lending. By the way, this story implies the heroic assumption that, in equilibrium, financial intermediaries have no costs and earn no profits (Rudolph 2006: 41), i.e., that in equilibrium financial intermediaries are redundant.

The uniformity of interest will not only hold for both lending and borrowing, but also for loans of different maturities. As Rothbard ([1962] 2009: 448) explains, if the interest rate on long-term loans is higher than that on short-term ones, arbitrage will erase the difference. There will be

an irresistible arbitrage movement from shorts to longs, with the rate of interest in the former thereby rising from the sales of loans on the market, and the rate of interest in longs falling, until the rate of interest is uniform throughout the time structure.

There are further implications of the no-arbitrage principle. Not only do the lending and borrowing rates concur. The interest rate will also be independent of the amount of funds that the respective individuals or enterprises want to borrow or lend and the amount of collateral that the individuals are able to provide. This, once again, contradicts real-life experience, where the borrowing rate usually increases with the size of the credit and where banks offer different rates to rich individuals and large corporations than to John Smith. Once again, however, these are violations of the no-arbitrage principle. There are opportunities for profit that, in the end, will be competed away in equilibrium.

The Fisher separation theorem

From the point of view of economics, Fisher's claim that there is only one rate of interest in equilibrium has important implications for comparative static analysis.

It means that economists may safely assume that the capital market allocates the available capital “perfectly” in society. In other words, under the assumptions of certainty (Vickers 1978: 76) and a perfect capital market with one uniform rate of interest for everyone, all profitable investment projects, that is, all investment projects that yield more than the prevailing interest rate will be executed (Rudolph 2006: 30). This is so because a perfect capital market removes all obstacles that could hinder individual investors from actually investing in profitable projects. Instead, everybody is able to invest their funds up to the point where the marginal return on their investments is down to the interest rate (Rudolph 2006: 31).

This is not self-evident. People with high time preference often dispense with investing their funds, even though they may have good ideas and talents and be able to invest profitably. This problem is illustrated in Figure 5.1 (adapted from Hirshleifer 1958: 330). If we leave aside the interest rate line for a second, consumers have to decide on how much of their initial endowment, E , they consume today, in period 1 (C_1), and how much they invest and instead consume only in period 2 (C_2). Their investment possibilities are depicted by the grey investment-opportunities curve or transformation curve TC . This curve contains all the intertemporal consumption combinations that the individual may choose from. The curve is not a straight line because of diminishing returns from investing in the real economy

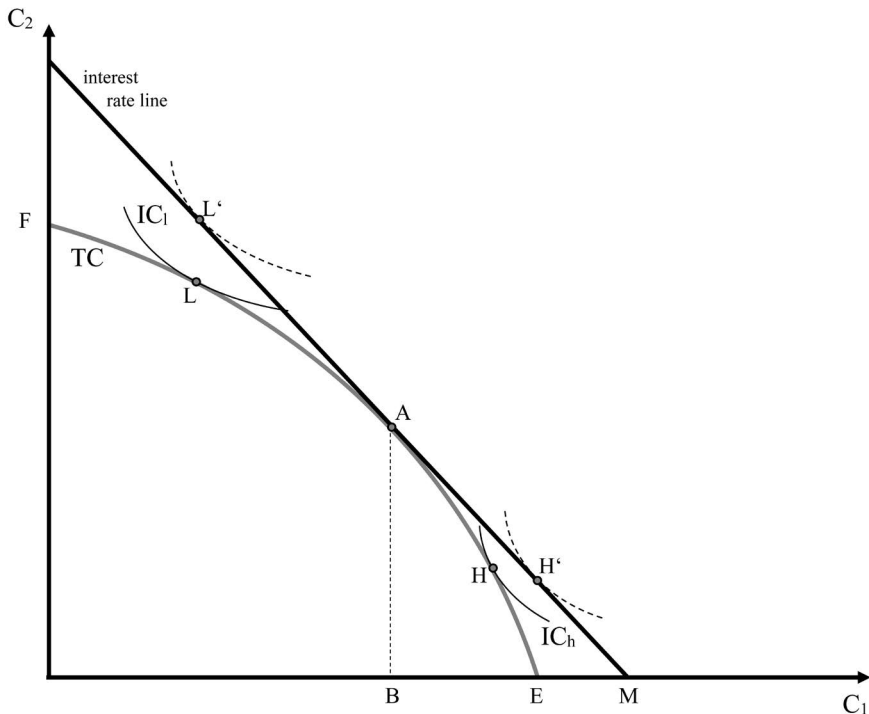


Figure 5.1 The Fisher separation theorem

(Emery and Finnerty 1997: 126). In point E, the investor consumes everything in period 1 ($C_1 = E$) and has nothing left in period 2 ($C_2 = 0$). In point F, he consumes nothing in period 1 ($C_1 = 0$) and invests his entire endowment ($C_2 = F$). These are extreme cases, of course. In all other cases where C_1 and C_2 are both above 0, the individual will find himself somewhere on the transformation curve between E and F.

In Figure 5.1, we see two different individuals. One has a high time preference and chooses to consume a lot in period 1 and invest almost nothing, so that consumption in period 2 is very low (point H). The indifference curve of this individual is IC_h . The other individual has a low time preference and chooses to invest a lot in period 1 and defer consumption to period 2 (point L). His preferences are depicted by the indifference curve IC_l . We see that the decisions of the individual with high time preference places him in an area where the slope of the transformation curve is steep. The individual thus leaves many high-yielding investment opportunities unexploited. On the other hand, the individual with low time preference is placed on the transformation curve where the slope is rather gentle. He implements investment projects that have small rates of return. It is intuitively obvious that it would make sense economically if the high time preference person invested more and the low time preference person less. However, as long as no capital market exists, no transfer of funds between the two persons is possible.

Now, if we introduce the (perfect) capital market, individuals obtain the further option of lending or borrowing money for interest. In this way, they may be able to trade and thus improve their utility, i.e., to attain a better indifference curve (Emery and Finnerty 1997: 129). Fisher's point was that under the assumption of a perfect capital market with only one rate of interest, the investment decision of individuals would be independent of their consumption preferences (Rudolph 2006: 31). "The determination of the optimum becomes objectified" (Standop 1976: 59).

Let me explain. The possibility of both lending and borrowing at the uniform interest rate r is depicted in Figure 5.1 by the interest rate line. The slope of the line is $-(1+r)$ (Emery and Finnerty 1997: 125). It shows the possibilities of lending (borrowing) one euro in period 1 and obtaining (paying back) $1+r$ euros in period 2. Figure 5.1 contains only one interest rate line, but there is an indefinite number of them. Whatever your initial endowment is, you are able to lend or borrow on the perfect capital market, and your consumption possibilities are then depicted by an interest rate line with the slope $-(1+r)$.

If there is the possibility of using the capital market, people with high time preferences (IC_h) will not spend most of their endowment in period 1 anymore, and people with low time preferences will not continue to embark on low-yielding investment projects. The point is that, given a perfect capital market, the consumption possibilities available to individuals are no longer depicted by the transformation curve. Instead, the interest rate line that is tangent to the transformation curve shows all attainable *efficient* combinations of consumption in period 1 and consumption in period 2. This particular line is efficient because it is the highest in terms of consumption in period 1 and 2, i.e., in terms of the indifference curves that investors are able to achieve (Rudolph 2006: 31). Given a perfect capital market, all individuals, independent of their time preferences, would invest up to the point

A on the transformation curve, that is, they would invest the amount EB of their endowment. That is to say, they would realise all investment projects that yield a higher return than the interest rate. In point A, the slopes of the transformation curve and the interest rate line are identical. That is the optimum point with regard to the amount of investment that individuals should undertake if they want to maximise their return. Starting from A, all individuals are then able to reach any position on the interest rate line. People with high time preference (IC_h) will borrow money and in this way obtain the point H' on the interest rate line where they are on a higher indifference curve than without the perfect capital market. Likewise, people with low time preference (IC_l) will lend money and thus achieve the point L' on the interest rate line where they are on a higher indifference curve.

What Figure 5.1 demonstrates is that individuals are able to make their investment decisions independently of their consumption decisions. Because of the existence of a perfect capital market, they are able to embark on all projects that yield more than the interest rate. In a second and separate step, they are able to borrow or lend money in order to attain a point on the interest rate line that is either on the transformation curve (point A) or lies beyond it. That investors are able to make their investment decisions independent of their time preferences and therefore their consumption decisions has become known as the “Fisher separation theorem” (Vickers 1978: 72). According to the theorem, investment and consumption can be regarded as two separate decisions (Follert et al. 2023: 3281). The perfect capital market allows investors to separate their investment decisions from their consumption decisions.

There is an important implication of the Fisher separation. If investors invest up to the point where the interest rate line is tangent to the transformation curve, independent of their time preferences, all their consumption options are depicted by the interest rate line. As a consequence, for any individual, M is the point that depicts the maximum amount of consumption possible in period 1, namely in the case when nothing is saved for period 2 and all is consumed in period 1 (Rudolph 2006: 33). M is the situation where the individual invests the optimum amount EB in order to achieve point A, but at the same time borrows the amount EM at the interest rate in order to consume the amount M in period 1. The amount M is equal to the initial endowment E plus the discounted value of the optimum amount of revenues from investment (line segment BA) (Rudolph 1983: 270). No matter whether individuals choose L', A, H', or any other point on the interest rate line, the *present value* of these options is always depicted by M (Hirshleifer 1958: 332), and the *net present value* of the investment programme by EM (Breuer 2012: 56).

The Fisher separation implies, therefore, that in market equilibrium, all investors choose their investment programme such that they achieve the maximum amount of net present value (Hirshleifer 1958: 332; Vickers 1978: 71; Emery and Finnerty 1997: 130). The maximisation of net present value is simply a different expression for choosing point A where the slope of the transformation curve equals the slope of the interest rate line. The reason is the following: At this point, all investment projects are undertaken that yield more than the interest curve and therefore have a positive net present value. The idea that, in equilibrium, everyone maximises net

present value is a consequence of the uniform interest rate and the existence of a perfect capital market.

M also depicts the *equilibrium market price* of an enterprise that has chosen investment programme A (Rudolph 2006: 32). In equilibrium, the market price of any asset or firm corresponds to its present value (Fuller 2013: 380). The justification for this relation between present value and market prices lies in the fact that in a perfect capital market, an asset or firm must earn a rate of return exactly equal to the interest rate; “otherwise arbitrage opportunities emerge, which is inconsistent with equilibrium” (Leroy 1989: 237). Therefore, in equilibrium, where all investors maximise net present values, the net present value of an asset, investment project, or firm is competed down to zero (Fuller 2013: 381). In terms of Figure 5.1, this means the following: If an investor wanted to *buy* an enterprise that realises the investment programme depicted by point A, the market price of the enterprise would be M, i.e., equal to its present value. Purchasing it would therefore only yield the interest rate, and the net present value would be zero.

As I see it, the Fisher separation theorem does not do any harm as long as it is confined to comparative statics. The theorem, as far as it goes, is simply an implication of what it means that there is an equilibrium on the capital market. In equilibrium, no possibilities for supernormal profits exist and interest rates are the same for everybody. We can therefore calculate the equilibrium as if the capital market were populated by *homines economici* who make two separate decisions, one where they invest their funds in an optimal way and one where they make their consumption/saving decision in an optimal way, given their preferences. Optimal in this regard means that the *homines economici* choose the investment options that have the highest net present value and thus bring about an equilibrium where net present values are zero and prices correspond to present values. Since all equilibria conform to these characteristics, we as economists can analyse the isolated effects of parameter changes on the economy by comparing the equilibrium before with the one after the parameter changes. A brief look at Figure 5.1 shows that we could, for example, analyse the effects of a change in the technological knowledge (transformation curve), in the interest rate, and in the endowment of individuals.

The irrelevance of finance

There is another important implication of the assumption that there is only one uniform rate of interest that, in equilibrium, equals the marginal return on investment (point A in Figure 5.1). It is closely related to the Fisher separation theorem. In equilibrium, it does not matter whether investments are financed by equity or debt capital or a combination of both (Vickers 1978: 72 ff.; Drukarczyk 1980: 37 ff.). Investors will choose the same investments irrespective of the way they finance them (Breuer 2012: 48). This point is illustrated in Figure 5.2, adapted from Vickers (1978: 53) and Drukarczyk (1980: 40). It reproduces Figure 5.1, only that now the initial endowment E is at the origin of our coordinate system. This means that Figure 5.2 shows an extreme case. Our investor does not have any initial endowment, no equity at all. If it were not for the capital market, he could

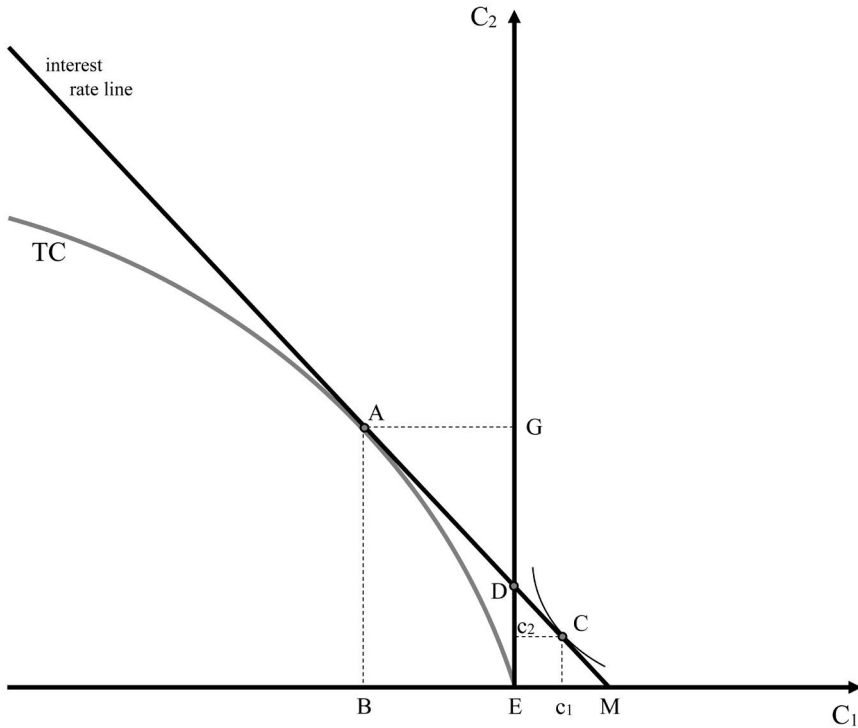


Figure 5.2 The irrelevance of finance

neither consume nor invest in period 1, and therefore he could not make it to period 2 on his own. Different from the investor in Figure 5.1, he is not able to finance any amount of his investment with equity. Nonetheless, he will choose the same amount of investment. Finance is irrelevant to his decision. In his case, as well as in the case depicted in Figure 5.1, the tangent point of the interest rate line with the transformation curve marks the optimum amount of investment. Given a perfect capital market, our penniless investor will borrow funds on this market up to the point where the marginal return on investment equals the rate of interest (line segment EB) and thus attain point A.

In order to explain Figure 5.2, I would like to state precisely what our penniless investor does. He starts with nothing in period 1. Therefore, he borrows the amount EB on the capital market at interest. he knows that in period 2, he will have to pay interest and repay the loan. The amount due in period 2 can be seen in Figure 5.2, too, it is the line segment DG. The investor further borrows the amount Ec_1 in order to be able to consume in period 1. For this, he will have to pay back the amount c_2D in period 2. Now, in period 2, he earns the amount EG from his investment. Of this amount, he will have to give Gc_2 to his lenders and is able to consume the amount Ec_2 .

Of course, in the case of zero equity, the investor does not have much to consume in either period. Starting from point A, the interest rate line depicts the

combinations of consumption in period 1 and consumption in period 2 that are open to him by borrowing additional funds. (We ignore the case that he lends money because this would mean that he chose a consumption combination that lies on the left of A on the interest rate line. Consumption in period 1 would be a very large negative amount.) In order to consume at all in both periods, the investor has to choose a point in the area between M and D on the interest rate line. In our case, the investor chooses the combination c_1, c_2 depicted by the point C.

The point of this subsection is to make clear that the implications of the Fisher separation hold independently of the way investors finance their operations. In equilibrium, they choose the option that has the highest net present value (Vickers 1978: 74). In our comparative static analysis, therefore, we are not only able to ignore the consumption or time preferences of individuals, but also their preferences or limitations when it comes to their mix of equity and debt capital.

The no-arbitrage principle under risk

So far, we have ignored risk and instead assumed a state of certainty. In this book, I am not going to deal with the general development of models that integrate risk into the body of economics. It is well known that, among other branches of economics, Information Economics and New Institutional Economics explore the territory of decision-making under risk.

For us, it is important that it is possible to apply comparative static analysis to the capital market even if we assume the existence of equilibria where risk has not been eliminated. We are able to imagine a world where the decision-makers cannot be certain about the future state of the economy but supply and demand still meet. In these cases, decision-makers base their decisions on imperfect information, most notably on probability distributions of future returns and prices. It appears, however, that we can still make important and meaningful statements about equilibria.

As a consequence, most of our results above also hold in a world that is characterised by risk (Rudolph 2006: 45). In particular, the idea that, in equilibrium, investors choose the investment that is associated with the maximum amount of net present value is valid even under risk (Leroy 1989: 238; Rudolph 2006: 67). Therefore, the equilibrium market prices of assets and firms equal their present value. In the same way that time preferences do not influence the optimal investment decision, risk preferences do not influence the optimal portfolio of assets chosen by investors. Instead, in equilibrium, all investors choose the same portfolio. By incorporating risk, the proposition that investors choose the investment options with the highest net present value appears to become more realistic and practical. Apparently, even in a real-life scenario with uncertain investment outcomes, it makes sense to determine equilibria without considering individual preferences for time and risk and instead focus exclusively on net present values of future cash flows.

That is an interesting proposition. After all, we would expect that investors with high risk aversion choose portfolios that differ from those picked by less risk-averse ones. In this case, the maximisation of net present value would not be the sole criterion for investors and we could say nothing about either the optimal

portfolio or the equilibrium market price. That investors do not choose different options is, once again, a consequence of the no-arbitrage principle. What it means that no arbitrage is possible under the condition of risk has been worked out on the basis of [Markowitz's \(1952\)](#) portfolio theory.

In order to understand the idea that risk preferences do not matter in equilibrium, it is necessary to have a look at Modern Portfolio Theory. This theory is based on the fundamental insight that it is often possible for an investor to reduce risk by combining different assets into a portfolio ([Rudolph 1997](#): 123). It is only necessary that these assets are not perfectly positively correlated. If they are not, holding several of them is less risky than holding only one of them. In particular, Modern Portfolio Theory states that by combining assets, the resulting expected return of the portfolio is the weighted average return of the isolated assets. The resulting risk of the portfolio, however, is lower than the weighted average risk of the individual assets. (The weights correspond to the proportions of each asset in the portfolio.) Thus, due to diversification effects, overall portfolio risk does not simply equal the weighted average risks of the assets. As a result, by diversifying their investment, risk-averse investors are able to improve the relationship between risk and expected return ([Schäfer 2005](#): 281, 285).

[Figure 5.3](#), adapted from [Breuer \(2001](#): 331), illustrates this important insight in the curve AB. In the figure, the x-axis depicts the standard deviation σ – the established measure of risk in this theory ([Sharpe 1964](#): 428) – and the y-axis depicts the expected return μ . A and B are individual assets. B is riskier than A but has a higher expected return. By combining them in a portfolio, it is possible to diversify and thus to reduce risk. Let us say we start with nothing but asset A. By adding units of the higher-risk and higher-return asset B, we are able to increase our expected return. However, as long as we add only a few units of B, the overall risk of our portfolio becomes smaller. The reach AC illustrates this relationship. The portfolio with the least risk is depicted by point C ([Drukarczyk 1980](#): 313). If we add even more of B, the expected return increases more but risk also starts to rise again.

Modern Portfolio Theory, of course, assumes that investors are risk averse. This assumption has another important implication: An investor will opt for an investment with increased risk only if compensated by higher expected returns ([Laux et al. 2018](#): 281). This means that a rational investor will not invest in a portfolio if for the same level of risk, an alternative portfolio exists that has higher expected returns ([Markowitz 1952](#): 82; [Sharpe 1964](#): 428; [Lintner 1965](#): 590; [Hering 2015](#): 297; [Frankel et al. 2024](#): 49). Since, in equilibrium, this is true for all investors, for each level of risk only those portfolio(s) will be selected that have the highest expected return. All other portfolios are dominated and will not be selected. In [Figure 5.3](#), there is a frontier line BC that describes all efficient portfolios, that is, all portfolios that provide the maximum expected return for a given rate of risk ([Sharpe 1964](#): 429). Portfolios on the line AC are not efficient since they are dominated by portfolios on BC that have the same risks but higher expected returns ([Drukarczyk 1980](#): 313). For example, point A where we only hold asset A is dominated by portfolio D.

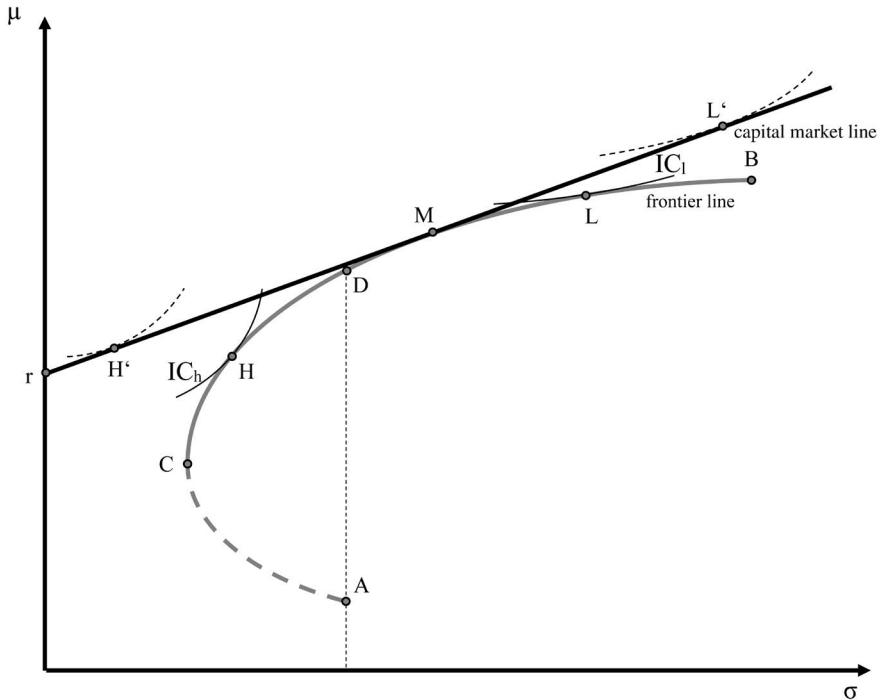


Figure 5.3 Portfolio selection

The Tobin separation

So far, we have not explained why all investors choose one and the same portfolio in equilibrium. After all, the frontier line BC in Figure 5.3 contains an infinite number of combinations of assets A and B . They all have different amounts of risk and expected return, and it is obvious that the risk attitude of individual investors will determine which portfolio they choose. An investor with high risk aversion (depicted by the indifference curve IC_h) will choose a portfolio that is more to the left, containing more of the relatively less risky asset A (point H). An investor with low risk aversion (indifference curve IC_l) will choose a portfolio that is more to the right, containing more of the relatively riskier asset B (point L).

Like in the case of the Fisher separation, once we introduce the perfect capital market, the preferences of individual investors cease to be relevant for the optimal portfolio (Tobin 1958: 84; 1969: 16). When it is possible to lend and borrow on the capital market at a uniform and riskless rate of interest (Rudolph 1979: 1043), all investors will choose one and the same “optimal” portfolio.

In order to understand this, let us have another look at Figure 5.3. In the first instance, the perfect capital market simply introduces a third possibility to invest funds. Next to assets A and B (and combinations of both), we now have the possibility of investing in a riskless alternative that yields the rate of interest r . In Figure

5.3, this third option is depicted by the point r on the y -axis (Sharpe 1964: 426). At point r , the expected return μ equals the interest rate r , while the risk is zero.

Now, in the same way that it is possible to combine assets A and B , it is also possible to combine the riskless alternative provided by the perfect capital market with asset A , asset B , or any portfolio containing both assets A and B . Since the interest rate is riskless, combinations between capital market investment (point r) and other investments are not depicted by a bent line such as AB . Instead, these combinations are on straight lines (Kruschwitz 2007: 197). For example, combinations of the riskless alternative with asset A would be on a straight line between r and A ; combinations of the riskless alternative with asset B would be on a straight line between r and B (Sharpe 1964: 432). In Figure 5.3, we see one of these lines, namely the one that goes through points r and M . M stands for a certain portfolio of A and B , and the line rM depicts all combinations of portfolio M with the riskless alternative. The line continues on the right-hand side after touching M if investors have the possibility to borrow at interest r and invest these funds in the portfolio M (Sharpe 1964: 433; Drukarczyk 1980: 306).

The point M has been chosen for a reason. The line rM is tangent to the frontier line. Therefore, all combinations depicted by rM dominate the portfolios depicted by the frontier line (Sharpe 1964: 432; Drukarczyk 1980: 305) – except for M , since M is on both curves. What we can say, therefore, is that it is advantageous for each and every investor, independent of risk preferences, to choose a portfolio on the line rM . Those with high risk preferences (IC_h) are able to improve their position from H to H' since they obtain a better indifference curve in this way; likewise, those with low risk preferences (IC_l) can obtain a higher indifference curve by choosing point L' . In other words, all investors are able to achieve higher indifference curves by investing in portfolio M and combining this investment with the secure alternative r . All other combinations of securities A and B are dominated by the combination M , if it is possible to lend and borrow resources without risk on the capital market at the rate r .

Investors are therefore confronted with *two separate decisions*. First, they decide on the optimal combination of the risky assets A and B . We have seen that risk preferences do not play any role in these decisions as long as there is a riskless alternative (Kruschwitz 2007: 176). All investors choose portfolio M . In a second step, investors decide on the amount of risk they want to bear. They do so by choosing the amount of the portfolio M they want to hold, i.e., by choosing one point on the line rM (Kruschwitz 2007: 177). This could be point r for those with very high, point H' for those with high, and point L' for those with low risk preferences (Drukarczyk 1980: 306).

Similarly to the Fisher separation, the Tobin separation implies that the investors in the model choose their investment portfolio independently of their preferences. What they do, here again, is choose the option that has the highest net present value. After all, if it can be combined with the riskless alternative r , the portfolio M dominates all other portfolios on the frontier line. Given any amount of risk that an investor may want to take, portfolio M is always the means of choice (Frankel et al. 2024: 51). If the no-arbitrage principle holds, no other portfolio can

therefore be worth more today than portfolio M. If it were, investors could improve their position effortlessly by selling their current portfolio and purchasing portfolio M that promises less risk for the same return or a higher return for the same risk.

Although the portfolio selection theory is rather normative, I want to point out that, on a certain level, it is simply a description of the characteristics of equilibrium on the capital market (Hering 2015: 306). For some commentators, the gist of the Capital Asset Pricing Model (CAPM) – a derivative of modern portfolio theory (Laux et al. 2018: 464) – is to determine the characteristics of prices in equilibrium (Kruschwitz 2007: 179; Olbrich et al. 2015: 12). It states that the risk-adjusted return in equilibrium must be the same for every stock (Harrison 1997: 179). Even if we include risk, therefore, the assumption of the perfect capital market implies that, in equilibrium, capital is allocated perfectly in the economy. Again, like in the case of the Fisher separation, we are able to calculate the equilibrium as if the capital market were populated by *homines economici* who make two separate decisions, one where they invest their funds in an optimal way (portfolio M) and one where they decide, based on their preferences, how much of the risky portfolio they want to hold and how much of the riskless alternative *r*.

In equilibrium, there are no costless arbitrage opportunities anymore. The prices of assets adapt in a way that, in equilibrium, it is not possible for investors to improve the return on their investment without incurring a corresponding cost. The cost is that they have to accept higher risks (Drukarczyk 1980: 323; Dybvig and Ross 1989: 59). In Figure 5.3, the linear relationship between additional return and corresponding additional risk in equilibrium can be seen in the slope of the capital market line *rM* (Rudolph 2006: 82). The slope can be interpreted as the expected return of incurring additional risk.

For comparative static analysis, this linear relationship between return and risk implies that in equilibrium, prices of assets are such that it is impossible to improve the return-risk ratio beyond the possibilities provided by the capital market line. This is, as Mossin (1966: 776) adds, “the ultimate outcome of the equilibrating effects of the market process.” No investor would profit from changing the portfolio from M to a different combination of risky assets. Therefore, since all investors hold a certain amount of M (including the possibility of holding zero units of M and only the riskless alternative *r*), M is identical with the so-called market portfolio, that is, it necessarily includes all assets that are traded on the market (Mossin 1966: 776; Rudolph 1997: 124; Follert 2020: 150). In Figure 5.3, M only includes two assets, A and B, but the result can be generalised for *n* assets (Laux et al. 2018: 287 ff.).

If we ignore some logical flaws of the model (Schmidt 1976: 669 f.; Hering 2015: 307; Olbrich et al. 2015: 13), the Tobin separation and the CAPM can be utilised to analyse how capital markets adjust to changes in exogenous variables. They widen the applicability of comparative statics (Markowitz 1952: 91; Tobin 1958: 85). For example, we could investigate how an increase in the supply of less risky assets (such as government bonds) influences the composition of the market portfolio. Comparative statics can also be used to understand how an increase or decrease in market risk (e.g., due to political events, economic shocks, etc.) would

affect the selection of portfolios in equilibrium. Furthermore, when the expected returns of risky or risk-free assets change (e.g., due to macroeconomic developments or changes in monetary policy), Modern Portfolio Theory allows for analysis of how these changes influence the position of the efficient frontier and, accordingly, the optimal portfolio M.

The value additivity theorem

Both the Fisher and the Tobin separation theorems imply that the preferences of investors do not matter for determining the equilibrium position. The question of how much to invest and in what portfolio is independent of consumption choices and the attitude towards risk. In any case, in equilibrium, those investment projects are chosen that have the highest net present value.

In equilibrium, another relationship holds: The present values of different investment projects add up. In particular, the present value of a company equals the sum of the present values of the company's individual investment projects (Breuer 2012: 64). Likewise, when two companies merge, the present value of the resulting company is the sum of the present values of the merging companies (Franke and Hax 2004: 334). As Hax (1993: 1086), Ang and Clark (1997: 5), and Franke and Hax (2004: 358) explain, it would be a violation of the no-arbitrage principle if present values did not add up. If it were possible to increase the present value of two companies by merging them or of one company by spinning off certain departments, a costless opportunity for arbitrage would exist. This, however, would be inconsistent with the perfect capital market. In equilibrium, therefore, the present value of a company equals the sum of the present values of its individual investment projects (Franke and Hax 2004: 337). This relationship is often called the value additivity theorem. If we assume a perfect capital market, the present values of individual objects can be added up to form the present value of the aggregate.

Brealey and Myers (1996: 516, emphasis added) explain why it is hardly possible to exaggerate the importance of the value additivity principle. Without it, we would be unable to determine the influence of investment projects on the value of our firm:

If value additivity did not hold, the value of the firm with the project could be more or less than the sum of the separate value of the project and the value of the firm without the project. *We could not determine the project's contribution to firm value* by evaluating it as a separate mini-firm.

Value additivity holds both under certainty and risk. It would go too far to present the formal proof of value additivity under risk. Franke and Hax (2004: 356) show that CAPM is characterised by value additivity. Brealey and Myers (1996: 165) provide an intuitive explanation for the phenomenon: If investors can diversify (and undiversify) on their own account – and on a perfect capital market, they can – they will not pay any extra or any less for firms that diversify. “[D]iversification does not add to a firm's value or subtract from it. The total value is the sum of its parts.”

For us it is important that if value additivity holds in equilibrium, it is possible to combine and split cash flows at will. “We can slice a cash flow in as many parts as we like; the values of the parts will always sum back to the value of the unsliced stream” (Brealey and Myers 1996: 450). Let us be more precise. On a usual balance sheet, we have the asset side and the liabilities side (see Figure 2.1). The asset side shows us the assets that generate cash flows for the business. The liabilities side shows us the liabilities that demand payments from the business. If the principle of value additivity holds, it is possible to slice the asset side into as many parts or investment projects as we like. Their individual and their aggregate value will stay the same. As a consequence, the value of the asset side is independent of the number and nature of the claims against it. “Firm value is determined on the left-hand side of the balance sheet by real assets – not by the proportions of debt and equity securities issued by the firm” (Brealey and Myers 1996: 450, emphasis deleted).

The Modigliani–Miller capital structure and dividend policy irrelevance theorems

The famous Modigliani–Miller (MM) irrelevance theorems are basically an outflow of the no-arbitrage and value additivity principles (Breuer 2001: 221; Kruschwitz 2007: 251; Penman 2011: 20). Dybvig and Ross (1989: 67) even go so far as to maintain that “it is possible to view absence of arbitrage as the one concept that unifies all of finance.” Briefly stated, MM claim that “assets with the same expected payoffs and the same riskiness of those payoffs must have the same value” (Harrison 1997: 180). The point of MM is that, even under the conditions of risk, firms can analyse real investments as if the actual financing plan does not matter at all (Rudolph 2006: 39). In other words, MM provide further separation theorems. “[D]ecisions to spend money can be separated from decisions to raise money” (Brealey and Myers 1996: 516). It amounts to the same point if we say that, in equilibrium, the debt level of an enterprise does not influence its present value, and therefore its market price (Kruschwitz 2007: 245). “[F]inancing activities are not value-relevant” (Scholze 2010: 37).

Once again, these are theorems that contradict real-life experience. First, we know that there are a number of diverse instruments for financing an enterprise: normal shares, preferred shares, redeemable preferred stock, income bonds, and convertible bonds, to name just a few. If finance were irrelevant, there would be no explanation for this diversity (Hax 1997: 67). Second, we know that for actual businesses, the decision between raising debt capital and raising equity capital is very important. Initially, debt capital is cheaper than equity because borrowers have to bear less risk. In case of bankruptcy, they are paid with priority as compared to the providers of equity. On the other hand, when the debt level rises, borrowing becomes expensive as well. Lenders will start to fear losing some or all of their funds, and the business runs the danger of going bankrupt because of rising debt service. As a consequence of these conflicting effects, in actual business life it is considered important to find the optimal combination of debt and equity instruments, i.e., the optimal capital structure (Schäfer 1997: 78; Kruschwitz 2007: 243).

In contrast, the MM theorems claim that there is no such thing as an optimal capital structure (Schäfer 1997: 81). There are basically two MM theorems (Rudolph 2006: 39). The first one claims that the mix of securities on the liabilities side of the balance sheet does not influence the choice of investment projects on the assets side (Modigliani and Miller 1958). Since a firm's mix of different securities is known as its "capital structure," the first MM theorem is often called the "capital structure irrelevance theorem." It states that "the market value of any firm is independent of its capital structure" (Modigliani and Miller 1958: 268), i.e., the market value stems exclusively from the cash flows generated by the assets on the asset side of the balance sheet (Hax 1993: 1086). The question of how these cash flows and the corresponding risks are allocated to the providers of capital on the liabilities side does not matter (Kruschwitz 2007: 251; Cardao-Pito 2021: 509). Otherwise, the argument goes, the law of one price would be violated (Schäfer 1997: 81). Arbitrage makes sure that identical investment projects have the same price, independent of the way they are financed (Schäfer 1997: 83).

In the MM argument, it is private investors who arbitrage price differences away. In a perfect capital market, private investors face the same conditions for lending and borrowing as enterprises. Therefore, if they hold securities of a certain enterprise and are unhappy with its mix of debt and equity instruments, they are able to offset the unwanted debt/equity relationship by market transactions on their own (Hax 1993: 1083). For example, if a firm does not have enough debt, in the view of private investors, the latter are able to compensate for that by incurring debt on their own (Perridon et al. 2022: 26). They are able to build up any capital structure they like for themselves. Since this is possible, the capital structure of enterprises is irrelevant for their market price. In the words of Modigliani and Miller (1958: 270),

levered companies cannot command a premium over unlevered companies because investors have the opportunity of putting the equivalent leverage into their portfolio directly by borrowing on personal account.

Therefore, the values of the individual assets and investment projects simply add up to form the value of the enterprise (Hax 1998: 223).

It is important at this point to note that this terminology – capital structure – is confusing, particularly for readers of the present book covering the Austrian theory of capital. Lachmann (1978) called his famous study "Capital and its Structure." What he and many other Austrian economists mean when speaking about the capital structure is not the mix of equity and debt instruments characterising the right-hand side of the balance sheet. They use this term when referring to the heterogeneity of the produced means of production. I explained in Section 1.2 why I do not follow this practise.

The second MM theorem refers to auto-financing. MM claim that it does not matter for the present value or the market price of a firm whether it retains its earnings or pays them out as dividends (Miller and Modigliani 1961; Breuer 2001: 224). The theorem is often called the dividend policy irrelevance theorem. The argument is very similar to the first MM theorem. Again, private investors on a

perfect capital market are able to compensate for any dividend policy of an enterprise whose securities they happen to own. For example, if investors consider the dividends an enterprise pays out to be too high, they are able to invest these dividends in further securities of the enterprise. Conversely, if investors are of the opinion that the enterprise should pay higher dividends, they are able to sell their securities (Miller and Modigliani 1961: 412; Perridon et al. 2022: 27), i.e., “investors can create their own dividends by selling shares of stock” (Brickley and McConnell 1989: 120).

The efficient market hypothesis

Another implication of the no-arbitrage principle is the so-called efficient market hypothesis or EMH (Penman 2011: 14). It says that on an efficient capital market, no arbitrage is possible on the basis of information. Therefore, the price of an asset fully and correctly reflects all available information (Malkiel 1989: 127). In other words, prices accurately reflect what is sometimes called fundamental values (Harrison 1997: 180). As Dybvig and Ross (1989: 68) explain, the intuition behind the EMH is that if the price of an asset does not fully reflect available information, there is a profit opportunity available from selling the asset if it is overpriced or from buying it if it is underpriced. Arbitrage exploits profit opportunities immediately, and therefore prices adjust to their equilibrium level instantly (Malkiel 1989: 128).

A direct consequence of the EMH is that prices on an efficient capital market follow a so-called random walk. Since all currently available information has already been priced in, future price changes will only reflect future news and will therefore be independent of recent price movements. New information by definition is unpredictable “and thus the resulting price changes must also be unpredictable and random” (Malkiel 1989: 128). According to the EMH, changes in price are unrelated to past price changes.

For us, the EMH is important as a final point of this chapter. It illustrates very well the methodological contrast between modern finance theory and the institutional market-process point of view that I have presented in the foregoing chapters. Finance theory focuses on equilibria, the theoretical end points of market processes. As the EMH demonstrates, the way in which the various equilibria are interconnected is of no importance. The new equilibrium results from new information and does not somehow emerge organically from the old one. On the contrary, the EMH emphasises explicitly that the old equilibrium does not contain the information that is necessary to forecast the new one. *The market process, as well as the underlying institutions, is ignored, whereas the end point is considered as independent magnitudes worthy of isolated analysis.*

In a certain sense, the EMH delivers exactly what comparative static analysis needs: Several independent states of equilibrium that can be compared with one another. For this very reason, the EMH is totally different from the theory of capital presented in this book. It does not mention money, entrepreneurship, economic calculation, and the other institutions that we have demonstrated to be behind the real-world tendency of market processes to equilibrate supply and demand and

organise the complex structure of production. In particular, it excludes any role for economic calculation. If all available information is already reflected in market prices, there is no need for enterprises to embark on generating or processing information themselves. Prospective economic calculation becomes meaningless since by definition enterprises do not have better information than the market that they could base their calculations on. Retrospective calculation becomes meaningless, too, because the success or failure of an enterprise must be random under the EMH. Profits and losses of an enterprise are therefore detangled from the plans and actions of its managers, and retrospective calculation cannot help anyone when it comes to evaluating past decisions.

The EMH takes these institutions for granted. I have already explained that there are good methodological reasons for this scientific division of labour. However, we will see in the next chapter that the division has broken down. The theorems and concepts of finance have been used as a theoretical basis for reforming the institutions that it takes for granted, with unfortunate consequences.

6 Value-orientation as a misplaced blueprint for economic practice

6.1 A prescriptive turn in economics

The equilibrium concepts of finance theory in real life

It appears to be unproblematic to assume a perfect capital market or that agents in models act like the *homo economicus*, as long as we keep in mind that these methodological devices serve certain limited scientific purposes. If we want to isolate the effects of parameter changes, it makes sense to assume that we both start and end our observations in equilibrium situations. It is more than obvious, therefore, and should not be noteworthy, that the theorems and concepts presented in [Chapter 5](#) do not describe the real world. However, in the 20th century, economists and policymakers have started applying the theorems as if they did so. Institutions have been reformed in a way that made them fit better into a world that is supposedly characterised by equilibria as described by equilibrium models ([Blinder 2000](#); [Cooper 2015](#)). Two areas where institutions have been reformed in this spirit are financial accounting and corporate governance. Both developments are of utmost importance from the point of view of the capital theory that I have presented in this book. They are directly related to and interfere with the economic calculations of business enterprises that create both the dynamics of capitalism and the tendency towards equilibration in the first place. Therefore, it is necessary to indicate the practical inapplicability of the theorems presented in [Chapter 5](#) at some length.

Let us start with the no-arbitrage principle. Obviously, real markets are not characterised by equilibrium prices. The very existence of profit-oriented business enterprises, arbitrageurs, and speculators proves beyond doubt that there are profit opportunities out there that can be exploited. “[B]usinesses are actually in the business of arbitrage” ([Penman 2011](#): 29). In fact, there must be gaps in the price structure that allow for profitable action and arbitrage, otherwise not only businesses, but markets would cease to exist. The point is that the assumption of a market in equilibrium is based on the idea that in disequilibrium, certain market forces are at work that push prices towards equilibrium. The market equilibrium is the theoretical consequence of arbitrage and profit-making – it *requires* arbitrage and profit-making. Arbitrage is the pre-condition of the no-arbitrage principle. Therefore, reforms of actual institutions must not start from the no-arbitrage principle.

Policymakers must rather understand how disequilibrium market processes tend to equilibrate supply and demand on the various, interconnected markets.

The same holds for value additivity. Sure, in equilibrium, values add up by definition. A company that owns a factory building worth 1,000,000 euros and a vehicle fleet worth 500,000 euros must be worth 1,500,000 euros in equilibrium. If it were worth less, it would sell some or all of its assets and in this way increase its company value relative to the value of its assets. If it were worth more, the company or some imitators would expand, increase the demand for the particular or similar factory buildings and vehicles and in this way bring about equilibrium where the value of the sum of the individual assets is equal to the value of the whole company. Once again, the story presupposes the market process. There must be arbitrage, profit-seeking, and competition on monetised markets. If there are, then there is a tendency towards equilibrium where prices of individual goods add up and are equal to the price of the whole or aggregate. If you are a policymaker, therefore, you should seek to understand these processes that tend to bring about value additivity. Value additivity must not be your starting point. It is a theoretical end result of functioning market processes, not a real-life characteristic of asset prices.

The argument that the starting point of policymakers must not be the theoretical end result of market processes becomes particularly clear when we look at the Fisher and Tobin separation theorems. These two theorems assume that each and every investor and consumer can deposit and borrow unlimited funds at a uniform interest rate. Obviously, this is not a real-life observation. We must not treat real-life market prices as if they were generated in a world where such a uniform rate of interest holds for everyone. The Fisher separation theorem however, is based on this assumption and concludes therefrom that the investment decisions of investors are independent of their consumption decisions or, in other words, their time preferences. Allegedly, therefore, they always choose those investment projects that have the highest net present value. In equilibrium, then, the market price of goods, assets, and enterprises corresponds to their present value.

Again, this has to be explained as the theoretical result of market processes. If market prices of assets were less than the present value of the cash flows they are expected to generate, demand for them would rise and, accordingly, their prices as well. Likewise, if market prices of assets were higher than their present value, demand for them would decrease until prices and present values match. However, we cannot deduce from the Fisher separation theorem that actual market prices of assets accurately reflect their present value. The very point of business enterprises, speculators, and arbitrageurs is to spot instances where market prices and present values do not coincide. They operate under the assumption that prices and values diverge. That is how they make their living. Actual values of assets and enterprises are not observable. Their prices can be observed, but these prices do not reflect an objective truth about the good being priced. In particular, they do not necessarily reflect all available information.

A similar point can be made for the Tobin separation theorem. If all investors chose the same market portfolio, as the theorem maintains, markets and competition

would not make sense anymore. They would cease to exist. Everything would be priced correctly, including risks, and ignoring or doubting market prices would lead entrepreneurs to losses. This, however, is not a proper description of what happens on actual markets. Policymakers should therefore think twice before they introduce reforms that require or incentivise enterprises to treat prices as if they reflected correct values. They should rather start with understanding the processes that lead to the generation of information and the adjustment of prices to values.

The Modigliani–Miller irrelevance theorems are likewise not good starting points for institutional reform. They describe equilibrium phenomena. In equilibrium, the value of an enterprise is independent of its capital structure (debt vs. equity capital) and its dividend policy. But this is, once again, the theoretical end result of certain market forces. If we want to understand how the market process works, we must deal with the tendency towards equilibrium in actual markets, and in actual markets, both dividend policies and capital structures matter a lot.

Values and prices

In the second half of the 20th century, economists and policymakers nonetheless started to apply the theorems of finance and other equilibrium concepts outside of comparative static analysis. Although these theorems ignore the institutional framework of capitalism, they were used as a basis for reforming the very institutions they ignore. As far as I can tell, the most important force behind this development is the idea, fostered by the structure of financial economics, that actual market prices of assets and of shares correctly reflect the “value” of these items. In other words, under certain circumstances, actual market prices were supposed to have the same characteristics as equilibrium prices. According to [Blinder \(2000: 20\)](#), neoclassical free-market economists make the “stunning intellectual claim” that “[e]verything a market participant needs to know is embodied in the market price.” One could say that these economists raise the market to the second power or market squared. In this view, the market is not only a helpful but imperfect institution that processes information and coordinates the behaviour of people and firms who orient their actions by market prices. Instead, the market is characterised by equilibrium prices, brought about by *homines economici*, and does not need any informational input; it commands all information at all times and, therefore, always spits out the correct value of goods and services ([Cardao-Pito 2023: 10](#)).

If we assume that the market knows everything and prices contain all relevant information, other institutions complementing this “pure” and “perfect” market appear to be redundant. To say it once again, in comparative static analysis, it is indeed not necessary to include institutions such as money, enterprises, economic calculation, and real markets (as opposed to perfect markets). It is another thing, however, to say that the values generated by the market in real life are absolutely correct, given the available information, and that they therefore suffice as action orientation for managers and consumers. Friedrich von [Hayek \(1937: 50\)](#) argued that neoclassical economists overlook the fundamental problem of economics. By restricting their analysis to equilibria, economists implicitly assume that the

dispersed knowledge held by the many individuals in society has already been processed and perfectly incorporated into the prevailing prices.

In the capital theory presented in [Chapters 2 to 4](#), neither market prices nor profits and losses were assumed to be correct or perfect. Market prices do not reflect the “true value” of traded goods nor the “true” magnitude of earned profits. Instead, they fluctuate continuously as a result of ongoing market processes driven by the constant buying and selling activities of consumers and profit-seeking firms. Prices are not set exogenously by the market for firms and consumers; rather, consumers and firms interacting through market transactions jointly determine prices in a dynamic, never-ending process. It is precisely because market prices do not represent the “value” of traded goods that corporate management believes it can profit from buying and/or selling these goods at prevailing market prices. The market is characterised by exchanges in which “it is precisely the *disparity* in the [subjective] value attached to the objects exchanged that results in their being exchanged” ([Mises 1949](#): 205, emphasis added).

Imperfect prices and differing expectations about the future development of supply and demand keep the market and competition alive. As long as the market process is ongoing, even “the notion of a measurement of value is vain” ([Mises 1949](#): 205). This point has been emphasised in the German-language literature on business valuation for several decades. [Matschke and Brösel \(2021](#): 8), summarising this body of work, argue that there is “no value per se.” According to [Hering et al. \(2010\)](#), it is “jugglery to assume the existence of ‘objective,’ ‘true,’ ‘actual,’ ‘intrinsic,’ ‘inner,’ or ‘fair’ values’ [instead of mere] human, subjective value judgements” that lead to imperfect market prices (see also [Follert et al. 2018](#): 317; [Follert 2023](#): sect. 2.1, and [Follert et al. 2023](#): 3281).

In contrast, neoclassical economics takes the market process for granted. It focuses on equilibrium “values” and largely ignores the operational and institutional prerequisites of the market. The best way to understand what that means is to have a look at the neoclassical theory of the firm. We have seen that the firm is a central institution of capitalism, inseparably linked to most other capitalist institutions – in particular to money, private property, the market, and economic calculation. Nonetheless, neoclassical economics does not really have a theory of the firm that separates it from the market. From the point of view of [Jensen and Meckling \(1976](#): 311), “it makes little or no sense to try to distinguish those things which are ‘inside’ the firm [...] from those things that are ‘outside’ of it.” Since all prices are assumed to reflect correct values and to be in equilibrium, the firm – as an entity that seeks to profit from price spreads arising from disequilibrium – ceases to exist. Consequently, strategy, organisation, and finance within the firm are trivialised ([Lazonick and Shin 2020](#): 16). In equilibrium, firms are nothing more than “nodes in a network of transactions” ([Simon 1991](#) 25), mere verbal add-ons to the price system.

[Kohn \(2004\)](#) argues that the mainstream economists’ acceptance of the interpretation that market prices are values – rather than signals derived from actual exchanges – can be traced back to [Hicks \(1939\)](#) and [Samuelson \(1947\)](#). Hicks aimed to develop a value theory that would unify economics based on the Walrasian general equilibrium framework, while Samuelson sought to reformulate economic

theory using the language of mathematics (Klamer and McCloskey 1992: 151; Kohn 2004: 303 f.). These two projects complemented each other effectively, and although Hicks and Samuelson recognised the underlying market processes, their followers increasingly equated economics with value theory, to the extent that this perspective “has come to dominate economic theory” (Kohn 2004: 305). The confusion between prices and values appears to persist within neoclassical economics (Biondi 2010: 35f.).

Economic income

Of course, I would make a straw man argument if I maintained that neoclassical economists generally claim that market prices are equilibrium prices and, therefore, correctly reflect the value of goods. However, there are important areas where they actually argue *as if* real-life prices were equilibrium prices. This is particularly true with the concept of “economic income.”

Irving Fisher, the originator of the Fisher separation theorem, is also one of the main contributors to the concept of economic income and, consequently, the idea that actual market prices equal present values (Cardao-Pito and Ferreira 2018). In his book *The Nature of Capital and Income*, Fisher (1906) sought to grasp the essence of capital and income. He came to the conclusion that an equilibrium concept of income would be ideal. The concept of equilibrium, in other words, should not only be relevant for the analysis of snapshots in time, i.e., of states of the world where supply equals demand. It should also be relevant for the flows of income that occur over a certain period of time. It would be best, Fisher (1906: 255) explained this idea, if we lived in a world where income flows do not disturb the equilibrium:

We have learned, then, to distinguish between standard and realized income. The one is ideal, the other actual. The one is that income which, if it were received, would leave the level of capital-value [= present value] unchanged; the other is that income which is actually received and detached from capital, no matter whether that capital, as a result, is increased or decreased. In short, the one is earned, the other realized.

Ideally, then, income is not a tangible monetary magnitude – the difference between monetary revenues and monetary expenses over a certain period of time. Instead, it is a theoretical magnitude. Economic income is the amount of income that leaves the level of present value unchanged, that is, it does not interfere with equilibrium and equilibrium prices. This of course is the case if the profit or net income of an enterprise consists of interest on its present value (Sefton and Weale 2006). Another way of expressing economic income would be that the income of a firm corresponds to the continuous increase in its present value – in the amount of the interest rate - that would appear over time if it were not paying dividends (Hansen 1962: 15; Barton 1974: 671; Penman 2016: 6; Braun forthcoming b: 2). It must be assumed, however, that economic income (i.e., the mentioned increase in present value) is distributed to the owners

or shareholders. Otherwise, the accumulation of value would destabilise the equilibrium (Biondi and Olla 2020).

John Hicks' famous book *Value and Capital* contains a very similar idea. He did not define income as an actual amount of money, but as a magnitude that relates to values. He provided several possible definitions of income, but according to his famous income concept no. 1, income is

the maximum amount which can be spent during a period if there is to be an expectation of maintaining intact the capital value of prospective receipts (in money terms).

(Hicks 1946: 173)

To be sure, the economic income concept would not go beyond the scope of comparative statics if it only referred to a theoretical concept of income that describes relationships between equilibrium prices. As such, it is the concept of income that most economists use (Scapens 1978: 448). However, Fisher's and Hicks' concept of income serves, in the words of Fisher, as an "ideal." It supposedly captures the essence of income. A casual reader of these authors could come to the conclusion that it would be best if economists, practitioners, and politicians found ways to make reality resemble this ideal. They could come to believe that income in real life should ideally be determined not as the difference between revenues and expenses but as interest generated on the basis of a constantly maintained present value.

It is important to realise what that means. In Chapter 3, I have presented the way business enterprises determine their income. As a starting point, I used the ingenious Marxian formula Money – Commodity – Money'. The actions of enterprises and their calculations start and end with money. They are supposed to pull out more money from the production process than they invest in it. Accordingly, they calculate their profits more or less as a purely monetary magnitude. The expenses derive from money they actually spent and the revenues derive from money they actually earned. This kind of calculation presupposes the institutional framework of capitalism, especially money, enterprises, capital, markets, and private property.

Economic income, instead, starts with "values" and ends with "values" (Frankel et al. 2024: 124). If there are no parameter changes, the increase of the present value (PV) is economic income, where the increase must in theory equal the interest rate. As a Marxian formula, we could write that PV becomes PV', with $PV' = PV \cdot (1 + \text{interest rate})$. It is true, economic income somehow also presupposes the institutional framework of capitalism. However, at the same time, it assumes that these institutions work perfectly. It assumes that present values are not subjectively estimated magnitudes, but objectively available information. Obviously, that is only the case when the market is in equilibrium and prices equal present values.

The economic income concept acknowledges, however, that even in a world characterised by equilibrium, present values do not have to be fixed forever (Fama 1965). It may be the case that, according to the efficient market hypothesis, prices are generally "equilibrium" prices that incorporate "all information available to investors at that time" (Brealey and Myers 1996: 327). However, present values may

still change over time as a result of new information. Since new information, by definition, is unpredictable, the resulting sequence of price changes must be random (Brealey and Myers 1996: 327). Present values, and therefore market prices, follow a “random walk.” Their path consists of a succession of random steps, that is, tomorrow’s price will differ from today’s price in unpredictable and random ways (Soufian, Forbes, and Hudson 2014: 736). Only utterly unexpected changes in these values may occur (Morck 2014: 186). Allowing for these unexpected value changes, economic income is defined as “the residual derived from estimating capital value at the beginning and end of a period, after allowing for consumption during the period” (Myddelton 2009: 88). Brealey and Myers (1996: 306) define it succinctly as: “*economic income = cash flow + change in present value.*”

The heroic assumptions of economic income

One could think that the assumptions of economic income are the same as those of comparative statics. Economic income is the correlate of two successive equilibria, and therefore no assumptions appear to be necessary in addition to those needed for these equilibria. However, this is only partly true. There is a conceptual difference between the individual equilibria and economic income.

In comparative static analysis, equilibria are theoretical constructs. They are the imagined outcome of certain tendencies and would only appear if no data in the economy changed. As such, these equilibria are timeless. We do not say that an equilibrium is reached in one day, week, month, year, or decade. It exists instantaneously in our imagination and our models, but it never exists in real life (Boulding 1955: 489).

Therefore, we would believe that economic income, as the correlate of two timeless equilibria, must be timeless as well. However, as a timeless concept, economic income does not make a lot of sense. Even if we take it as a purely theoretical construction, if it is to be meaningful, economic income must always relate to a specific period of time, typically a year. The equilibria at the beginning and at the end of the respective year, then, cannot be understood as timeless constructions. Between the equilibrium at the beginning and the equilibrium at the end of the year, 365 days pass. At the end of this specific and limited time period, any changes that occurred in the meantime – in information, preferences, resources, or otherwise – must have been digested entirely by the market so that we have achieved equilibrium again. In short, the concept of economic income presupposes that equilibrium appears in real time, not only in theory and in imagination.

Accordingly, when it comes to economic income, the theorems presented in Chapter 5 do not have to hold only in timeless theory but also in concrete time. Economic income as the difference between two present values only makes sense if these values are actually correct, that is, if the market is able to start from and achieve equilibrium in a specific period of time. Most importantly, the no-arbitrage principle must not be violated in either equilibrium. We must assume that in both concrete points in time between which we want to measure economic income, all possibilities for arbitrage, all gaps in the price structure have been eliminated. For instance, we must assume that, say, on both January 1, 2026, and December 31, 2026, the market

was in equilibrium and no entrepreneurial action was possible based on the respective available information. This is indeed a very heroic assumption. In addition, it would be arbitrary to assume that equilibrium existed only on these two days, and not on the other days of 2026. Why would equilibrium exist only on January 1 and December 31, but not on September 29 or October 10? If this were the case, we could only calculate economic income for entire years, and not for any shorter periods of time, such as quarter years or months. Obviously, this cannot be the intention of the economic income concept. Rather, we must conclude that the concept is based on the idea that each and every day, or better, each and every point in time is characterised by equilibrium. In other words, the no-arbitrage principle holds all the time.

As a consequence, all other principles and theorems must hold all the time, too: the value additivity principle, for example. If the values of a firm's assets did not add up to form the value of the entire firm, arbitrage possibilities would still exist and we would not be in equilibrium. Likewise, the Fisher and Tobin separation theorems must be valid all the time as well. All investors must be able to lend and borrow money at the same rate of interest so that all of them can choose the investment programme that maximises the net present value of future cash flows, independent of their time and risk preferences. Furthermore, finance must be irrelevant, according to the Modigliani–Miller theorems. Otherwise, the value additivity principle would be violated and we would not be in equilibrium.

If we take the economic income concept seriously, *homo economicus*, equilibrium, and the theorems of finance cease to be mere timeless theoretical constructions, necessary in comparative static analysis, but instead become concepts that supposedly characterise the economy in each and every point in time.

Despite these unrealistic implications, the theoretical concept of economic income, derived from equilibrium analysis, has actually been adopted by financial accounting and corporate governance theorists, policymakers, and financial reporting standard boards. Regarding this concept of income, a prescriptive or normative turn happened throughout the 20th century. Economic income, despite its heroic assumptions and its purely theoretical character, has been adopted as an ideal for the real world, as a model for institutional reform. It was applied to provide practical decision guidance for investors and politicians. Of course, in this, economic income was not marketed as a purely theoretical equilibrium concept. However, economic income would only make sense in practice if real-life prices were in equilibrium and actually and correctly reflected present values (Braun forthcoming b: 17). We will see in the following sections that both fair value accounting and shareholder value maximisation, two concepts that rest on the idea of economic income, assume that prices have characteristics that only exist in equilibrium.

6.2 Fair value accounting

The demise of retrospective calculation

The economic income concept became relevant for practical purposes first in the context of financial accounting. However, it would not be true if I maintained that it was only after the contributions of Fisher (1906) and Hicks (1946) and the

development of modern finance that economic income came to be considered as a viable alternative to net income. Braun and Follert's (forthcoming) discussion demonstrates that some kind of economic income concept must already have been on the mind of German legislators in the 1860s and 1870s. However, at the time, this was not backed by economic theory. The *theoretical* foundations for applying economic income in practice were indeed laid by neoclassical equilibrium theory. It is well known that the International Accounting Standards Board (IASB) and the US Financial Accounting Standards Board (FASB) "root their conceptual frameworks in the late 1960s' state-of-the-art knowledge of finance and economics" (Basu 2015: 248). In particular, they use John Hicks' (1946) discussion of income as a reference point (Bromwich, Macve, and Sunder 2010: 350). Standard-setters explicitly aim at Hicks' income concept N° 1 (Barth 2006: 280). Usually, they refer to this kind of income as "comprehensive income" (Dhaliwal et al. 1999: 44; Cauwenberge and Beelde 2007: 5). There are some conceptual differences between economic income and comprehensive income, but for the purpose of this book, they are not essential (Schildbach 2015: 148).

For the standard setters, income is only of secondary or derived importance. Income is supposed to be the difference between two values: the value of the net assets of a firm at the end of a period minus the value of the net assets at the beginning of the period. (Net assets = value of assets – value of liabilities = present value of the firm) That is why standard setters reject the revenue-expense approach (Perry and Nölke 2006: 563). This approach underlay our discussion of the market process and its institutional pre-conditions in Chapter 4. We have seen that in the revenue-expense approach, the income statement is the primary statement of the retrospective economic calculations of the enterprise. The annual reports with their balance sheets are only auxiliary and subordinate constructions (Schmalenbach [1919] 1959; Littleton 1953). Stated briefly, in the revenue-expense approach, the balance sheet serves as a store for the income statement, containing, on the asset side, the historical costs that have not yet been matched with the related revenues on the income statement. The "values" of assets in the balance sheet are only a "by-product" of the determination of profit (Sprouse and Moonitz 1962: 16).

As opposed to this, the standard setters endorse what is usually called the balance-sheet or the asset-liability approach (Perry and Nölke 2006: 563). In line with the economic income concept, in this approach, the balance sheet loses its subordinate character (Frankel et al. 2024: 124). It is instead considered to be the statement where the primary information, namely the values of the assets and liabilities, is depicted. The income statement, by contrast, becomes subordinate. Its role is basically restricted to showing how the value of the net assets, depicted by the balance sheet, has changed over the course of time. In the view of the standard setters, financial accounting is not, for the main part, concerned with the determination of profit from past transactions. Profit and loss in the traditional sense only play an ancillary role (Dichev 2008: 454). Already, Sprouse and Moonitz (1962: 11) were very clear on this point:

Profit is a function of an increase in the net resources of the business entity. The measurement of the components of profit (revenue, expense, gain, and loss) must accordingly rest on measurements in the area of assets and liabilities.

In order to better understand the rationale of the balance-sheet approach, it is helpful to have a look at the conceptual framework of IASB and FASB. As Barth (2014: 332) succinctly states, “the Framework identifies assets and liabilities as the objects of measurement.” In other words, assets and liabilities must be measured (or valued) in their own right. Barth (2014: 332, emphasis added) summarises the role of the balance sheet according to the standard setters:

The Framework states that the objective of financial reporting is to *provide financial information* about the reporting entity that is *useful* to existing and potential investors, lenders, and other creditors in making *decisions* about providing resources to the entity. The Framework identifies *relevance* and *faithful representation* as fundamental qualitative characteristics, and *comparability*, *verifiability*, *timeliness*, and *understandability* as characteristics that enhance the usefulness of financial information. The Framework explains that financial reporting information that is useful in achieving the objective of financial reporting is information that maximizes these qualitative characteristics.

Obviously, the balance sheet does not have a subordinate function in the view of IASB and FASB. It is not a mere store for the income statement. It is a statement that faithfully provides relevant, comparable, verifiable, useful, and understandable information to existing and potential investors.

One important consequence of the balance-sheet approach is that standard setters reject historical costs as a basis for valuing assets and liabilities. From the perspective of this approach, it does not make sense to put the historical costs of assets in the balance sheet and store them until they can be matched with revenues. The balance sheet itself is supposed to provide useful and relevant information (Barth 2006: 272; Hitz 2007: 327). In order to do so, it preferably has to reflect the *correct* values of assets and liabilities. “The problem of measuring (pricing, valuing) an asset is the problem of measuring the future services” (Sprouse and Moonitz 1962: 55 f.). Historical costs are of no use in this regard. They are data from the past, not relevant for present decisions concerning the future. Historical costs remind of the money payments that were necessary to purchase the assets, but they rarely reflect the present value of these assets (Sprouse and Moonitz 1962: 28). Furthermore, adding up the historical costs of the assets of a business does not result in its present value. Only if the balance sheet shows the *correct* values of the assets and liabilities of the respective firm, can we add them up in order to (allegedly) receive a meaningful statement of the present value of the firm.

In the view of the standard setters, therefore, financial accounting has fundamentally changed its character. It is not a retrospective calculation anymore. The balance sheet is not supposed to contain remnants of the past. It has to depict the present values of assets and liabilities. These present values, of course, refer to the monetary streams that are expected to flow in (assets) or flow out (liabilities) in the future. Likewise, income is not supposed to be a concrete amount of money that results from past and realised monetary flows. Instead, in accordance with the

economic income concept, income is derived from the present values depicted by consecutive balance sheets.

Fair values

If the economic income concept is to be implemented, the balance sheets at the beginning and at the end of the relevant income period must depict the correct value of a firm's net assets. This view gives "conceptual primacy" to assets (Bullen and Crook 2005: 7). Income can only be determined as a correlate. "Income and expenses are defined in terms of changes in assets and liabilities" (Barth 2008: 1167).

Consistent with the balance-sheet approach, standard setters and many academics in their wake argue that it is the main purpose of the balance sheet to inform investors about the correct value of assets and liabilities. This idea is where the concept of "fair value" stems from. Only if assets and liabilities on the balance sheet are valued "fairly," balance sheets provide useful information to investors. In financial accounting, fair value basically means the present value of the cash flows that the items in the balance sheet are going to produce in the future (Barlev and Haddad 2003: 397). Assets "represent expected future economic benefits, rights to which have been acquired by the enterprise as a result of some current or past transaction" (Sprouse and Moonitz 1962: 20). Accordingly, the monetary amounts identified with assets "should be related to those anticipated benefits" (Sprouse and Moonitz 1962: 23).

Standard setters prefer fair values because these supposedly provide useful and relevant information to investors (Schildbach 2015: 25). This claim is very often backed by so-called value relevance research. This literature takes for granted that "an accounting amount is defined as value relevant if it has a predicted association with equity market values" (Barth et al. 2001: 79). It is no wonder that value relevance studies consistently find that investors perceive fair value estimates for assets and liabilities as more value relevant than historical cost amounts (Barth et al. 2001: 84). After all, adherents of the revenue-expense approach and historical cost accounting do not at all claim that the balance sheet reflects (or should reflect) equity values. That is not what historical costs are here for. Whereas standard setters claim that balance sheets can be used both for determining "equity values" and (economic) income, the adherents of the revenue-expense approach argue that these two objectives are irreconcilable (Schildbach 2015: 148). Schmalenbach (1926: 80 f.) famously argued that financial accounting can only accomplish one objective, either determine profits or the values of assets and liabilities, but certainly not both at the same time. According to him, financial accounting that uses historical costs has the function of determining profits, not the value of assets or the entire firm (Schildbach 2015: 147). The value relevance literature is therefore beside the point when it pretends to find arguments against the revenue-expense approach. This literature accepts the idea, taken from the balance-sheet approach, that the balance sheet has to provide useful and relevant information about the value of assets and liabilities, and then claims that the balance-sheet approach fares better at implementing this idea than the revenue-expense approach, which does not even claim to implement it.

It is important to understand that the fair value concept is conceptually related to economic income and thus entails the same heroic assumptions. When it comes to the question where the accountant is to know the fair values of the business assets and liabilities from, the answer is that usually actual market prices are the best guess (Cardao-Pito and Ferreira 2018: 154 f.).

Market price is an exchange price which is ordinarily independent of the plans or expectations of the individual entity. It therefore represents a *neutral, objective evaluation of economic benefits*. Since people act in the present and the future, and not in the past, current market price is preferable to past, all other things being equal. Current market price is also superior to past market price (acquisition cost) as a measure of the “forgoing” or “sacrifice” involved in the use or other disposition of the asset.

(Sprouse and Moonitz 1962: 26 f., emphasis added)

In practice, therefore, the accountant is to determine fair values with the help of the market (Barker and Schulte 2017). The International Financial Reporting Standard 13.9 stresses the market basis of the fair value concept by specifying that the fair value is the “price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date” (IFRS 13: §9). In a functioning market, in other words, current market prices of assets and liabilities are supposed to accurately reflect the present value of the cash flows they will generate in the future. Mind you, we are not talking about theoretical equilibrium prices as in comparative static analysis. According to the fair value concept, actual real-life market prices are supposed to reflect the present value of assets and liabilities. Otherwise, the claim that they provide useful and relevant information would make no sense. In Penman’s (2011: 170) words, “[f]air value accounting finds its justification in efficient market theory.”

This means that the theorems of finance are not only assumed by the theoretical economic income concept but they are also assumed by the standard setters who promote fair value accounting. In their view, the sum of the fair values of the individual assets and liabilities equals the total value of the firm (Schilbach 2015: 60), that is, the principles of value additivity and no-arbitrage are taken for granted when it comes to actual market prices. Furthermore, the Fisher and Tobin separation theorems and the Modigliani–Miller theorems must hold as well if the no-arbitrage and the value additivity principle are accepted. Otherwise, arbitrage possibilities would still exist and the values of assets and liabilities could not be said to be “fair” values.

Furthermore, income as the difference between the values of net assets at two different dates would be incorrect if these values were not “fair.” In this regard, it is important to add that some accounting theorists have realised the close relationship between the structure of comparative static analysis on the one hand and the balance-sheet approach and fair value accounting on the other. Fritz Schmidt endorsed economic income on the basis of equilibrium theory and drew a close parallel between economic income and comparative statics. According to Schmidt

(1929: 46), comparative static analysis puts several, consecutive snapshots of the economy side by side in order to compare them. He argued that this method is closely related to the way business enterprises determine their income. In his view – he was a predecessor of the balance-sheet approach – enterprises put several consecutive snapshots of their assets and liabilities side by side in order to compare them and thus determine their performance between the two snapshots.

To say it pointedly, fair value accounting is the translation of comparative static analysis into real life. Arbitrary points in time are assumed to be characterised by equilibrium on the market. At these points in time, asset and liability prices allegedly reflect the present value of the future cash flows they are expected to generate. The value of a firm is equal to the net sum of the values of its assets and liabilities. Income can correspondingly be determined as a change in the value of these assets and liabilities.

6.3 Shareholder value maximisation

Maximising share prices

Eventually, the equalisation of prices and values extended beyond the accounting profession. Since the 1980s, economists and management experts have advocated for a general orientation of business management towards “value” generation. [Jensen and Meckling \(1976\)](#) argued that the management of public companies suffers from significant principal–agent conflicts ([van der Zwan 2014: 107](#)). Shareholders (principals) typically do not manage companies themselves but delegate this responsibility to salaried managers (agents). However, these managers may prioritise their own interests over those of the shareholders. This principal–agent conflict between shareholders and managers has led [Jensen and Meckling \(1976\)](#), along with many economists since, to advocate for corporate governance structures that incentivise managers to act solely in the interests of shareholders. There is a general consensus among neoclassical economists that this goal is best accomplished when managers are incentivised to maximise the value of the firm they manage, as measured by share price ([Stout 2012: 5](#)).

In parallel with the principal–agent models, an important development occurred in the management literature. [Rappaport \(1998](#), first published in 1986) successfully promoted the idea that increasing corporate value is the most important task of management. In a competitive environment – such as the market for corporate control (see [Scharfstein 1988](#)) – financial investors have the ability to acquire corporations whose share prices are lower than they would be if managed according to shareholder value maximisation. As a result, managers are said to have no choice but to increase their firms’ share prices by following Rappaport’s recommendations. For [Rappaport \(1998: 59\)](#), creating shareholder value and obtaining competitive advantages are essentially the same.

Importantly, in an environment where prices are in equilibrium, shareholder value is essentially equivalent to the present value of a firm ([Blinder 2000: 18](#)). As finance professor Alex [Edmans \(2021\)](#) explains, “Finance 101 teaches us that

shareholder value is the present value of all future cash flows.” Once again, we see that prices (in this case, share prices) are supposed to reflect values.

The shareholder value revolution has been widely discussed. Among the two words, “shareholder value,” it is the first that has sparked the most debate. Critics of the shareholder value approach argue that it compels directors to focus exclusively on the interests of shareholders (van der Zwan 2014: 102; Mansell and Sison 2020). This focus can be traced back to Berle and Means (1932), who contended that it was no longer the shareholders who controlled firms, but salaried managers (Weinstein 2012). Since the 1970s, the central question has been how to incentivise managers to act in the best interests of shareholders rather than their own. Jensen and Meckling (1976) became well-known for formalising this problem in their agency theory and demonstrating that contractual incentives could help resolve the conflict between managers and shareholders. Among other solutions, they suggested providing managers with stock options and facilitating hostile takeovers (Jensen and Meckling 1976: 353).

Milton Friedman was arguably the most prominent advocate of the idea that businesses should be directed solely in the interests of shareholders (Robé 2012; Menges and Thiede 2023: 60; see also Hayek 1967). Friedman (1970: 113) famously asserted that corporate officials undermine the foundations of a free society when they accept responsibilities other than to “conduct the business in accordance with their [the owners’] desires, which generally will be to make as much money as possible.” According to the shareholder value approach, shareholders are considered the owners of corporations, and the interests of other stakeholders – such as workers, customers, and creditors – should not concern directors. At most, these interests should be viewed as intermediate steps towards the primary objective of maximising shareholder value. The rationale for neglecting other stakeholders’ interests is that they are best served indirectly when managers maximise firm value in competitive markets. This holds true as long as we operate within “a market-based economy that recognizes the rights of private property” (Rappaport 1998: 5). It may still occur that the distribution of value increases is perceived as unfair, favouring shareholders; according to the proponents of shareholder value maximisation, in these cases, the interests of other stakeholders should be protected by contractual or political means rather than through reforms of company law or corporate governance (Hansmann and Kraakman 2001: 449; Robé 2012: 8).

Critics emphasise that the relationship between firms, shareholders, and other stakeholders is more complex. For instance, managers may sometimes pursue perfectly legal, high-risk strategies that elevate share prices in the interests of shareholders while simultaneously undermining the quality and value of the firm’s debt, thereby harming creditors (Myers 1977; Stout 2005: 51).

A significant portion of the varieties of capitalism literature (Hall and Soskice 2001) also revolves around the first element of the term “shareholder value.” Anglo-Saxon countries are said to focus exclusively on the financial interests of shareholders, while the institutions of Rhenish capitalist countries integrate the interests of other stakeholders, primarily organised labour (Lütz, Eberle, and Lauter 2011).

In line with the discussion in this book so far, I am interested in the second element of the “shareholder value” concept – the “value.” If share prices actually reflect the value of the firms, then the value additivity principle must hold. The shareholder value must be equal to the company’s net assets. Any increase in share prices must therefore reflect an increase in net assets. This implies that increasing shareholder value is in line with generating economic income (Claes 2008: 20 ff.).

Regardless of whether businesses are managed in the interests of shareholders or other stakeholders, the question arises: does it make sense to ask managers to maximise shareholder “value,” i.e., the price of the company’s shares? Do market prices actually reflect the “values” of traded goods, commodities, and securities to the extent that it is meaningful to suggest that maximising the price of shares makes sense or is even socially beneficial (Stout 2016: 169)? This point has not garnered much attention in the ongoing debates. According to Stout (2005: 46), the “assumption that stock price reflects corporate performance is so deeply ingrained that, for many, it has become a mental habit, rarely subject to critical analysis.”

Institutional reform

According to Rappaport (1998: 3), the interests of managers can be aligned with those of shareholders through four incentive mechanisms:

- 1 a relatively large ownership position,
- 2 compensation tied to shareholder return performance,
- 3 the threat of takeover by another organisation, and
- 4 competitive labour markets for corporate executives.

If these measures are implemented, Rappaport (1998: ch. 3) explains, directors will be incentivised to increase the shareholder value of their firms, a task that can be measured by concepts such as “shareholder value added” or similar metrics (Biondi 2012).

There is no doubt that the notion that market prices reflect the values of goods, and that the generation of shareholder value should be the goal of corporate governance, has been embraced by many policymakers. As Blinder (2000: 16) states, “real-world economies, including ours, have changed in a number of ways that bring them into closer alignment with the pristine model envisioned by economic theory.” In other words, policymakers have attempted to implement the neoclassical idea that the market determines the fate of all assets and liabilities both outside and inside the firm. After all, if we assume that the market “knows” the correct values of goods, we have no reason to distrust it as a guide for business and financial affairs. According to the neoclassical theory, the perfect market has become the reference point, whereas the role of the market process and the other institutions of capitalism become more and more neglected.

Although I do not claim that the shareholder value paradigm has been comprehensively adopted, several institutional reforms indicate a movement in this

direction. The European Union (EU) exerts pressure on its member states to embrace the shareholder value paradigm, although the rationale behind this push remains difficult to comprehend. [Langenbucher \(2022: 266\)](#) argues that the EU is especially inclined to adopt economic concepts because it must reconcile diverse national legal systems and therefore requires a common language – one that mainstream economics provides.

The European Capital Markets Union exemplifies this trend. [Ertürk \(2015\)](#) demonstrates that this union is founded on the “corporate governance ideology of shareholder value maximisation.” Furthermore, according to [Apeldoorn and Horn \(2007: 212\)](#), “we see a process of what we call the marketisation of corporate control as part of a broader European marketisation project.” It is well known that member states had limited scope to escape the introduction of fair value accounting – characterised by its dependence on current market prices – in their national legislation ([Lütz and Eberle 2008: 578](#); see also [Section 3.2](#)).

The EU has also taken several steps to create a market for corporate control ([Bulfone 2017](#)). The market for corporate control refers to the arena through which ownership and management rights in companies are bought and sold, primarily through transactions such as mergers, acquisitions, and takeovers. The market for corporate control is not necessarily a part of any capital market. The capital market may only involve the buying and selling of financial securities like stocks and bonds to facilitate capital raising and investment, without necessarily altering the control or governance structure of the companies involved. The threat of hostile takeover bids on the market for corporate control is viewed as a significant step towards implementing the four measures mentioned by Rappaport and establishing a capital market that meets the requirements of the efficient market hypothesis ([Styhre 2018: 14](#)). The market for corporate control is intended to help managers assess the correct value of their firms and incentivise them to act in the best interests of shareholders ([Lazonick and O’Sullivan 2000: 16](#)).

In the market for corporate control the share price becomes a disciplinary device vis-à-vis management; it is thus seen as the external control mechanism par excellence to ensure the protection of shareholder interests, aligning managerial strategies with the latter.

([Apeldoorn and Horn 2007: 218](#)).

As part of the broader movement towards the marketisation of the firm, in 1998, Germany allowed stock options to be used as compensation for managers and enabled firms to repurchase their shares ([Jürgens, Naumann, and Rupp 2000: 67 f.](#); [Klages 2013: 162 f.](#)). In the 1990s and 2000s, Germany also enacted laws designed to dismantle the network of managers and supervisory board members that had characterised the German economy for so long. Instead of relying on personal ties between firms, insurers, labour unions, and banks, the international market for corporate control was intended to have the final say regarding mergers, acquisitions, and bankruptcies ([Lütz and Eberle 2008: Sect. 2](#)). Until that point, Germans did not view hostile takeovers as part of their social market economy ([Streeck and Höpner](#)

2003: 24). In summary, legislation in the EU and its member states has facilitated firms in incentivising managers to align with the demands of the corporate control market and the overarching shareholder value approach.

6.4 The paradox of value-orientation

Circular reasoning

I have been interested for many years in the substitution of values for actual market prices in financial accounting and corporate governance. So far, I have dealt with the topic in [Braun \(2014\)](#), [Braun \(2022b\)](#), and Braun (forthcoming b). I find it very difficult to discuss the issue from an economic perspective. Of course, what has happened can easily be described. What used to be monetary calculation has become value calculation. While profit used to be a monetary figure – the difference between monetary revenues and monetary expenses – the economic income concept has turned profit into a value figure – the difference between the value of net assets at a later time and net assets at an earlier time. In the monetary story, an actual surplus of money must have flowed into the enterprise so that we can speak of a profit; in the value story, it suffices that the value of the net assets has increased, independent of the question whether the enterprise has made any transactions. Furthermore, since the share price is supposed to reflect the value of the net assets, an increase in share prices – of the shareholder value – measures how well an enterprise has fared.

The next point is also easy to understand, and I have stressed it several times throughout the book. The monetary calculation approach is embedded in the institutional framework of capitalist societies. It is part of everyday market processes. Enterprises try to profit from operating on markets, i.e., from buying at low prices and selling at high prices, in this way earning a preferably high return on their capital. Monetary calculation is the way enterprises fit into the market economy and help organise it according to consumer demand. Value calculation, on the other hand, abstracts from this institutional framework. As [Biondi \(2011: 8\)](#) stresses, financial accounting standard setters have removed every reference to actual monetary flows from their frameworks.

The difficult thing is to understand why this is a problem. What difference does it make whether we calculate with money prices or with values? To put the answer in general terms, *value-orientation in financial accounting and corporate governance involves circular reasoning*:

Fair values are allegedly superior to historical costs because they provide useful information to the market. They do not inform about past prices that are irrelevant to present investors, but about current market prices. Therefore, financial reporting and shareholder value maximisation are supposed to rely on market prices. Since fair values and shareholder values are derived from market data, however, it logically follows that the market must not depend on information provided by these values. If the market depended on information provided by financial reports, it would create a circular situation where the market informs

the management while simultaneously being informed by it (Schildbach, 2012). As Hax (2003, p. 680) states,

[market value] certainly cannot serve to inform the market about the firm's performance. The result of information processing through the market cannot at the same time be the information input needed to yield a valid result.

Yet, this is exactly what the logic of value-orientation implies. It transforms the market price into both the source and the outcome of the same information (Sunder 2011a: 298; 2011b: 126 f.).

As easy as this general point may be, it is hard to understand the grave practical implications of this circular reasoning for the concept of economic income and its derivatives, fair value accounting, and the shareholder value paradigm. I argue in the following that the implementation of the economic income concept has jeopardised both retrospective and prospective calculations.

The inconsistency of economic income with the purpose of retrospective calculation

We have seen in Chapter 4 that profits, as determined on the basis of the revenue-expense approach, stem directly from a detected and exploited gap in the price structure. They more or less directly reflect a mismatch of supply and demand in the economy. For this reason, positive and negative profits serve as a signal for investors. Capital flows where positive profits are made and flees those industries and businesses where losses are made. In this way, the retrospective calculations of profit-oriented business enterprises contribute to the equilibration of the economy and the orientation of production towards consumer demand.

Insofar as retrospective calculations become reformed such that fair values take the place of historical costs and economic income takes the place of net income, this relationship does not hold anymore. Economic income does not in the same way signal to the market where there are gaps in the price structure. This can be illustrated by an example from Braun (2022b: 16):

Consider the price of coal. In a severe winter, consumer demand for coal may rise, resulting in an increase in its price. Companies that hold inventories of coal will report economic income due to the appreciation in the value of one of their assets, regardless of whether they process coal for consumers or for entirely different purposes, such as steel production. This increase in the price of coal could be viewed as useful information for management when deciding whether to continue operations or sell the coal. However, as long as management has not made a decision on this matter, investors and outsiders are misled if income figures fluctuate based on this price increase.

The rising economic income of steel companies when coal becomes more expensive in winter does not necessarily indicate that they are now meeting urgent demand or that they have detected a mismatch between supply and demand. In fact, the opposite may be true. What has actually occurred is that the costs for these

enterprises have risen, and the appreciation of their inventory is merely a symptom of this increase in expected expenditures on coal (Hodgson and Russell 2014: 101). Thus, their economic income does not signify greater profitability, nor does it reflect a gap in the price structure, and therefore cannot serve as a reliable indicator of mismatches in the market.

Net income is derived directly from a detected and exploited gap in the price structure, reflecting the existing mismatch. In contrast, economic income arises in all enterprises that own certain assets, regardless of whether they actively participate in exploiting the gap. As long as these companies hold assets whose prices increase due to the actions of other enterprises, their financial reporting will show economic income. Yuan and Liu (2011: 23) refer to this phenomenon as “double-counting.” Profit is not only recognised in companies that actively seek to close the gap, but also in those that merely coexist within the same industry and thus benefit from the price changes of their assets. Consequently, the total economic income reported in a particular industry significantly exaggerates the actual market gap.

Economic income, which arises from the difference between a firm’s present values at two different dates, neither informs the firm about the success of its business actions, nor does it guide entrepreneurs and investors in society at large to areas where gaps in the price structure exist. Reporting economic income, therefore, does not promote a tendency towards equilibrium, as it does not – other than the revenue-expense approach – focus on actual cash flows but rather on current values.

And here we come to the decisive point: the circular reasoning of value-orientation. The policy makers and standard setters who endorse and implement fair value accounting implicitly assume that the market process has already fulfilled its role. There is a belief that the market can achieve equilibrium without relying on information provided by financial reporting. The equilibrium is there before and comes about without the help of financial reports.

The adherents of fair value accounting fall back on the assumption of comparative statics that the market is in equilibrium and therefore market prices contain all relevant information, thus evading any real solution to the issue (Zappia 1996: 112). These proponents claim that fair values provide information to the market, yet they revert to the assumption that the market process – including financial reporting according to the revenue-expense approach – has already fulfilled its role, resulting in market prices that simply reflect all available knowledge. They begin with the market efficiency hypothesis and assume that market prices already incorporate all available information (Chiapello 2015: 19), while ignoring the knowledge-generating process necessary to achieve such a result.

As Nissim and Penman (2008: 33) note, the adoption of fair value accounting undermines historical cost information. I would add that this implies that *by replacing historical cost accounting and the revenue-expense approach, fair value accounting destroys the very foundation of the price formation process that underlies the market’s tendency to create fair values in the first place*. By demanding enterprises to switch to fair value accounting and abandon historical cost accounting, financial reporting standard setters jeopardise the very process that makes prices tend towards

fair values. And it is not explained in which alternative way the market is supposed to be informed and to what extent this is possible (Schildbach 2012: 532).

***Maximisation of economic income in prospective calculation
as a self-defeating prophecy***

We have seen that there is circular reasoning in value-orientation. The market is supposed to be informed through financial reporting, but financial reporting, in turn, gets its information from the market. As a consequence, the economic income concept does not make sense in retrospective calculations. It does not generate information that could help in coordinating the actions of business enterprises such that they tend to satisfy the preferences of consumers.

However, the circular reasoning in value-orientation also affects prospective calculations. I am going to argue that the orientation towards economic income and the maximisation of shareholder value is a self-defeating prophecy. Please note, I think this is the case even if we assume that current market prices actually reflect the present value of future cash flows correctly. In this, I go further than most critics of value-orientation. Both critics and adherents of fair value accounting and shareholder value maximisation agree that under the conditions of a perfectly efficient market that correctly forecasts future cash flows, value-orientation would make sense (e.g., Bratton and Wachter 2010: 691; Barlev and Haddad 2003: 405 f.; Chorvat 2003: 91; Shwayder 1967: 24). I think this is an illusion.

The point that I want to make has been stated clearly by Sprouse and Moonitz (1962: 56), two early adherents of value-orientation. When it comes to a method or basis or formula for valuing assets, they propose, among other options, the “future exchange price, e.g., anticipated selling price.” They (Sprouse and Moonitz 1962) continue that when

this basis is used, profit or loss, if any, has already been recognized in the accounts. Any asset priced on this basis is therefore being treated as though it were a receivable, in that sale or other transfer out of the business (including conversion into cash) will result in no gain or loss, except for any interest (discount) arising from the passage of time.

In other words, when we value our assets according to the cash flows they will generate in the future, we recognise *future* profits or losses in the accounts. As a consequence, when we finally sell these assets or the goods that we produced with the help of them, no gain or loss will result since we have already anticipated them in the accounts in the past. Profits are not recognised when they are realised, but when they are anticipated.

Sprouse and Moonitz (1962) did not consider this to be paradoxical. However, the circular relationship between expected cash flows and their value in the present has caused major controversies in economics. Many economists realised a circularity in the relationship between capital and income if capital is supposed to be valued as the discounted value of future income.

Barton (1974: 675) pointed out that the problem has already been noted by Kaldor ([1955] 1969: 170 f.), who stated that

[i]n Hicks's approach the source or corpus from which the income is arrived disappears altogether as a separate entity – capital appears only as the capitalized value of a certain future prospect and income as the 'standard stream equivalent' of that prospect. Capital and income are thus two different ways of expressing the same thing, not two different things.

Even earlier, Davenport (1913: 410) had claimed that there is a "circuitry in the capitalization doctrine." He wrote that there "is no telling what interest a rent-bearing property earns until the value of the property is fixed. [...] But how arrive at this price otherwise than by appeal to the very interest rate"? Later on, the issue was debated in the Cambridge capital controversy. Since I have covered this debate in Section 1.2, I do not repeat it here. In short, Joan Robinson and others pointed out the circular reasoning in neoclassical capital theory: The interest rate depends on the quantity of capital, and the quantity of capital depends on the interest rate.

The debate and its outcome are significant for our issue. Following the Neo-Ricardian critique accepted by Samuelson (1966), it can be inferred by analogy that either the present value of assets and liabilities is determined by expected future cash flows, or vice versa. In the former case, these cash flows cannot be explained as originating from the same present value; instead, they must be derived from a different source. In the latter case, expected future cash flows are derived from the present value of assets and liabilities in the form of interest. Consequently, present values must be explained independently of the future cash flows they generate.

The problem of circularity has been acknowledged by several attentive accounting theorists over the years. However, no one has yet expanded on this issue or applied it to a general discussion of value-orientation. For instance, Fischer (1909: 33) noted that concepts like economic income imply the absurdity of "profit derived from discounted profit." According to Treynor (1978: 613), the

process by which the accountant arrives at earnings by estimating or measuring the change in value over the accounting period – and the analyst in turn uses these earnings to estimate value at the end of each period – is in some danger of being logically circular.

Following Treynor, Myddelton (2009: 90) maintains that

to accept the Hicks approach would be absurdly circular: first to calculate changes in the equity value, then derive an income figure, and finally 'capitalise' that income to calculate the equity value!

For the sake of completeness, we must add John Hicks and Irving Fisher themselves. It is well known that Hicks was not in favour of implementing value-orientation in practice (Brief 1982; Jameson 2005). Fisher (1906: 248 f.) even

pointed to the problem of circular reasoning. The fact that an “increase of capital is not income co-ordinately with ordinary income is evident from the fact that this item is never discounted in making up capital value.” He argued that “the hypothesis which counts an increase of value as income is self-destructive; for if the increment is income, it must be discounted, but, if discounted, it is practically abolished.”

When it comes to practical implementation, this problem was perhaps most systematically addressed in the first half of the 20th century during discussions about the proper rates charged for public utilities. The US Supreme Court decided that a company providing a public utility was entitled, under ordinary circumstances, to earn a “fair return upon the value of that which it employs for the public convenience” (quoted in [Potter 1926](#): 233). However, the term “value” remained ambiguous. [Bonbright \(1926: 309\)](#) pointed out the risk of “circular reasoning.” Specifically, the value of a public utility depends on the rates it is allowed to charge, creating a logical circle in which these rates would themselves need to depend on the value of the utility ([Cardao-Pito and Ferreira 2018](#): 168). In this context, the very earning power that is supposed to be evaluated is assumed rather than determined.

The market value of the utility depends largely on what investors think its earning power will be. And it would be obviously absurd to use this market estimate of what the earnings will be as a measure of what the earnings should be.

([Bonbright 1926](#): 308)

At the time, [Bonbright \(1921\)](#) demanded that the original cost should be the basis for capitalisation, not market value or earning power.

The circularity arises from the inherent connection between future cash flows and present values in equilibrium. This circularity implies that maximising shareholder value is, in fact, self-defeating. If share prices accurately reflect the present value of future cash flows, it follows that future income can consist solely of interest payments on this present value. This raises the question of why the business should continue operating at all. Why invest time and resources in a business that merely performs transactions that produce no income above the interest rate?

As [Shwayder \(1967: 30\)](#) notes, the profit from these future transactions “is recognized when cash flows are discovered rather when they are created.” Once expected future cash flows have been discounted to the present, value gains determined and added to equity, and managers compensated based on shareholder value performance – as suggested by [Rappaport \(1998: 3\)](#) – this income cannot be generated again. Income cannot be produced twice. Consequently, there is little incentive to actually create cash flows in the future. Once shareholder value has been maximised, managers lack motivation to engage in those very transactions that were expected to generate the cash flows on which maximised shareholder value and related bonuses were based.

[Matschke and Brösel \(2021: 28\)](#) make a similar point:

The question arises as to why people constantly act, that is, buy and sell traded securities (capital investments), despite having no individual additional utility

(in terms of a positive net present value). After all, every market participant has the same interests and expectations regarding similar commodities because they have the same level of information. The marginal prices of all market participants in reference to the same capital investment are absolutely identical. But to do business at a marginal price means to do no business at all, that is, to expect no advantage from doing business.

Follert (2020: 16, n. 36) links the lack of incentive to do business directly to the idea that prices reflect values – an idea that is based on quite heroic assumptions. The seemingly accurate forecast is a self-defeating prophecy. If all that management can achieve between two points in time is to increase the present value of the firm by the factor of $(1 + r)$, where r represents the interest rate, then it makes little sense to engage in any productive or speculative activities. Transforming input factors into products would, by definition, only yield interest.

A much better alternative, from the perspective of both managers and shareholders, would be to sell or liquidate the company at the current market price, disregarding predicted and discounted cash flows. Consequently, the future business transactions expected to generate cash flows will become irrelevant to managers. However, these transactions are essential for creating a tendency towards the equilibrium of supply and demand for resources. Without them, there would be nothing to discount to the present, no shareholder value, and no invisible hand of the market to coordinate the actions of consumers and producers. In short, if we take shareholder value maximisation seriously and treat market prices as if they genuinely reflected the value of goods, the processes necessary to generate these values will fail to occur in the first place.

The shareholder value approach, rather than encouraging long-term strategies, incentivises managers to concentrate exclusively on current market prices while neglecting the creation of future cash flows underlying those prices. This perspective offers a plausible explanation for Lazonick and Shin's (2020) observation regarding the growing short-termism in business management. Within a framework that prioritises shareholder value maximisation, managers often resort to boosting the current share price – through mechanisms such as share buybacks – and seek to divest company assets as rapidly as possible. Conversely, investing in productive projects that only yield cash flows in the future is rendered irrational in a setting where there is no reward for generating these cash flows when the future ultimately arrives. Thus, the more rational strategy becomes the rapid extraction of value from the firm. Lazonick and Shin (2020: 8) describe this phenomenon as the “generalized looting of the industrial corporation.”

Maximising economic income under the conditions of a random walk

In the last subsection, we have assumed that prices correctly reflect future cash flows. Even under this assumption, the maximisation of economic income (or shareholder value) does not make sense. It leads us into a circle. However, the concept of economic income acknowledges that there is a second component of

income, namely changes in present values over time (capital gains or losses). [Bratton and Wachter \(2010\)](#) clarified that changes in present values are compatible with the efficient market hypothesis, provided that prices follow a random walk and cannot be predicted. In this subsection, I show that, for this unpredictable component of economic income, the same problem holds: It is circular reasoning to argue that it can somehow be maximised.

Let us assume that the future is uncertain and that the share prices at time t_0 do not align with the share prices at time t_1 , when discounted back to t_0 . This means that at t_1 , we recognise that the share prices at t_0 did not accurately reflect the present value of future cash flows. Various factors may contribute to this discrepancy, provided they are random and unpredictable: The interest rate and/or inflation rate might have changed unexpectedly between t_0 and t_1 due to unforeseen actions by government or monetary authorities; some transactions may not have materialised at all, or they could only occur under conditions that differ from those originally planned; or the overall market situation may have evolved differently from what was anticipated.

In any case, if the firm's share price at t_0 turns out to have been incorrect ex post, it is impossible to ascertain the extent to which the firm's value has changed since then. The change in shareholder value between t_0 and t_1 arises from the fact that, judged based on information available at t_1 , the shareholder value at t_0 was inaccurate. If it had been correct, it would have represented the discounted value of the shareholder value at t_1 . However, if the shareholder value at t_0 was wrong, the difference between the shareholder values at t_0 and t_1 does not indicate how much the shareholder value has increased or decreased during that period. Consequently, evaluating management success becomes impossible. Moreover, management may find it challenging to feel accountable for changes in value attributed to the "short-term whims of the market" ([Palea 2018](#): 253). After all, how do you maximise a figure that follows a random walk?

Thus, the second component of economic income does not initiate an equilibrating market process either. Based on both components, managers appear functionless; the market operates independently of them. In the case of certainty, market prices accurately reflect future cash flows, meaning managers need not take action because economic income consists of interest. In cases of uncertainty, where market prices follow a random walk, managers again need not take action, as fluctuations in shareholder value are unrelated to their decisions and are unpredictable.

If we assert that prices accurately reflect values, management becomes irrelevant, and maximising shareholder value becomes an untenable goal. Furthermore, and crucially, managers then do not initiate a market process that somehow equilibrates supply and demand.

7 Conclusion

7.1 A summing up

In this book, capital is defined as acquisitive sums of money that are invested in assets of a business, be they land, tools, buildings, cash, claims, or whatever. Capital includes not only cash but also the monetary sums historically invested in business assets. I adopt this use of the term from the actual practices prevailing in business life. Capital in this sense does not exist on Robinson Crusoe's island or in socialist societies. It is a historically specific phenomenon that is associated with the existence of the capitalist institutions of private property, money, markets, business enterprises, and economic calculation.

By developing the implications of this capital concept, the book not only presents a theory of capital but also explains at the same time the central processes of capitalist societies. In fact, the presented theory of capital is also a theory of capitalism. In capitalist societies, it is mostly business enterprises trying to make a return on their capital that organise the production process, allocate resources in society, and distribute income to citizens. Almost all goods, services, and income payments are delivered by enterprises, and almost all goods that we own and consume have been on the balance sheets of numerous enterprises as part of their capital before we have got them.

The book deals in depth with the economic calculations that enterprises use to maximise the return on their capital. The societal role of retrospective calculation, i.e., of financial accounting according to the revenue-expense approach, is to make sure that enterprises that have detected and exploited gaps in the price structure and have therefore contributed to coordinating the production process can and do report profits. The societal role of prospective calculation, i.e., of investment appraisal and valuation, is to help enterprises find new paths to invest their capital and, by doing so, create innovations, progress, and economic growth. In other words, the economic calculations of capital-based enterprises are a major reason for both the stability and the dynamics of capitalist societies.

Although this theory of capital and capitalism adopts the definition of capital as used by actual business people, it has only had a few adherents in the history of economic thought. Among them were several (but not all) members of the Historical and Institutionalist Schools, as well as famous economists such

as Joseph Schumpeter and Ludwig von Mises, but the latter were outliers when it comes to their approach to capital, even within their respective schools of thought. The relative obscurity of this theory of capital is why I discuss other and more popular theories of capital at some length. The main purpose of this is to demonstrate the problems that arise when economists ignore everyday language and instead define capital as a factor of production of some sort. In particular, economists forgo the opportunity to understand and comment on the function of capital in capitalist business life. They bypass the role of economic calculation in organising the complex production processes in developed societies.

Based on the theory of capital and capitalism presented in this book, it is possible to deal with important issues that concern the economic calculations of business enterprises. I demonstrate this point by applying the theory to discuss the trend towards value-orientation in economic calculation. In the second half of the 20th century, financial accounting saw several reforms that were meant to replace the valuation of business assets according to their historical costs with valuation according to their so-called fair values. Likewise, managers were urged to maximise the so-called shareholder value for the shareholders or owners of their firms.

These developments can be commented on from the point of view of the theory of capital and capitalism presented in this book. Both fair value accounting and shareholder value maximisation implicitly presuppose the working of the market process and the equilibrating role of economic calculation. Fair value accounting and shareholder value maximisation do not, in themselves, contribute to these processes. They take them for granted. Implementing these approaches, however, interferes with the very market processes they presuppose. Therefore value-orientation is not consistent with the way capitalist societies work. If economic calculations are reformed so that they fit in better with value-orientation, it follows that the market processes that create a tendency towards equilibrium are jeopardised.

The book explains the origin of value-orientation. It is an outflow of comparative static analysis. To be sure, in comparative statics, it makes total sense to assume that equilibrium prices reflect the present value of future cash flows. However, neo-classical economists did not stop with comparative statics; they also developed the economic income concept. Like comparative static analysis, the latter assumes that prices reflect present values. By adopting the economic income concept and making it appear as an ideal, neoclassical economists made it possible for the idea that market prices reflect present value to infiltrate business practice. The concept had a strong appeal to both financial reporting standard setters and theorists of corporate governance.

The book then demonstrates the problems that arise from the trend towards value-orientation in economic calculation. My main criticism is that asset prices only reflect fair values – and share prices only reflect shareholder values – in equilibrium. It is paradoxical to assume that shareholder value maximisation and fair value accounting could somehow contribute to achieving an equilibrium situation that they take for granted in the first place. They are rather the source of confusion and short-termism in market processes.

One important thing that I want to achieve by presenting a theory of capital that is also a theory of capitalism, and by applying it to relevant policy issues, is to propagate a better understanding of the division of labour among us economists. For example, I do criticise neoclassical economics in this book, but I also defend it when it comes to its proper role. In fact, I explain the methodological purpose of *homo economicus* – the rational man – and the focus on equilibria in some detail. These constructs are very helpful in comparative static analysis. However, when it comes to market processes that tend towards equilibrium and the institutions that underlie them, neoclassical economics is not of much help. In this regard, other schools of thought have the relevant theories and explanations. The Austrian School is known for its analysis of market processes, and the Institutionalist and Historical Schools are concerned with the institutions of the market economy. It is no wonder that the theory of capital presented in this book has mostly been inspired by economists who belong to these schools.

It would be very helpful if economists acknowledged this division of labour. Neoclassical economics serves us well when it comes to analysing the impact of parameter changes on prices, quantities, and other magnitudes, both in a partial and a general equilibrium framework. However, when it comes to understanding or even reforming the institutions of capitalism – the preconditions of functioning market processes – neoclassical economists should rather step back and listen to economists from other schools of thought who specialise in these issues. Likewise, heterodox economists should be careful not to condemn neoclassical economics wholesale. Their criticisms tend to overshoot since they are sometimes based on ideological grounds. A better solution would be to demarcate precisely the area where neoclassical economics is applicable from the area where it is not. In this book, I have done so for the theory of capital.

7.2 A suggested application

The book is written in the tradition of the Austrian School of Economics, but it deviates from other works of the school. True, it builds on [Menger \(1888\)](#), [Mises \(1949\)](#), and [Reisman \(1996\)](#) and links to [Lewin and Cachanosky \(2019, 2021\)](#). However, these are exactly the members of the school who define capital in the way business practice does and therefore deviate from the Austrian theory of capital that usually does not define capital in this way.

There is a consequence of picking this capital theory that makes the book deviate from other Austrian works even more. The Austrian business cycle theory has not been mentioned throughout the book so far. This theory looms large in many other Austrian publications. Central banks, their monetary interventionism, and artificially lowered interest rates are identified as the main sources of malinvestment during the boom phase and therefore the unsustainability of the structure of production. The reason why this business cycle theory is not covered in the book is that the theory is based on the conventional Austrian approach to capital, which defines capital as a physical factor of production or a structure of heterogeneous producer goods. It would go beyond the scope of this work to reformulate the

Austrian theory of the business cycle in terms of the presented approach to capital. This is a task for future research.

I have indicated the problems that arise from linking the Austrian business cycle theory to a physical capital concept in [Braun \(2020a: sect. 5\)](#). In the exposition of the theory, it often happens that the physical capital concept and the real-life role of capital in the economic calculations of business enterprises are jumbled up. I showed that even [Mises \(1949: 550–556\)](#), who did not start from a physical capital concept, was not able to outline the theory without confusing the different definitions of capital. The explanation for this confusion is not difficult. Both capital concepts appear to play a central role in the Austrian business cycle theory. On one hand, the consequence of artificially lowered interest rates is that *physical capital*, i.e., capital goods are misallocated in the structure of production. That is what most expositions of the theory focus on. On the other hand, however, when it comes to explaining why and how the structure of production adapts to the decreased interest rate, Austrian economists often smuggle in the other capital concept. The point is that the lowering of the interest rate influences the economic calculations of enterprises. Long-term investment projects and the accumulation of debt become more attractive when interest rates are low. It is for this reason that enterprises adapt the way they invest their *business capital*. To express it pointedly, according to the Austrian business cycle theory, *capital* is invested in the wrong *capital*. In this sentence, capital has two different meanings, one monetary and one physical.

I am convinced that the Austrian business cycle theory would profit if it were reformulated consistently based on the approach to capital presented in this book. It is through the economic calculations of enterprises that the structure of production adapts in an unsustainable way to expansionary monetary policy, backed by credit inflation. During the boom phase, retrospective calculations not only show profits where enterprises have satisfied consumer demand. Especially in higher-order industries, high profits may result from the cumulated effect of artificially lowered interest rates. Likewise, prospective calculations may determine exaggerated present values for long-term projects due to the artificially lowered discount rate.

I strongly believe that a focus on economic calculation would open up new territory for the Austrian business cycle theory. In my opinion, the demise of retrospective calculation and the adoption of fair value accounting have an accelerating and boosting effect during the boom phase. When interest rates are lowered artificially, fair value accounting adds to the distortion of the economic calculations of enterprises. [Braun and Follert \(2025\)](#) describe a historical example where fair value accounting and expansionary monetary policy combined to cause a severe economic crisis. It would be a promising task to develop the relationship between the economic calculations of enterprises and the business cycle more systematically.

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