1. Introduction

It has become quite fashionable to start off a book—even academic and analytical works—with personal anecdotes. One of the few advantages of getting older is that one accumulates plenty of potential material over the years, making it easier to turn individual and—ignoring structural and specific historical dynamics—for the most part coincidental experiences into a host of anecdotes. But fear not, dear reader, I will spare you this. That said, I cannot refrain from outlining my personal frame of reference, for there is one thing that has accompanied me ever since I began working: that which we nowadays refer to as digitalisation[1]. I intentionally use this now-ubiquitous term, which has strayed considerably from its original meaning (that is, a technical procedure for the conversion of information from analogue to digital form, at times also referred to as 'digitisation') and instead become a kind of meta tag[2] for how society perceives the reach, direction and depth of the assumed transformation of our time.

As a sociologist, I have focused on digitalisation since day one. Prior to that, during my earlier work as a toolmaker, it was digitalisation that focused its attention on me. During my professional training in the mid-1980s, I worked on a computer for the first time. (I intentionally say *on*, not *with*.) I was operating a measuring machine that allowed curved tubes to be measured in three-dimensional space. At the time, I was unaware that I was working with an application program

1 In the current debate, digitalisation mainly refers to two aspects: on the one hand, a batch of recent information technology artefacts and technologies (from Artificial Intelligence, Machine Learning and the Internet of Things (IoT) to new approaches in robotics) and, on the other hand, the economic and social changes expected throughout the course of their introduction and application.

2 The term 'tag' refers to additional information that describes a data pool, and a 'meta tag' is used for information that describes the origin or purpose of an entire data entity (file or website). Such tags are used in HTML, XML or specific XML variants (such as JATS to indicate academic journal articles). This book, for instance, will be marked with tags such as <title>Digital Capitalism and Distributive Forces</title> <author>Sabine Pfeiffer</author> <year>2021</year> in order to make it retrievable online or for reference management programs like Zotero to be able to directly access this information. In the code, these three tags would commonly be written one below the other and there would be more 'tags' (for the publisher, place, keywords, etc.).

that was being run by an operating system behind the scenes. I tried, albeit unsuccessfully, to eke more out of the measuring machine's application program, as I suspected that the computer was able to complete many more and varied tasks.

I was training as an apprentice at a medium-sized family-run business whose line included products as wide-ranging as extruder machines, turbine blades, cutting tools and exhaust systems. Today, we would refer to this as 'diversified' production. CNC machines and welding robots with so-called teach-in processes had already found their way into production, and there was even an NC milling machine in our training workshop[3]—although learning to use it was not yet officially included in the training curriculum. I am mentioning this to show that, even though I was by no means working on the information technology frontline of the manufacturing industries, I was still able to work on a computer while only an apprentice. At the same time, the role of digitalisation was almost negligible in our offices: the construction department used drawing boards, not CAD systems[4], and the all-female shop clerk team (yes, they were all women and, yes, office jobs in manufacturing did still, in fact, exist) worked mainly with paper and were delighted if they had an electrical typewriter. There is a reason why I have decided to begin with this marginal note: the academic debate on digitalisation often overlooks the fact that the shop floor became digitalised earlier, more comprehensively and in a more integrated manner than other areas simply because it contained very little visible digital technology. It is no coincidence that the term 'embedded systems' is used: they are embedded in material technology, yet no less digital. The display on a machine is not only a control device, but the interface of a fully fledged computer.

I thus encountered digitalisation as a trainee industrial technician at a rather down-to-earth medium-sized company. At my subsequent employer (a distributor of CNC machine tools), I worked with CAD/CAM[5] systems from the end of the 1980s and was made aware of the vision of CIM[6] and flexible manufacturing

3 CNC is the abbreviation for 'Computerized Numerical Control' and refers to the computer-aided control of machines, whereas NC (Numerical Control) denotes its technological precursor without a (micro)computer.

4 CAD is the abbreviation for 'Computer-aided Design' and comprises software for constructing two- or three-dimensional models on a computer.

5 CAM is the abbreviation for 'Computer-aided Manufacturing'. This type of software links up the construction data produced in CAD and the CNC processing program in the machine. This allows for, say, construction data to be turned into processing data via CAM and converted into the different CNC languages of the various manufacturers of controls.

6 CIM is the abbreviation for 'Computer-integrated Manufacturing' and in fact, as a vision, it anticipates in the 1980s much of what reappeared from 2011 under the term 'Industry 4.0' in the shape of altered technical possibilities, namely the computerised networking of all processes relevant to production.

systems (FMS) during my job interview. (While the implementation of CIM was a rather long time coming, FMS were, in fact, sporadically introduced whenever a product's piece number justified the effort.)

At my next employer, I was finally able to be much more involved with the 'behind the scenes', i.e. the operating system (mainly MS DOS, sometimes OS/2 or Unix), setting up computers for our customers, installing interface cards (IEEE) that enabled a connection to 3D-coordinate measuring machines or touchscreen attachments for displays. Our development department would send us new versions of the measuring machine software to the distribution hub via the telephone line and acoustic coupler. At home, too, I already had a computer of my own (the first of which was an Amstrad Schneider PC 1512 with a double floppy disk drive), and before too long, first a 9-pin and later a 24-pin dot matrix printer was clattering away as well.

Years later when my journey into higher education led me first to engineering science and subsequently to sociology, digital technology remained both my work tool and my object of study. Eventually—it must have been in 1996—I found myself sitting in the café of an adult education centre in front of a PC with Internet access and a Netscape browser. Fully equipped with my own domain, I launched my first website, designed with a simple HTML editor, in 1998. A year later, I placed my first order with Amazon (not that I actually recall doing so, but Amazon never forgets). In sum, technology—both material and digital—was an equally natural and important component of my world of work, and, before too long, of my private life as well. It remained so (which appeared just as natural to me) when I replaced my work bench, machines and CNC code with sociology books, theories and statistical syntax.

This background story explains *why* I am writing this book, but it also gives a hint as to *how* I shall go about it. Technology and its potential remain an essential point of reference throughout. At the same time, my first professional role (more so than my current occupation) has taught me one thing: whether technology finds its way into a company, whether and how it is used in order to change or replace work processes, and whether it creates better- or worse-paid jobs or new qualifications in the process depends on the actors involved and the relationships between them. All these outcomes may take very different forms. The result, however, will never be decoupled from economic intention and de facto technological (im-)possibilities. That which changes in the social sphere, in the world of work, in life and in society can only be comprehended through both the technological *and* economic dimensions—and through both their respective distinct and shared path dependencies.

The insight gained through the tangible experience of technological change during my initial professional practice gave rise to a recurring perplexity about the responses in my current professional domain. To this day, sociology largely con-

siders technology, work, economic matters and the lifeworld in separate niches. It avoids theoretical approaches that at least attempt to conceive of all of the above as one. Moreover, sociology often fails to take technology seriously in its specific manifestations, instead turning it into something 'purely' social or abusing it as a vague metaphor for comprehensive, yet not always conducive, social diagnoses. I first had to learn this when I made the move from technology to sociology; at times it would make me feel rather exasperated; today, I find it easier to comprehend.

Society and social change cannot be and never were comprehensible without their underlying technical foundations, technological realities and their use of technology. Nor can or could society and technology—particularly when undergoing (large-scale) changes—ever be understood without taking into consideration the economic contexts in which and through which they develop. The question of how work, production and life as such are shaped, what they enable us to do and how this feels both individually and collectively cannot be comprehended without factoring in the overarching web of the economy and the market. Whether all of this is—perhaps even fundamentally—changing and whether we are currently at the beginning, or already in the midst, of a process of transformation or disruption is a debate that has concerned our society for some years now.

Almost no other subject is being discussed and researched as extensively as the digital transformation. In Germany, this discourse was launched in 2011—and quite deliberately so—through the introduction of the term 'Industry 4.0' (*Industrie 4.0*). From the outset, this discourse addressed not only the closed professional circle concerned with production and automation technology, but a whole range of actors in the economic sphere and throughout society. However, said discourse soon departed from purely focusing on the industrial realm, and instead increasingly turned to the bigger picture of digitalisation, placing other digital technologies centre stage: while the debate initially still focused on robotics, mobile devices and social media, today attention has shifted primarily to Artificial Intelligence (AI) and Machine Learning.

I myself have contributed to this discourse through publications and lectures at countless conferences and workshops, including outside the narrower academic context. At such events, I have increasingly sensed the great need for well-founded analytical approaches that enable a better understanding of the here and now and also point out the possibilities and limitations of influencing the process. This book thus intentionally sets itself apart from the numerous utopian and dystopian predictions that exist.

The debate on digitalisation is increasingly punctuated by one diagnosis of the times after the next. These proposals for interpretation and prediction—as distinct as they may be with regard to their respective orientation, target audience and background in academic discipline—all largely agree on three aspects: firstly, that we are dealing with a comprehensive transformation whose scale and

dynamics of change are comparable to historical precursors like the emergence of agricultural society or the Industrial Revolution. Secondly, that the cause of this transformation lies in technological advances, especially in robotics, the acceleration of computing capacity and AI. And, thirdly, that this process entails dramatic, radical changes for our economies and the way we work, the consequences of which must urgently be dealt with by society. Wherever we look and whatever we read, these three assumptions can ultimately be found in all diagnoses pertaining to digitalisation—be it explicitly stated, implicitly insinuated or tacitly presupposed. Although the specific assessments as to where the whole process will lead and which aspects can be proactively shaped where and according to which criteria (or not) may differ, the fundamental assumption of technological progress as the actual underlying cause is the common theme. It is portrayed either as an anthropological constant—human beings as a compulsively innovative species that cannot help but infinitely produce technological advancements—or as a quasi-evolutionary process, at the end of which humanity makes itself obsolete.

Against this background, this book does not seek to propose another diagnosis. It does not follow the triad of 'technological development sparks economic dynamism which in turn yields social consequences'. Nor does this book seek to join the ranks of the ever-expanding list of publications that work their way through these (expected) consequences and argue about which jobs will be replaced and when, and whether a universal basic income (UBI) is the solution. This book shall not present another classification of stages determined by technological artefacts—from agricultural society to the data economy, from the steam engine to the Internet of Things, from book printing to social media. Furthermore, this book is not one more attempt to declare a technology-inspired metaphor—as in network, algorithm, pattern—the new concept of society or expose it as something that has always existed. All this has already been done and comprises valuable contributions to the debate, while simultaneously expressing the apparently great desire in society for an exchange about what is currently going on (with us? as a result of our actions?).

Like other publications, this book does by all means assume a transformation, and it embarks on the search for that which is new and explores how it is connected to the old. Rendering comprehensible this 'new', its structural causes and the related specific consequences is what I set out to accomplish with this book. In the process, we dare to take a look behind the phenomena of digitalisation (without neglecting the realities of technology). The objective is to develop an analytical perspective that conceives of the development of technology, the economic logic and the social dynamic as one, rather than as a sequential succession. In the process, the focus will be on devising a diagnosis of more recent developments over the past decades and thereby pursuing two intentions: firstly, merging distinct

strands of current digitalisation and assessing the outcome thereof, and secondly, interpreting these developments based on a theoretical analysis.

1.1 The central hypothesis—in bad neighbourhood?

In his book *Muster* ('Patterns') (2019), which presents a theory of the digital society, Armin Nassehi sets out to pinpoint the exact problem digitalisation actually solves (see ibid.: 12). His answer—albeit presented here in an abbreviated form that does not do justice to his elaborate deliberations—is that modernity has always been digital and relied on patterns to cope with complexity; that is to say, the digitality of society is the result of its own structure and complexity (see ibid.: 321–325). I find this answer unconvincing. Nassehi's analysis marginalises economic actors and the market, while the economic system that characterises modernity—capitalism—disappears behind society. Although his analysis does provide a refreshingly novel view of the dominant discourse, which often only focuses on the economy (as a field, not as a structure) and assigns society the mere secondary role of cleaning up the mess left by disruptive developments. However, neither can modernity be grasped without capitalism nor can digitalisation be comprehended without the related economic strategies, actors and dynamics.

This book, then, proceeds not from society, but from capitalism. The fact that the latter has turned digital does not sufficiently answer the question, as will be shown. Capitalism as such, the continued existence of which relies on selling ever more products and goods on ever-newer markets, must currently be beset by a problem for which digitalisation proves (or is at least perceived to prove) to be a particularly adequate solution.

The simple answer seems to be that digitalisation is the technology that replaces (human) labour. For some, this may already sound like a critique of capitalism, yet with regard to an analysis of capitalism, it is too reductionist and too simple a conception. That is why this is the preferred answer by those parties who refrain from analysing capitalism, instead choosing to produce endless forecasts concerning the scale of the replacement of labour. How many people does a robot replace? How much office work can AI perform? Academic studies and an attention-seeking media relentlessly raise these questions and underpin them with corresponding figures that achieve the highest possible number of citations, clicks and circulation volumes. Granted, just like every other technology that came before it, digitalisation is being used to replace human labour. But that is not a problem for capitalism; it requires no new solutions or answers to accommodate this process. It is in fact quite good at this (though 'it', of course, is not good at anything—it is the countless decisions, negotiations and implementations of efficiency-increasing strategies in individual companies that are made almost

inevitable in the capitalist system, but which can by all means be conducted and led very differently in specific, concrete strategies). This book is not just another attempt to search for the new technological options for replacing labour. Instead, the guiding question is whether capitalism itself has any new—or preexisting but intensifying—problems, and whether this helps explain why certain forms of digitalisation and digital business models are particularly successful.

The corresponding hypothesis that this book develops theoretically and substantiates empirically is the following: the problem businesses and national economies increasingly face in a highly advanced, globally operating capitalism is that of successful sales. The goods that can be produced (or even just copied) at ever-greater volumes and more and more efficiently are worth nothing if they are not sold. That is the objective of all activities. Competition on global markets continues to drive the hunt for the cheapest possible forms of production. Yet what is becoming increasingly relevant is the competition for too few buyers. Corporate efforts towards more efficiency and optimisation are increasingly aimed at the market, which they seek to serve more quickly and in a more planned and targeted manner. Shareholders do not like surprises. The crucial bottleneck for all business activities remains, firstly, the market and, ultimately, the related act of purchase (or sale, rather). The corresponding strategies, however, have been pushed more and more to the fore, and this, as I hope to show in this book, is where digitalisation is particularly convenient (although it ultimately does not pose a solution, but rather contributes further to the fundamental problem).

The core analytical message of this book could also be worded as follows: the central problem of advanced capitalism today is the realisation of produced values on markets. Strategies of market expansion and consumption constitute the main elements of an increasingly relevant and competitive field. Alongside the productive forces geared towards value *generation*, the forces aimed at value *realisation* are becoming increasingly dominant. The reasons are economic, inherent in the logic of our economic system, and not the result of digitalisation. In order to better elucidate this shift in significance analytically and empirically, these special productive forces are given their own separate title: the *distributive forces*. They include, *firstly*, all the technological and organisational measures and activities related to value realisation, the intention of which is, *secondly*, to guarantee the constant expansion of this value realisation, ensure this expansion in the long term and to do so at the lowest possible circulation costs. This is precisely where digitalisation and digital business models have proven particularly promising.

To return to Nassehi's question, the *problem* lies in the economic mode itself; the *solution* is a whole bundle of technical, organisational, institutional and social responses; digitalisation's success is owing to the fact that it optimises and accelerates these solutions. Unfortunately, these solutions are not real, and digitalisation changes nothing about this (on the contrary, it exacerbates the underlying

problem). The 'meta problem' is that it can only be solved—at least within this economic logic—in isolated instances, for a limited period of time, and in the interest of individual actors, but not as a whole. Here, capitalism is in the same situation as Nassehi's modernity: much like the latter, which cannot rid itself of the complexity problem through digitalisation, capitalism cannot solve its central problem (always too many goods for never enough markets) through digitalisation. In fact, in both cases the ostensible solution aggravates the respective problem.

Seeing as I speak of capitalism—and not simply of 'the economy'—and of productive forces (or rather of their special form, the distributive forces), most readers will not be surprised that I increasingly end up mentioning Marx in this book. That is not because I always wanted to proceed from his standpoint, but—and the order of the following chapters illustrates this—because current analyses of digital capitalism fail to provide the crucial answers. Those who wish to follow my argument will find it impossible to avoid Karl Marx. This ought to be established from the outset—for all those who may gasp at just hearing his name or consider such theoretical associations altogether to be a 'bad neighbourhood'[7].

Given the outlined intention of *how* I wish to go about writing this book, Marx's theoretical approach is indispensable, for it is—to this day—the first and most comprehensive conception of work and life, economy and society, technology and the social, the market and the world both as one and in a process of constant change. We shall see whether this theoretical toolkit proves applicable to digital capitalism as well. In drawing on Marx, I follow the insight "[…] that present trends in modern societies cannot be even approximately understood without the help of key concepts from the Marxian tradition – and this will become all the more the case, the more plainly the capitalist market economy becomes the driving force of the emergent global society" (Streeck 2017: 49).

To all those who harbour reservations about Marx, I would like to encourage you to engage with his analytical insight and approach. There is certainly much space for argument concerning the political consequences of his analyses, but not about his analytical capacity as such. Even actors who can in no way be regarded as critics of capitalism find it hard to ignore Marx at times—even though they (intentionally or unintentionally) usually completely misunderstand him. Even the World Economic Forum (WEF)[8] wants to prescribe at least 'some Marxism'

7 In the digital world, a 'bad neighbourhood' refers to websites providing links to link farms, websites with malware or illegal or other content suppressed by the algorithms of Google and other search engines. As a result, such websites themselves can be downgraded in the search rankings. Search engine optimisation (SEO) strategies seeking to improve their ranking through a large number of links often walk right into this trap. The question is always where the links lead to.

8 Neglecting its own crisis diagnosis of 2016, the WEF is currently—after the Great Transformation (the birth of capitalism, so to speak) and the Great Depression (its first but, as we know today, not its final major crisis)—calling for a Great Reset, given the backdrop of rising social inequality and

(Bendell 2016), thereby referring to the unconditional basic income (UBI). The aim in this context, however, is not to protect people from falling into poverty because digitalisation might destroy jobs on a large scale, but to maintain the mass consumption capitalism relies on. Often enough, the difference lies in who is speaking: when Marx—or critical voices referencing Marx—say(s) that corporations are only driven by profit interests, this is commonly criticised as too radical or disregarded altogether. Yet, strangely enough, when Nobel Prize laureates provocatively and intentionally reduce the concept of corporate social responsibility to the aim of 'increasing profit' (Friedman 1970), this is largely accepted without question.

The reason for this is that his name is frequently misused; that *Capital* exegesis is often conducted with the same fervour as biblical exegesis (although the former provides an astute analysis while the latter is religious scripture); that the range of interpretations of Marx's writings is infinite and those proposing an interpretation often disagree with each other; that only very few people have actually read Marx in the original, but have mainly read *about* him, if at all. For all these reasons, in the analytical passages of this book I will let both Karl Marx and Freidrich Engels speak for themselves. While working with these original sources, I discovered many new arguments, and read other passages with fresh eyes. The renewed and comprehensive study of so many volumes of the *Marx Engels Collected Works* (MECW) was indeed very rewarding and satisfying. The struggle for analytical precision, the intellectual complexity, the repeatedly astounding topicality, the prognostic foresight—all this provides an impressive instrumentarium, not least to help understand an ageing yet constantly reinvented capitalism, including in its digital form. So, should you harbour such reservations, please try to push them aside for the time being (as they can, of course, be put right back around one's perturbed shoulders thereafter). Especially if reading Marx has not been among your interests thus far, if you do not distinguish between economy and capitalism, and if you find the world just fine as it is, I would still urge you to be truly 'disruptive', to develop an open mindset and join me on a journey into Marx's world.

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the ecological crisis. Only this time, it is not digitalisation that requires responses, but COVID-19. In the book on the conference (see Schwab/Malleret 2020), which generally presents a shockingly shallow argument, the reader encounters—besides the calls for more global (see ibid.: 114–119) and national governance (see ibid.: 89–95)—mainly more of the same: a further accelerated digitalisation (see ibid.: 153–154 and 176–180) and more growth (only somehow more sustainable and measured differently) as a means to make polarised income levels, unevenly distributed participation opportunities or social resilience more visible at the level of national economies (see ibid.: 58–63). A WEF website lists the four 'building blocks of the Great Reset' as an adjusted mindset, new metrics for measuring the world's wrongs, the latter's mitigation through incentivisation and people making more meaningful connections with each other and the natural world.

The analytical and theoretical basis of this book is built around the mentioned concept of the *distributive forces*. It is a term I have devised by analogy with Marx's concept of productive forces. In Marx, as is quite well known, science and technology are *one* (not *the*) expression of the development of the productive forces, which he always discusses in the context of the relations of production. This book picks up on this notion and seeks to refine it. The aim was not to write a book along the lines of 'Marx was always right', but to harness the analytical strength of Marx's works, particularly for the interrelation of technological development and economic as well as social relations as a tool and to (if necessary, entirely disrespectfully) adapt and refine them wherever the current social changes require.

My distributive-force hypothesis seeks to grasp digitalisation in the sense that a large share of the activity it currently triggers aims above all to achieve one thing: the realisation of value on markets. That is to say, the objective is no longer just the creation of new values, but, to put it simply, to successfully—and more safely, more quickly, with the greatest possible certainty and in the long term—operate on markets. The aim is not to substantiate a hypothesis of transition 'from the industrial capitalism of productive forces to the digital capitalism of distributive forces'. That would be delightfully simple but, unfortunately, far *too* simple. The matter turns out to be much more complex. That is why it is so important to distinguish analytically that which is inextricably compounded empirically. In this intellectual task, again, the Marxian toolkit is of great help.

Even in the scholarly world, real reading—i.e. the complete reading of a text from start to finish—has gone out of fashion. Academia has long been governed by key performance indicators and compelled to produce more and more growth: more students, more third-party funding, and more cited, international, high-ranking publications! Yet, as in the economy, the market is limited here, too. The rising overproduction of academic texts is matched by the declining possibility for them to be read (therein perhaps lies a good idea for an economics article: 'Calculating the tendency of the rate of reading to fall' … but I digress). That is why we all (skim-)read more quickly, in a more targeted and selective way, and with ever-greater gaps and omissions—which is perfectly sufficient most of the time.

This overproduction is intensifying because market expansion in academia is particularly difficult, as the call for the growth of science and research almost never includes the request to 'write more for society!', to 'establish exchange with as many others as possible who do different things in other places!' or to 'leave your ivory tower as often as possible!' Who, outside of the scholarly world, reads academic texts anyway? And why would they, given that most academic texts make no effort to at least point out any potential use of its subject beyond the respective discipline? Admittedly, this book may not be the most suitable read after a long work day, a (very) late dinner, perhaps with grouchy and/or pubescent children, or family members or room mates whose work extends seamlessly into

their private lives. And my book is certainly more time-consuming and less pacey than a 45-minute episode of the latest hit series on a popular streaming site. But that is the case with most academic books. Nonetheless, I would still like to invite you to follow the argument presented here from one chapter to the next. The compact summaries here and in the concluding chapter inevitably leave some aspects unresolved that require more extensive reflection.

1.2 Digital capitalism and value

The list of diagnoses linked to digitalisation is endless. Depending on the year of publication, the technological phenomena and/or the most recent business models or corresponding protagonist companies taken into consideration vary. For the purpose of order and overview, the best thing would be to skim over all of them in the introduction. Yet, I will refrain from doing so (and spare you this minor ordeal), for, as inspiring or debate-worthy many of these diagnoses may be, my interest lies in the economic dimensions behind the digital phenomena. My concern is not the power of the big tech companies that extends far beyond the economic sphere, but the question of how we ended up here to begin with? And I find the answer to this question given by most diagnoses rather unsatisfactory. After all, many of them ultimately just describe the same unchanging recipe (either critically or with a sense of awe): mix innovative digitalisation forerunners with disruptive business conduct, season with immaterial products (with few or zero marginal costs), infuse with unlimited data as raw material and, after a good shake, end up with runaway scale and network effects. Yes, this may all be true. But is that alone the explanation we seek? If we pursue this image further, does it not have to include the bar itself as well as the fact that the bar has always been stocked with a far greater number of beverages than needed to satisfy its customers? In other words: can capitalism and its economic logic perhaps provide a more comprehensive explanation than digitalisation and its algorithms?

The attempt to answer this question proceeds from the concept of digital capitalism in Chapter 2. Dan Schiller (1999) originally coined this term, and it was not the only attempt to examine digitalisation and capitalism together—in fact, he himself launched another such attempt (2014) in the wake of the 2007/8 financial crisis. Schiller's geopolitical, technological and historical perspective is supplemented by the more media-theoretical considerations of Michael Betancourt (2015), for whom the financial crisis and the financial system also represent significant points of reference and thus a lens through which to focus his engagement with digital capitalism.

Throughout this book, I cross-reference these authors—whose approaches are by all means distinct, yet still revolve around digital capitalism—along three the-

matic complexes that appear most conducive to my initial question (i.e. what about the bar?). I explore whether the summary overview of the three authors already answers the three questions about digital capitalism I deem most relevant: *what* happens through *whom* with *which dynamic*? Does 'the immaterial' really change the fundamental basis of the economy (labour and value)? What is the actual force driving it all? Needless to say, this book ultimately went beyond just Chapter 2 (and indeed is longer than originally intended). This is because the two authors essentially provide no satisfactory answers to my questions and because one cannot elude the suspicion that it may be the Digital[9] itself that drives the debate around digital capitalism after all, instead of any novel, or at least significantly altered, economic dynamics. Having said that, the engagement with these authors and their respective answers to my three questions does reveal an initial blind spot, which takes centre stage in Chapter 3: the question of value. Here, we shall first seek argumentative guidance and find analytical depth in Mariana Mazzucato (2018). Not only does she occupy herself with value and its place of origin: she also demonstrates the extent of the deception by economics that lets value—the core essence of all economic activities—disappear from our view. Moreover, she shows that this has nothing to do with the immateriality of the Digital but with very material interests.

Only when value and its significance have been established can we ask how it will fare in digital capitalism. Does the already obscured concept dissolve into bits and pixels at a factual level as well? Karl Marx assumes that commodities in capitalism comprise two—utterly contradictory—values: use value (in terms of qualitative, specific use) and exchange value (i.e. a purely quantitative measure, which must prove itself above all on the market, where it becomes visible—but where it does not originate, according to Marx).

To Marx, this value is generated during the production process, the measure is the 'necessary labour'. And, because in industrial capitalism one appears related to mechanics and steel and the other to manpower and (physical) strength, many are lured into assuming that the underlying structure disappears along with the change in forms of appearance. However, use and exchange value also exist in digital capitalism, even though the means of production alter their form and labour requires new skills. Value and labour, use and exchange value may appear differently and be assembled in different configurations in digital capitalism, but, so far, the original Marxian categories are still accurate in analytical terms.

Does that imply that the answer at the end of Chapter 3 will be: 'business as usual' in digital capitalism? New wine in old wineskins? Good old capitalism goes

9 *Translator's note:* The terms "the Digital" and "the Immaterial" have been capitalised throughout this book to emphasise the two dimensions' scope and significance in the context of the distributive forces.

digital? The answer is yes and no. Firstly, a change in form changes many other things—and does so simultaneously in many instances and places worldwide, extending into our personal lifeworld. Secondly, we have thereby only glanced at one, albeit quite essential, aspect of capitalism. If there is no fundamental change here, why, then, do the giant tech corporations with their staggering stock ratings exist? Have they simply seen through digitalisation more cleverly? That would take us back to our initial question. When Facebook or Google, as we all know (and as we shall inspect more closely in this book), generate mind-boggling revenues through advertising alone, there must be companies which, in turn, are willing to spend that kind of money. Are we simply looking at a change of medium, i.e. fewer national TV ads and more global Internet advertising? That is also true. And yet, it explains neither the gigantic revenues nor the staggering stock valuations. At this point, two hypotheses begin to take shape.

Firstly, that which is new in digital capitalism may not be located on the side of value generation but on the side of value realisation. Secondly, we may in fact be dealing with a systematic imbalance, which already filters through in Michael Betancourt's notion of scarcity in Chapter 2. In his view, this is a phenomenon of digital capitalism. If we were then to imagine the latter without the Digital**,** the same processes could also be explained through overproduction, over-accumulation and contradictions between the real and the finance economy, all of which can also be found in Marx's analysis of the industrial capitalism of his day. Regardless, I shall refrain from prematurely pursuing the looming hypothesis that the answer may be found at the 'back' (on the market) and not at the 'front' (in production). Let us first return to the origins of capitalism and its analysis.

1.3 Productive forces and the market

In Chapter 4, we turn to the two theoreticians who studied the last great transformation—i.e. the first Industrial Revolution—and in the process conceived analytical instruments which consider technology, economy and society as elements that mutually interact instead of occurring in succession: Karl Polanyi and his historical analysis of the Great Transformation, and Karl Marx and his analysis of capitalism and the theory of the development of the productive forces. I treat both analytical viewpoints somewhat impiously and merge the two approaches much more than is commonly the case; after all, Polanyi and Marx direct their critique at the same object with the same intention—albeit at times from different angles. Even where, as we would say today, their 'wording' or 'framing' appear distinct from one another, they ultimately highlight the same painful issue. Furthermore, I allow myself the freedom of adopting only as much of their analyses as appears conducive to my purpose—i.e. understanding what is really new about the devel-

opment of digitalisation over the past decades. Finally, I take the liberty of thinking beyond Marx and complementing his productive forces with the concept of the distributive forces. As my central hypothesis runs, this is precisely where digitalisation's actual novelty becomes tangible.

In their analyses of the emergence of capitalism and its unique features, both Marx and Polanyi, again, albeit from distinct angles, focus on the process of production. Initially, both intentionally, for the most part, omit the other side, namely the sales market, i.e. the sphere of circulation, from their analysis—in part explicitly justifying this procedure. Of course, both are perfectly aware that the creation of values on one side (production) is only feasible economically if these values can be realised—i.e. sold—on the other side (the market). Although both authors point out this circumstance, they focus their attention on that which drove the dominant dynamic of their time. Marx thus dedicates himself to the surplus value arising from the productive process, while he pursues the question of value realisation on the market above all from the vantage point of the power of consumption and thus the relations of distribution. Polanyi, on the other hand, considers the altered role of the merchant, who used to buy and sell finished products but now purchases raw materials and labour forces—this is where Polanyi locates the transformative quality of the dynamic, not in terms of the sale of products now created under the supervision of the merchant-turned-entrepreneur. Hence, Polanyi and Marx see the transformative dynamic of early industrialisation in the convergence of technological innovation in production and a new economic logic of buying (Polanyi), or the creation of surplus value (Marx).

Polanyi does not believe, and this shall also be shown later, that market society can be hemmed in. This brings him much closer to Marx than many are prepared to accept. What discernibly motivates both is something beyond mere factual analysis: for Polanyi, it is the systematic consumption of the actual substance, by which he refers to human beings, but also nature and society as a whole. For Marx, it is the assessment that capitalism, despite its unleashing of all that which he refers to as productive forces, ultimately impedes real progress for mankind (as a species more generally).

The concept of the 'development of the productive forces' devised by Marx must also be considered in this context, not only because it comprises everything that concerns us here (society and economy, change and transformation, technology and labour), but also because digitalisation itself is readily regarded as a major advancement (or 'leap') in the development of the productive forces by some more recent observations. Furthermore, we must inspect more recent applications of the Marxian concept at this point. After all, we may actually find the answers for the analysis of digital capitalism right here, simply left unused by the two authors initially discussed. Yet this hope is quickly dashed. As helpful as the Marxian concept of the productive forces (and the relations of production as well as the mode

of production arising from both) may be, when applied to current developments, it remains analytically vague and unspecific. It is either (acclaimingly, not argumentatively) elevated to a leap in the productive forces, or (mistakenly and unfortunately) reduced to the question of productivity.

Apart from the first blind spot (value) identified in the recent texts on digital capitalism mentioned at the outset, we thus find a second blind spot (the realisation of value) in the classic analyses of the development of industrial capitalism. Yet, as shall be made clear in Chapter 5, in the latter case is not an inherently a blind spot. In advanced capitalism (be it digital or not), value realisation becomes increasingly important. However, simply claiming as much will not suffice. The aim must be to theoretically elaborate and analytically substantiate this. In Marx, we can initially identify three relevant driving dynamics here: market expansion, consumption and crisis.

These dynamics are not random, as precapitalist markets also exhibit expansive tendencies; on each market, items are only bought and consumed if there is a desire and ability to do so; the entire history of humankind was dotted with economic crises long before capitalism. Market expansion, consumption and crisis, however, are not just potential but necessary dynamics in capitalism. *The competition between production-based, manufacturing enterprises for a more cost-efficient form of production while maintaining or even increasing value generation is complemented by an intensified competition for the pole position on sales markets*.

Given production's inherent tendency to be immoderate, the same applies to sales. That is why new markets must constantly be created, opened, developed and, if possible, closed off to the competition (using a large variety of methods). In spite of extensive market expansion, competitors are fighting over a systematically decreasing good: market participants willing and, above all, able to consume. While the willingness to consume can be proactively created, the ability to consume (in the economic sense of purchasing power) remains limited. That is why *value realisation* becomes *more and more important—but also more difficult to achieve*. This fundamental problem, the systematic imbalance, remains and must by definition lead to crises time and again. In order to avoid these crises (for as long as possible) or to minimise their impact (as far as possible), this imbalance between too much production and too few consumers (always conceived in relation to one another) must constantly be painstakingly minimised. For this purpose, there are permanent small-scale and large-scale efforts (i.e. at the level of individual enterprises and nationally) to increase the willingness to consume. Consumption becomes a dominant and expanding social mode, and has been for so long and to such an extent that it is difficult to make meaningful distinctions between *consumption and society*. The willingness to consume must constantly be reignited—but even where this is successful, the limits to the ability to consume remain in place. For some time—and since long before the onset of digitalisation—means

of communication have played a major part in this, being applied for the purpose of market expansion, stimulating consumption and minimising the risk of this permanently crisis-prone process. These aspects—and all this can already be discerned in Marx—require more and more attention; and the productive forces employed to this end increasingly comprise more effort, technology and labour.

1.4 Three distributive forces and their development

Chapter 6 focuses on the three productive forces geared towards value realisation or—as I refer to them due to their increasing significance—the distributive forces. They include *advertising and marketing* (all efforts directly aimed at value realisation, i.e. consumption and the market), *transport and warehousing* (all efforts to secure physical access to markets and value realisation) and *control and prediction* (all efforts to link up value generation and value realisation and render them calculable, in the truest sense of the word, in all circulation movements). All three distributive forces are analytically and historically elaborated in Chapter 6. After all, they are not an expression of digitalisation, but rather its most eager subscribers. *Control and prediction* is unique among these distributive forces, as it can appear both by itself and—quite often and increasingly so—in connection with the others. Despite an analytically separate presentation and empirically distinct individual phenomena, all three distributive forces are interrelated, overlap and sometimes develop—in a technical, organisational and complementary division of labour—together, but almost always interdependently.

Seeing as these distributive forces substantiate the actual essence of my distributive-force hypothesis, each of them is theoretically deduced from Marx, yet simultaneously always related to concrete, current (but deliberately not only digital) empirical examples. In the process, we shall come across such distinct concepts as the old idea of 'customer engineering' or the more recent 'retargeting'; we shall consider how many T-shirts fit into a single cargo load and what the Ford Foundation has to do with the teaching curriculum in business schools around the world.

As emphasised above, the distributive forces comprise all technical and organisational measures linked to surplus value realisation and activities towards (the securing of) value realisation. That is to say, they pertain not only to what happens inside or at the hands of individual companies or, indeed, in individual industries or value chains, but also to the closely related, supporting and enabling institutional structure and the political framework conditions, social practices, social norms, etc. We shall deal with the distributive forces only in the narrower sense of the term—i.e. the strategies and technologies applied by economic actors and the corresponding and simultaneously developing forms of harnessing labour and

labour capacity. At the same time, they always remain an element of the development of the productive forces and, just like the latter, thus constitute an expression of, and are embedded in, the same relations of production.

Distributive forces are not a new phenomenon, but the longer capitalism exists, the more relevant and indispensable they become—both for the individual enterprise competing for successful value realisation and for entire national economies competing to postpone the next inevitable crisis for as long as possible.

Digitalisation is a particularly compatible ally in this context: it is brought to bear far more effectively at the level of the distributive forces than at other levels of the productive forces. This is because its technologies and business models promise three things in particular: market expansion, the stimulation of consumption, and value realisation at the lowest possible risk. This constitutes a new quality. Wherever it merely serves the generation of value to influence the surplus value, it is applied much like any other productive force. What is new and distinguishes digital capitalism from its predecessor, then, occurs at the level of value realisation. That is why—if we wish to name this phase of capitalism—we must speak of *distributive-force capitalism*. After all, what is new is a shift in the economic, not the technological domain. Neither the distributive forces nor their digitalised and digitalising levels of manifestation constitute a solution to capitalism's susceptibility to crisis, for they themselves, as well as the business models geared towards them, are subject to the same logics they seek to react to. Moreover, given the rise in the costs and the share of living labour in the area of the distributive forces, familiar methods to reduce (circulation) costs can be observed here, too.

Those who read not just this very concise introduction, which invariably must omit many arguments, but the corresponding chapters, too, might expect a few remarks about the development of the distributive forces over time. Marx fans may also be eager to address some more sceptical questions. There is room for both in Chapter 7. And because the former is only briefly addressed and serves as a bridge to the following, more empirically detailed Chapter 8, and the latter is only of interest to those who were already convinced that Marx is anything but 'bad neighbourhood' and who have likely previously spent time engaging with one or two of his famous texts, or even volumes, the following keywords shall suffice: regarding the development over time (roughly considering the period since the 1980s), the question of 'leap', 'disruption' or 'layering' arises. Butterfly or locust? Concerning the distinction from other concepts of the Marxian theoretical edifice, the task at hand will be to establish links with and distinctions from the relations of distribution and circulation. With regard to both, I shall refrain from spoiling anything and simply recommend reading Chapter 7.

1.5 Illustrations and destructions

Following so much theory and analysis, Chapter 8 is above all empirical and delves even more into the digital depths than the previous chapters. Needless to say, an individual empirical chapter cannot present the distributive forces in their entirety, including their interrelationships and development. This would indeed require no less than a comprehensive research programme. In this sense, the chapter is more of an illustration and touchstone to see whether phenomena of digital capitalism become more comprehensible when examined through the lens of the distributive forces. The starting point is the GAFAM corporations (Google, Amazon, Facebook, Apple and Microsoft)—the protagonists of almost any diagnosis of current digitalisation and, in part, important points of reference for those authors writing on digital capitalism discussed at the beginning of this book. A comparison of various key figures based on these five (and three other) corporations' 2019 annual reports and other sources reveals many differences. Only the distributive-force lens, then, allows for a more precise understanding of what causes these differences. This is the first empirical illustration.

The second one identifies two catalysts that reinforce the distributive forces' two central motives (market expansion and consumption) and which are a specific feature of the current variant of distributive-force capitalism—namely venture capital and ubiquitous consumption. Venture capital flows simultaneously enable and succumb to the promise of infinite market expansion. Once digitalisation and neuroscience are linked up with one another, they engender forms of stimulating consumption that become increasingly unavoidable.

The third illustration categorises dominant digital business models and the currently most important digital technologies with a view to the theoretically developed concept of the distributive forces and reveals the extent to which value realisation takes priority. Another aspect that becomes visible (in the true sense of the word) is that one company is the most adept at harnessing the power of the distributive forces: Amazon, as merchant capital 4.0, so to speak, represents a case apart. Although one may already suspect this, the distributive-force lens helps substantiate this more comprehensively.

Finally, the fourth illustration places the focus less on the companies than on labour in concrete terms. Proceeding from quantitative analyses, it demonstrates how the increased significance of the distributive forces is also reflected at the level of professions and jobs. In sum, all four empirical illustrations underscore that the hypothesis of the distributive forces offers a different and thus far neglected approach to understanding capitalism in its digital form.

The final chapter is more an outlook than a conclusion. Not least with regard to concepts and terminology, we shall unravel rather than tie up the matter: productive and distributive forces, relations of production and reproduction. From

an ecological perspective, we raise the question about the role of digitalisation and especially of Artificial Intelligence. Subsequently, in the concluding ninth chapter, we then take a closer look—once again building on Marx and Polanyi—at the relations and forces of reproduction. Even during their respective eras, both Karls were already driven by concerns that also resonate in today's discourses on digitalisation, namely that a certain application of technology paired with a certain economic logic has not only productive outcomes, but also and inevitably destructive ones: in Polanyi's work, this pertains to damages to the substance (that is, the 'human and natural substance of society'), in Marx, to the existing relations of production which—and his analysis should not be reduced in this way—are not only linked to the exploitation of human labour and natural resources, but prevent human and social development from attaining its full potential. To conclude, we shall discuss the dangers that the development of the distributive forces hold for the reproduction of mankind, society and nature, raising the question—with a view to the more recent variants of digitalisation: Artificial Intelligence and Machine Learning—whether digitalisation can be used in a way that prevents it from becoming a force of destruction even in distributive-force capitalism.

One day in the strange year that was 2020, during the long periods of working from home that were forced upon us by the pandemic, yet also greatly welcomed as it gave me an opportunity to focus on this book, my gaze shifted from endlessly staring at my screen to actually looking out the window. At that very moment, I was able to witness first-hand how an (analogue, not digital) advertising column[10]—an aged means of distribution—was literally skinned. I must admit, I had never given any thought to how the many layers of advertising posters are taken down from these columns. After a while, the column itself becomes so enveloped in posters and wallpaper adhesive, which, soaked in rain and bleached by the sun, turn into a solid mass. Of course, if the column is to continue to serve its purpose, these layers must be removed at some point. At that moment I was able to observe two workers cut the thick paper cylinder open lengthways using a saw. They widened the radius of the broken-up cylinder through cumbersome, repeated pulling and stretching—quite noticeably hard physical work—until the column itself became visible again. The mighty hardened reel lying on the pavement was so large and heavy that it had to be cut into smaller pieces with a chain saw like a

10 The advertising column has existed since 1855 (see Reichwein 1980) and continues to enjoy great popularity as a 'learned' medium. There are still tens of thousands of them in German cities (see FAW 2005), albeit long outnumbered and optically marginalised by (Digital) Out-of-Home advertising ((D)OOH), i.e. advertisement via different digital formats in public spaces such as billboards, video displays and posts, and public transport TVs or info screens. In Germany, more than 100,000 such devices have been installed in public spaces, with budgets for individual ad campaigns ranging from one to ten million euros (see FAW 2020). Furthermore, OOH is believed to be the third fastest-growing advertising market (Warner 2020: 490).

felled tree. In the end, the advertising column was as good as new and free to be once again plastered with ad posters until this procedure has to be repeated—or the column is replaced by a digital version.

As is the case with most comparisons, this one may be a bit clumsy, and yet it seems quite fitting in two regards with a view to the distributive forces and digital capitalism, i.e. the central subjects of this book: firstly, when considering the development from the old advertising column to comprehensive digital out-of-home (DOOH) campaigns, we see a formidable empirical example of the evolution of the forces of distribution. Secondly, the costly process of column-skinning provides a metaphor for that which we are analysing in this book, namely the novel feature of digital capitalism: the distributive forces.

Sticking with the column metaphor, what is occurring today is that a new layer of posters is being employed, filled with louder, more colourful and, finally, digital content. The basis, however, i.e. the column, or the capitalist logic, remains. And yet, as a phenomenon, it is changing almost beyond recognition. The productive forces are not replaced by the distributive forces. That is not the hypothesis (after all, logic would not permit as much, given that the latter is an element of the former). Hence, the question is not when or if the analogue advertising column, and thus the job of putting up and removing advertising posters, are universally replaced by DOOH devices. It is about much more. For the initial question was not 'What does digitalisation turn capitalism into?' but 'Which of capitalism's mechanisms are reinforced, enhanced and shifted (and why)—and what is the role of digitalisation in this process?' This is where the digital replacement of the column gets interesting, as, on the one hand, it allows for an infinite increase in the frequency of alternating ads while the related circulation costs can be reduced to a minimum in the long run. On the other hand, the costs are likely to rise because more advertising firms are now needed in order to recoup the funds spent on the digital version. Moreover, the management of omni-channel client projects that incorporate one individual advertising column into an entire marketing strategy requires new skills and qualifications. This surely entails much higher costs compared to charges for printed poster designs and for their placement and removal. Then competition comes into play. All of a sudden, the bus stop next to the advertising column also becomes a DOOH, while the advertising effect of the column—which is difficult to ascertain in the first place—is diminished.

This individual advertising column is thus not only a tool for market expansion and enhancing consumption, but it actually creates more, new justifications for even more market expansion and an even greater number of ways to encourage consumption. It may do so with an uncertain outcome for the company involved—despite all impact assessments—but, at any rate, with a social and ecological footprint. This is where the whole dilemma of digitally enhanced distributive-force capitalism comes into view.