2. Digital Capitalism Revisited—again?

The term digital capitalism is anything but new: I seek neither to stake a claim to nor to reinvent it. It is simply well suited to the analysis I present in this book, namely of capitalism in the age of digitalisation. Yet my objective is not to characterise capitalism as digital or expose digitalisation as ultimately capitalist in nature. Both are trivial, and both have often been done. Back in 1998 when I was writing my master's thesis on Internet-related work, which focused specifically on the example of information broking, Dan Schiller's book *Digital Capitalism* had not yet been published. At the time, it was already quite common to use certain adjectives or nouns with 'capitalism' and/or 'society' to describe what we now call digitalisation. It began with the 'information society' (Crawford 1983) that has been discussed since the early 1970s, then there was mention of the 'network society' (Castells 2000) and now the currently en vogue term is 'surveillance capitalism' (Zuboff 2019). I will, however, refrain from referencing all such diagnoses that have appeared on the world stage ever since the emergence of the Internet, engaging with the new technology from various perspectives. That said, the critical engagement with other approaches does help clarify—for oneself and for those readers looking to engage—what one's own approach seeks to and can accomplish and what it does not and cannot. In pursuit of this objective, I intentionally limit myself here to a specific selection: to begin, it is certainly worth briefly considering the work of Dan Schiller, the author who coined the term 'digital capitalism' (Chapter 2.1). One could argue that is in fact necessary to examine the original text, as Schiller shares the fate of many other authors: although his term is frequently referenced, his central reflections are presented in a reductionist or even altogether distorted manner. Dan Schiller is an American historian of economics and technology whose perspective links information and communications technologies with geopolitics. His book on *Digital Capitalism* (1999) was one of the first to present an in-depth study of the Internet, which at the time was still in its infancy, from a political-economic perspective while situating it historically and, moreover, systematically conceiving of market relations and (technological)

networks as one. Apart from this initial diagnosis, I have selected two books to frame my own analysis:[1]

- Dan Schiller's second major examination of digital technologies and capitalism (2014) that appeared about 15 years later and links up current developments in the digital economy with the experience of the 2007/08 financial crisis. In this analysis, he remains true to his original—historical and geopolitical—perspective on digital capitalism. Due to their analytical overlap, I highly recommend reading both books together.
- Michael Betancourt, who is also from the United States, has a disciplinary background in critical theory and film and media criticism. His analysis appears to proceed seamlessly from Dan Schiller, as the book title promises both a critique of digital capitalism and a political-economic analysis of digital culture and technology (Betancourt 2015). However, despite some obvious parallels, Betancourt does not mention Dan Schiller once in his book. Much like Schiller's work, his book—a collection of essays—draws multiple comparisons with the world of finance.

Both analyses date back only a few years, i.e. they describe the more recent development of digital capitalism. Furthermore, they adopt a perspective that is unmistakeably critical of capitalism, while the term 'digital capitalism' features explicitly and takes centre stage. Another common feature is that both studies make a broader diagnostic claim—i.e. they point out connections and lines of development that go far beyond a narrow understanding of the information economy or technological development. Besides these commonalities, it is the disciplinary differences and thus distinct centres of gravity in the analyses, in particular, which allow for an overall inspiring—and generally broader—view of digital capitalism.[2]

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1 The issues discussed in this book are complex. Political-economic analyses require a precise use of language. Wherever possible, I shall do my best to achieve just that (and probably also fail repeatedly in the process). Experience has taught me that this is not always easy, particularly when analysing digital capitalism, as the arguments in the literature are not always put forward as precisely as one would hope. There are two reasons for this: firstly, 'the Digital' and 'the Immaterial' often tempt authors into using metaphors that do little to clarify the matter in question, and at times even cause (additional) confusion. Secondly, when authors speak of capitalism, they often make reference to Marx, yet his concepts are frequently used in an insufficiently precise way, which is not always conducive to a clarifying analysis.

2 Some readers may assume that the difference in age between the two authors might have an influence: after all, Dan Schiller completed his PhD when Michael Betancourt was still in primary school. It is true that the narrative that *digital natives* (i.e. those born into a digital world) and *digital immigrants* (who acquire digital knowledge and experience as adults) experience and use the

Nonetheless, I will limit myself to three thematic complexes that are particularly fruitful for my subsequent argument. Both authors address all of these thematic areas, in part exhibiting substantial overlaps and conceptual and terminological proximity to one another, but also some major differences.

(1) Dynamic—Transformation—Actors (Chapter 2.2). The questions in this sub-chapter essentially include: what is happening and what is the underlying dynamic? In other words, how dramatic or revolutionary, or how gradual or evolutionary, is the development assessed by each author? Are we dealing with a fundamental transformation *within* or *of* capitalism? Which fields and actors do the two authors focus on specifically?

(2) *Immateriality—Labour—Value* (Chapter 2.3). Here, the question of 'Why' takes centre stage. How do the two authors account for the ongoing changes? *Where*, or *in what*, do they see the initial impetus for what they consider to be the real novelty about digital capitalism? What phenomena do they base their assumptions on? Why does the Immaterial fundamentally change central elements of the economy, namely labour and value?

(3) *Scarcity—Superabundance—Crisis* (Chapter 2.4). What is the economic driving belt of it all that can be explained *within* and *through* the capitalist logic? Does this level pertain to causes or effects? What kind of interplay between the Digital and the economic sphere do the authors describe?

Proceeding from Dan Schiller and Michael Betancourt, then, we pursue the following questions: what is changing? Why and how is this discernible? What is cause and what is effect? In other words, we shall work our way backward from the phenomena to the underlying driving dynamic. After all, the first two central thematic areas are essentially dealt with in all diagnoses of contemporary phenomena that describe digitalisation or 'Industry 4.0' in some way or another. In most cases, technological change or the Digital as such is identified as the main driver, exempting one from having to seek any other causes. Our two authors, of course, do not stop there. Whoever proclaims digital capitalism and adopts a political-economic perspective generally assumes the causes or consequences to lie elsewhere and, more importantly, deeper. The economy becomes more than just the field in which businesses deal with digitalisation and workers are replaced by robots. And politics is no longer merely an authority imposing or phasing out regulations. Correspondingly, as we shall see, in the first and second thematic areas, Schiller and Betancourt certainly parallel many other interpretative approaches to current developments that offer no critique of capitalism whatsoever. The more

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Internet in very different ways persists. However, the odd biographical marginal note aside, such differences in age are not recognisable in the respective analyses. This does not come as a real surprise given the host of empirical evidence that the *digital natives/digital immigrants* contradistinction in terms of age or cohort cannot be substantiated (see Thomas 2011).

political-economic perspective of both authors, then, becomes more pronounced, especially in the third thematic area.

2.1 Dan Schiller and the emergence of digital capitalism

Dan Schiller (1999) coined the term 'digital capitalism' quite early. In retrospect, he explained that he chose this term because capital remains the centre of the political economy even in the digital world—even though the market system first had to be adjusted in order "to accept a profitable information-intensive orientation" (Schiller 2011: 925). And he added: "This remains true today." Against the backdrop of the 2007/08 crisis, he asserted, the theory of digital capitalism had to inquire as to how the economy's increasing dependence on communication and information was linked to this particular crisis. What role could communication and information play in overcoming this dependence through a reorganisation of the global market system (see ibid.)?

In Dan Schiller's view, the Internet did not simply emerge as a consequence of technological development. Instead, he pinpoints the architects of digital capitalism for whom the Internet was no more than the technical key to the proverbial door through which they wanted to pass. The goal was "to develop an economy-wide network that can support an ever-growing range of intra- and intercorporate business processes. This objective encompasses everything from production scheduling and product engineering to accounting, advertising, banking, and training." (Schiller 1999: 1) This refers to all business processes within and between different companies, ranging from production to advertising, all of which were to be linked to one another. In debates on digitalisation, be it about 'Industry 4.0' or, as is currently the case, AI or blockchain, this vision is invoked time and again—both by its advocates and its critics, framed by new technological conditions and including new political and economic players (particularly in China).[3] Schiller reconstructs the evolution of this economy-spanning network from the 1950s onward, emphasising that this process did not reach its conclusion after the first decisive step—the commercialisation of the Internet in the mid-1990s—was completed, but really only gathered pace from that point on. Ever since, every new technological innovation in what Schiller calls the 'cyberspace' has been harnessed in the service of the realisation and optimisation of this goal, i.e. its economic use. So, this initial passage alone already proves that he is serious about the subtitle of his book: his objective is to describe a new form or stage of global capitalism. This

3 This can be shown, for example, with a view to the discourse put forward by international and clearly interest-driven actors in preparation of the ostensibly German debate around Industry 4.0 (see Pfeiffer 2017).

essentially economic change makes use of technological developments—not the other way around. That is to say, it is not the technological innovations from which economic changes more or less inevitably emerge (although that, of course, also and increasingly does occur and can lead to mutual reinforcement).

The protagonists proactively pursuing the goal, as identified by Schiller, of a global network linking up all economic processes from the mid-1990s onward include computer and telecommunication companies as well as a number of transnational corporations. These actors were encouraged by the political precept "that corporate capital's ownership and control of networks should be put beyond dispute, even beyond discussion" (Schiller 1999: 1). Networks and thus the actual communications infrastructure were to be transferred from public to private ownership. Furthermore, the processes as such should even cease to be a matter of social or political debate.

During the 1990s, then, the top item on the agenda was no less than "a top-to-bottom overhaul of worldwide telecommunications" (ibid.: 2). This top-to-bottom overhaul became possible, on the one hand, because the corresponding network was expanded on an unprecedented scale. On the other hand, politicians followed a neoliberal strategy and governments around the world agreed to hand over the critical infrastructure of telecommunications from public ownership to the free market: "Policy makers of the world over simultaneously abandoned public-service policies for market-driven tenets […]. National welfarist controls over this critical infrastructure dropped away […]." (ibid.) This step had been prepared well in advance ever since the 1950s and occurred transnationally in an almost synchronous manner (see ibid.: 2–7).

Schiller considers corporations and the neoliberal motivated political strategy of privatising telecommunications as two particularly relevant factors in the emergence of digital capitalism. However, he also notes two other aspects of the Internet's founding story which at first glance have nothing to do with the market as innovator. Firstly, he points to the original commissioning parties: "The Internet's emergence had nothing to do with free-market forces and everything to do with the Cold War military-industrial complex." (ibid.: 8) To some readers, that last sentence may invoke the suspicion, omnipresent as it is these days, of conspiracy theory. Yet Schiller quite literally means what he says here, providing ample evidence for his argument. The Internet's precursor—the Arpanet—was developed under the auspices of the US Department of Defense, which also remained in exclusive control of all technical data during the first years. The Arpanet linked independent computers with one another and was already based on the same technology that is still fundamental to the Internet today: the partition of data into small packages, which can be transmitted via different network paths and reassembled at their destination. This way, data flows are preserved even if individual network nodes break down. This fundamental idea of technological decen-

tralisation coupled with the long maintained yet today factually obsolete promise of net neutrality (i.e. the ideal of neutrally processing these small data packages independently of their content, sender or recipient) has fuelled an Internet optimism time and again, in the sense that democracy, participation and equality are, so to speak, structurally inherent in the Internet. Yet this hope has been repeatedly dashed. As early as 1999, Schiller exposed the notion that the Internet would act as a kind of social leveller as naïve: "Knowledge carried through the Internet is no less shaped by social forces than it is elsewhere." (Schiller 1999: xiv) In another instance, he refers to these social forces shaping knowledge as "the age-old scourges of the market system: inequality and domination" (ibid.: 209). Hence, the all too familiar plagues of the market—social inequality and domination—have influenced the Internet from the outset as well.

The second key aspect relevant to the Internet's founding story that Schiller refers to—and which initially had nothing to do with the market—is the basic underlying technology of the Internet that was freely accessible and available to everyone (and, in fact, still largely is), even though its use was effectively limited to universities and the military at the time (see ibid.: 9). Years—or rather decades—later, Mariana Mazzucato (2015) picks up on this observation and once again debunks the myth of the free market as a driver of innovation (Chapter 3). Schiller subsequently describes, in great detail and using what were at the time very impressive figures, the optimisation and acceleration in production and the expansion and increase in e-commerce that was initiated—on this technological basis and with regard to the commercialisation of the Internet—in the market during the 1990s (see 1999: 9–36).

The fact that the Internet was subjected to an expansive market logic represented a great step forward for the economy in establishing an "epic transnationalization" (ibid.: xiv). In this sense, the Internet catalysed "an epochal political-economic transition". This transition to digital capitalism, according to Schiller, was to have rather unfavourable consequences for the majority of the population (see ibid.: xvii). The Internet was (and is) thus not simply a passive instrument in the hands of capital, but rather turned into—Schumpeter sends his regards!—a 'hurricane of destructive creativity' within neoliberal structures, drawing on the productive base and the structures of control of emergent digital capitalism (ibid.: 37).

As described previously, Schiller also considers which exact elements of the productive processes should be connected via the Internet, e.g. accounting, advertising. For the most part, however, he merely describes these free-market strategies and the network logic of the Internet and leaves the question as to why they go together so well largely unanswered. In one instance, he does make reference to the issue we seek to better and more thoroughly understand here, namely the role and significance of distribution. In his view, the latter becomes a crucial factor: "Control over distribution often creates a vital avenue to market power."

(ibid.: 97). The question of why this is key to understanding digital capitalism is the focus of the central reflections in this book and will therefore be of decisive interest to us in the following (Chapters 5 to 7).

2.2 Dynamic—Transformation—Actors

Some 15 years after his first book on the subject, Dan Schiller (2014) embarked on a renewed assessment of the development of capitalism in the digital era. His objective in doing so was not to carry out an updated review on changes in the technological landscape; rather, his analysis occurred against the backdrop of the noticeable impacts of the 2007/08 financial crisis, which is already reflected in the book's title. He no longer speaks of *digital capitalism*, but of the *Digital Depression*, a term he conceives exclusively in economic terms.[4]

He recalls that this crisis, quite paradoxically, originated in the United States, the "heartland of advanced communications technology" (ibid.: 1), which he finds all the more astounding given that, for decades, digital technologies[5] in particular were said to hold significant potential for economic growth. This was argued by theories ranging from those of 1960s post-industrialism to the promise of the information society in the 1990s and is still being put forward today. In his introduction, Schiller draws some parallels with the economic crisis of 1929 (and the subsequent Great Depression) and briefly presents a number of authors along with their interpretations of the current crisis. He asserts that all explanations have one thing in common: they all fail to take into account what Schiller refers to as a "contradictory matrix" of technological revolution and capitalist stagnation. This "contradictory matrix" interprets highly diverse theories (liberal or radical) equally as a rupture in the history of capitalism. Yet all of these authors pay too little attention to the role of digital technologies: "They neglect, belittle, or simply abstract away from ICTs' economic role." (ibid.: 4) Schiller's own theory of digital

4 Unfortunately, there is increasingly concerning evidence of the impact of the Digital on depression as a psychiatric diagnosis: depression, anxiety disorders and suicides have been increasing on an unprecedented scale, particularly among young people. For example, the number of suicides among female adolescents in the United States has doubled over the past decade, while adolescents exhibit almost double the rate of depression (22 per cent) than can be found among adults (see Ghaemi 2020). One may object that there are many very rational reasons—from the impact of the Anthropocene to social inequality—for the young generation to look anxiously to the future. However, the study, firstly, does not deal with legitimate concerns, but with pathologically manifested symptoms and, secondly, provides evidence of an unequivocal causal relationship between digital consumption and the diagnosis of depression.

5 Schiller continues to use the abbreviation ICT, meaning Information and Communication Technologies.

capitalism, by contrast, is characterised—even in its initial version—by its analysis of digital technologies as the pivotal aspect of a constantly evolving capitalist political economy (see ibid.: 4). By doing so, he refrains from overemphasising the Digital and its role for the development of current capitalism. Instead, Schiller seeks to demonstrate that *US capital* and the *US state* (not to be confused with simply *the* United States) represent the crucial actors and most important factors in the emergence of digital capitalism (see ibid.: 6).

In other words, Schiller illustrates how the powerful actors of 'old' industrial capitalism use the digital option to enable and shape a new form of capitalism. Here, the Digital is a consciously employed tool, not the initial driver. Even though he proceeds from his 1999 analysis, he offers some self-criticism, too. Given the current developments, he explains, the need for a revision of his earlier concept of digital capitalism developed in the late 1990s is undoubtedly necessary. After all: "Our epoch is marked not by expansion but by contraction, not by stasis but by dizzying structural change." (ibid.: 6) According to Schiller, the close and systematic connection with the financial crisis is essential, for the technological revolution is "wrapped up inside an economic collapse" (ibid.), or, as he puts it elsewhere: the role of digital technologies must be sought "*within* the political economy's chief developmental processes" (ibid.: 7). Here, again, he considers the analysis of general economic development to take priority over that of digital development.

Schiller's objective is thus to discern the process as such as contradictory instead of understanding contradictions merely as a consequence of otherwise largely stringent developments: in each new stage of capitalism, the concomitantly emerging new possibilities of capital formation inevitably trigger the next crisis, or, as Schiller puts it: "As regeneration takes hold, the seeds of a subsequent crisis are planted deep in the political economy." (ibid.: 7) In his current diagnosis, Schiller once again adopts a geopolitical perspective and specifically addresses government action—from ICANN[6] to NSA (see ibid.: 151–246). He elucidates, in great detail, the political aspect of the term political economy and the role of the state in particular. He meticulously traces the significance of regulatory measures and strategies regarding the market, ranging from the privatisa-

6 ICANN stands for 'Internet Corporation for Assigned Names and Numbers', a non-profit organisation founded in the United States in 1998 that is in charge of essential coordination and protocol-related tasks, such as the allocation of one-time IP addresses. Apart from the, initially, purely technical questions, geopolitical and economic interests also play an increasingly important role in this context. This has been the subject of countless studies—particularly in political science. A more recent study was published by Carol Glen (2017). She demonstrates how closely the technological infrastructure (e.g. physical networks or providers), technical standards (such as protocols, interoperability and WWW standards) and resource allocation (e.g. naming) are related to questions of security, private ownership and copyright, human rights and economic development (ibid.: 6).

tion of the old telecommunications network to the cap on roaming fees within the EU implemented in 2011, the latter of which occurred in response to a decrease in telecommunications spending in those southern European countries more heavily affected by unemployment (see ibid.: 27–42). Schiller presents numerous examples to illustrate the close interlinkage of the private digital economy and parliaments, government authorities and secret services (particularly in the US) that both sides continue to maintain and expand. For example, the certification of Amazon's Web Services cloud service by the General Service Administration in 2010 has made it possible for numerous US government authorities to use it for data hosting (see ibid.: 173). Likewise, as he did in his first analysis, Schiller very attentively considers the close relationship between the military and the digital economy (see ibid.: 57–72).

The overall direction of Dan Schiller's analysis thus differs quite markedly from most other authors engaging with digital capitalism. Whether it is Michael Betancourt, Jeremy Rifkin or Paul Mason, each of the digital capitalism narratives put forward by these scholars starts off with the changes resulting from digitalisation, which lead to the immateriality of production, including phenomena of scarcity and superabundance—depending on the respective vantage point—which are then defined as new. All of these readings culminate in the notion of an altered type of capitalism (in which the state and capital supposedly act very differently than in the past). By contrast, the focal point that Schiller chooses to illustrate the actual changes is capitalism and the—or, if you will, 'its'—state (from a geopolitical perspective, the US state in particular). The main actors harnessing the Digital to their own end are hence the same ones who have dominated (economic and political) structures all along. His narrative is one of an inherently contradictory development leading to new contradictions. In Schiller's view, capitalism's susceptibility to crisis is inevitable, as it is inherent in the system. Correspondingly, Schiller's main focus lies not on the question of how disruptive (or not) the development really is: his analysis of the 'digital depression' instead describes current developments as a continuation of 'digital capitalism' that can be explained in political-economic terms—in part with unchanging actors (the state and the—respective—economic elites), who, however, act differently and in new ways under altered digital conditions and in an altered (but not fundamentally transformed) geopolitical context.

At first glance, Michael Betancourt's perspective appears similar. In his view, the development of digital capitalism requires "not a hard break with the established interpretations so much as a fundamental modification to address immaterialism" (Betancourt 2015: 217). To him, the reason for this is not related to the economic core, i.e. the capitalist dynamics are not decisive. Rather, it is immateriality, emerging over the course of digitalisation, that causes new dynamics within capitalism. Here, right in the nature of the Immaterial, is where he sees

the real novelty (his central reflections on the Immaterial and its significance shall be addressed in more detail in Chapter 2.3).

The critical approach to the media inherent in the author's perspective becomes particularly tangible when he classifies digital capitalism as an affective form of capitalism given that it pursues its objectives through affective techniques. However, he considers "capitalism systemically based on the production and maintenance of ignorance" (ibid.: 207) a more accurate label (although to him, the label itself is '*agnotologic* capitalism' (ibid.).[7] According to Betancourt, systematically produced ignorance enables new investment bubbles to emerge again and again in endless continuation (see ibid.). In his view, the economy as a whole—including the United States' Federal Reserve System—follows the logic of a Ponzi scheme. The latter is based on fraudulent investments that are made in good faith in the promise of returns guaranteed (only on paper) and in return for confidence-building partial pay-outs of sham returns. When a large number of investors simultaneously demand their money back, the system collapses. Betancourt examines the significance of the world of finance, speculative bubbles and of cryptocurrencies as the digital phenomenon thereof. To him, these constitute the levels that are relevant when describing digital capitalism in its current form (more on this in Chapter 2.4).

Despite the many parallels, Michael Betancourt's analytical lens does differ from that of Dan Schiller. Betancourt fails to even consider how disruptive or evolutionary the development really is: the current development must necessarily lead to a speculative bubble that can no longer be mitigated in a controlled manner but bursts with an almighty bang, inevitably harming the economy and society. The acting protagonists are difficult to discern: in Betancourt's text, it is 'the system' that acts, 'capitalism', 'the financial market', 'the Ponzi scheme'. In contrast to Dan Schiller, however, Betancourt does not consider the state a strategic actor. He mentions only the US Federal Reserve, although he rather views it as a token of digital capitalism, given that it plays a part in—perhaps not causing, but—significantly inflating the speculative bubble. Digital immateriality and the scarcity of capital essentially constitute the themes of Betancourt's analysis, while he considers questions about actors and development dynamics to be mere consequences of the former two aspects. We shall take a closer look at both in the following two sections (Chapters 2.3 and 2.4). Given that he does not explicitly engage with Dan

7 Betancourt references Robert N. Proctor, who coined the term 'agnotology' and distinguishes between three forms of ignorance: ignorance as a state to be overcome and thus as a resource and challenge for science; ignorance as a lost realm and the result of selectivity; and ignorance as a conscious and strategic construct (see Proctor 2008: 4–35). His collection of essays by different authors contains contributions that address the various manifestations of agnotology in areas as diverse as modern censorship, the female orgasm and smoking.

Schiller's analysis, the essence of his contributions to this key thematic area has thus been conclusively presented.

To Schiller, the state purposely relinquishes its control over the Internet as a strategic enabler of digital capitalism. By commercialising the Internet, the state ultimately pursues what Schiller refers to in the book's subtitle and what constitutes the central idea of his analyses: *Networking the Global Market System*. One need not agree with this hypothesis, but Schiller at least offers a theory—one that helps explain the state's actions and illustrates the link between the drive to geopolitical hegemony and global capitalism.

In his study of capitalism, World Bank economist Branko Milanović points to a more important aspect in this regard. He describes present-day capitalism as a globally evenly prevailing economic system and makes explicit reference to Marx's theorem of economic base and political-legal superstructure: according to Milanović, both are "well aligned" globally today (Milanović 2019: 3).[8] Like Schiller, Milanović is not interested in the United States' or China's relative position of power, but in the competition between two varieties of capitalism which the two countries generally embody: Milanović distinguishes between liberal, meritocratic, Western capitalism on one side (see ibid.: 12–66) and political, authoritarian, Asian state capitalism on the other. With regard to the latter, he refers not only to China, but also to other Asian as well as a number of Caucasian and African countries (see ibid.: 67–128). Milanović reconstructs the historical emergence of both varieties of capitalism.

2.3 Immateriality—Labour—Value

The special significance of the Immaterial ultimately inspires all diagnoses concerning the Internet and the Digital. In other words, the notion that the immateriality of the Digital changes everything is widespread. We may therefore refrain from elaborating on the vast body of literature that is based on this fundamental observation. From Manuel Castells (2000), Michael Hardt and Antonio Negri

8 This allowed the dominance of capitalism to be maintained. The question is not so much whether an individual state loses out to or partners successfully with the Digital at the national level. One could perhaps say, in this perspective, the state and capitalism act in unison, albeit not necessarily at—and certainly not limited to—the national level. The second consequence of a globally uncontested capitalism is far more momentous in Milanović's view, as it entails the homogenisation of people's actions and thoughts: not only the aims of people in different countries, social strata and cultures would objectively become more compatible, but communication of that one goal that overshadows all others would thereby become clearer and simpler: "We live in a world where everybody follows the same rules and understands the same language of profit-making." (Milanović 2019: 3)

(2000) and Scott Lash (2002) to Paul Mason (2016) and Jeremy Rifkin (2014)—and this list could be endlessly continued—the central argument for the proclaimed novelty is essentially the distinction between material and immaterial products, from which the transition from an old industrial world to a new society and/or economy is then deduced.

Generally, the significance of infrastructures is increasingly coming into view once again—evidenced not only by the dramatic scandals surrounding the supply of drinking water in Detroit and Flint in the US, the road network in Peru or the energy grid in Vietnam (see Anand et al. 2018), but also manifested in the erosion of their function as 'services of the social order' in such distinct contexts as rural villages and academia (see Barlösius 2019). However, the number of studies that address the (re-)discovery of the physical dimension and of material infrastructures, including in relation to the digital world, remains rather scant. Ursula Huws, for example, argues quite early on against the notion of a "weightless economy" (see Huws 1999), while Jean-François Blanchette (2011) shows that bits are equally unable to escape the material limitations of the devices on which they are modified, stored and exchanged. Eventually, Andrew Blum (2012)—quite shaken by the personal experience of learning that the Internet is a "thing" that is not safe from a squirrel's appetite for nibbling at cables—set out to search for the actual "tubes" of the Internet and indeed managed to find them. Benjamin Bratton (2016), proceeding from a perspective closely oriented towards physical materiality as well, develops his philosophically inspiring concept of *The Stack*: a global mega-structure connecting computer systems and material levels so that the six central layers (*earth*, *cloud*, *city*, *address*, *interface* and *user*), as a physiological-virtual overarching structure, supersede other forms of human dominance and sovereignty, rendering them superfluous. Finally, Kate Crawford and Vladan Joler (2018) meticulously lay out, taking the Amazon Echo and the Artificial Intelligence it uses as an example, how much material (such as rare earths) and human labour are needed before a small box can become a seemingly natural part of our everyday communication as a matter of course.

Similarly, Dan Schiller (2014) also noticeably bucks the trend of all those diagnoses whose claims are based, above all, on the significance of the Immaterial: he takes the Internet and thus digitalisation as a whole seriously, seeing it as a technological structure instead of losing himself in the metaphor of the Immaterial. In fact, his approach essentially sees the physical dimension as the central analytical access point. Much like in his first book (Schiller 1999; see Chapter 2.1), he emphasises the fact that the actual infrastructure of the Internet is just as physical as railway or telephone lines. Moreover, he takes 'commodity chains' into consideration,

which continue to be largely material as well (see 2014: 27–42).[9] A third level of the physical dimension central to his line of argument is hardware, which essentially does not feature in Betancourt's investigation. Schiller also includes hardware innovations in his analysis. For example, he proves one of his central claims by reference to leaps in innovation concerning the quality of screens, namely that technological innovation is unable to combat capitalism's fundamental crisis factor: overproduction. Correspondingly, he reminds us, an oversupply of TVs using LCD or LED technology arose fairly quickly, as ever more films were watched on other digital devices, a circumstance that could not be changed by innovations towards 3D or UltraHD (see ibid.: 45). We could almost say that Schiller always approaches the Immaterial—the significance of which, in the form of data, he, of course, does not deny—from its material basis, as he does when addressing the overwhelming success of Apple's iPhone. He describes how the previously existing commodity chains of mobile services were "massively disrupted": in the course of the phenomenal proliferation of smartphones and tablets, data replaced language as the mainstay of mobile services (see ibid.: 39). When emphasising the physical dimension, Schiller's aim is not to somehow romantically salvage it, but to point out that this physical reality is highly relevant and contested both in terms of power politics and economically. Schiller sees one indication of the economic significance of this infrastructure in the fact that the European telecommunications providers were willing to increase their debt to 272 billion euros during the 4G spectrum auctions in 2012—even though (or, rather, because) 'by this time, of course, the digital depression had struck' (2014, p. 42).

So, while Dan Schiller insistently stresses the materiality of the Digital, the fascination with the Immaterial represents a guiding theme in Michael Betancourt's book. The latter draws on the concept of 'aura' and takes up Walter Benjamin's central notion thereof, namely, according to Betancourt, that technological changes can lead to historical loss (see Betancourt 2015: 39). In doing so, Betancourt makes reference to *The Work of Art in the Age of Mechanical Reproduction* (Benjamin 2019; German original in 1935). To put it in very simple terms, Walter Benjamin states in his essay that a work of art suffers a certain loss when it is mass-reproduced by machines. The reason is that its perception is thereby also mass-reproduced, as a result of which the perception, or the experience of the original piece of art, is

9 Here, Dan Schiller draws on the 'global commodity chains' approach developed by Hopkins and Wallerstein (1986). The two authors proceed in their analysis from the sold product and reconstruct the global upstream commodity chains. Taking ships and wheat flour as an example, they demonstrate that the production activities related to these goods were already part of a global network as early as the period between 1590 and 1790. Schiller thus distances himself from the 'value chains' approach that is certainly far better known today (see Porter 1985).

ultimately stripped of its singularity and distinctiveness. Walter Benjamin uses the concept of 'aura' to denote this particularity that is lost in mass reproduction.

While Walter Benjamin, at least in my opinion, strongly refers to the act of sensuous perception of the original in contrast to the perception of that which is mass-reproduced, Betancourt transfers this contrasting juxtaposition to the comparison of the original with the reproduced object. However, this represents a fundamental shift of viewpoint and inevitably raises the question as to whether Benjamin would agree with such a reading. This is all the more true given that many people may associate 'aura' with esotericism rather than with Walter Benjamin. Hence, it is not immediately obvious why Betancourt arrives at an economic—instead of, say, a more cultural—critique of digital capitalism (or even cultural pessimism) when proceeding from this hypothesis. After all, he is ultimately concerned with something much simpler, which makes bridging the gap with the economic sphere much more comprehensible than Benjamin's concept of aura: Betancourt seeks to prove that physical objects "always have an implicit limit on their availability", whereas digital objects are subject to no such limitation (see Betancourt 2015: 41). That is to say, his aim is not to compare the perception of the original with the perception of its reproduction, as Benjamin does, nor to capture the difference between the original itself and the (mass) reproduction: "The distinction between physical objects and digital objects is absolute." (ibid.: 43)

If, however, immateriality is the substantial precondition for the emergence of digital capitalism, the question remains as to how and why digital business models also become relevant for necessarily material products. Secondly, and closely related to the first question: is the immateriality and the possibility of copying and scaling these products at will really the initial and basic precondition for GAFAM and the like? The answer is not that simple: Google's and Facebook's actual products—their advertising earnings—may be immaterial, and there is no question that the market is artificially restricted due to the exclusivity of access and the non-transparency of algorithms. Yet this consequence is not exclusive to the Immaterial, but applies to advertising in general—both online and on good old advertising columns. If an infinite number of advertising columns were installed (entailing only a one-off cost, albeit a substantial one), the value of an advertising poster would be hugely diminished, as the individual ads would drown in the sea of posters competing for consumers' attention (we shall return to the relevance of advertising and marketing at a later point; see Chapter 6.1). In the case of Amazon, we are not even dealing with immaterial products, but the opposite: the goods that are traded here—with the exception of, say, e-books and audio books—are, for the most part, material products. Moreover, Amazon uses knowledge on consumer behaviour, among other things, to sell particularly successful material products via its own website. Similarly, material products remain crucial for Apple. Despite the Appstore, Arcade, Apple TV and all the rest, Apple may have invented a stan-

dard variant of proprietary markets and thus opened access to a worldwide market for the actual producers of immaterial products—from the individual software developer in Kaiserslautern to the app programmer in Kazakhstan. And yet, none of this would be conceivable without pioneering innovations in hardware. We shall analyse these different business models (Chapter 8.3) and the categories for distinguishing them (Chapter 6) in more detail.

So far, we can summarise that while Dan Schiller emphasises the materiality of the Digital, Michael Betancourt sees the real novelty in the Immaterial. The latter is characterised not by the absence of materiality, but by the fact that the Immaterial is infinitely available at no cost—in contrast to the physical, material product, which is regarded as limited and the production of which, moreover, inevitably produces costs. We shall ignore the interesting fact that both authors exclusively refer to products. Processes or services are left unconsidered, as broader scrutiny would likely cause the conclusiveness of their arguments. The contrasting pairs (material vs. immaterial, industrial vs. digital capitalism, limitation vs. limitlessness, costs vs. no costs) seem to follow a convincing logic as long as one remains at the product level. But what about the immaterial processes and services that were already around before the onset of digital capitalism? Is there any kind of fundamental shift in this regard when industrial capitalism turns into digital capitalism? Both authors leave these questions unanswered. Yet only by accepting this blind spot, by maintaining the juxtaposition tied to the product itself, can the Immaterial be identified as something fundamentally new and as the initial impetus for digital capitalism. This raises questions about the implications of the Immaterial for labour and the creation of value.

Seeing as Dan Schiller's analysis focuses primarily on the macro-economic and (geo-)political dimensions of digital capitalism, he hardly addresses the role of labour and the creation of value. To Michael Betancourt, by contrast, the technical potential of computer technologies obfuscates an aspect that is crucial to understanding digital capitalism: "[they] obscure the nexus of capital, human agency, social reproduction, and physical production"; in his view, this negation of the physical dimension is a specific feature of the "Aura of the Digital" (2015: iii–iv). Production is seemingly decoupled from human labour, and human labour is thus perceived as obsolete in the digital information economy, which in turn gives rise to the valorisation of social behaviour (see ibid.: iv). His main argument is that labour becomes less visible. Let us be clear, he does not say that it actually becomes obsolete, but that its significance becomes less obvious. Betancourt's reference to social behaviour can be explained by his focus on social media when examining digitalisation. Much like in Shoshana Zuboff's work (2019), he sees an increased economic relevance of online social behaviour. Betancourt labels the notion that the significance of labour is disappearing a "corrosive fantasy":

> "In its place is a corrosive fantasy that digitality has opened up a magical realm beyond physical constraints, where the duality of production/consumption is resolved to allow growth without limit—the continual expansion of wealth—beyond the constraints of production, materiality, and labor." (Betancourt 2015: iv)

Betancourt thus draws a clear distinction between manual and intellectual activity, although his contradistinction is not entirely convincing. In his view, the manual element—physical action—is not entirely transferrable to a commodity, even though this illusion may be created time and again through automation, whereas intellectual labour does lend itself to such a transfer (see ibid.: 3). It is transformed into a modular commodity, valorised and eventually automated as a result of digitalisation, he contends (see ibid.: 2). We shall demonstrate at a later point that this is a major misunderstanding. Human activity as such is not converted into a commodity. Instead, there is a dialectically contradictory aspect inherent in the qualitative capacity of labour. The commodity is the labouring human, in the sense of a labour force on the labour market, regardless of whether their activity is manual or intellectual, whether they perform it in the context of industrial or digital capitalism. He or she produces—material or immaterial—commodities that are intended for the market (and not for society).

Furthermore, the one-sided way in which Betancourt depicts intellectual work is slightly disconcerting. In his view, it is "something of benefit to society as a whole" (ibid.) before it is transformed into immaterial and valorisable labour. Here, he entirely pretermits the fact that intellectual labour, no matter whether conceived as academic or as any other form of cognitive activity, hardly exists outside a valorisation context even in the absence of digitalisation. After all, a large share of this kind of labour serves precisely, and often exclusively, the optimisation of valorisation processes even in pre-digital capitalism. Conversely, Betancourt also walks right into the trap of equating productive labour with manual labour (the products of which seem to have no practical use for society) and then reducing his argument to the two binary extremes idealised beyond all recognition. Only a few pages later, it becomes obvious that this argument comes to nothing: Betancourt regards the fact that the same technologies that initially led to the offshoring of 'the knowledge worker's labour' now enable the automation of intellectual labour as a characteristic of digital capitalism (see ibid.: 3, 11). Furthermore: "Immaterial labor is inventing its own obsolescence through 'smart' digital automation for tasks previously requiring human thought *and* oversight." (ibid.: 17) This interpretation can be reversed as well, however, namely in terms of a formal similarity with production work in industrial capitalism. Here, the machines built by production workers also allow for the offshoring and automation of labour, thereby rendering the workers' labour obsolete. All the differences Betancourt implies between production and immaterial labour aside: in a some-

what idiosyncratic class perspective that does not tie class antagonisms to ownership but to management and control, he considers the middle and lower classes to be in the same position: "[T]he middle class ('white collar') labor is no different than that of the 'blue collar' workers: both groups are directed by the upper classes who employ them." (ibid.: 10) Given that the contradistinction between production and intellectual (or immaterial) labour remains rather simplistic, it is hard to pinpoint where exactly Betancourt sees the manifestation of a changing relevance of human labour in digital capitalism. In contrast to Schiller, however, he at least addresses the topic of labour and noticeably makes an attempt at a political-economic interpretation (for example, in the form of borrowing from Marx's so-called *Fragment on Machines*, see ibid.: 21). Ultimately, however, Betancourt ends up leaving more questions unanswered.

This also applies to the question of the actual origin of value. Betancourt addresses value as exchange value without mentioning use value, the former's dialectical companion: "exchange value emerges from the relationship between one commodity and another—from the *exchange of a commodity for the acquisition of another*" (ibid.: 21; emphasis in the original). This sounds as if value does not accrue until this level of exchange relation is reached. If this were the case, labour as such (regardless of its specific type or under which form of capitalism) would have no part in generating value. And, correspondingly, this would mean that the cost-free and unlimited reproducibility of immaterial goods—which, as shown previously, represents a crucial feature of digital capitalism—would be irrelevant for the creation of value: the crucial condition would then simply be sufficient exchange on markets. That said, Betancourt subsequently does seem to suspect some—however vague—link between value and labour, when he writes: "[…] in capitalism this exchange devolves fundamentally to transfers of labor between different social strata where higher level values derive from the action of labor at lower levels in that same society." (ibid.: 33)

The decoupling of productive processes in the digital sphere, he contends, makes the Digital independent from the material base. However, as a result, the life and actions of humans as well as their social reproduction become a commodity instead of being regarded as central factors of production and consumption (see ibid.: ix). Interestingly, Betancourt considers this to be a consequence of the Digital and thus a characteristic feature of digital capitalism, which he in turn envisages as the starting point for a political-economic analysis. Marx, by contrast, in his *Critique of Political Economy*, regards precisely the latter as a fundamentally characteristic feature of capitalism: everything is turned into a commodity, including human relations.

In the context of social media, in which the "transformation of social activity into commodity" can be observed (at this point his argument resembles that put

forward by Zuboff (2019) when she applies the term '*behavioral surplus*'),[10] Betancourt discerns two related "illusions": firstly, the illusion that digital production can generate value without any expenditure and, secondly, the illusion "of capital production without its necessary consumption" (Betancourt 2015: ix). Why exactly he speaks of illusions here, when many of his other arguments ultimately suggest just that, remains a mystery. For example, Betancourt elsewhere blames digital automation for the paradox that the "exponential escalation in value" (ibid.: 32), which automation in fact enables, creates surplus values for which there is an exponentially decreasing possibility of exchange. Up to that point, Betancourt's argument is quite coherent. And yet, the conclusion he draws from all this points to a rather major misunderstanding: he contends that Marx's concept of exchange value is undermined in the course of this development, as this value emerges only in the relation of one commodity to another (see ibid.: 33). Betancourt thus confuses the generation of value in production with the realisation of this value on the market (for which both use and exchange value are vital). What Betancourt blends together here is neatly separated into the spheres of production and circulation by Marx, as we shall see. In digital capitalism, in particular, where production and circulation converge in a technologically almost inextricable way, this analytical distinction is even more important.

10 The argument regarding surveillance and control Betancourt puts forward illustrates his partially contradictory reasoning, which might be explained by the fact that the book's sections were originally written as stand-alone texts and at different points in time. At one point, Betancourt regards surveillance and control as inevitable consequences of the "unintelligent nature" of digital technologies because they are unable to distinguish between "means and meaning" (2005: viii). Despite the ethical dimension Betancourt initially addresses, he views surveillance, which to many participants in the discourse on digitalisation represents the central threat and is often thought to be intentionally built into the technology for political or economic purposes, as an "epiphenomenon resulting from other, more fundamental demands posed by digital capitalism" (ibid.: 154). If we take the term epiphenomenon seriously, that would mean: digital surveillance causally follows from the logic of digital capitalism without having any further effect on the latter. So, it is once again unclear: is surveillance a technologically and functionally inevitable side effect of digital technologies, or is it a result of the capitalist logic? Or is the technologically inevitably becoming a hallmark of the capitalist logic as the latter is coupled to the Digital? Both notions could be argued either as mutually excluding or, indeed, in combination, for example, by reference to the logic of a technologically required formalisation on one side and an economically immanent formalisation on the other—a logic which may differ but is compatible nonetheless. Yet ultimately, it is not entirely clear which position Betancourt champions. Betancourt presents his arguments in such a way that they remain contradictory, and he does nothing to resolve those contradictions.

2.4 Scarcity—Superabundance—Crisis

The three key terms from the headings were already hard to analytically separate in the first two thematic areas—partly because they are difficult to disentangle in terms of their substance (as in the case of value and labour), but also because they are largely blended and then used and developed somewhat imprecisely by the two authors. The systematic delineation of the key terms in this third section is just as difficult because the juxtaposition of scarcity and superabundance does not address two entirely different things, but rather different perspectives on the same subject matter. We shall start off with the term 'scarcity' and turn to Dan Schiller only briefly, as his argument is not systematically based on the both terms 'scarcity' and 'superabundance'.

In his examination of advertising—one of the most ubiquitous online activities—Schiller addresses a subject which we shall return to in more detail and more systematically in Chapter 6.1, as it is (at least according to the hypothesis put forward in this book) central to an understanding of digital capitalism. Schiller notes that advertising is becoming increasingly influential, ultimately seeking to seize all cultural white spaces. To him, however, this objective "to turn cultural white space into signage" (Schiller 2014: 125) cannot be explained in terms of a pursuit of dominance, but rather economically: "[…] it is grounded in capital's need to realize the sale of commodities already produced in order to resume the cycle by producing and selling once again. A break in this process of commodity circulation—whether local to a specific company or industry, or sweepingly widespread—is a desideratum of crisis." (ibid.)

According to Schiller, advertising fulfils an important function in maintaining the circulation by ensuring systematic and constantly expanding access to customers. During the crisis—i.e. in Schiller's words, during the digital depression—this drive to realise value on the market further intensified. On the Internet, measures to boost advertising and sales were hugely reinforced and supplemented by more effective methods. He asserts that e-commerce, that is to say, the actual sales transaction, is often no more than a mere shift from the offline to the online world—from movie theatres to streaming services, from concert earnings to music downloads, from the printed book to e-books and so forth (see ibid.: 143; see also Pfeiffer 2013). However: "Advertising therefore not only sustained but also deepened its role as a primary source of finance for digital services." (Schiller 2014: 125) After all, when the digital depression hit, the advertising and marketing industry was able to draw on 15 years of experience with Internet channels that would henceforth be systematically expanded (see ibid.: 128). This was shown in two-digit growth rates in online banner and search ads during the crisis, but also in more innovative and less visible methods such as so-called fingerprinting, a technology through which individual computers can be identified and which in

2012 was already capable of gathering 65 individual sets of information on average per website view in order to then sell them on in "real time bidding exchanges" (ibid.: 129).

To Michael Betancourt, scarcity represents the fundamental economic feature of digital capitalism. Prior to that, capitalism was marked by abundance: the number of produced goods exceeded demand and thus the "capacity to generate profit". In digital capitalism, by contrast, where everything is immaterial signage—Betancourt therefore speaks of semiotic production—the crisis is caused by the scarcity of capital. Capital no longer functions as the "repository of value", but as a "title to future production". This claim, however, is impossible to fulfil, Betancourt argues: the system can only continue "through the addition of an external source of value", necessitating an expansion into areas which have thus far not yet been developed for the creation of value (2015: 174).

What Betancourt describes as a new phenomenon is the imbalance between "existing values and the number of potential future claims", between the significantly greater value of derivatives in comparison to "immanent labor (physical, automated and immaterial) available to produce new physical values", which in turn correspond to these existing claims. Although this may read—especially given this condensed version of Betancourt's otherwise detailed argument that is strongly oriented towards questions of currency—as resembling the contradistinction between productive and speculative capital, or between "commodity values vs. speculative values", Betancourt indeed rejects just that. He emphasises that his concern is the antagonism between rentier claims (in the sense of titles to production values) and production capacity, i.e. the "mismatch between capital and rentier claims" (ibid.: 195–196).

In Betancourt's analysis, a kind of timeline must be imagined: the promise of tomorrow's expected capital earnings cannot simply be produced today. To Betancourt, the scarcity of capital results from the contradistinction between that which is possible today and what has been promised for tomorrow. He sees the particular and novel aspect in the investment in immaterial assets. He is not so much interested in private investors or hedge funds, but rather focuses on the level of national economies on a geopolitical scale. Betancourt underscores this idea that something is promised but cannot be redeemed through his reference to the scale in which China invests in US government bonds and other immaterial assets (as Japan did during the late 1980s) instead of its own national economy. At this level, according to Betancourt, or rather, as a result of these promises, 'immaterial values' dominate both physical commodities and material production (see ibid.: 219).

These observations undoubtedly point to fascinating processes that have multiple political and economic implications. And yet, Betancourt's argument leaves (at least) two questions unanswered: why exactly are these processes specific to

digital capitalism? Because digital and immaterial products are more significant in terms of production and currencies than during the 19th century? And, secondly, why is this any different in nature from the old antagonism between productive and speculative capital? Simply because the relevant actors move at the level of national economies and countries instead of (only) at the company level or on national stock markets? All this is ultimately left unanswered.[11]

It is not always easy to ascertain whether Betancourt transfers familiar categories that were devised with regard to industrial capitalism to the Digital or whether he considers them to be a consequence or characteristic feature of digital capitalism. After all, the basic arguments for capital scarcity also correspond to the 'old' production-based capitalism and were developed by Marx precisely with a view to its emergence (see Chapter 5). Betancourt relates the scarcity of capital to the "Aura of the Digital", which he so strongly emphasises, thus equating it with a "pathological myopia": in his view, the latter can be found both in the anti-capitalist fantasy about an end to all scarcity that will supposedly herald the end of capitalism and in the capitalist ideology that relies on the illusion of production without consumption (see Betancourt 2015: 59). Betancourt's argument in this regard is quite obviously directed against claims put forward rather prominently by Jeremy Rifkin (2014) and Paul Mason (2016), albeit without quoting the two authors directly, who assert that, because the marginal costs in the digital sphere are virtually zero, capitalism is giving way to the collaborative commons (Rifkin) or post-capitalist commons (Mason), these claims assert.

11 It is perhaps no coincidence that he refers only on a few pages (Betancourt 2015: 220–222) and rather sketchily (and without quoting a single publication by the author) to David Harvey's deliberations on the Marxian crisis of overaccumulation of capital, according to which "the local market is no longer capable of providing sufficiently profitable investments in production and infrastructure", driving increasing financialisation. To Betancourt, this contradicts reality: global wage differentials and asset bubbles in China today or in Japan during the 1980s disprove this. However, the main counterevidence, according to Betancourt, is the fact that all currencies continue to be pegged to the US dollar and thus—regardless of the current state of the American real economy—the United States' hegemony is not threatened. So, while Harvey speaks about an excess of capital, Betancourt argues that there is insufficient capital to meet the obligations arising from the production of immaterial goods. Despite distancing himself from Harvey, he eventually acknowledges that the scarcity of capital, as he interprets it, may amount to a negative reflection or logical inversion of Harvey's overaccumulation of capital—exhibiting similar effects as well as significant differences (see Betancourt 2015: 222). Moreover, Betancourt's account of Harvey's crisis of overaccumulation reads as if Harvey were caught up in a national perspective (which would be rather odd for a social geographer). A more thorough engagement with Harvey would have shown that not only he himself, but even Marx had already addressed the issue of international diversion of capital flows in response to a crisis of overaccumulation (see Harvey 2006b: 432).

In the Foreword to the German edition of *The Critique of Digital Capitalism*, the anonymous translator helps clarify Betancourt's core argument even more trenchantly than the author himself: the promise of future returns on investments is no longer redeemable, as "the owed labour exceeds the sum of the material, automated and immaterial production that is possible"; in digital capitalism, he continues, the difference between the outstanding debt and the money that is available for debt repayment increases—and that is precisely what Betancourt means by "scarcity of capital" (see Betancourt 2018: 13; Translator's Foreword).

This scarcity of capital imposes limits on the immaterial production that is a characteristic feature of digital capitalism. That is why the Digital is not limitless, as Betancourt himself explains subsequently (see ibid.: 15–16). In other words: in principle, digitality could allow for infinite production, as the products are immaterial and can be copied as desired and at (virtually) no cost. However, capital restricts this because the promises of returns can still not be redeemed. The argument seems paradoxical: even though there is limitless immaterial production, it is still not enough to redeem the promises of returns. Only two logical explanations for this are possible.

Either the returns promised are entirely overblown. And, in fact, common sense suggests that there must be quite a substantial amount of promised earnings that have accumulated in the overheated logic of an investment bubble driven by venture capital that cannot be redeemed (see Chapter 8.2). However, this is most likely due to the bubble and the fact that too few people actually have sufficient excess or leftover capital available to invest billions (see also Piketty, Thomas 2014).

'Leftover' capital is to be understood in a literal sense here, i.e. '*after* taxes' (although taxes can largely be regarded as a negligible factor in the world of global investors)[12], *after* (re-)investments have been made in existing business models or

12 Between 1985 and 2018, the average global corporation tax rate fell by more than half, from 49 to 24 per cent (see Tørsløv et al. 2018). The large multinational corporations (and other players) of the digital economy such as Apple, Google and Facebook are especially versed in shifting earnings to countries with low-tax jurisdictions via subsidiaries. Yet, what is shifted is not capital for the purpose of, say, producing (or programming) something on the ground locally, and more cost-efficiently, using machines (or servers or offices) and real staff. If 'immateriality' exists, then it is in this form of tax evasion. After all, earnings are merely shifted in the books—and entirely legally. In 2016, for example, Google Alphabet earned an income of 19 billion US dollars in Bermuda, even though the corporation, of course, has virtually no staff nor tangible assets on this tiny Atlantic island with its roughly 64,000 inhabitants and a corporate tax rate of 0 per cent. Around 40 per cent of the earnings of all multinational corporations are shifted to low- or zero-tax countries using this method; the authors provide detailed evidence in the form of precise figures and disclose not only the raw datasets but also their exact calculation method in transparent Stata do-files (see Zucman et al. 2017). The calculations in this study also show that if this offshore revenue were taken into account in the countries where it was actually earned,

foundations (which further diminishes the already low tax level), *after* each and any private luxury consumption has been satisfied and *after* traditional forms of investment (from shares to real estate, wine or arts) have been exhausted. When, *after* all this, there is still a million or two left that faces the same 'cold expropriation' suffered by the savings accounts of workers, freelancer retirement funds or the savings of a medium-sized business (though the consequences will usually be somewhat more severe and existential for the latter), then even an investment in business models that at least offer a vague promise of being 'the next big thing' in the digital economy will not cause any financial harm. In the case of venture capital investments in the digital economy (particularly platform and sharing business models) the issue is not—as Betancourt does not seem to differentiate—promised earnings in the sense of 'old school' investments such as shares and stocks, which arise from produced (or indeed copied) values, but the promise of an exclusive and durable future market and thus a risk-free and infinite realisation of value. Viewed through my analytical lens, this can be explained—as will be shown later—above all as a phenomenon of the increased significance of the distributive forces in digital capitalism (Chapters 5 and 6).

Or, the attempt to explain the current capitalist economy based exclusively on the diagnosis of the Immaterial (see Chapter 2.3) and the corresponding hypotheses of scarcity (of capital) as developed by Betancourt, or the reversal thereof, namely a superabundance of immaterial goods, may be inadequate more generally. After all, firstly, such analysis is content with the assessment that digital capitalism's distinctive feature is the Digital. Secondly, and more importantly, such a one-sided view entirely ignores the question of how the industries and individual capitals whose products/goods/services are material in nature might benefit from this development. A new stage of capitalism that would merit a new label of its own, however, would have to be logically deduced from the limitations of the previous model or changes in the interest of all other individual capitals. In Chapter 5, we shall explore this approach in more detail. With regard to technology,

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the corporate earnings of these countries would be 2–2.5 per cent higher. Not only could they be taxed accordingly, but the relation between national income generated via income tax and corporation tax would be altered considerably. The authors also point out that there is one unequivocal winner in this game of tax evasion, namely the United States, whereas EU countries in particular are prepared to accept significant losses. Considering further details of this study, it becomes clear that countries with a higher corporate tax rate have not only taken serious hits to their public coffers as a result of the loss in tax revenue; it also weakens the negotiating position of trade unions and considerably impedes the competitiveness of small and medium-sized enterprises. Those who evade taxation, of course, have no qualms about accepting tax money in subsidies: while, for example, Amazon avoids paying tax in at least 16 countries worldwide, the company has received hundreds of millions of US dollars' worth of tax money in subsidies (see LaVecchia/Mitchell 2016: 63–67).

Betancourt's critique of digital capitalism essentially turns on the peculiarity of digital media. He refers to their "effective immortality", or rather their potential for a perpetual, perfect replication. These particularities, then, apply to another characteristic feature of digital capitalism as well: the "scarcity of capital" (2015: viii). Betancourt takes this limiting factor as a starting point not only to analyse the Digital with his critique of political economy, but also to explain the economic crises of recent years more generally—especially in the United States (see ibid.). Yet, in my view, this leads to three misunderstandings.

First misunderstanding: *the digital economy and its products cannot be equated with digital media*. The media in question are largely left unspecified, or are sometimes described rather vaguely as 'social media'. No one would consider industrial capitalism to be adequately characterised or explained if just *one* level in *one* area of production were used as a metaphor for fundamental economic processes of an entire economic system. And yet, with regard to the digital economy, this seems to be common practice. It is perfectly legitimate to speak of platform capitalism when examining the economic specificities of platform-based business models. However, it would certainly not be appropriate to transfer the empirical observations (or even potential labels) deduced from this example to all other business models or economic processes with a general analytical claim. Nonetheless, this is precisely what is occurring. Social media include the after-work blogger as much as the professional influencer; they require the provider as much as the web designer and the database programmer; they include ratings that can be bought as well as the psychologically horrendous work of the 'cleaners' who constantly scan for and delete inappropriate content; they include advertising revenues for the classic insertion of ad banners or affiliate links as much as the sale of customer profiles for target marketing; ultimately, they also comprise the physical infrastructure of servers and network connectivity. All these catchwords point to long-standing as well as entirely novel, yet utterly diverse, production and valorisation processes. And, depending on which area of the rather vaguely specified 'social media' one refers to, the answers to the following questions would differ considerably: how exactly is turnover generated? What is the product? What is the means of production? Where, or rather, by what or by whom is value created? Yet all this would have to be clarified in very precise terms if the aim were to write a political-economic analysis of digital capitalism and not an essay that critiques the media.

Second misunderstanding: 'effective immortality' is an attribute that applies even less to digital products than to most physical products. Nowhere can the strategy of 'planned obsolescence'—i.e. the calculated, premature end of the lifespan of a product for the purpose of renewed consumption—be achieved more easily than with software. It takes little more than a software producer's announcement that it is ending support for a certain operating system—no more updates, no more

security patches, no more drivers for new peripheral devices like printers. When a major update of a new operating system then requires new hardware resources or is supported only by a new generation of processors, then the 'obsolescence' of an operating system simultaneously affects the hardware as well—the laptop or smartphone also becomes obsolete. And yet, this does not pertain exclusively to planned obsolescence. Sometimes entire systems become obsolete because the licenses or certificates for individual products expire, individual manufacturers go bankrupt or the business model has changed and no longer provides security updates for the household router or 'smart' thermostat.

Third misunderstanding: *the scarcity of capital is not a characteristic of the Digital*. To Betancourt, the alleged immortality and infinite replicability of digital media (as well as their superabundance) explain the scarcity of capital. As I have just argued, however, as convincing as the hypothesis of the Digital's immortality may sound, it is empirically wrong. But even if we were to agree with his hypothesis in this respect, Betancourt does not explain the actual nature of this link: is there an overproduction of digital products that faces a lack of capital in terms of sufficient buying power? A phenomenon that would by all means be typical of capitalist economies (see Chapter 5)—yet anything but exclusive to, or characteristic of, digital capitalism.

Therefore, in doing so, Betancourt adopts a conventional economic viewpoint that is perfectly legitimate. But one that has little to do with a political-economic perspective or critique. At any rate, we can establish that even industrial capitalism often produces scarcity in multiple ways: from steel, coal and rare earths to ships, cars and food (let alone myriad—more or less useful—consumer articles). Far too much is produced or consumed during production: more than can be sold under the given income distribution and more than is reasonable in ecological terms (see, e.g., Johnson/Quance 2013; Kim/Kim 2019; Sharma et al. 2019). Ultimately, despite his critical style and numerous evident phenomena of overproduction, Betancourt remains within the confines of classic (i.e. non-Marxist) economic thought that can be found in every textbook: according to this view, the total amount of goods is always insufficient to fully satisfy human needs, and market prices are regarded as an expression of this relation of scarcity.[13] If this were the case, then the task of advertising and marketing would be not to instigate needs which we never had until that point, but to niftily explain to us why we cannot have a certain thing (except perhaps for artificially created scarcity, which ranges from seasonal ice cream to the steel-made Rolex diver's watch). If this were really true, then car prices, for example, would have to decrease until the very last overproduced vehicle has been sold; and yet, almost all we seem to witness in this

13 This definition of scarcity, typically and, unfortunately, entirely unecological as it is, can be found in just about any economic encyclopaedia (see e.g., Claassen 2009).

area is more forceful advertising, appealing leasing offers or manufacturers buying their own vehicle stock for their own Car Sharing start-ups.

As I have said before, it is perfectly legitimate to operate on the basis of conventional economic doctrine. However, in pursuing a critique of capitalism, one should at least take Karl Marx's critique of this conventional stance seriously (or explicitly refute his claims). To Marx, superabundance (which he refers to as abundance, surplus or excess) is merely the result of regular everyday capitalist business. There are two reasons for this: *firstly*, individual companies each produce the highest possible number of goods in order to achieve maximum profit. This necessarily leads to the superabundance of the produced goods in this economic segment. Although this abundance is then responded to with different strategies—some of which are more, others less successful—this does nothing to change the fact. *Secondly*, one essential feature of capitalism is production for exchange instead of existing (social) needs—but only what is abundantly available can be exchanged. Furthermore, as Karl Marx would likely point out, the value of a product does not emerge on the market, but as a result of the expended labour during production. Hence, any selectively or artificially created scarcity can at best cause a surcharge on the market, but it cannot change anything about the original inherent value. We shall pursue these ideological depths and two crucial blind spots by exploring the concept of value with reference to Mariana Mazzucato's writings (Chapter 3) and, in even more detail, the significance of value realisation in (digital) capitalism based on Marx (Chapter 5). In the following, we shall see that the nature of the new digital markets is constituted above all by the promise of sales and thus the reduction of overproduction.

To illustrate this, let us take the example of Facebook: it appears as if the marginal costs are virtually zero, while scaling up the infrastructure to accommodate more users seems, at first glance, to merely entail an increase in energy costs, if anything. But what is the product here? And whose costs are rising? As we all know, Facebook does not charge any fees for the use of its website or app, nor does it sell a product. Rather, the interactions on the platform as such become the commodity. Yet this only becomes a marketable product once Facebook creates new use value through its algorithms (for a given company—which might even be suffering from overproduction). A substantial amount of labour has thus actually been expended: the gratuitous work of the Facebook users who interact on the platform as well as the labour that goes into Facebook's software development (from the development of new Machine Learning algorithms and target marketing to the host of server admins and UX design that is supposed to keep users active on the platform for as long as possible) and a great deal of objectified work pertaining to servers, electricity lines and network structures—all the material aspects of the Internet that Dan Schiller (1999; 2014) has emphasised and described (for an assessment of Facebook, see Chapter 8.2).

As many others before me have mentioned—by using terms such as 'prosumer', 'producer' or 'co-creation' (Bartosz 2019; Proulx et al. 2011; Scholz 2012; Zuboff 2019), there is really only one factor that is systematically superabundant, and that is endless amounts of unpaid human labour. Even before digital market research, surveys conducted on high streets, whereby questionnaires were handed out to people asking for their preferences regarding certain products, already made use of unpaid living labour. The 'payment' came in the form of a small giveaway or voucher—instead of free access to a communication platform. In that sense, Facebook certainly has more use value to offer in the long run: communication. Incidentally, the analytical models or calculation methods (i.e. algorithms) of pre-digital market research were never disclosed either. Then, as now, the client companies essentially have no idea about how exclusive (scarce?) the service they are buying really is or whether their direct competitor (faced with the same problem of overproduction) might be paying the same price for the same service simultaneously (as a result of which neither of the two is likely to significantly mitigate their overproduction problems). From a more fundamental perspective, Facebook may not have innovated the existing system that much after all. As in the past, the generation of value remains dependent on living labour: if everybody starts using TikTok tomorrow and quits Facebook, then Facebook no longer has anything it can sell. What is new in this regard, however, is the permanence of 'observation' and the market research being imposed upon people who in fact simply want to communicate with one another and have not made the conscious choice to participate in such research. And this new feature is closely linked to the possibilities digitalisation has to offer.

Scarcity and superabundance always represent relative quantities. Wherever there is an overage of something, there must be a corresponding lack somewhere else—or vice versa. And even though Michael Betancourt explicitly distances himself from the theme of overproduction crisis, one thing is quite obvious simply for logical reasons: wherever there is an imbalance between produced values and capital in the economy—regardless of whether this can be explained with or through the Digital—a pursued or assumed equilibrium becomes fragile and the threat of crisis arises. The insight that crises are an inherent feature of capitalism is not new. According to Marx, crises are indeed immanent, meaning they are inevitably built into the system. In conventional economics, crisis is treated as something that can theoretically be avoided but nonetheless is an empirically proven phenomenon. Likewise, both authors referenced here address the topic of crisis and do so under the impression of, and with direct reference to, the latest financial crisis. Both authors focus on the interplay and parallels between the financial market and the (almost exclusively digital) real economy. The state itself

plays a significant role only in Dan Schiller's approach; and it is only the state that links up the military and the digital economy.[14]

Dan Schiller's entire book (2014) is centred on the *Digital Depression* and explores the context of the economic crisis. To him, however, the latter did not start with the financial crisis of 2008 but began as early as the 1970s. Alongside military spending, it was investments in information technologies that helped mitigate the economic downturn during the 1970s. As a result, he argues, entirely new networks emerged between corporations and the military, while the economic crisis intensified. Schiller identifies a clear line of development from the ICT investments of that time right up to the latest crisis. That is why he refers to it as digital depression: "Eventually, we now know, the bright line of the ICT investment led on to a precipice as the financial collapses of 2008 transformed into a digital depression." (ibid.: 71) In Schiller's view, then, this crisis is all but over, the events of 2008/09 merely having marked the beginning. He contends that the crisis was still ongoing when his book was published (2014). Although governments[15] were eventually able to contain the crisis in isolated locations and for limited periods of time, they never managed to overcome it entirely. And, while the crisis became increasingly entrenched, network technologies provided new sources of profit (see ibid.: 151).

Michael Betancourt also takes the financial system into account—not only with respect to the latest financial crisis, but more generally: in his view, the United States' Federal Reserve System is itself a giant Ponzi scheme (see 2015: 210). He argues that every Ponzi scheme resembles a microcosm of capitalist capital formation and works only as long as the number of investible expectations of future profits remains constant and no sources of income exist that require repayment, thus dropping out of the system of exchange and circulation. Even given these restrictions, however, a collapse is possible at any point (see ibid.). Betancourt emphasises: "the earlier the investor, the greater their profit" (ibid.: 211). He thus also considers the crisis, or, more precisely, the system's susceptibility to crisis, to be inevitable. He goes on to highlight, in more detail, two of the preconditions

14 Interestingly, however, neither Dan Schiller nor Michael Betancourt make any reference to David Graeber (2011), who, in his anthropological and historical study of the role of debt over the past 5,000 years of human history, is in fact able to prove precisely this link. The history of debt in modernity, i.e. since the days of King Philip II of Spain, shows: government debt is always war debt as well (see ibid.: 307–360); at least in the case of the United States, this is illustrated by the curves depicting government debt and military spending, which, between 1959 and 2008, followed a remarkably similar trajectory and, moreover, both steeply surged—almost exponentially—between 2000 and 2008 (see ibid. and figure: 366).

15 His analyses continue to focus mainly on the United States. At the same time, however, Dan Schiller, from his geopolitical vantage point, does deal at length with China, asking what may follow after the US-centred Internet (see 2014: 185–210).

required to keep the Ponzi scheme running: firstly, profits must be quasi-recycled by being converted into new investments. This is exactly what the US Fed does when it buys government bonds and thus ultimately its own debt. Secondly, the task is to always create new investment sources via financial markets and the related products, such as derivatives (see ibid.: 212). Betancourt regards this as a process with long historical precursors. In contrast to Schiller, however, he does not substantiate the connection to digitalisation with investments in digital technology and infrastructure: in order to keep the Ponzi scheme from collapsing, he argues, the base of the pyramid must be constantly expanded, meaning that ever new areas must be harnessed for valorisation. In this, the specific role of the Digital is to turn social behaviour (particularly on social media platforms) into a commodity (see ibid.: 217): "As the Ponzi model suggests, digital capitalism is threatened with immanent collapse when this circulation ceases. Asset 'bubbles' are not only required by this system, they are a function of digital capitalism in action; thus the necessity for bailouts when asset bubbles burst.' (ibid.: 223).

In this sense, according to Betancourt, the cryptocurrency Bitcoin also simulates a scarcity of capital when attempting to produce value. The scarcity of material goods is created by the algorithm that imposes physical constraints on the mining of the cryptocurrency and by a specified limit to the total amount of potentially available coins (Betancourt 2015: 66). And indeed, the maximum number of Bitcoins is limited to 21 million units (and not 2.1 million, as Betancourt erroneously indicates, see ibid.).[16]

Understanding Betancourt's argument—and why it is flawed—requires a brief introduction to the world of cryptocurrencies. Betancourt refers almost exclusively to Bitcoin, which is certainly the most well known and most mined, but it is just one among thousands.[17] Cryptocurrencies are based on the blockchain technology that was developed during the early 1990s: decentralised database architectures, the smallest unit of which is a block. Each block is assigned a hash value, a kind of mathematically calculated individual fingerprint. Since the calculation of a block's hash is always coupled to the hash of the previous block, the linking of the blocks is specific and could only be manipulated if all the hashes in an entire chain were recalculated anew. To do that is extremely complex. But even in the absence of manipulation attempts, the entire chain of previous transactions

16 Furthermore, there are additional quasi-physical restrictions that Michael Betancourt does not mention, such as the predetermined block size or the speed of the transaction. These restrictions pertain to the network protocol level and can therefore not be altered. The issue of scaling, however, has been debated in the cryptocurrency community, and there is in fact the possibility of creating a 'Hard Fork', which is when a branch point is generated based on a new network protocol which is no longer compatible with the original downstream protocol.

17 At the time of this writing, there are around 11,180 cryptocurrencies in existence (see CoinMarketCap 2021).

must be somehow verified, as it changes with each transaction. Given that a trustworthy third party or centralised audit body is intentionally dispensed with, a consensual procedure must be applied if new blocks are to be created. This procedure is called 'proof of work', which is quite an apt term considering our topic. The calculations required as a result of the mass of transactions are fairly complex and rely on colossal server capacities. Providing such capacities—and being paid to do so in cryptocurrency—constitutes the equally profane and, ultimately, physical precondition of the whole undertaking. This is the actual process that is referred to by the term 'mining'.[18]

The electricity consumption of the Bitcoin network was estimated between 2.6 and 7.7 gigawatts in 2018. A single transaction requires as much electricity as an average household in the Netherlands consumes per month (see Vries 2018). Even though the logic of the forward projection may be questionable—the increase in user numbers corresponds to those in other digital technologies, yet the transaction frequency cannot be equated with user numbers—, another study (see Mora et al. 2018) concludes that Bitcoin mining significantly contributes to climate change. Moreover, one could critically note that the energy consumption for other digital transactions, too, such as intraday trading or between banks, is likely quite substantial as well. That said, this whole debate would go beyond the scope of this study. What is relevant here is that the mining of cryptocurrencies is by no means immaterial, its physical requirements and constraints are more than a mere parameter specified by the network protocol. It relies on very material prerequisites: different kinds of power plants (to a large extent, coal-fired power plants in China), substations, power lines, routers, servers, deep-sea cables, satellites, etc. Although Betancourt does mention the energy consumption and the fact that computers are needed for mining Bitcoins (see Betancourt 2015: 62), he maintains that it is immaterial labour. Yet there is one thing that all these basic or active mining components contain: human labour. This includes people who work in the control room of a power plant, manufacture servers somewhere in the world, as well as others who set up and update these servers, build and maintain substations and so forth. If there is anything infinite about all this, then it is the complex interplay between various forms of human labour at different points in time and in different places, extending into the many unpaid reproductive activities, too. It is all this labour that enables a single Bitcoin transaction. Betancourt's

18 Michael Betancourt should be rather pleased to see that the blockchain technology can help sniff out fraudulent Ponzi schemes. This has been proven for the cryptocurrency Ethereum (see Chen et al. 2019). But then again, Betancourt does seek to portray the entire economic system as one giant Ponzi scheme, not just individual fraudulent activities within the system. The example demonstrates, nevertheless, that digitalisation could also be used to at least mitigate the most extreme and crisis-inducing excesses of financial market capitalism—should society and political decision makers be in favour thereof and act accordingly.

argument about capitalism resembling a giant Ponzi scheme does not somehow become more 'digital', nor does his general hypothesis about capitalism apply any more specifically to digital capitalism as a result of his deliberations on Bitcoins.

In my view, the argument could be reversed: what we are dealing with are strategies that are not only characteristic of digital capitalism, but of capitalism in general. The same mechanisms cannot only be found in the finance or the Internet economy, but also in the real (productive) economy and were even present in industrial capitalism. What characterises digital capitalism (historically) is the fact that it came onto the scene at a point in time, after about two centuries of the 'old' capitalism, in which capital was (and still is) as superabundant as never before. This is, firstly, because values have permanently been extracted from the real economy for such a long time and, secondly, because the finance economy has long been decoupled from the real economy. And when there is so much capital 'left over', the most rational investment strategy is to put money into those markets which promise not only the quickest possible growth but also a closure in terms of market control, although the latter promise goes largely unfulfilled. The object of this investment strategy resulting from the superabundance of rentier capital (a term that already featured in Marx's writings, and for good reason) may be a certain business model in the digital economy today, or one in biotechnology tomorrow. What is decisive is not whether the 'object' is digital, but that capital strives to and must flow.

We could also ask: what does growth mean? Ultimately, of course, it means that the greatest possible amount of value is realised, that is to say, that products—be they digital or not—are successfully introduced to the circulation sphere in large quantities. And what does closure mean? Simply making it difficult or, better yet, even impossible for competitors to join the game of value realisation. The platform economy is one way of achieving as much. Value realisation means nothing other than sales. However, the product must not only be 'sold' to end users or online buyers (they are often only the generator for surplus behaviour as per Zuboff, depending on the respective digital business model), but also to individual and institutional investors (who have to believe in the promises of growth and closure) and those who enable those business models, even if other spheres of the economy suffer 'disruptive' damage as a result. And indeed, the dominance of Internet business models geared towards advertising and distribution, or, rather, the circulation sphere, is remarkable, as we shall see in Chapter 6.

Comparing the financial and the digital world, as well as their respective logics, is undoubtedly intriguing. And there certainly are numerous parallels between the two if we focus on their specific phenomena. The real question, however, is how these parallels can be explained. Are they mere structural similarities that can be easily justified because both areas are being considered within the same period of capitalism and both are an expression of the same basic under-

lying economic logic? This is certainly one part of the explanation. One may also add that there are functional and technological parallels at the level of 'production' processes and work 'objects': in both cases, we are dealing with data-based processes, statistical evaluations as well as predictions and options of relatively easily implementable algorithmic automation—an automation that need not factor in the uncertainties of material production. This may also entail similarities, extending even into the professional habitus. A third explanation may be that the logic of production is eclipsed by the more dominant logic of speculation in both spheres. After all, the logic of financial markets has always had, and indeed is increasingly having, an impact on the real economy—from the logic of quarterly figures and reports, etc. to shareholder dominance and the effects of futures trading on commodity prices. Businesses have to find a way of dealing with all this in specific terms by creating complementary business structures, developing adaptive, compatible data structures and thinking and acting in sync. All these are issues that could potentially reveal the driving force of the mechanism behind empirically discernible structural equivalence. Unfortunately, Betancourt fails to follow these subsequent steps in his analysis. For there is one thing that cannot be concluded from the—albeit somewhat constructed, but nonetheless undeniable—similarity: whether digital capitalism differs fundamentally from its predecessor. Although Betancourt does present compelling phenomena and reveal striking parallels, he fails to explain why it actually works and why it works today—except for once again falling back on the ultimate explanation of digital capitalism by reference to the Digital. Yet my point here is this: the parallelism can be explained by the economic structures and dynamics, some of which can currently be more easily implemented in the digital sphere.

2.5 Much said—any questions answered?

So far, I have discussed the analyses of digital capitalism by Dan Schiller and Michael Betancourt on the basis of three distinct thematic areas with three key concepts each, adding some more or less extensive criticism. Before I move on, proceeding from Mariana Mazzucato, to address the concept of 'value' in more detail—which constitutes a bridge between the two analyses outlined here and my own analytical approach to the distributive forces—allow me to briefly summarise the main reflections of the two authors with regard to the three concepts concerned.

In terms of the first thematic area, *Dynamic—Transformation—Actors*, we can establish that while Dan Schiller considers the development *Dynamic* to arise from the contradiction between technological revolution and capitalist stagna-

tion, Betancourt regards the immateriality of the Digital to constitute the initial impetus.

The question of *Transformation* is also answered by the two authors in both different and complementary ways. Neither follows the primacy of 'disruption', which is currently dominating relevant debates. While Dan Schiller emphasises capitalism's permanent susceptibility to crisis, in which new options for capital formation always carry the seed of the subsequent crisis, to Michael Betancourt, everything converges into a single gigantic speculative bubble that will inevitably burst with a bang.

With a view to *Actors*, Dan Schiller is most specific and cites, based on several illustrative examples, the role of the state and capital—not just the tech corporations. In the process, he broadens his view to include the geopolitical strategies of China alongside those of the United States. Michael Betancourt, by contrast, adopts a rather general perspective: to him, the *Actor* is capitalism, as a system and producer of ignorance as well as the Federal Reserve System of the US (albeit in an implementing role).

What unites both authors, is an analytically elaborate view that is—at times more, at others less—critical of capitalism. The differences can be explained by their distinct disciplinary perspectives, but also by the specific aspect of digitalisation each of them selects for study: in Dan Schiller's work, this is above all the digital infrastructure (or, rather, the infrastructure of the Digital), whereas Michael Betancourt focuses on blockchain and social media.

As both authors promise a political-economic perspective on digital capitalism, they raise high expectations of a new insight to the implications of the Immaterial and the related consequences for labour and value. After all, labour and value constitute essential categories in (the critique of) political economy. And one question that arises is whether labour in fact loses its value-generating potential—due to the increase in the Immaterial—and whether this may be what is actually new about digital capitalism. This triad of *Immateriality—Labour—Value* was addressed in the second thematic area.

Concerning *Immateriality*, a clear distinction between the two authors is initially striking: Dan Schiller focuses not on the immaterial but the very material, physical side of the Internet. In doing so, he refers to three things: the Internet's infrastructure, the corresponding global value chains and the various forms of hardware. Yet Michael Betancourt is hardly interested in the different facets of digitalisation. To him, the Immaterial is both the starting point of his deliberations and the crucial expression of what is new about digital capitalism. The pivotal distinction is that between immaterial and physical goods: the latter are always limited, whereas the former are infinite and cost-free.

The topic of *Labour* hardly features in Dan Schiller's analysis, but is only referenced in terms of an analytical level when the author quotes Marx. In Michael

Betancourt's work, we find many sections that address the question of labour. According to Betancourt, digital production conceals labour more effectively, meaning that it is not the relevance of labour that is decreasing, but its visibility. His somewhat crude juxtaposition of production-related labour and intellectual labour and his relatively vague conceptualisation of intellectual and immaterial labour, however, cloud his analysis rather than make it more precise.

The last of the three thematic areas dealt with the specifically—at least for the most part—economic driving force behind digital capitalism. While both authors are able to contribute to each of the three key terms of the two previous sections, this is not the case with regard to *Scarcity—Superabundance—Crisis*: Dan Schiller does speak at length about the question of crisis, yet he leaves the issue of scarcity and superabundance largely unaddressed. Betancourt identifies a parallelism between the financial market and digital capitalism, linking both to the issue of crisis. To Betancourt, the scarcity of capital is the defining economic feature of digital capitalism. In industrial capitalism, he argues, there were too many goods in relation to demand (overproduction). But today, there is a lack of capital in relation to the associated investment promises, that is to say, between the existing values of today and the number of potential future claims. The promises of returns on invested capital have exceeded the scope of what is redeemable; they cannot ever be fulfilled through labour and production.

Dan Schiller does not speak of the scarcity or superabundance of capital, though he does address capital's urge to sell already produced goods. Circulation is the all-decisive factor to him. And that is also how he establishes the link to the question of *crisis*. His argument is that capitalism has been in constant crisis ever since the 1970s. Investments in information technologies were an attempt to counteract this tendency, a measure that does not avert the crisis, however, but protracts it, if anything. The latest financial crisis—the 'digital depression'—was therefore no more than a preliminary manifestation of the long ongoing crisis, meaning that the latter is far from over.

The driver of the crisis is capitalism itself, and the respective technologies are only a means of mitigating the crisis. Betancourt likewise sees capitalism as engulfed in permanent crisis. To describe this, he applies the metaphor of the Ponzi scheme, as capitalism always requires new spheres of valorisation in order to mitigate the crisis. To him, digitalisation is also a means to serve precisely that objective, but not because of the investments, as argued by Schiller, but rather because it is a way of opening up what was not valorisable thus far—namely social behaviour—to valorisation.