

4. Transformation and the Productive Forces

So far, we are still searching for a digital capitalism that is analytically defined by more than its digital means (see Chapter 2). Marx would associate the altered, now digital means with the level of phenomena, the materiality of which must by all means be taken seriously. And yet, he would only proclaim a new stage of capitalism if the economic principles as such had altered in some way or another. Consequently, our search ought to continue by investigating what lies ‘behind’ the phenomena and venturing into the domain of economic principles. At the same time, the fundamental economic principles of capitalism must remain in place to some extent if the term capitalism is still to apply. At least with regard to use value and exchange value, we have seen that this is the case (see Chapter 3): both sides of value and their relation to one another do not disappear in digital capitalism; instead, what becomes clear, quite paradoxically, is that human labour continues to be the crucial factor for the generation of exchange value and the appropriation of use value even in the (allegedly) new type of capitalism. And indeed, some intriguing shifts do become apparent. However, one question raised by all diagnoses of digital capitalism remains unanswered: what new aspect is *really* underlying the fact that many things are becoming (more) digital? What would be the justification for a discourse on digital capitalism in which the ‘digital’ were to refer not only to the—without question, utterly dramatic—otherness of the means, but also signal a more fundamental economic shift within capitalism?

The platform economy, as a new form of marketplace, appears to constitute an important—yet inconclusive—response by digital capitalism. Whether or not we are seeing only a temporary formation of monopolies, which may be swiftly brought under control by government regulation and market competition—both of which constitute common self-descriptions of democratic states and economic actors—is impossible to say at this point.¹ For now, it seems promising to continue

1 It is but more evidence of Marx’s dialectics that he does not consider the formation of monopolies in direct opposition to competition, nor as the end point of a development, but as a movement: “In present-day economic life you will find, not only competition and monopoly, but also their synthesis, which is not a *formula* but a *movement*. Monopoly produces competition, competition produces monopoly.” (Marx 1982: 101; emphasis in the original). And even though he is, of course,

along this path a little further. After all, according to Karl Polanyi, the *Great Transformation* (2001) that led to capitalism also entailed the creation of a market that had been unknown up to that point. It is Polanyi's understanding that during the 15th and 16th centuries, the state enforced the national and competitive market very purposefully and in spite of opposition from towns, which initially walled themselves off, while local and international markets had existed long before—albeit for the most part not as competitive markets. Market implied, above all, bartering and exchange, not competition: exchange and bartering at the local level in order to guarantee the subsistence of the community and long-distance trade based on a division of labour that emerged naturally from differing geographical and climatic conditions. In his deliberations on the 'Evolution of the Market Pattern' (ibid., pp. 59–70), Polanyi thus also dispels two myths that are still quite common today: firstly, that national and international markets emerged naturally from local markets and from the respective economic activities. In this regard, Mariana Mazzucato also notes: "In Karl Polanyi's epic book [...], he argued the State created—pushing, not only nudging—the most 'capitalist' of all markets, the 'national market' (while local and international ones have pre-dated capitalism)." (Mazzucato 2015: 209) Secondly, and, in my view, more importantly, Polanyi also reckons with the idea—which may appear rather inconceivable to us these days—that market and competition need not necessarily be equated.

Before returning to Karl Marx, we will first briefly digress to Karl Polanyi (Chapter 4.1). His analysis of the *Great Transformation*—i.e. the emergence of industrial capitalism—can perhaps help us better understand the current transformation and its specific character. We will witness that Karl Polanyi sees one crucial change in the role of the merchant and the act of buying. Besides that, he is far more critical of capitalism and the possibility of its restriction than is often assumed today. To Polanyi, the transformation begins with the purchase of something that was previously not a commodity: human labour. He does not limit his diagnosis to purely economic or technological explanations, but places these dimensions in relation to (social and institutional) reactions from within society.

also interested in the cause of monopoly formation, he does not neglect the devastating effects for other, smaller companies—a concern that one sometimes misses among those who so enthusiastically address the middle classes in their soap-box oratories: "Concentration grows at the same time, since beyond certain limits a large capital with a lower rate of profit accumulates more quickly than a small capital with a higher rate of profit. This growing concentration leads in turn, at a certain level, to a new fall in the rate of profit. The mass of small fragmented capitals are thereby forced onto adventurous paths: speculation, credit swindles, share swindles, crises." (Marx 1998: 249). The formation of monopolies and the global dominance of 'corporate giants' continues to be a phenomenon away from the digital economy, as Tim Wu (see 2020) demonstrates for the case of meat production—even though the tech explosion of the 1980s and 90s and today's tech giants do play a significant role in his view as well.

Karl Marx analyses the evolving capitalism of his day in a similarly complex manner, applying the term of the 'development of the productive forces' (Chapter 4.2). Both Karls reconstruct the technological, economic and social changes in at times perplexingly detailed empirical depth, often with a good grasp of specific technological issues. In contrast to Polanyi, however, Marx rigorously focuses on the productive process, which remains a peculiar black box in Polanyi's analysis. Marx's productive forces provide us with a highly productive (as would fit our terminology here) analytical screen that not only conceives of technology, the economy and society as one, but which pinpoints the mechanisms of their interplay and inherent contradictions, and thus brings the dynamic of change itself into view. The triad of productive forces, relations of production and the resulting mode of production thus reveals additional layers of analysis and insight that seem particularly conducive to systematically studying current capitalism in its digital incarnation.

Proceeding from this perspective, we will then once again take aim at the current discourse surrounding digital capitalism (Chapter 4.3) and assess whether it has in fact been exhaustively studied using the analytical tools provided by these two key economic thinkers. We will see that both are vaguely referenced, but that particularly the somewhat more multi-layered Marxian approach of the development of the productive forces is used in an insufficiently complex and often merely metaphoric manner, leaving the explosive force of this analytical toolkit unused. On the contrary, when it comes to the question of the development of the productive forces, we find either hollow exaggeration claiming a leap in development or empiricist reductionism. Only rarely were the tracks laid out by Karl Polanyi and Karl Marx earnestly and skilfully pursued. Just how unfortunate that is becomes obvious when considering that the clear and precise structure of their ideas, their empirical seriousness and analytical breadth suggest a way forward that also seems promising for an understanding of today's digital capitalism.

Taking into account Polanyi's merchant and the altered significance of buying, and Marx's production-based analysis and the momentum of the development of the productive forces in isolation, does not, however, explain what is really new about digital capitalism. Yet at the end of this chapter, we should be somewhat better equipped theoretically to reveal just that. Although the answer is unlikely to be fully elucidated, it will hopefully be much clearer which blind spot(s) still require attention.

4.1 Polanyi's Great Transformation

While Marx addresses mainly the (dys-)functional mechanisms of capitalism, Polanyi historically reconstructs the emergence of capitalism in England. This detailed focus on the transformation itself (instead of its 'outcome')² appears productive for our search for digital capitalism's novel feature(s). After all, we are looking for something that suggests change on a far greater scale than what would be considered normal in modern societies. So, is it really more dramatic, life-changing—'starker'? Karl Polanyi at least begins his famous diagnosis of the *Great Transformation*, originally published in 1944, by describing a comprehensive collapse in his dramatic opening statement: "[n]ineteenth century civilization has collapsed" (2001: 3); a collapse that has its roots in the utopia of a self-regulating market: "Our thesis is that the idea of a self-adjusting³ market implied a stark Utopia." (ibid.) This might be precisely the reason for the rediscovery of and engagement with his work in recent years: today, there seems to be a sense that the end of the 20th century also heralded the end of all its associated social dimensions.

Correspondingly, a whole host of publications on Karl Polanyi has appeared, particularly concerning his *Great Transformation*, owing not only to the 75th anniversary of the book's original publication, which was marked in 2019. The German-language publications include, for example, the comprehensive special issue of the *Berliner Journal für Soziologie* (Dörre et al. 2019), which adds a question mark to the title (*Great Transformation?*) with a view to the threat of ecological collapse. Back in 2011, an ecological report submitted to the German government (WBGU 2011) adopted Polanyi's title and sparked renewed interest in his work—which was originally supposed to be called *The Origins of Our Time* (see Sachs 2013: 19); however, Polanyi himself would probably be turning in his grave were he to read this report, which—blissfully clinging to the notion of 'feasibility' as it does—shows absolutely no intention of calling the market into question (see ibid., p. 22).

Gareth Dale, Christopher Holmes and Maria Markantonatou (see 2019), for example, present a comprehensive introduction to Polanyi's work that is intentionally not only designed with economics departments in mind, but open to all disciplines, and which discusses each of his central concepts in dedicated chapters (e.g. commodification, the gold standard, geopolitical economy, etc.). Peadar

2 Likewise, Karl Marx, of course, not only considers the 'outcome'; he and Friedrich Engels also always closely inspect the historical stages and predecessors of capitalism. Their primary intention, however, is to analyse the particular mechanisms of the capitalist mode of production (and especially its crises). Karl Polanyi, with his special focus on historical development, goes more into detail and pursues a kind of path of economic sociology with a focus on institutional interrelations.

3 Karl Polanyi, for the most part, speaks of 'self-regulating markets'; his use of the term 'self-adjusting' is to be understood synonymously here.

Kirby (2020), by contrast, builds on Karl Polanyi's theories to develop his own theses on the ecological and socioeconomic crisis, as well as a model of eco-socialism that he seeks to position in critical distance to the weaknesses of Marxism. In a collected volume edited by Radhika Desai and Kari Polanyi Levitt (2020), comprising conference papers and lectures from the year 2014, the question is pursued, among others, whether Karl Polanyi's work will be as influential in the 21st century as that of John Maynard Keynes and Friedrich A. Hayek was in the 20th. From the discussion presented in this book, we learn that *The Great Transformation* in fact re-emerged in economic discourse as early as the 1990s. Ever since, the interest in Polanyi has steadily grown (see an overview in Polanyi Levitt 2020). As is the fate of all the major economic thinkers, the interpretations of Karl Polanyi's work (or rather: his intentions) vary in accordance with the views of the respective person doing the interpreting. Gareth Dale (2016: 4–5), for instance, describes how Polanyi has been referred to by various authors either as 'soft', in the sense of 'social democratic mainstream', or 'hard', meaning 'red-blooded socialist'. Michael Brie distinguishes between three interpretations of Polanyi, alternating between "Polanyi Light", 'Polanyi Faked', and 'Polanyi Himself'" (2017: 12).

It is not just Polanyi, but also his critics who are being rediscovered. There is the book *Has Market Capitalism Collapsed?* by Allen M. Sievers (2020), for example, originally published in 1949 and re-edited in 2020, which critically engages with Karl Polanyi and already casts doubt on the 'collapse' in the book's title. However, it has not always been as *en vogue* to align oneself with or oppose Polanyi. For instance, the author of an early review of Sievers' book raises the question as to whether Karl Polanyi's *Great Transformation* is even sufficiently relevant to be dealt with in such detail. He concludes: "Here a negative answer seems in order." (Oliver Jr. 1950: 366) After all, he contends, Polanyi's work has neither had any major impact nor has it led to anything resembling a status of authority.⁴ This has undoubtedly changed since.

For the objective we are pursuing here—i.e. a more profound understanding of digital capitalism—a glance at the original work by Karl Polanyi seems appropriate. Polanyi very succinctly sums up his central theses on the introductory pages of his book: in his understanding, 19th-century society was based on four institutions that ensured a degree of stability and continued development—or, as he put it: a "hundred years' peace" (Polanyi 2001: 5). Between 1815 and 1914, he explains, there was a total period of only 18 months of war between England, France, Prus-

4 However, according to Oliver, both books—Polanyi's original and Sievers' criticism—are valuable in their own right, as they argue against both laissez faire and interventionist economics which still assume that society and economy can be considered separately. Besides this, the review's author shows appreciation for the "aesthetic merit" and "strict logic" of "Marx, Polanyi, *et al.*" (Oliver Jr. 1950: 366)

sia, Austria, Italy and Russia, “a phenomenon unheard of in the annals of Western civilization”, as Polanyi emphasises. However: “This triumph of a pragmatic pacifism was certainly not the result of an absence of grave causes for conflict.” (ibid.: 5) As a result of the “rising tide of the Industrial Revolution”, “peaceful business as a universal interest” (ibid.: 7) was established. And this did not simply happen automatically. What it required was an authority that would effectively assert the objective of peace. According to Polanyi, it was *haute finance* that assumed this role (ibid.: 10). The actors in that context were not particularly pacifist—in fact, many had accumulated their wealth by funding wars. And yet, even at the time, *haute finance* already had a supranational function and was recognised as an intermediary between governments and industrial enterprises in a rapidly growing global economy. What emerged as a result was one of the most complex organisational forms in human history: “Organizationally, *haute finance* was the nucleus of one of the most complex institutions the history of man has produced.” (ibid.: 11) So, this is the context in which Polanyi sees the emergence of the four relevant institutions occurring: a political balance of forces that is viable in the long term; the gold standard; the liberal state and the self-regulating market (see ibid.: 3). Yet he does not consider these four institutions to be equal or interchangeable. On the contrary: the self-regulating market assumes a key position. Not only does it initiate the formation of the other three institutions, but it is also, and above all, the cause of potential destruction as a result. According to Polanyi, “Such an institution [the self-regulating market] could not exist for any length of time without annihilating the human and natural substance of society; it would have physically destroyed man and transformed his surroundings into a wilderness.” (ibid.: 3) From today’s perspective, we might add that this wilderness would also be destroyed and turned into barren land.

In order to prevent this from happening, society was forced to take protective measures, which then damaged the self-regulating mechanisms of the market and led to the disorganisation of industrial development and shattered the related social structure (see ibid., p. 4). The point Polanyi makes is not that an ultimately socially and ecologically destructive economic form needs to be socially controlled, but that this economic form *will (necessarily) have a destructive impact with or without social control*. Polanyi admits that his assertion on the self-regulating market-system is quite extreme and “shocking in its crass materialism” (ibid.: 31). Yet, as he notes, the mechanism through which the hunt for profit was originally set in motion is comparable, if at all, with “the most violent outbursts of religious fervor in history”—and the world was subjected to this unbridled authority only a generation later (see ibid.).

Now, let us consider the developments of the 20th century through Polanyi’s analytical lens: up until the late 1980s, the balance of forces between the two superpowers was the all-determining factor. The market economy, which had

been re-established in Western countries, was constituted as a 'social' market economy and thus as one that was to be politically and socially controlled. It is since this decade that the measures to restrict market society established after World War II have continuously been dismantled, while the process of globalisation has simultaneously been further institutionalised transnationally. The end of the community of Socialist countries was ultimately accompanied by a largely unimpeded expansion of a world-spanning, self-regulating market which today—to put Polanyi's argument in a nutshell—requires a new quality of restriction. When reading Polanyi's remarks on the historical emergence of the self-regulating market economy, however, it becomes clear: to him, the re-establishment of a profit-driven market economy following World War II and then once again after the collapse of the Eastern bloc would constitute a more fundamental 'knitting flaw', once more inevitably causing the destruction of human beings, nature and society. Admittedly, today's global, for the most part fully implemented market society is also anything but self-regulating and thus fails to live up to its own utopia. But in Polanyi's view—and this is overlooked by all those who read his work as a one-sided call for market restriction—both directions of a 'double movement' (towards the self-regulation of the market and back to its restriction in order to protect society) equally represent phenomena of the same major, and ultimately destructive, transformation:⁵ "Social history in the nineteenth century was thus the result of a double movement: the extension of the market organization in respect to genuine commodities was accompanied by its restriction in respect to fictitious ones." (Polanyi 2001: 79)

From this perspective, renewed destruction is inevitable, even if the forms and paths were to take an unexpected direction and possibly entail completely different tendencies and manifestations of destruction than those that influenced Polanyi's work. Only this reading, which construes market restriction as ultimately destructive as well (even though it may not constitute the actual cause of destruction), makes it comprehensible why Polanyi referred to his own assertion as "crass" and "shocking" (ibid.: 31). The assumption of a market economy that generally requires some sort of restrictive measures may offer many starting points for reforms (and to many different interested parties, too). Polanyi, however, is concerned with carving out the destructive force inherent in both the nature of

5 Polanyi considers any restriction of the self-regulating market—even frequently called for by economic liberals—as something that ultimately reinforces the utopia of the self-regulating market: on the one hand, free market liberals can claim that short-sighted union officials and Marxist intellectuals, greedy industrialists and reactionary landowners are preventing the utopia from materialising, while the opposite side can point to the restrictions as evidence of a threat to society posed by a utopian principle of a self-regulating market (2001: 157). So, according to Polanyi, both protagonists and critics ultimately promote the same utopia.

the market economy and in all attempts at its restriction, for that destructive element, to him, is the revolutionary aspect.

The Industrial Revolution, he asserts, improved the means of production in wondrous ways, yet people's lives changed dramatically for the worse: "In the heart of the Industrial Revolution of the eighteenth century there was an almost miraculous improvement in the tools of production, which was accompanied by a catastrophic dislocation of the lives of the common people." (Polanyi 2001: 35) This development of the productive forces has permanently continued ever since and today, aided by digitalisation, once again descends on people's lives, both globally and locally, in rather polarising ways: it affects everyone—high-income groups, but also those high potentials threatened by burnout as a result of their flexible and packed work schedule; the hip yet precarious self-employed digital worker; the Indian family who shares an account on a micro-task platform; the skilled worker in the automotive industry who is exposed to the relentless competition between production locations, or the unemployed person whose level of qualification is labelled an 'obstacle for placement' (*Vermittlungshemmnis*) on the local labour market. Phenomena of dislocation can be seen as much in Böblingen as in Bangalore. Those affected are subjected to the constantly advancing improvement of the means of production everywhere (or, in fact, actively involved in this process via production-related Continual Improvement Processes (CIP) or Objectives and Key Results (OKR)) and confronted with production methods that are more reminiscent of Polanyi's time than ours. What they all have in common is the participation in consumption—with differing financial possibilities and very diverse individual motivations for doing so; we will return to this later.

This condensed summary of some of Karl Polanyi's central theses regarding the first *Great Transformation* must necessarily remain somewhat simplistic. Some parallels with the current situation and with digital capitalism have already been hinted at and indeed seem plausible. At least one aspect that is conspicuous is that although Polanyi believes this sea change in human history to be overwhelmingly dramatic, he does not consider this shift to be a phenomenon of the new mechanical means of production, let alone try to explain it from such a perspective. He displays a very differentiated understanding of development, which is often lost in the engagement with his work. For example, he emphasises that the often-told story of the Industrial Revolution cannot be reduced to a single cause, but resulted from the interplay of economic (market expansion, a vast number of destitute people), social (free institutions), technical (innovation in raw material processing and machinery) and natural (raw material supply, climate) factors:

"The story [of the Industrial Revolution] has been told innumerable times: how the expansion of markets, the presence of coal and iron as well as a humid climate favorable to the cotton industry, the multitude of people dispossessed by the new

eighteenth-century enclosures, the existence of free institutions, the invention of the machines, and other causes interacted in such a manner as to bring about the Industrial Revolution. It has been shown conclusively that no one single cause deserves to be lifted out of the chain and set apart as *the* cause of that sudden and unexpected event.” (Polanyi 2001: 42)

This shows that Polanyi rejects the kind of reductionism that we are faced with once again in discursive terms and which, in the debate surrounding ‘Industry 4.0’—the four stages of which are each, per definition, causally linked to a specific technology—is seeing a seemingly unending resurgence much like the living dead in a zombie movie. Yet Polanyi is equally discontent with simply listing the characteristic phenomena and relevant conditions of that which is new. Instead, he raises the question we should also be asking with regard to digital capitalism: what exactly makes this process of digitalisation so revolutionary? What is being brought into the world that is so fundamentally new?

“But how shall this revolution itself be defined? What was its basic characteristic? Was it the rise of the factory towns, the emergence of slums, the long working hours of children, the low wages of certain categories of workers, the rise in the rate of population increase, or the concentration of industries? We submit that all these were merely incidental to one basic change, the establishment of market economy, and that the nature of this institution cannot be fully grasped unless the impact of the machine on a commercial society is realized. We do not intend to assert that the machine caused that which happened, but we insist that once elaborate machines and plant were used for production in a commercial society, the idea of a self-regulating market system was bound to take shape.” (Polanyi 2001: 42–43)

Similarly, we may ask today: is it the relocation of production facilities to other countries? Is it the emergence of slums in the former centres of industrialisation? Is it the endless working hours of the highly skilled? Is it the low wages paid to workers at Amazon’s fulfilment centres or to Facebook’s outsourced content moderators? Is it the population growth in some and the simultaneous over-aging in other regions of the world? Or is it the concentration of digital infrastructure companies? As in the past, Polanyi would today disagree with merely listing phenomena and effects. Instead, he would be keen to know: how is this revolution itself to be defined? What is (or was) its characteristic feature?

His response consists of two components: to him, the introduction of the market economy marks the beginning of a fundamental change. The nature of this institution, however, can only be fully comprehended with an understanding of how the machines—i.e. the novel technology—affect the previous commercial

society. Polanyi does not see technology itself as the actual cause of change but is instead much more concerned with what happens when a certain technology encounters existing economic mechanisms. To him, the concept of a self-regulating market system took shape in reality at the very moment in which production machines were applied in a commercial society. *That which is technologically new, then, must in some way or another be able to link up with existing economic mechanisms in order for something economically new to emerge* (which to both Karl Polanyi and Karl Marx also always means 'socially new').

So, if we follow this logic, what would be the answer to the question raised above? That is to say: what happens if it is not production machines that encounter commercial society, but information machines that encounter production capitalism? *Which existing economic mechanisms are digital capitalism's novel technological features forging links with?* Interestingly, we find fairly similar questions being raised by Polanyi: he explains that, in the course of the emergence of the market economy, towns, which themselves emerged from markets, acted not only as protectors of these markets but were also supposed to prevent the expansion of markets and thus the destabilisation of the existing economic organisation of society (see *ibid.*: 65). Towns thus had a dual function: they developed markets and simultaneously limited the expansion of this model: development *and* closure. The parallels with the platform economy become apparent if we replace only a few words in Karl Polanyi's original text:

"Platforms [Towns], insofar as they sprang from markets, are [were] not only the protectors of those markets, but also the means of preventing them from expanding into the whole economy [countryside] and thus encroaching on the prevailing economic organization of society. The two meanings of the word 'contain' express perhaps best this double function of the platforms [towns], in respect to the markets which they both enveloped and prevented from developing." (Polanyi 2001: 65; words in italics have been added, the original wording is in brackets)

So, the only change that the proprietary markets of the platform economy would entail is that the erstwhile geographic and political ties to the town have been severed. Would Polanyi consider this a fundamentally new development or rather interpret it as a—no less intriguing, or consequential—continuation, or perhaps even an intensified development? In my view, the latter seems more likely. This becomes clear when we continue to trace Polanyi's search for the new. Before doing so, however, let us briefly consider two more recent texts that examine the platform economy through Polanyi's analytical lens.

In a study conducted by Gernot Grabher and Jonas König (2020), the authors draw a parallel between Polanyi's remarks on the steam engine and today's digital platforms: to Polanyi, they inform us, "the industrial revolution, not the rise

of capitalism is the turning point of modern history', as he repeatedly emphasises 'that machinery is the driver of marketization, and not capital accumulation.' (ibid.: 100) This reading degrades Polanyi—in my view, unfairly so—from an analyst and critic of capitalism to a technology-deterministic historian. A few pages on, the authors do qualify this impression to some extent, yet only to once again equate Polanyi's statement that the machine cries out for workers' hands with the notion that the platform economy cries out for data: "We recall Polanyi's [...] theatrical portrayal of machines that 'were crying out for human hands.' The ramifications of the proliferation of the new digital infrastructures are no less far-reaching, albeit they 'cry out' for another essential resource: data." (ibid.: 105) If we refer to the actual passage in Polanyi (see 2001: 92–93), we find that he is not referring to technology, but to the conflicts between political and economic actors surrounding the regulation of labour, as it became necessary to supply the capitalist mode of production with sufficient 'free' labour forces. As Polanyi states in his historical review of the Speenhamland system, it was not a response to some technical requirements, but to the arrival of capitalism, which appeared on the scene unexpectedly for the corresponding actors: "Capitalism arrived unannounced." (ibid.: 93)

Grabher and König classify 'data' as another one of Polanyi's fictitious commodities of land, labour and money: "Data, then, correspond with Polanyi's [...] construal of 'fictitious commodities': they are brought to the market, but are 'not produced for sale'." (2020: 105) Here, again, a glance at the original source is worthwhile. In my view, there is far more we can learn about the platform economy from Polanyi's argument than to declare data a fictitious commodity. Polanyi initially considers the complexity of the whole and the requirement for everything to be dissected into supply and demand and receive a price in order to comply with the market logic:

"In practice this means that there must be markets for every element of industry; that in these markets each of these elements is organized into a supply and a demand group; and that each element has a price which interacts with demand and supply. These markets—and they are numberless—are interconnected and form One Big Market.

The crucial point is this: labor, land, and money are essential elements of industry; they also must be organized in markets; in fact, these markets form an absolutely vital part of the economic system. But labor, land, and money are obviously *not* commodities; the postulate that anything that is bought and sold must have been produced for sale is emphatically untrue in regard to them." (Polanyi 2001: 75)

Only in this context, Polanyi continues, do land, labour and money not become fictitious commodities as themselves, in their substance; what then becomes ficti-

tious is to refer to them and treat them as such. A fine, yet crucial distinction: ‘The commodity description of labor, land, and money is entirely fictitious.’ (ibid.: 76)

A recent study published by the *Berkeley Roundtable on the International Economy* (BRIE) also critically engages with the deliberations by Grabher and König (Kenney et al. 2020). Initially, the authors draw parallels with Polanyi (and Marx) themselves. They state, for example, that the platform economy entails an intensified process of commodification, extending into ever more areas of social life (see ibid.: 4). Furthermore, they continue, attempts at government regulation can increasingly be observed (see ibid.: 6), as in the case of the legal battles in California surrounding the question of whether Uber drivers ought to be regarded as employees (see ibid.: 10). Although the authors find the idea of viewing data as another fictitious commodity in the Polanyian sense inspiring, they are not entirely convinced by it: in their view, raw data becomes a commodity only when processed by algorithms and human beings: “Being a by-product does not make something a fictitious commodity.” (ibid.: 13) Besides this, the authors write, the platforms’ business model consists precisely of extracting value from data, which is why the classification as “not produced for sale” would appear inaccurate in this case, while it is also “uncertain how much greater analytic precision is gained by labeling it a fictitious commodity.” (ibid.: 14) It is quite likely that a degree of uncertainty regarding that last point will arise in every attempt at theoretical classification. Still, the second point concerning the processing by human beings does not convince me, for even if labour itself remains an essential source of value in digital capitalism, this does not rule out the commodity character of data as raw material or of processed data as end product.

But let us return to the original. It is not the question of the commodity fiction that lies at the heart of Polanyi’s considerations, but, at least most importantly, the altered function of the merchant. According to Polanyi, the reason why a form of production that used specialised, complex and expensive machinery could be introduced in a commercial society was that this new form of production could be made compatible with the existing dominant economic mechanisms—buying and selling—namely by the central actor called ‘merchant’ (see 2001: 43). So, as we can see once more: that which is new must link up with what is already there, and actors who have been powerful thus far are also the protagonists who pave the way.

That is not to say that the protagonist of the old economic model is simply handed a new toy. Something about the mechanisms themselves changes, and something about the role of the protagonists, too. As a result, as Polanyi shows, everything remains the same on the sales side: the merchant continues to sell products on markets. On the buying side, however, crucial changes occur: The merchant no longer buys finished products which he can sell on to others with a surcharge, but begins to acquire entirely different commodities: labour power and raw materials. Yet, seeing as they have to be brought into a systematic inter-

play, the merchant takes charge of an additional task and assumes a new role. He becomes an entrepreneur, a commercial capitalist—a ‘merchant-producer’—at whose command labour forces now produce new finished products from the raw materials: “[Labor capacity and raw materials] put together according to the merchant’s instructions, plus some *waiting* which he might have to undertake, amount to the new product.” (ibid.: 43; emphasis added)

Polanyi’s use of the term ‘waiting’ at this point is somewhat surprising. It only becomes clear if we compare the new function of the merchant with that of their historical predecessors. Yet this also allows Polanyi to remain silent on what actually occurs during this period of ‘waiting’—and what takes centre stage in the Marxian analysis, namely the actual act of production. Needless to say, it is only the merchant-producer who is ‘waiting’, while the workers are doing the opposite: they are getting to work. It is at least noteworthy that Polanyi, who otherwise strives to conduct such detailed and lucid economic analysis, displays a moment of remarkable evasion here. Production itself remains a black box, impenetrable to both Polanyi’s analytical view and the merchant. And yet, at the same time, what is going on inside that black box is supposed to be commissioned and set in motion by the merchant. In this instance, Polanyi’s argument exhibits a peculiar blind spot, though it has little impact on his analysis as such. After all, Karl Marx has already thoroughly engaged with—to continue with the metaphor—the content of that black box in great detail and sees it as the origin of profit. What concerns Polanyi, by contrast, is the significant impact the changes on the buying side have on society.

“Contrast, for example, the merchant-producer’s selling activities with his buying activities; his sales concern only artifacts; whether he succeeds or not in finding purchasers, the fabric of society need not be affected. But what he buys is raw materials and labor—nature and man. Machine production in a commercial society involves, in effect, no less a transformation than that of the natural and human substance of society into commodities.” (Polanyi 2001: 44)

That is to say: on the selling side, the merchant-producer’s actions and the implications thereof do not differ from those of their predecessor: that which is sold—or not, should there be nobody willing to buy—are products. Yet the social structure remains as it was. So, if we consider, in analytical terms, only the selling side, then the commercial and capitalist market society appear unchanged. This differs on the buying side: here, Polanyi locates the actual novelty that to him marks the society-transforming dynamic. The commodities being bought are not some random objects, but raw materials and human labour power. Both nature and humans turn into something they were never meant to be: a commodity. At first glance, it may be objected that the merchant already sold raw materials to trades-

men in medieval times, or slaves to aristocratic households in antiquity. Of course, Polanyi is also aware of that. The particular aspect he refers to is not the fact that nature and human beings are traded like commodities. If the already ongoing commercial process consists of *Purchase of commodity X—Sale of commodity X*—in which the commodity always remains unchanged, regardless of whether it is a finished product, raw material or labour force—then a new factor now enters the equation, changing the process itself: *Purchase of commodity X and Y—Creation of new commodity Z—Sale of commodity Z*. The intermediary step of creating a new commodity—only possible, according to Marx, because human labour is introduced to the process—is, however, precisely the step that Polanyi transfers to the black box of ‘waiting’ and which his analysis fails to address.

As a result of incorporating machine production into the economic mechanisms of commercial society, these mechanisms change. Nature and humans, the natural and human substance of society, are made general commodities. Polanyi locates the society-transforming potential of the *Great Transformation*—which to him is as complete and irreversible as the metamorphosis of a caterpillar into a butterfly (see *ibid.*: 44)—on the buying side, precisely because this is where the substance of society becomes a commodity. What is inevitably linked to this, in Polanyi’s view, is the fact that production is constantly fed with raw materials and labour forces which, correspondingly, must be available for purchase in sufficient amounts, or numbers, rather (see *ibid.*: 43). Yet the selling side is also important to him, even though he does not attribute a transformative quality to it. After all, the merchant is only “fitted to do so as long as this activity will not involve him in a loss.” (*ibid.*) And, given that the machinery in use is expensive, one thing must never cease: the constant sale of the produced commodities (see *ibid.*).

On the whole, we may deduce two important insights from the analysis of the first *Great Transformation* for our study of digital capitalism: firstly, the question arises as to whether we are seeing the repetition of something generically similar. Are new technological options being integrated into existing economic processes (of production capitalism) and having a transforming impact on existing society? And, secondly, the question must be answered as to where the transformative quality really lies. Is it the buying side once again? Or is it more closely linked to the selling side? In this search for what is really new about digital capitalism, should we perhaps also take a peek at the content of the black box Polanyi refers to as ‘waiting’ time? We will continue to pursue both of these directions of inquiry. But first, let us return to Karl Marx, for he also links that which is substantially new about production machinery to the economic mechanisms without one-sidedly exaggerating the causal impact of either side. In contrast to Polanyi, however, he places the act of production at the heart of his analysis of capitalism.

4.2 Marx's development of the productive forces

Karl Polanyi's merchants simply spend their time between the purchase (of raw materials and labour) and the sale (of the finished commodity) 'waiting', Marx views what happens precisely during this time to be crucial. He concentrates on the act of production, in which, through the interplay of human labour and added raw materials, something new is created: it is here that we find the genesis of value. Value is created that did not previously exist. A value that has two sides to it: exchange value and use value (see Chapter 3). The produced commodities engender both of these sides precisely because that is what they are: commodities, produced for the market. This analytical distinction is not only at the heart of Marx's analysis. As we have seen, Polanyi also identifies the commodity form as alien and endowed with a transformative quality. To Marx, however, the period of 'waiting'—or, more precisely, of production—is famously important for another reason: it is the origin of profit and surplus value because human labour creates more values than its own exchange value costs; after all, it has itself become a commodity. It would appear highly unlikely that Polanyi, who references Marx in various instances,⁶ should have been unaware of how central this, as he calls it, 'waiting' time, is to Marx.

If we read the original passage containing Polanyi's above cited notion that it is merely a fiction to view nature and human beings as commodities, it does sound quite closely in line with Marx. According to Polanyi, the names and descriptions we use are the problem ('wage labour' instead of 'activity', 'land' instead of 'nature', 'money' instead of 'purchasing power'). None of this was originally produced to be sold, which is why he considers the commodity ascription to be fictitious:

"Labor is only another name for a human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that

6 Polanyi avoids Marxist terminology, even though he is concerned with the same phenomena and analytical implications. Correspondingly, Polanyi's merchant in the market society is no different from the capitalist in capitalism. Nor does Polanyi explicate that there is no substantial difference between the purchase of raw materials and finished products, but there undoubtedly is between the purchase of these two goods and that of labour power. He does mention Marx in several instances, referring to him as the "state-socialist" (2001: 113). Particularly with regard to the debates of his day surrounding the issue of poverty, Polanyi considers Marxian economics to be too close to Ricardo and liberal economic views, and in this sense "an essentially unsuccessful attempt" (ibid.: 131). For instance, Polanyi refers to the 'Ten Hours Bill' of 1847, which Karl Marx celebrated as the first victory of socialism, as no more than the "work of enlightened reactionaries" (ibid.: 174). However, Polanyi also differentiates between a popular Marxism with a narrow class theory and the actual philosophy of Karl Marx, which by all means views society as a totality and takes non-economic human nature into account (see ibid.: 158).

activity be detached from the rest of life, be stored or mobilized; land is only another name for nature, which is not produced by man; actual money, finally, is merely a token of purchasing power which, as a rule, is not produced at all, but comes into being through the mechanism of banking or state finance. None of them is produced for sale. The commodity description of labor, land, and money is entirely fictitious." (Polanyi 2001: 76)

In a footnote on the same page (see *ibid.*: 76), then, Polanyi clarifies that his argument differs from that of Marx, or rather pertains to an object that is distinct from that of Marx: the latter's thesis on the fetish character of the commodity value, Polanyi states, refers only to the exchange value of genuine commodities and has nothing to do with Polanyi's fictitious commodities. One might suspect what Marx might have replied: the exchange value only arises because human beings turn something into a commodity—and this constitutes a fiction to Marx as well (because: it is unnecessary); or, rather, as for Polanyi: a fiction with considerable implications (see Chapter 3.2). In this instance, Polanyi seems to be much closer to Marx than he would have admitted. After all, Marx also regards the socially transformative force of capitalism to be constituted by the fact that it commodifies that which was never meant to be a commodity:⁷ humans and nature; human activities in a metabolic interplay with nature. In his analysis, Marx focuses on the cause of transformation and repeatedly emphasises that he will initially ignore other aspects.⁸ That is what we shall also do for now, and instead turn to the production

7 This ultimately normative dictum cannot only be found in Polanyi (indeed, the better part of his entire argument is based on it), but also in Marx—if we understand his Early Writings not as youthful misdeed, but as an expression of the more comprehensive perspective of his critique of capitalism (on the debate concerning the significance of Marx's Early Writings, see Pfeiffer 2004, pp. 153–159). (on the debate concerning the significance of Marx's Early Writings, see Pfeiffer 2004: 153–159)

8 This explosive force in the ideas of Karl Marx is underestimated and overlooked in the (both sympathetic and critical) engagement with his work: as the philosopher that he is, his strategy often consists of initially reducing economic processes to their bare core in order to then conduct an analysis that would be impossible when considering the empirical phenomena alone. Yet to deduce from this that Marx in fact really viewed the world and its workings in such a reductionist way is an utterly mistaken conclusion. Unfortunately, even in the social-science debate, we have to some extent unlearned the art of struggling for an analysis that provides the greatest possible lucidity. Semantic precision and the clear spelling out of what is being considered analytically and what, for that very reason, is being analytically (but not in real terms or empirically) omitted would mark a competence that has to be once again taught and learned in the social sciences (I am not exempting myself from this criticism of the discipline; it is a collective deficiency which requires a collective effort to be overcome). At the same time, even the most beautiful and intellectually sophisticated analysis can become somewhat bloodless if it abandons empirical verification procedures and the will to correlate or compare the one with the other.

side of commodities, Polanyi's 'waiting' time, and thus to the analytical level of value genesis. The greater the discrepancy between expended human labour and its price for a certain period of time, the more (surplus) value is created. We need not even delve any deeper into the details of the Marxian analysis at this point (and explain, for example, the difference between variable and constant capital, or between absolute and relative surplus value). For now, it suffices to establish what everyone knows: every business enterprise will naturally seek to generate a surplus in commodities and thus in newly created value per purchased hour of labour power. The lower the wages, the more standardised the procedures, the faster the labour forces, the more innovative the product and process engineering technologies and, most importantly, the more effective the applied technical and organisational measures are, the easier it is to achieve such value generation. Seeing as all enterprises constantly advance along this path, a more generalised process ensues, which Marx refers to as the development of the productive forces.

In the introduction to their edited volume, *Marx und die Roboter* [*Marx and the Robots*, forthcoming in English], Sabine Nuss and Florian Butollo address four functions of the term 'productive forces' (also: 'productive power') (see 2019: 12–17). According to the authors, the term helps sensitise us to the fact that the "the development of the productive forces is not an end in itself, but rather a mere means for capital accumulation"; it facilitates "a more precise definition of what is really new and revolutionary and what is not" (ibid.: 12, 13; translation amended), which is why it illustrates that the current changes are part of an historical continuity; the term also takes into account the meaning of cooperation, qualification, science and hierarchical forms; finally, it also directs our attention to the relationship between the development of the productive forces and the relations of production. From this perspective—and this applies especially to the second point—the term 'productive forces' relegates digitalisation, in materialist terms, to a more modest position (ibid.: 13). Correspondingly, they see no indication of any second *Great Transformation*, but rather of continuity, i.e. of capitalism with digital means.

As is so often the case, a glance at the original proves illuminating. Karl Marx and Friedrich Engels carve out the concept of the productive forces primarily in the texts *The Poverty of Philosophy* (1976a) and *The German Ideology* (Marx/Engels 1976b). Yet the development of the productive forces is far more than a term. It is a complex—as we would say today, socio-technical—concept that draws a connection between the interplay of society and economy and of change and transformation and, at the same time, takes the micro-, meso- and macro-dimensions and their interrelatedness into consideration. For that reason alone, it ought to be clear that you cannot reduce the development of the productive forces to a single facet, such as (digital) means of labour. That said, dismissing the latter would equally contradict the concept:

“Machinery is no more an economic category than the bullock that drags the plough. Machinery is merely a productive force. The modern workshop, which is based on the application of machinery, is a social production relation, an economic category.” (Marx 1976a: 183)

In this instance, Marx differentiates between the productive forces and the relations of production to which they correspond, i.e. how and for what purpose production takes place. Both converge in the factory. To Marx, of course, this means that the purpose of production in the capitalist factory is profit. Or, to put it in less Marxist terms (although saying the same thing, which can also be found in any random corporate mission statement): the objective of the company is to successfully create growing value added. Up to here, Marx essentially agrees with today's business consultants and business economists, although he does disagree with them regarding the source of profit, or 'value added', and how profit is socially distributed. Besides that, he would most likely argue with them spiritedly on the question of whether profit and value creation (and the concomitant relations of production) allow for economic and social progress in the long term.

That is why the factory, to him, represents an economic category, even though—and Marx was the last person to deny this fact—it is simultaneously an assembly of technical (and human) productive forces of a very special kind. Marx also sees the labour forces and the respective abilities and skills as productive forces. Yet if the relations of production are capitalist in nature, then the technology, in a way, turns against the humans, then “[...] the appliance of machinery is but one of the many methods for increasing the productive powers of labour. This very same development which makes common labour relatively redundant simplifies on the other hand skilled labour, and thus depreciates it” (Marx 1985: 147)

Here, Marx addresses issues that are also being discussed in the context of today's digitalisation debate: namely, the question of how, or rather to what extent, technological advancement is being used to replace human labour and, at the same time, standardise human tasks. Unlike the claims put forward in the current academic and public discourse, to Marx this is in no way a question of technology *versus* human beings. In other words, Marx is less concerned with the rivalry between these two productive forces than with the relations of production and their economic dynamic, which causes business enterprises to try to outdo one another in the race to minimise the share of the productive force 'labour' (i.e. human beings) through the greatest possible use of the productive force 'technology' (which, to Marx, can only occur to a limited extent, as the former constitutes the actual source of profit).

Similarly, the current debate on digitalisation is hardly conceivable without the topic of 'innovation'. For the most part, it is interpreted as the main lever and driving force of technological development or attributed to the genius of individ-

ual entrepreneurs.⁹ Freidrich Engels, who engaged thoroughly with the technological innovations of his time (ranging from electricity to chemistry to the Theory of Evolution), groups innovations with the productive forces, although they do not always achieve the desired effects, captured in his sardonic subsequent phrase: “That in a good many cases the productive power of labour is increased by inventions and discoveries (but also that in very many cases it is not increased, as is proved by the mass of waste-paper in the archives of every patent office in the world) we knew long ago.” (Engels 1987: 206)

Concerning a holistic conception of economy and society, of technology and labour and of innovation and change, the concept of the development of the productive forces is more comprehensive and up to date for an interpretation of present-day digitalisation than many would think.

The forces and relations of production together constitute the mode of production. We could also say: what Karl Polanyi encapsulates in the term *Great Transformation* is the establishment of capitalism as a new mode of production to Marx. Indeed, this is precisely what Sabine Nuss and Florian Butollo are implying when they speak of a more modest position of digitalisation: although the productive forces may be currently undergoing a process of change, the capitalist relations of production are not (at least not automatically)—although it is precisely this hope that seems to resonate in the works by Jeremy Rifkin and Paul Mason. Most diagnoses of society under digital capitalism, however, follow a more pessimistic interpretation of current processes and place less emphasis on emancipatory potential. They are convinced that the mode of production that emerged during the *Great Transformation* and to this day, by and large, has brought its processes and operations to perfection is becoming more expansive and yet more volatile (and, in a Marxian dialectical reading, is thus also inevitably ‘co-perfecting’ its own limits and contradictions).

According to Marx, the productive power of labour is determined by an overall social diversity that is of a dizzying scale, especially when trying to devise a research design that represents all these factors and traces their changes and mutual interrelations. Its main determining factors, he states, include the natural conditions of labour, such as the soil’s fertility, the availability of natural resources, etc., and the “progressive improvement of the Social Powers of Labour, such as are derived from production on a grand scale”, which includes the “concentration of capital and combination of labour, subdivision of labour, machinery, improved methods, appliance of chemical and other natural agencies.” (Marx 1985: 125) Yet Marx does not stop at the material base, but also lists aspects which

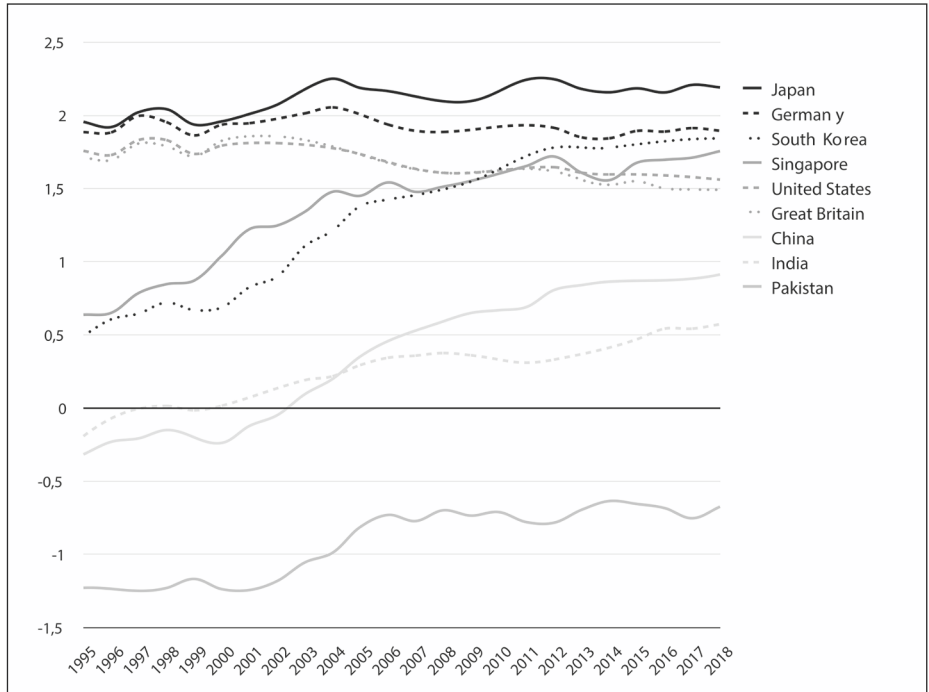
9 Mariana Mazzucato (2015) has contributed considerably to demystifying this one-sided interpretation—unfortunately, without changing much about the dominant discourse, despite all empirical evidence.

would most likely be regarded as marking the crucial difference between digital capitalism and its industrial predecessor today: the “shortening of time and space by means of communication and transport, and every other contrivance by which science presses natural agencies into the service of labour, and by which the social or co-operative character of labour is developed.” (ibid.) Yet none of this simply happens coincidentally, let alone as the inevitable consequence of technological change (although the latter may well play a significant part in the process), but for a very specific purpose: reducing the share of living labour per product (see ibid.).

Incidentally, some economic studies that appear entirely unsuspicious of Marxism are a good example of the foresight Marx and Engels displayed. In their *Economic Complexity Index* (ECI), César A. Hidalgo and Ricardo Hausman seek to empirically represent at least some of the phenomena which the two key economic thinkers capture in the concept of the development of the productive forces (albeit without referencing Marx and Engels directly or citing the term ‘development of the productive forces’). According to the authors, the complexity of a national economy increases in relation to the level of diversity of the products it exports and the volume of non-tradeable goods it produces, such as property rights, regulations, infrastructures and specific skill levels of labour forces, i.e. resources which cannot simply be imported or copied by other countries (Hidalgo/Hausmann 2009). It would also be accurate to say that the ECI seeks to represent the complexity of a national economy based on the diversity of useful knowledge, or knowledge that is used in that specific economy. This diversity of products is included in the index as a measurement parameter, as is the relative export of products, i.e. how many other countries export similar products.

Figure 1 shows some ECI values for selected countries between 1995 and 2018. Japan and Pakistan are included to underscore the value range: while Japan, Switzerland and Germany have been ranked top for a long time, Pakistan is one of the lowest-ranking countries (as well as having comprehensive data available for all years covered by the index). From the perspective of the development of the productive forces, we could interpret this chart in the sense that the productive forces built up in countries like Japan and Germany since the *Great Transformation* are stagnating at a high level, while they are currently being developed in South Korea, China, India and Singapore, albeit following distinct trajectories and dynamics. In the UK and the United States, by comparison, a decline in the development of productive forces can be ascertained, beginning around the end of the New Economy. This may seem surprising, seeing as the US is the home of GAFAM, yet the (regional) impulses emanating from Silicon Valley are apparently unable to offset the downward dynamics in other regions of the US like the Rust Belt.

Fig. 1: Development of economic complexity



Data basis: extract from the Economic Complexity Index 1995-2018 (OEC 2020).

The index was also complemented by additional data pertaining to immaterial goods and used for growth and income forecasts (Albeaik et al. 2017; Hartmann et al. 2017; Hausmann/Hidalgo 2011), and it received some criticism regarding its content and methodology (Kemp-Benedict 2014). Yet, on the whole, given its effort at completeness in the sense of a quantitative national economic balance, the index probably captures best what Marx and Engels refer to as the productive forces.¹⁰ The development of the productive forces is thus just as much the result as the precondition of the competition between corporations and countries.

¹⁰ Hidalgo also published a book more recently in which—if you will, quite similar to Engels—he seeks to establish a material parallelism between natural-science dynamics and economic developments. Although it does amount to an inspiring read, it is ultimately unconvincing. The only thing worth mentioning with a view to digital capitalism is that Hidalgo interprets information in a physical sense: “The word information became a synonym for the ethereal, the unphysical, the digital, the weightless, the immaterial. But information is physical. It is as physical as Boltzmann’s atoms [...]. Information is not tangible; it is not solid or fluid. [...] Information is incorporeal, but it is always physically embodied. Information is not a thing; rather, it is the ar-

“The relations of different nations among themselves depend upon the extent to which each has developed its productive forces, the division of labour and internal intercourse. [...] But not only the relation of one nation to others, but also the whole internal structure of the nation itself depends on the stage of development reached by its production and its internal and external intercourse.” (Marx/Engels 1976b: 32)

With the onset of capitalism, the development of the productive forces is accelerated and expanded on a scale unprecedented in human history. Marx repeatedly pays homage to this aspect, and, as is probably well known, considers capitalism to be an historical stage in the development of humanity that is just as indispensable as it requires overcoming. The Marxian diagnosis (or, rather, prediction) is gleefully and frequently attacked for its notion of an historical quasi-inevitability, not least because, in the so-called actually-existing Socialist countries, this idea in particular was reduced and endlessly, boldly and simplistically spelled out and parroted under the banner of historical materialism. And yet, the basic notion of a development for the better is a very modern idea, variations of which can be found in a vast range of schools of thought and theories. What is currently new about this idea is that the utopias are being devised and framed by the tech corporations of the world and discursively marketed and sold by business consultants. Although these utopias do always entail the now proverbial ‘make the world a better place’, one thing is never called into question: the dominant economic logic of distribution.¹¹ But that is, of course, precisely what concerns Marx in particular. And this applies not, as is often insinuated, ‘solely’ to direct exploitation, i.e. capitalists appropriating the surplus value that the workers dependent on them have created. Marx is more concerned with a greater and more all-encompassing contradiction that can only be grasped through a broader understanding of his notion of productive forces. For the crux of the matter is: what evolves and unfolds so

rangement of physical things. It is physical order, like what distinguishes different shuffles of a deck of cards. What is surprising to most people, however, is that information is meaningless [...]” (Hidalgo 2016: xv)

- 11 In the utopias of Silicon Valley, deregulation is in fact being promoted and driven forward quite consciously. There are long-standing precursors in this regard: from the influence of market-libertarian objectivism along the lines of Ayn Rand on the post-humanist ideas of important entrepreneurs in Silicon Valley (see Murnane 2018) to the so-called Californian ideology, which combines traits as contradictory as “the free-wheeling spirit of the hippies and the entrepreneurial zeal of the yuppies” (Barbrook/Cameron 1996: 44). This can currently be empirically verified in the intentionally instigated discourses via institutional coalitions between tech companies and venture capital (see Rothstein 2020). Besides this, global actors can be identified who tie considerable economic interests to the seemingly purely technologically inspired discourse of the digital future (Pfeiffer 2017).

dramatically and impressively with the emergence of capitalism is ultimately no achievement of the market, nor of individual entrepreneurs. This process, which continues to this day, is a huge social achievement (though there is the related collateral damage that is at least as immense). That is precisely why the fruits of this achievement should be returned to society as a whole (while the negative consequences and risks should equally not be borne by just one part of society alone). The owner of the manufacture, who gradually turns into the factory owner, does not successfully accomplish this transformation of simple means of production into powerful productive forces

“without transforming them, at the same time, from means of production of the individual into social means of production only workable by a collectivity of men. The spinning-wheel, the hand-loom, the blacksmith’s hammer, were replaced by the spinning-machine, the power-loom, the steam-hammer; the individual workshop by the factory implying the cooperation of hundreds and thousands of workmen. In like manner, production itself changed from a series of individual into a series of social acts, and the products from individual to social products.” (Engels 1987: 256)

The vigorous attacks Friedrich Engels launches at his contemporary Eugen Dühring in this ‘Anti-Dühring’ text show the society-encompassing scope in which the economy is conceived here. The text offers a stark reminder of how strongly we experience and comprehend the dominant economic principles of today as given and unchanging—without alternative, as it were. Karl Marx, also engaging critically with one of his contemporaries, Pierre-Joseph Proudhon, emphasises “[...] that men make cloth, linen or silk materials in definite relations of production” but “that these definite social relations are just as much produced by men as linen, flax, etc.” (Marx 1976a: 165–166) Most importantly, however, it becomes clear how comprehensively Engels and Marx conceive of economy, society and change. And we can see the extent to which material-physical conditions and social and economic conditions are interwoven:

“Social relations are closely bound up with productive forces. In acquiring new productive forces men change their mode of production; and in changing their mode of production, in changing the way of earning their living, they change all their social relations. The hand-mill gives you society with the feudal lord; the steam-mill, society with the industrial capitalist.” (ibid.)

The call issued time and again by economic sociology to consider the economy as embedded in society; the social aspects of technology which the sociology of

technology has repeatedly emphasised; and even sociology's '*material turn*'¹² and the fear of technological determinism¹³—none of this would even have to be mentioned if we, in the sociology department, were able to overcome the discipline-based division of labour and consider, in the sense of Karl Marx's forces and relations of production, the bigger picture in all its complexity and with all the inherent interrelations. Marx even goes one step further, taking into account social change and the discursive level as well—these integral parts (and simultaneously the expression) of the forces and relations of production:

"The same men who establish their social relations in conformity with their material productivity, produce also principles, ideas and categories, in conformity with their social relations.

Thus these ideas, these categories, are as little eternal as the relations they express. They are historical and transitory products.

There is a continual movement of growth in productive forces, of destruction in social relations, of formation in ideas; the only immutable thing is the abstraction of movement [...]." (Marx 1976a: 166)

Even if one is reluctant to follow Marx, many would most likely intuitively agree with the last phrase in this quote as an accurate diagnosis of our present day: we live in the midst of a constant movement, the destruction (and creation) of social

12 In contrast to what the term '*material turn*' may suggest, it has not led to the social sciences taking the material more seriously. Historian Jan Keupp (2017), tired of the interdisciplinary links being forged with sociology, sums this up in a wonderful polemic: he laments that the "self-referential theoretical caprioles" are "hardly substantial" and sees them as a "refusal to commit oneself to clear standpoints and observant perspectives"; much like the "pot and the potter", "humans and things, sense and being" are blended into a "fleeting, sheer incomprehensible amalgam" (ibid.; translation amended).

13 Ever since a German sociologist proclaimed the "end of technological determinism" (Lutz 1987), the interest in the material aspects of technology has largely been lost in the German sociology of work and industrial sociology. At the time, Lutz did not even reject taking technology seriously, but the notion that this necessarily implies social consequences. On the contrary, he actually made very specific proposals as to how sociological technology research could be flanked institutionally. Had his advice been heeded at the time, sociology would most likely be able to contribute significantly more to the current digitalisation debate and, more importantly, draw on a far greater theoretical and empirical material in order to answer the question of 'what is really new?'. Karl Marx and those who build on his ideas have been accused time and again of deterministic conceptions (see, for example, Dafoe 2015; Kline 2001), although it is precisely the multi-layered concept of the productive forces that illustrates the baselessness of such accusations.

relations, the formation of ideas—all of which can be found in the discourses surrounding the digital transformation. Yet there are many who have used Marx's analytical lens to examine current changes and addressed the Digital drawing on the concept of the development of the productive forces. These current diagnoses will take centre stage in the following step—and, who knows, we might just encounter that last piece of the puzzle we are looking for to understand digital capitalism.

4.3 The productive forces and digital capitalism: reductionism and misunderstandings

Of course, it seems natural to apply the Marxian term 'productive forces' and their development to digital capitalism. After all, all the analyses cited here pertain to a fundamental change in capitalism, which is (also) linked to a change in technology. If we did not know better, this would appear as a veritable invitation. And yet, the analyses of digital capitalism presented here (see Chapter 2) largely ignore the term 'forces of production'. This is indeed rather surprising. Dan Schiller (2014) does not use the term 'productive forces' once; though he does speak of 'productive capacity' here and there, but refers to nothing more than quantitative production capacities, which, for example, increased after World War II (see *ibid.*: 21), or virtually exploded as a result of the production networks of multinational corporations expanding during the 20th century (see *ibid.*, p. 38). Michael Betancourt hardly uses the term productive forces, except in the context of his diagnosis that the role of capital will shift from that of a means of storing or representing value towards one denoting a claim to future productive forces (see Betancourt 2015: 174).¹⁴

With regard to the development dynamics of the productive forces, we may recall one of the three *laws on dialectics* Friedrich Engels outlines and in which he assumes, based on observations, for example, in thermodynamics, that the transition from quantitative increase to qualitative change could also apply to socio-historical processes as an almost naturally-occurring dynamic. At first glance, it may seem plausible to revitalise this outdated approach. Ultimately, the more recently popularised concept of 'singularity' (Kurzweil 2005) follows a similar line of thought (albeit entirely without any intention of criticising capitalism—*au contraire*). Ray Kurzweil transfers erratic dynamics from biology to technological and

14 Most of the time, Michael Betancourt does not even use the term 'productive forces', but instead, for instance, "production capacity" (2015: 14), which ought not to be confused with one another. After all, according to Marx, the workers' skills are part of the productive forces, but not identical with them.

social developments, and he is also concerned (although he certainly does not see himself in the tradition of Engels) with the hypothesis of a natural law that manifests itself in processes initiated by human beings; and to Kurzweil, too, quantity (exponentially growing Artificial Intelligence) eventually leads to a change in quality (a technological consciousness in its own right, i.e. the singularity). This view shows a kind of religious fervour. If we were to interpret digitalisation as a qualitative turning point in the productive forces, however, there is substantial need for clarification: what exactly is increasing quantitatively (the expansion of the cyberspace, the number of people who work in it, a concomitant increase in productivity?) and what exactly is qualitatively new (a different, more global, or even a self-transcending capitalism)?

Pointing out what is new, then, does not yet constitute an analysis. That might be the reason why it is so successful: this way, the reader who is critical of capitalism may feel just as personally addressed as those believing in the singularity; the left-wing trade unionist feels as close to the intensifying contradictions of late capitalism as the consultant who has adopted a currently rather successful business model that has harnessed the very disruptive transformation proclaimed in the course of digitalisation.

Christian Fuchs references Marx when proposing “[to] think about the Internet dialectically just like Marx thought about technology in capitalism as being shaped by an antagonism between productive forces and relations of production.” (2015: 37) He illustrates this contradiction (albeit not entirely convincingly) with a view to the problem of orienting a supposedly public Internet towards the common good and the new possibilities of surveillance and valorisation of private user behaviour (*ibid.*). Mike Wayne also vaguely references the Marxian concept of the development of the productive forces when distinguishing between the three sides of productive forces, namely machinery, human labour capacity and natural resources, as long as the latter are made accessible through human labour (see Wayne 2003: 38–60; in particular: 39). On the whole, neither of the two authors establishes any kind of elaborate links between digital capitalism and the Marxian theorem of the development of the productive forces. In sum, the reviewed body of work concerned with applying the Marxian concept of productive forces to the Digital has so far failed to provide us with the piece of the puzzle that we are missing for a comprehensive understanding of digital capitalism.

As we have seen, the development of the productive forces entails far more than an increase in productivity. And yet, there is one connection that keeps resurfacing. Many individual measures introduced by companies to increase productivity substantially contribute to the permanent development of the productive forces. So, whoever speaks of the Marxist concept of productive forces will not be able to avoid the term ‘productivity’. Yet productivity and its growth is regarded as a legitimate and central objective of entrepreneurial activity and, from a non-Marx-

ist perspective, a driver of the application of technology on the shop floor, too. Given the increasing application of digital technology, however, the link between the use of technology and productivity increase is becoming weaker. Digitalisation seems to be a peculiar variant of technology, or rather, a technological productive force that is unreliable in its productivity—as the repeated diagnosis of a so-called productivity paradox can be found only in connection with precisely this productive force (i.e. digitalisation). What does this mean?

As is well known, productivity is one of the key economic indicators, linked to the expectation of lasting growth—and whenever productivity does not increase, investors and economists get nervous. During each new digitalisation hype—first Industry 4.0, now Artificial Intelligence and Machine Learning—the business consultants and business associations frantically try to outdo one another with sometimes breathtaking forecasts of growth in value creation and productivity. That is, of course, always on the condition that businesses and the national economy do not miss the hype and invest in the new, promising technologies. That is the message to the—sometimes rather hesitant—traditional entrepreneurs. In fact, this message—investment in productivity increase—harbours a contradiction, at least in the short term, as major investments initially lead to a decrease in both (at least for those who are investing): value creation and productivity. But in the slightly longer term, there is an expectation of even greater growth.

Another aspect that is repeatedly mentioned in the context of digitalisation is the productivity paradox, most prominently by the following quote: “You can see the computer age everywhere but in the productivity statistics.” (Solow 1987: 36) This witty phrase is not from a conclusion of a study on the topic, but from a one-page book review in the *New York Times* (of Cohen/Zysman 1987), which addresses not digitalisation but productivity. Although Robert M. Solow has been awarded the Nobel Prize for his neoclassic model for calculating growth (1956), he himself never actually conducted a study on the link between IT and productivity. He later self-critically admitted that, in order to obtain straightforward results, he conceptualised technological change as exclusively beneficial to capital and neglected effects that benefited employment or output (2007: 13).¹⁵

Added to this is the fact that the existing empirical evidence is inconclusive: while at least half of the decline in productivity growth between 2010 and 2014

15 Following Solow's interpretation in the aforementioned book review, the reviewed authors as well as everyone else were 'somewhat embarrassed', given that the technological revolution everybody could sense was not showing in the form of productivity growth. Although the authors, in their study on the significance of production, do make a far more important statement regarding the object of our study here—which is the productive forces, and not just productivity—that would these days probably be discussed using the catchword eco-system: “Advantage in a national economy is embodied not simply in the capacities of specific firms but in the web of interconnections that establishes possibilities for all firms” (Cohen/Zysman 1987: 102).

can be ascribed to a decline in demand, only the other half can be explained by the subsiding of the IT-induced productivity boost, particularly in the United States (see Bughin et al. 2018). Other calculations suggest that billions of dollars' worth of immaterial goods have been produced for IT-related capital that never actually made it into the national accounts. The output and productivity effects of so-called base technologies are initially underestimated and later overestimated once the earnings of the immaterial investments start to roll in (see Brynjolfsson et al. 2018). A meta study (Biagi 2013) on the productivity effects of digitalisation detects an IT-related productivity increase even between 1995 and 2005, especially in the US, which receded only afterwards. Two aspects concerning the numbers presented in this study stand out: the organisational change that commonly accompanies IT investments represents a substantial financial strain on companies and has a negative effect on productivity. Even in the United States, productivity gains occur less in the IT-based manufacturing industries than in the IT industry itself, and above all in wholesale, retail and finance (see *ibid.*: 59–60). In other words: in the sphere of distribution, not production. This finding is no coincidence, but has more systematic reasons (Chapter 5) and entails specific phenomena (Chapter 6) and implications (Chapter 7) to which we will return later.

A more recent approach to calculating national accounts (Rahmati et al. 2020) no longer uses the item of IT investments alone, but instead seeks to depict the extent to which digital elements are being introduced to previously non-digital products and services. This measurement of *digital proximity* suggests a close link with the immaterial value of a company (defined as the relation between market value and asset value). This approach promises more complex answers and—translated across to the object of our study here—not only searches for productivity effects but also more strongly looks for additional indicators of shifts within the productive forces. This represents another hint at the missing piece of the puzzle, though we do not yet have any idea about its place, shape or colour. This limited insight into the sometimes contradictory studies on the productivity paradox proves at least one thing: it appears that digitalisation, in its various manifestations since the 1970s, has been unable to slow down or stop the continuing trend of secular stagnation—i.e. the state of declining growth rates (on the theories, figures and the link with social inequality, see Anselmann 2020). What we need to be explain, then, is why the economy as a whole, businesses and politics have such a great interest in these particular productive forces, which seem to lack precisely one thing: the potential for productivity increase. One reason might be that there are other areas that are deemed better suited for their economically advantageous deployment. We will take up this thread again in Chapter 5. Another explanation, then, might be the expectation of a fundamental transformation of the economy owing to digitalisation and resulting investment strategies that pin their hopes not on today's productivity increase but on tomorrow's business opportunities.

The discourse surrounding the digital transformation, an alleged disruption, exponential development and the leap into the 4.0 world has been with us—and particularly with people in decision-making positions—for some years. Although long-term investment strategies are not regarded as a particular strength of management teams guided by quarterly figures, the transformation factor may nonetheless be part of the explanation. After all, the transformative force of the development of the productive forces cannot only be ascertained by productivity increases, as it manifests itself in far more complex interconnected processes. This can also be found in Karl Marx—which is why we return to some of his remarks in this section: alongside what is also commonly considered a productivity increase today, i.e. when “the mass of the product [increases] in proportion to the labour power employed” as a result of, say, a “mere improvement in methods [...]” (Marx 1998: 231), Marx also addresses two further aspects.

Firstly, the issue of regulation, which is similarly fraught with diverging interests in the current digitalisation debate: “The same occurs, if the productive power of labour [...] is freed from hindrances in communications, from arbitrary or other restrictions which have become obstacles in the course of time; from fetters of all kinds, without directly affecting the ratio of variable to constant capital.” (ibid.) It is a well-known fact that the digital economy in particular is very keen to ‘liberate’ labour as far as possible from existing regulations. This circumstance has long motivated social and labour disputes. In the context of paid work, this ranges from legal attempts in the state of California to declare the officially self-employed drivers at Uber and Lyft company employees, to Amazon’s attempts to prevent unionisation (see Cattero/D’Onofrio 2018) or to fight corresponding efforts by means of veritable (counter)intelligence operations, i.e. union busting campaigns.¹⁶ In the area of unpaid work (such as that which we all perform when we use Internet search engines or social media) or in questions concerning net neutrality, this also includes the considerable lobby efforts orchestrated by the large tech corporations which have repeatedly sought to influence legislative initiatives advancing work safety or digital sovereignty (see Popiel 2018).

16 Seeing as Amazon regards union and environment-related activities by workers as such a risk, the company has hired private investigators Pinkerton to spy on their workers (see Gurley 2020). Pinkerton has been notorious for more than 170 years in the field of union busting, among other things, and was also involved in the false testimony that led to the executions of Ferdinando N. Sacco and Bartolomeo Vanzetti (see Young 1985: 27–29, 31–32 and 48–52). Facebook, Google and Apple also collaborate with the detective agency, although it seems that they do so mainly to prevent tech leaks (see Solon 2018). The Pinkerton National Detective Agency may be one of the oldest and most infamous among these detective agencies and consulting firms, yet a lucrative “union busting industry” (see Young 1985: 97–117) has in fact been established all over the world since the end of World War II.

Secondly, Marx also already addresses what would today perhaps feature under the heading of ‘taker takes it all’—an amalgamation of the ‘winner takes it all’ strategy and Mariana Mazzucato’s (2018) distinction between ‘makers’ and ‘takers’: while the ‘winner takes it all’ strategy mostly refers to network effects which then prevent other players, say, in the area of social media, from achieving the required scale, this amalgamation rather denotes business success on the backs of others, on a path that was cleared by the pioneer companies, or by use of inventions and infrastructures that were publicly funded. In fact, we can find both in Marx, too: the ‘winner takes it all’ businesses, in which “[...] a manufacturer who employs a new invention before it becomes generally used, undersells his competitors and yet sells his commodity above its individual value, that is, realises the specifically higher productiveness of the labour he employs as surplus labour. He thus secures a surplus profit.” (Marx 1998: 236) But also the ‘taker takes it all’ strategy:

“The far greater cost of operating an establishment based on a new invention as compared to later establishments arising out of their ruins, *ex suis ossibus*.¹⁷ This is so very true that the trail-blazers generally go bankrupt, and only those who later buy the buildings, machinery, etc., at a cheaper price, make money out of it. It is, therefore, generally the most worthless and miserable sort of money capitalists who draw the greatest profit out of all new developments of the universal labour of the human spirit and their social application through combined labour” (Marx 1998: 106)

One may refer to such processes as ‘integration of external knowledge’ and thus legitimise the enticement of talent, the buying up of companies or the Lead User method (see Pangarkar 2018). Or one can appropriate the ‘innovation spillovers’ and risk business, legal and ethical dilemmas (see Cieřlik 2017: 157–194). Jerzy Cieřlik cites the famous example of the graphic user interface, which was invented by Xerox, developed by Apple and used by Microsoft. Here, he quotes Bill Gates’ response to the accusation from Steve Jobs that Microsoft stole this technology from Apple: “Well, Steve, I think there’s more than one way of looking at it. I think it’s more like we both had this rich neighbour named Xerox and I broke into his house to steal the TV set and found out that you had already stolen it.” (Isaacson 2011; quoted in Cieřlik 2017: 177, emphasis in italics in the cited work)

17 The translation stated in a footnote reads: ‘from its bones’ (see *ibid.*).