CHAPTER 2

Theorizing Inequalities

Abstract This chapter aims to introduce the concept of social inequalities and how this phenomenon evolved over the years. This brief theoretical excursus introduces those basic ideas and concepts that are useful to reflect on how the advent of digital technologies might have exacerbated social inequalities. ICTs are cementing already existing social inequalities, both on a macro level, given the raise to a new digital oligarchy, and on a micro level, reinforcing inequalities between individuals. After a brief theoretical and historical excursus, this chapter looks at how the advent of technologies may become a barrier of social mobility and how, by concentrating resources and wealth in few hands, the digital revolution is giving rise to digital oligarchy.

Keywords Inequalities • Digital oligarchy • Digital underclass • Algorithms

This chapter aims to briefly introduce and theoretically explain the concept of social inequalities and how this phenomenon evolved over the years. Several disciplines, from sociology to economy, from psychology to anthropology, have proposed different ideas and approaches to analyse and understand the social process that determines people’s access to social rewards, depending on their characteristics and features. Due to the complexity of this topic, we cannot provide a full overview of how different
Disciplines and schools of thought have explained the phenomenon of social inequalities. However, at the same time, we cannot grasp and unpack the implications and social consequences of new inequalities if we do not use the proper theoretical lens and toolkit. Therefore, despite the impossibility to offer a complete overview of the different theoretical approaches, this chapter underlines that we cannot fully appreciate digital inequalities rising from the advent of new technologies if we do not first understand social inequalities. Moreover, to understand the persistence of digital inequality, we need to comprehend its relation to other aspects of the structure and reproduction of social inequality.

While it is not an aim of this chapter to provide a comprehensive review of different approaches and schools of thought, this brief theoretical excursus introduces those basic ideas and concepts that are useful to reflect on how the advent of digital technologies might have exacerbated social inequalities. Analysing the phenomenon of inequalities means representing a holistic vision capable of considering the different forms and levels of inequity, while taking into account its historical development and specific context. In this vein, this chapter will help guide the reader throughout the book, by showing that inequalities are not a natural fact, but a political choice. We shall see how ICTs are reinforcing and cementing already existing social inequalities, both on a macro level, given the raise to a new digital oligarchy, and on a micro level, reinforcing inequalities between individuals. This chapter, therefore, will orient the reader to the theoretical grounding by surveying some of the dynamics that shape and influence inequalities. Obviously, this chapter does not pretend to be exhaustive, but simply attempts to provide an overview of social inequalities and how with the rise of digital technologies the phenomenon has become more important than ever. More specifically, after a brief theoretical and historical excursus, we shall see how the advent of technologies may become a barrier of social mobility and how, by concentrating resources and wealth in few hands, the digital revolution is giving rise to digital oligarchy.

2.1 Introducing Inequalities

The term inequality identifies the differences of well-being mainly deriving from disparities in the level of income, consumption, access to health care, education and life expectancy. Using Kerbo’s words, inequality “is the condition where people have unequal access to valued resources, services, and positions in the society” (2003: 11). At the base of inequalities
are the objective and systematic disparities in the ability of individuals and groups to obtain rewards and material (i.e. income), cultural (i.e. education) and symbolic (i.e. prestige) resources. Furthermore, inequalities also mean the disparities in the ability of individuals and social groups to influence the behaviour of others for their advantage by exercising power or by autonomously choosing one’s own life destinies.

The unequal access to resources, rewards, positions and services is not a new phenomenon and it affects all ages and all societies. In fact, according to historians and anthropologists, in every culture at every time, mechanisms of prestige differentiation have existed, and they are linked to certain factors, such as beauty, knowledge, courage and so on. What are particularly important are those features of differentiation that become structured, embedded in the ways people interact with each other, think and act. This structured inequality, based on both individual differences (motivation, natural abilities, personal features, etc.) and socially defined characteristics (class, age, religion, gender, etc.), strongly affects individual rights, resources, opportunities and rewards. As we shall see, these structured inequalities also influence the way we access and use ICTs (digital divide), but also the way algorithms and artificial intelligence (AI) perceive, treat and influence individuals (Beer 2017; Gillespie 2014) across various life domains (algorithms divide).

The phenomenon of inequality does not produce a universally accepted definition and interpretation. Similarly, we cannot find a commonly accepted “date of birth” for it. However, it sounds more than plausible that it arose at least 11,000 years ago and was already widespread in ancient communities of Europe and Asia (Kohler et al. 2017). Its origins and growth seem to be connected to the spread of agriculture, the cultivation of plants and the domestication of large animals, such as cows and horses, as well as a growing social organization. Timothy Kohler et al. (2017) analysed the size and structure of homes in 63 ancient societies of North America, Europe, Asia and Africa, from hunter-gatherers to ancient cities. They discovered that the highest rate of inequality was in the Old World (Europe and Asia), where large domesticated animals were present, and not in the New World, which on the contrary currently holds the record with the United States. These animals, which were used to plough the fields and transport goods, led, in wartime, to the creation of a class of landless people and peasants (underprivileged) and a new elite of warriors on horseback, which allowed them to acquire more territories and earn and accumulate wealth (privileged). Moreover, in the ancient societies of
the Old World, the arrival of metallurgy and the use of bronze helped the warriors to become even more powerful and influential. The societies with the lowest rate of inequality were found to be those of hunter-gatherers, who, because they were not settled, could not accumulate much wealth to pass on to subsequent generations. Inequality in access to rewards in pre-literate societies, which are poorly structured and with a very low division of labour, was lesser than that in more complex societies, which require capital and resources. Moving from manufacturing to industry, the division of labour (Durkheim 1933) is no longer between those who manufacture the tools and those who use them, but between those who own the tools and those who sell their work (Marx 1887). In modern societies, therefore, inequalities are deeply embedded in the social structure (Weber 1949). They generate and sustain cultural differences, thus enlarging the gap between advantaged and disadvantaged individuals or groups. Following Cooley (1922) and Mead (1934), who claim that the complexity of society generates individuals who are different, we may suggest that an unequal society generates unequal individuals. Equality, evidently, is not the same as identity (which suggests that two items are the same). This confusion has led some scholars to claim that since everyone is different equality is not possible and, by following and promoting equality, we risk to destroy social diversity and differences (Novak 1991). In the same vein, Dworkin (1996) argues that equality, by its very nature, requires differences. Novak (1991) and Dworkin (1996) seem to suggest that not only is equality impossible to achieve, but it is also dangerous for freedom and social diversity. Despite a fruitful vein of research that has underlined how income inequalities have high social consequences (Wilkinson 1996; Wilkinson et al. 1998; Wilkinson and Pickett 2010), neoliberal ideas and doctrines have attempted to normalize these inequalities, not only by claiming that they are inevitable, but also by arguing that they are useful. This normalizing approach to social inequalities has found its picks in the golden age of neoliberalism and has seriously affected income and other social inequalities, specifically in Europe, where the protection of citizens from uncertainty and market-related risks and the containment of social inequalities through redistributive policies were an integral part of the European social model (Ross 1995; Giddens 2006; Therborn 2006). This model, which for some decades allowed the combining of market economy with democratic institutions (Crouch 1999), has been contrasted by neoliberal ideas widespread in Western societies and has also been adopted by governments led by centre-left parties (Bonoli and Powell 2002).
Therefore, social inequalities have become “the endangered species of political ideals” (Dworkin 2000: 1), marginalized in the public sphere and in the political agenda. As claimed by the Organization for Economic Cooperation and Development (OECD) (2014: 1), however, this “increase in income inequality is evident, not just in the widening gap between the top and the bottom income deciles, but also in the Gini coefficient”. Notwithstanding the importance of this topic, thanks to the spread of neoliberal ideologies, social inequality was not at the centre of political and scientific debate for two centuries (Dworkin 2000). However, inequality is regaining its momentum with an influential vein of scholars who have tried to criticize the pervasive political acceptance of increasing inequalities as a positive development (Hills 2004; Wilkinson and Pickett 2008, 2009).

### 2.1.1 Inequalities: Not Only an Economic Problem

The OECD report *Divided We Stand* (2011) noted that “[t]he gap between rich and poor in OECD countries has reached its highest level for over 30 years”, suggesting that “governments must act quickly to tackle inequality”. The rising income inequality in Western countries (OECD 2008) has (re)attracted the interest of scholars and policymakers, after the neoliberal euphoria (Acemoglu and Robinson 2012; Stiglitz 2012). A crisis in working conditions, for instance, generates a strong social conflict, economic and political instability, widening the consensus of populist and sovereign agendas almost everywhere in the globe. Joseph E. Stiglitz (2012) argued that the consolidated interests of a small part of the population (which he calls “1% society”) have prevailed over those of a large slice of the population (99% of society), increasing social and economic gaps between citizens. Given the pre-eminence and importance of material and economic disparity between hyper-rich elites and the majority of citizens, social and economic inequalities have become a key focal point of the academic debate and policy agenda in the last decade. Several works on social and health inequalities (Wilkinson and Pickett 2010), on housing and the social price of gross inequality (Dorling 2014, 2015), and on the economic impact of inequity (Piketty 2014; Stiglitz 2012) have brought this issue to the attention of the media and the public. Such works have motivated many examples of social action, including ones that promote the use of digital media and technologies as tools for change, routes to protest and solutions to inequity. Despite the fact that the social consequences of
growing inequalities are high and they affect the whole society at all levels, per capita income is the measure mostly used to quantify inequality. In our societies, and in the related public debate, there is often a tendency to take for granted that inequality is an economic problem. This vision risks overshadowing the complexity of the phenomenon by neglecting the various forms of inequality, such as social, cultural, political and digital, but also the different ways inequality manifests itself. In fact, as the 2020 UN Development report points out, citizens are no longer just concerned and disappointed about income and economic inequalities. They are also concerned about inequalities in political representation and access to power, inequalities in accessing higher education, accessing the resources to survive climate change and, finally, accessing and using technology properly. Inequality is, indeed, a complex and multidimensional phenomenon, deeply embedded in the social, political and cultural relations. Therefore, by talking about inequalities we are addressing a multilevel phenomenon that includes different, albeit strongly connected, forms of inequities in treatment, opportunity and condition. More specifically, inequality of treatment means the absence of equal conditions in accessing justice, the welfare state and resources. These inequalities are based on gender, age, and ethnic or other social group features that, over the years, have become structured and embedded in the social hierarchies. The advent of new digital technologies reinforces this form of inequalities both in terms of absence of equal conditions to access and use ICTs but also in the way biased algorithms and AI strengthen the socially structured unequal conditions. On the other hand, inequality of opportunity is the difficulty in accessing the labour market, obtaining financing for new business or accessing specific professional orders. Even here, new ICTs reinforce this form of inequality since specific social groups are more likely to be excluded from the digital realm where job opportunities and resources have increasingly moved. Furthermore, automated decision-making through personal data-based algorithms is biased and discriminatory—for instance in terms of hiring practices—towards specific social categories (Mann and O’Neil 2016). Finally, inequality of condition is evident in the different treatments that public actors reserve for citizens who, by principle, should be the same. Also, in this case, digital technologies are widening inequalities, both in terms of excluding already disadvantaged groups in society from accessing welfare services and in the different ways justice systems treat citizens who are supposed to be the same in front of the law (Dressel and Farid 2018). This brings us to the strong and negative impacts of data
mining, policy algorithms and predictive risk models on poor and working-
class people, as described by Virginia Eubanks (2017).

Inequality is, therefore, a complex phenomenon that differently affects
the lives of individuals and directly influences the socio-economic struc-
ture of the communities in which it occurs (Therbon 2013). The phenom-
enum of social inequality is taking on an ever-widening multiplicity of
dimensions that are intertwined with the various elements that describe
economic inequality. Scholars, specifically social scientists, have focused
their attention on some key concepts and on some characteristics of social
inequality, namely social vulnerability (Wilkinson 2006), social mobility
(Hoerder 2002), inequalities in accessing education (Ginsburg 1991) and
welfare (Hay 2005), gender inequalities (Wagner et al. 1986) and genera-
tional inequalities (Myles 2002). These forms of inequalities strongly
influence and determine both “traditional digital inequalities”, namely
digital divide, and “new digital inequalities”, namely algorithms divide.
More specifically, and briefly discussing each of them in turn and in rela-
tion to digital technologies, we can appreciate how social vulnerability
introduces a new dimension of social inequality that develops transversally
into social stratification. This phenomenon is becoming increasingly
important with the rise of disruptive technologies, such as AI and the
Internet of Things (IoT). In fact, the spread of income instability, the
growth of temporary jobs, the difficulties of reconciling care and work and
the explosion of non-self-sufficiency affect all social strata and determine a
sense of instability that affects, also, traditionally guaranteed social classes,
hence increasing the social vulnerability of all classes. Another important
issue at the centre of social and economic analysis is the inequality in terms
of social mobility. This is determined by the slowdown of economic mobil-
ity between generations and by an inheritance of poverty conditions.
When inequality increases, intergenerational mobility tends to decrease
(Burtless and Jencks 2003). More recently and in relation to the rise of
digital technologies and robotization, the generational inequality is char-
acterized by low wages, low level of job security, high unemployment rates
and low employment rates, lack of social rights and difficulties in finding
housing. Similarly, gender inequalities are mainly characterized by a lack of
job opportunities (Reskin and Padavic 1994), inequalities in gender wage
gap (Valian 1998), lack of social rights (Orloff 1993), access to power
(Wright 1997) and higher education, among others. In some countries,
for cultural, religious and historical reasons, these inequalities are stronger
than in others. This inequality is also reflected in the digital arena, not only
in terms of inequalities in accessing and using ICTs, known as gender digital divide (Kennedy et al. 2003), but also in terms of accessing a powerful position within the tech companies (Catalyst 1998). In this vein, Losh (2003: 65–66), assessing several surveys to track gender differences from 1983 to 2000, found that “[a]lthough women with baccalaureates or more advanced degrees have opportunities for jobs that use computers and the Internet for synthesis, simulations, diagnostics and information searches, women who lack a four year degree generally continue in the far less interesting ‘pink collar ghetto’ of word processing or data entry”. Furthermore, as we shall see later, women are further discriminated by the advent of new digital technologies, where gender stereotypes are rooted in AI systems across search engines (Noble 2018) and face and voice recognition technologies (Howard and Borenstein 2017).

Another form of inequality on which scholars have focused their attention is the differences in the opportunity to access education for individuals. This is an important factor in determining economic, social and cultural inequality. High educational levels, indeed, especially in the presence of a high demand for skilled workers, lead to higher wages (economic inequality), better social position (inequalities in social status) and access to cultural elite groups (cultural inequalities). Inequalities in accessing education might be characterized by several features, such as a lack of family financial resources (Blanden and Gregg 2004; Krueger and Zhu 2004), occupational prestige (Shavit and Blossfeld 1993), social class belonging (Breen 2010; Erikson and Goldthorpe 1992) or, more broadly, family cultural resources (Barone 2006; Van de Werfhorst and Hofstede 2007). Those who have higher education tend to have higher levels of satisfaction and personal well-being and greater opportunities in the labour market (Hanushek and Woessmannn 2008; OECD 2010; Stiglitz et al. 2009), but also higher digital competence (Livingstone et al. 2017) and motivation and capacity to use ICTs for capital-enhancing activities (Correa 2015), and higher algorithms skills (Klawitter and Hargittai 2018). Furthermore, since access to welfare policies is considered a privileged tool to reduce inequalities produced by social origins and positions in the labour market, a lack of or limited access to it is another vital dimension of inequality (Paull and Patel 2012). Paradoxically, since many services have increasingly migrated online, those who need the most welfare policies are also those who are excluded from or have limited resources and skills to access the digital realm, into which these services are moving (Larrison et al. 2002). Moreover, they are also penalized by policy algorithms and AI,
more frequently used by public actors to decide “neutrally” whether someone should get public services (Noble 2018). Furthermore, by applying the rigidity of the algorithms to social systems, we are removing the degree of human discretion, which is always present in the assignment of sustenance programmes, subsidies or assistance plans.

Finally, another category that is socially disadvantaged is the variegate world of disability, which comprises around 15% of the world’s population. A billion people on the planet have some form of disability and are affected by differences in opportunities to access education, jobs, resources, opportunities and services (WHO 2011). The advent of digital technology can help improve their life by simplifying some daily-life activities (Dawe et al. 2005). However, without adequate oversight and appropriate input, technologies could widen, instead of reducing, inequality. People with some forms of disabilities might be disadvantaged both for accessing and using technologies (Goggin and Newell 2000), or even be discriminated by predictive algorithms (Williams et al. 2018).

As mentioned several times, the digital revolution is radically changing the whole of society, affecting every sector and activity. First the Internet, followed by machine learning, big data and enabling technologies are now rapidly transforming and influencing our lives as they become part of how social services, job opportunities, health system and education function. These fast and radical changes are occurring with minimal accountability and public debate. The velocity of this digital revolution encourages passive thinking, which is the opposite of critical thinking, which requires moving beyond the surface. We need to slow down, observe and reflect over this technological revolution with critical eyes, without fear but also without a priori accepting the rhetoric narrative proposed by neoliberal policies or techno-evangelists. We need to think more deeply about how inequality in access to and use of digital media is influenced by the same axes of social inequalities. We should also reflect about the role played by digital technologies, and specifically AI and algorithms. We therefore need to ask ourselves whether digital technologies are mitigating or rather making inequalities greater, cementing and consolidating them into the social structure.
2.2 Has Technology Become a Barrier to Social Mobility?

Technology has played an important role, though it is difficult to accurately document, in the increase in inequalities in the last few decades. The new technological paradigm is now accelerating with the emergence of digitalization, automation and global platforms for network-based economic activities. The fact that technologies are becoming so deeply rooted and embedded in the workplace is forcing scholars and policymakers to (re)think the social consequences of digital inequalities and how they are affecting individuals’ everyday lives.

One of the main assumptions leading this chapter is that technological change is not neutral. Its effects unfold asymmetrically in terms of employment and remuneration of labour and capital (Solow 1957), between social groups, businesses and geographical areas. Technological change reflects existing power relationships (Rosenberg 1969) and contributes to their evolution, with significant consequences to the distribution of income, reinforcing patterns of economic stratification and broadening existing inequalities (Falck et al. 2016). While emerging technology may be used to enhance the rights and dignity of workers, too often those promoting technological solutions use it as a pretext to spread and foster inequality (Hall and Jones 1999). Furthermore, technologies have been historically used as a form of control and surveillance (Foucault 2007) rather than a means of freedom for workers (Bloodworth 2018). Examples of how technologies are employed today to control workers are flourishing everywhere in the world, from China to the United States, from small to huge firms, demonstrating the intrinsically non-neutral character of technology.

Technological changes are the result of existing power relationships that lead to consolidation of social hierarchy and structured inequalities. In this context, policies and institutions play, or should play, a key role in leading this revolution towards more inclusive and equitable outcomes. Public policies should (re)direct technological innovation in order to maximize benefits and try to minimize social costs. The advance of digitalization, AI and automation promises to increase productivity and growth, while simultaneously redesigning the economy and the way we work. However, despite the evident advantages brought by the digital revolution, technology has also contributed to the evolution of functional inequality by operating through various mechanisms. For instance, the
creation of new products and new markets has favoured the growth of profits, concentrating the wealth in the hands of the few, while the introduction of process innovations has reduced the contractual weight of work, fuelling technological unemployment (Kim et al. 2017). Parallel to this, the evolution of the labour market has gone towards increasing flexibility, weakening the bargaining power of workers and further promoting the containment and reduction of wages (Rubery and Grimshaw 2003). Technological change, as highlighted by Howcroft and Rubery (2019: 216), is eroding job quality, allowing increasingly “insecure, episodic, intensive and low paid work”. The concerns over the negative effects of technologies on occupations are widely discussed by academics, policymakers and commentators (Ford 2015; Susskind and Susskind 2015). Since the end of the last millennium, it has become clear that AI, machine learning, robots and other processes of automation have replaced so many jobs (Autor et al. 1998). This idea has become increasingly evident over the years. McKinsey Global Institute (2017), for instance, indicates that 15% of global jobs will be replaced by automation by 2030, while Hawksworth, Berriman and Goel (2018) estimate that automation can replace more than 30% of jobs by 2030 in OECD countries. This will force public and private actors (at regional and national levels) to think of new forms of distribution of income in order to prevent social disorders. In this vein, the former number one of the International Monetary Fund, Christine Lagarde, warned of the increase in inequalities, by stressing that technology is an opportunity, but governments must invest in education and work to improve welfare. Lagarde (2018) underlined how, with workers who lose their jobs, inequalities can increase, and our social fabric could fray further. Lagarde called on governments to reform educational systems and to invest in digital infrastructure. According to Lagarde, data and statistics must be used to help citizens cope with the consequences of automation and the turbulence that may accompany the introduction of new technologies.

In this vein, an important divide is that between the dynamics of labour productivity and the dynamics of wages, favouring profits over wages and polarizing income worldwide (Foster and Wolfson 2010). A strong path of research has focused on the inequalities between skilled and unskilled workers in terms of ICTs (Davis and Haltiwanger 1991; Autor et al. 1998; Krusell et al. 2000; Lee and Kim 2004). Other studies have deepened this analysis also considering the role of productive relocation and distinguishing wages for groups of workers with different levels of education
(Kampelmann et al. 2018) and highlighting the progressive precariousness of work and the reduction of protections for these workers (Gallino 2001). The results show that the possibility of delocalizing parts of the production process favours profits (Pickles and Smith 2011), with a further negative effect on wages, except for those of highly skilled workers. The relationship between technology and income is therefore the result of the characteristics of the workforce, the location of production and the nature of innovation, process or product (Banerjee and Newman 1993; Benabou 1996; Durlauf 1996; Piketty 1997). The combined disposition of intense innovation, individualization of industrial relations and reduction of union organizations’ ability to act can favour the position of highly skilled workers by guaranteeing them a share of the “technological income” connected to the introduction of innovations. On the contrary, workers with low qualifications can be put under pressure because of the risk of delocalization of parts of the production process where they operate, seeing their contractual capacity reduced in terms of wages and working conditions. This process is emblematically visible with the phenomenon of work platforms or gig economy (Taylor et al. 2017). Platforms such as Uber, Deliveroo or Glovo are a paradigmatic representation of how the current technological phase provides companies, which base their activities on digital networks and algorithms (Wood et al. 2019), with an unprecedented and radical ability to transfer costs and risks to external operators, namely to workers. By managing the activities through smartphones and apps, these companies delegate the completion of small portions of the production process to subjects operating as “partners” of the platforms without acknowledging their status as employees. While this process increases organizational efficiency and competitiveness, it has also significant implications in terms of greater flexibility, high risks and, often, low average wages, creating new vulnerabilities among people, organizations and societies (Ransbotham et al. 2016). Concepts such as “shared economy” are a form of an ideological term or a linguistic imposture that gives to neoliberal capitalism a generous and friendly face. The so-called sharing economy, or as Robert Reich underlined “a more accurate term would be the ‘share-the-scraps’ economy” (2001), instead of being environmentally friendly, economically efficient and socially respectful, is rather concentrating the advantages in a few hands, namely the rising digital oligarchy. Those who own the platform extract a commission from those who perform the service, widening inequalities, reducing workers’ rights and shrinking the “purchasing power” at the “micro level”. At the
“macro” level, the consequences are related not only to an increased level of inequality but also to the instability of the whole economic system. The COVID-19 crisis in the spring of 2020 shows how those highly technological companies have enabled the so-called smart working, allowing on the one hand individuals to work from home without losing their jobs, and on the other hand allowing companies not to lose their productivity. By contrast, small and not so highly technological companies have not been able to fully exploit these possibilities, both losing productivity and causing loss of jobs, thus further enlarging inequality. However, shedding light on the impacts of digital innovations on inequality and on how the benefits of such innovations have not been equally shared amongst countries, firms and citizens does not mean going against technology, but simply criticizing the over-optimistic narrative around the rise of technologies. Overall, it means highlighting how technological changes are not neutral and how benefits are not experienced equally by individuals, firms and countries.

2.3 THE NEW DIGITAL OLIGARCHY

With the high concentration of research and development activities on digital technologies around the globe in the hands of the very few, we are witnessing the rise of what we can define as digital oligarchy. Oligarchy in its etymological sense is intended as power concentrated in a few hands (from the Greek ὀλιγαρχία [oligarkhía], from ὀλίγος [olígos], meaning “few”; and ἀρχω [arkho], meaning “to rule or to command”). This high concentration of emerging and disruptive technologies—advanced robotics, AI, blockchain, the IoT, cloud computing and 3D printing—is a strong consolidation of power and wealth. Few hi-tech companies, known as FAMGA (Facebook, Apple, Microsoft, Google and Amazon), are leading investments in AI and other technologies, consolidating their dominant position in the market and in the whole of society. As a consequence of this concentration, we are observing a widening of inequalities not only between and within countries, but also between firms and amongst people working for them.

As Schumpeter underlined (1939), technological change is at the base of the forces that the capitalist system generates and that transforms it incessantly. By mimicking the functioning of living organisms, capitalism evolves, driven by “breaks” which are, at the same time, destructive and creative and which see new technological modalities reflected in new social
and market configurations, in new institutions and in new systems of preferences. This is the joint mutation of technological forms, on the one hand, and of the social and distribution structures found in correspondence with the different historical stages of capitalist evolution, on the other. The current ICT phase—that of the generalized digitization of economic processes and large masses of data as a crucial factor in determining power and success on the markets—is producing new organizational forms and, together with these, a deepening inequality. This is the opposite of what techno-evangelists predicted whose hope was the advent of digital technologies as tools of social emancipation (Curran 2012). By contrast, the high concentration of technologies in a few hands means both a growth of commodification and a widening of social inequalities (Mosco 2004; Fisher 2010; Prodnik 2014; McChesney 2013).

The channels through which technological change interacts with the distribution of economic resources and with the degree of inequality observable in this distribution are manifold. The first channel is the one that links the creative destruction that innovation brings with it (Diamond 2019) and the market power enjoyed by the companies that first master the new technologies. From this point of view, innovation becomes a harbinger of monopolistic power (Winseck 2011) and brings with it lower employment and wage levels than what the economic system could offer in conditions of greater competition. The technological transformation brings limited and polarized benefits for a small number of firms and companies, what we defined here as digital oligarchy. On the one hand, the different levels of adaptability and innovation of the industries make digital oligarchy lead the market, concentrating the power and subsequent benefits in large organizations while penalizing the “small” firms that are forced to disappear or be absorbed by the larger ones. In fact, some companies more than others, can take advantage of the opportunities offered by technological change and reposition themselves on the global market, while others are too small to survive or adapt to innovation. This is particularly true during times of crisis, such as the “coronavirus crisis of 2020” when big corporations have more resources (tangible and intangible) to adapt to the challenging situation and prosper.

The small companies, therefore, tend to be absorbed by the bigger tech companies. This is particularly true for small innovative start-ups, bought both to neutralize potential competitors and to supplement what they are already offering on the market. The companies that are, in various capacities, protagonists of the current qualitative leap—FAMGA—have acquired
an economic (and therefore political) power hitherto unknown. Since the 1990s, the FAMGA tech giants have collectively made over 750 acquisitions for a total of $27 billion (Cbinsights 2019). Furthermore, in the face of very low employment, Google and Facebook, for instance, in 2016 earned 85% of every new dollar spent on digital technology in the US market (Garrahan 2016). For small businesses to enter the Web market can be even more complicated than entering into other capitalist markets (Hindman 2011), to the advantage of big hi-tech companies. Digital oligarchy tends to exploit the free labour of users (user-generated contents) to canalize it and transform it for their private financial gain (Terranova 2000; Fuchs 2011; Prodnik 2012; Scholz 2013). Therefore, if, on the one hand, they generate little or very little employment, on the other hand, these companies now act as “infrastructure” service providers essential in our everyday life.

As noted, the results of this conglomeration are a concentration of wealth in a few well-known hands, located in some specific areas of the globe. This brings us to another level, namely the inequalities between nations or regions. Some societies are historically, diplomatically, militarily and culturally stronger than others and make up a fertile field for innovation, attracting highly skilled workers, know-how and resources to implement and support innovation that will affect the life of everyone on the globe (Crescenzi and Iammarino 2017). This creates a kind of concentration in some areas to the detriment of others, both between and within states. For instance, just to mention the US case, 90% of growth in the US tech sector between 2005 and 2017 occurred in five cities (Boston, San Francisco, Seattle, San Diego and San Jose). The tech industry giants, such as Amazon, Apple, Facebook and Google, have around 20,000 workers in New York City alone. Therefore, this may intensify income inequality, making the city high-priced and unaffordable for more people.

Finally, workers with complementary skills to new technologies improve their relative position towards the rest of the workforce, further widening inequalities. In this vein, Rosés and Wolf (2016) have analysed, with a focus on Europe, how the emergence of new intensive industrial paradigms of knowledge, technology and innovation has contributed significantly, since the late 1980s, to growth and wealth creation. Rosés and Wolf, by creating an algorithm that defines where wealth is accumulating, stressed that not only does wealth accumulate in the hands of a few, but it is concentrated in some areas, mostly urban, creating the void all around. The period of wealth diffusion ended in the mid-1980s, coinciding with...
the closure of the Fordist era and the end of the large factories, making room for knowledge economy and globalization, and centralizing the best human capital and know-how in the city. The latter needs a few highly educated people, and this is creating poles of extreme wealth and well-being. Looking at the ranking of the richest people in the world, we observe that they are all in activities related to the construction and management of platforms, whose materiality is largely made up of IT systems, but their functioning is largely immaterial. They run a business that is disruptive, which closes stores (think about the disruptive impact of Amazon on small businesses), replaces taxi drivers (see Uber and Lyft) and affects existing systems, spreading production and logistics all over the world and creating a new international division of labour. Organizing protests, demanding respect and workers’ rights, or even negotiating a better salary is increasingly complicated, given the fact that “boss” and “workers” often do not share the same physical space. The success of these forms of collective action depends mainly on the interaction (Ostrom 1990; Gintis et al. 2005) and the capacity to direct the demands towards a visible and identifiable subject. Capital and workers used to need each other, and this relationship was “fortified by the mutuality of their dependency” (Bauman 2000: 14). Today, digital oligarchy, made by those who rank first in the world ranking of billionaires, does not need the digital underclass and does not share with them the same “factory”. Often, they are in another state, with their platforms in other countries, and even the tax revenues are not in the same place where the platforms are. This has evidently had a great impact on society, industry and workers’ rights. Furthermore, given that these “firms are notorious for their opacity, lack of accountability and regulatory arbitrage” (Howcroft, Rubery 2019: 218), this oligopolistic control of the market affects both the democratic and regulatory process. Due to their peculiar and predominant nature the large platforms are able to increase their economic grip and their “implicit consent” incessantly. FAMGA, somehow, have obtained over these years the status of company-institution, similar to what happened to the manufacturing companies that led the evolution of the previous technological phase. However, the main difference is that this new digital oligarchy does not need to enter into social agreements with large masses of employees.

Furthermore, while AI, IoT and robotics are rapidly growing, only digital oligarchy is really earning. One of the first analyses that quantifies the impact of digital technologies was written by the World Economic Forum in collaboration with Accenture. The report “Digital Transformation
Initiative” (WEF 2018), stressed the fact that while the investments in new technologies have produced growth, these advantages are not equally distributed. The technologies behind digital transformation, such as AI, robotics, IoT, big data and social media, require huge investments and new skills that not all companies can afford, risking the generation of industrial inequality at the expense of small businesses. Companies are investing in new technologies to accelerate growth and productivity. Despite cognitive technologies and robotics, for instance, having a low level of investment, they seem to guarantee the greatest returns, specifically when used in combination with IoT, big data and AI. However, as mentioned earlier, while these opportunities, in principle, are available to everyone, they are effectively exploited by big companies that have the resources (material and immaterial) and skills to invest in these sectors. This results in a concentration of income on small groups of large companies. Furthermore, many people who enter online activities as producers are not able to establish themselves in a market organized so that “the winner takes all”. Technological giants are growing in a cumulative way. The consolidation of economic power is further enhanced both by the characteristics of technologies and by institutions that make it possible, using tools to “protect” ideas and innovations such as intellectual property and patents.

The digital revolution is, therefore, generating new polarizations, hence encouraging the rise of new oligarchy. As a result, there is a growing gap between rich and poor, big and small, similar to what Robert K. Merton (1968) defined as the “Matthew effect”. Applying a verse taken from the Gospel of Matthew—“For unto everyone that hath shall be given, and he shall have abundance: but from him that hath not shall be taken even that which he hath” (Matthew 25, 29)—Merton suggests that well-known scientists get more recognition than anonymous researchers, even if their research and findings are rather similar. This concept, which could be summarized as “the rich get richer and the poor get poorer”, is still relevant today and may be applied to macro and micro analyses, to disparities between both firms and countries, but also to inequalities between individuals. In fact, hi-tech giants gain economic and competitive returns by investing in advanced technologies, transforming the global economy with strong productivity gains for businesses and determining a competitive disadvantage for the smallest with fewer resources. The growth associated with these investments is driven by 20% of the most productive companies in each sector, with the risk that, without a more homogeneous
distribution, an industrial inequality would emerge that would leave behind small and medium-sized enterprises. Small businesses are suffering competitive disadvantages, while the spread of technology is widening inequalities. Technological choices, therefore, are at the same time the result and the cause of economic and social changes (Tilly 2006) and have strong impacts on inequalities. As already noted, technologies tend to reflect society’s dynamics, reinforcing pre-existing inequalities (Spencer 2018). The problem is not the technological advancement, but how society is facing the changes that will ensue and how it is planning (if at all) to tackle the rise of digital oligopoly from one side and the digital underclass on the other. To put it differently, the concentration of emerging and disruptive technologies in a few hands is a sign of consolidation of wealth and power in an elite class, widening the gap between digital oligarchy and digital underclass. These gaps, evidently, have serious consequences not only in the economic sphere, but also in the social and political arena.

2.4 Concluding Remarks

As we have seen in this chapter, inequalities have always been at the heart of social theories and empirical analyses. However, there is neither a common and universal definition of inequalities nor a common idea about its nature. On the one hand, functionalist/conservatives think that it is not only necessary but also useful, while progressive approaches think we should tackle social inequalities since they are not inevitable and they may have grave consequences on the entire society. On one point, however, all different approaches seem to have a common idea: inequalities are the result of multiple factors and social dimensions, with effects on micro and macro levels. This is valid also for digital inequalities that, as we shall see in the next chapters, are multilevel and multidimensional: their impacts are evident on both individual and society levels.

Despite neoliberalism rhetoric and ideology, the digital revolution is not favouring the reduction of unemployment or the equal spread of benefits and resources. Rather it is doing the opposite. That growth is good for the poor is a neoliberal myth spread by conservative think tanks and media, while, in reality, growth fails to improve the conditions of the poorest in relative terms (Sen 2000). Therefore, if on the one hand there is an ideological attempt to normalize inequalities making it not only inevitable but also positive for human progress, on the other hand protests and riots arise from an increasingly evident reality: the rich become
increasingly wealthy, while many others, too many, are struggling to survive. The Silicon Valley exemplifies this growing inequality by contributing to causing it and by producing digital technologies that eliminate the need for many middle-class jobs. Here technology probably evolves faster than anywhere else in the world. In this vein, different studies identify technology as the cause of rising unemployment. According to Carl Benedikt Frey and Michael Osborne (2013), for instance, 47% of jobs in the American market in the next 20 years could disappear due to automation and introduction of AI and robots. Furthermore, not only will several jobs disappear but those that will survive in the advent of disruptive technologies will undergo profound changes in their tasks and will therefore require great effort by the workers in retraining themselves. However, the issue is not simply which jobs will emerge and which will disappear, but how much inequality will be produced and “normalized” by innovation. The gap will be between who will be able to access new high-tech job opportunities with high remuneration and career prospects and who—the majority—will be forced to fall back on low-skilled jobs, further reinforcing social inequalities and further expanding the digital underclass.

The Fourth Industrial Revolution “will fundamentally alter the way we live, work and relate to one another”, predicted Schwab (2016: 1) a few years ago. We may say that this revolution is already here, and it is strongly influencing the rise of both digital and social inequalities. Technology, as we have tried to underline in this chapter, has produced extraordinary progress, improving our life and bringing in benefits. At the same time, however, it also creates threats of job insecurity, uncontrolled use of data, reliance on decisions made by algorithms, and exclusion from resources and services offered online to those who cannot access or lack the skills to use them. Furthermore, there is an increasing number of citizens, almost everywhere in the world, working without decent protection and, often, without appropriate salary, and therefore feeling less secure.

In this chapter, following Lawson-Mack’s suggestion, we attempted to explore the “complex and mutually evolving relationship between a technology and broader social structures” (2001: 202). We have seen, and will further stress it in the following chapters, how the new emerging and disruptive technologies, whose dividends and gains are reinforcing the already socially and economically advantaged social groups, are becoming more central and vital in our everyday life. Technological changes have become unbalanced in the past decades, due to the inattention of the ruling classes and the concentration of wealth and power in the hands of the
digital elite. We are observing the concentration of power control, which has reached unthinkable levels thanks to our daily consent, when, by using technologies, we give free information about ourselves. Online platforms belonging to the digital oligarchy want to increasingly rely on automation and AI, since it helps low average revenue per user (ARPU) businesses to be profitable. For instance, YouTube makes $7–8 from advertising revenue for each user, while Facebook makes $7.38 per user across its family of apps and Twitter makes $5.68 (Waters 2020). These data have almost zero commercial value for us as customers, but have a great commercial value when someone belonging to the digital oligarchy is able to collect and analyse millions of such information. This is a kind of paradox that seems to characterize our digital societies: hundreds of millions of people produce and give for free, on a daily base, data with enormous commercial value, without receiving anything in return. It is like working for free for these huge corporations without being aware that we are producing something of value to them, and in doing so we are widening the gap between citizens and the digital oligarchy.

Is it correct to think that, as Wadhwa and Salkever (2016) argue, the Silicon Valley really foreshadows a generalized future, in which some very rich people will leave all others hopelessly behind? There is, consequently, a need to understand whether inequality constitutes the worrying result of a global digitally enabled society, and which role technologies play in the rise of this inequality. The next chapter will deal with these last questions, attempting to shed light on the role of ICTs in exacerbating or mitigating social inequalities.

References

Acemoglu, D., & Robinson, J. (2012). *Why nations fail*. New York: Crown Publishers.

Autor, D., Katz, L., & Krueger, A. B. (1998). Computing inequality: Have computers changed the labour market? *Quarterly Journal of Economics, 113*, 1169–1213.

Banerjee, A., & Newman, A. (1993). Occupational choice and the process of development. *Journal of Political Economy, 101*, 274–298.

Barone, C. (2006). Cultural capital, ambition and the explanation of inequalities in learning outcomes: A comparative perspective. *Sociology, 40*, 1039–1058.

Bauman, Z. (2000). *Liquid modernity*. Cambridge: Polity Press.
Beer, D. (2017). The social power of algorithms. *Information, Communication and Society, 20*(1), 1–13.

Benabou, R. (1996). Equity and efficiency in human capital investment: The local connection. *The Review of Economic Studies, 63*, 267–274.

Blanden, J., & Gregg, P. (2004). *Family income and educational attainment: A review of approaches and evidence for Britain*. CMPO working paper series no. 04/101.

Bloodworth, J. (2018). *Hired: Six months undercover in low-wage Britain*. London: Atlantic Books.

Bonoli, G., & Powell, M. (2002). Third ways in Europe. *Social Policy and Society, 1*(1), 59–66.

Breen, R. (2010). Educational expansion and social mobility in the 20th century. *Social Forces, 89*(2), 365–388.

Burtless, G., & Jencks, C. (2003). American inequality and its consequences. In H. Aaron, J. M. Lindsay, & P. S. Nivola (Eds.), *Agenda for the nation* (pp. 61–108). Washington, DC: Brookings.

Catalyst. (1998). The 1998 Catalyst census of Women Board Directors of the *Fortune 500*: Fact sheet. Catalyst, 120 Wall Street, New York, USA.

Cbinsights. (2019). Visualizing tech giants’ billion-dollar acquisitions. Retrieved from [https://www.cbinsights.com/research/tech-giants-billion-dollar-acquisitions-infographic/?utm_source=twitter&utm_medium=social&utm_campaign=cbi-evergreen](https://www.cbinsights.com/research/tech-giants-billion-dollar-acquisitions-infographic/?utm_source=twitter&utm_medium=social&utm_campaign=cbi-evergreen). Accessed Apr 2020.

Cooley, C. H. (1922). *Human nature and the social order*. New York: Charles Scribner’s Sons.

Correa, T. (2015). Digital skills and social media use: How internet skills are related to different types of Facebook use among “digital natives”. *Information, Communication & Society, 19*, 1095–1107.

Crescenzi, R., & Iammarino, S. (2017). Global investments and regional development trajectories: The missing links. *Regional Studies, 51*(1), 97–115.

Crouch, C. (1999). *Social change in Western Europe*. Oxford: Oxford University Press.

Curran, J. (2012). Reinterpreting the internet. In J. Curran, N. Fenton, & D. Freedman (Eds.), *Misunderstanding the internet* (pp. 3–33). New York: Routledge.

Davis, S., & Haltiwanger, J. (1991). *Wage dispersion between and within US manufacturing plants* 1963–1986. In C. Winston & M. Baily (Eds.), *Brookings papers on economic activity. Microeconomics* (pp. 115–200). Washington, DC: Brookings Institution Press.

Dawe, M., Fischer, G., Gorman, A., Kintsch, A., Konomi, S., Sullivan, J., Taylor, J., & Wellens, G. (2005). Smart care: The importance and challenges of creating life histories for people with cognitive disabilities. In *Proceedings of the HCI International Conference (HCII)*, Las Vegas.
Diamond, A. M. (2019). *Openness to creative destruction: Sustaining innovative dynamism*. Oxford: Oxford University Press.

Dorling, D. (2014). *Inequality and the 1%*. London: Verso.

Dorling, D. (2015). *Injustice: Why does social inequality still persist* (2nd ed.). Bristol: Policy Press.

Dressel, J., & Farid, H. (2018). The accuracy, fairness, and limits of predicting recidivism. *Science Advances, 4*(1), 1–5.

Durkheim, E. (1933). *The division of labor in society*. New York: Macmillan.

Durlauf, S. (1996). A theory of persistent income inequality. *Journal of Economic Growth, 1*, 75–93.

Dworkin, R. (1996). Objectivity and truth: You’d better believe it. *Philosophy & Public Affairs, 25*(2), 87–139.

Dworkin, R. (2000). *Sovereign virtue: The theory and practice of equality*. Cambridge, MA: Harvard University Press.

Erikson, R., & Goldthorpe, J. (1992). *The constant flux: Class mobility in industrial societies*. Oxford: Clarendon Press.

Eubanks, V. (2017). *Automating inequality: How high-tech tools profile, police, and punish the poor*. New York: St. Martin’s.

Falck, O., Heimisch, A., & Wiederhold, S. (2016). *Returns to ICT skills*. OECD education working papers, no. 134, OECD Publishing, Paris.

Fisher, E. (2010). *Media and new capitalism in the digital age: The spirit of networks*. New York: Palgrave Macmillan.

Ford, M. (2015). *Rise of the robots: Technology and the threat of a jobless future*. New York: Basic Books.

Foster, J. E., & Wolfson, M. C. (2010). Polarization and the decline of the middle class: Canada and the U.S. *Journal of Economic Inequality, 8*(2), 247–273.

Foucault, M. (2007). *Security, territory, population: Lectures at the collège de France 1977–1978* (M. Senellart, Ed.). New York: Picador.

Frey, C. B., & Osborne, M. (2013). *The future of employment: how susceptible are jobs to computerisation?* Oxford, England: Oxford Martin School, University of Oxford, 2013. Retrieved from https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf

Fuchs, C. (2011). *Foundations of critical media and information studies*. New York/London: Routledge.

Gallino, L. (2001). *Il costo umano della flessibilità*. Laterza: Roma-Bari.

Garrahan, M. (2016, June 23). Advertising: Facebook and Google build a duopoly. *Financial Times*. Retrieved from https://www.ft.com/content/6c6b74a4-3920-11e6-9a05-82a9b15a8ec7. March 2020.

Giddens, A. (2006). *Europe in the global age*. Cambridge: Polity.

Gillespie, T. (2014). The relevance of algorithms. In T. Gillespie, P. J. Boczkowski, & K. A. Foot (Eds.), *Media technologies: Essays on communication, materiality, and society* (pp. 167–194). Cambridge, MA: MIT Press.
Ginsburg, M. B. (Ed.). (1991). *Understanding educational reform in global context: Economy, ideology and the state*. New York: Garland Publishing.

Gintis, H., et al. (Orgs.). (2005). *Moral sentiments and material interests: The foundations of cooperation in economic life*. Cambridge, MA: The MIT Press.

Goggin, G., & Newell, C. (2000). An end to disabling policies? Towards enlightened universal service. *The Information Society, 16*, 127–134.

Hall, R. E., & Jones, C. I. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics, 114*, 83–116.

Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature, 46*(3), 607–668.

Hawksworth, J., Berriman, R., & Goel, S. (2018). *Will robots really steal our jobs?* PwC. Retrieved from https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/impact_of_automation_on_jobs.pdf. March 2020.

Hay, C. (2005). Too important to leave to the economists? The political economy of welfare retrenchment. *Social Policy and Society, 4*(2), 197–205.

Hills, J. (2004). *Inequality and the state*. Oxford: Oxford University Press.

Hindman, M. (2011). *The myth of digital democracy*. Princeton/Oxford: Princeton Press.

Hoerder, D. (2002). *Cultures in contact: World migrations in the second millennium*. Durham: Duke University Press.

Howard, A., & Borenstein, J. (2017). The ugly truth about ourselves and our robot creations: The problem of bias and social inequity. *Science and Engineering Ethics, 24*(5), 1521–1536.

Howcroft, D., & Rubery, J. (2019). ‘Bias in, bias out’: Gender equality and the future of work debate. *Labour & Industry: A Journal of the Social and Economic Relations of Work, 29*(2), 213–227.

Kampelmann, S., Rycx, F., Saks, Y., & Tojerow, I. (2018). Does education raise productivity and wages equally? The moderating role of age and gender. *IZA Journal Labor Economy, 7*, 1.

Kennedy, T., Wellman, B., & Klement, K. (2003). Gendering the digital divide. *IT&Society, 1*(5), 149–172.

Kerbo, H. R. (2003). *Social stratification and inequality: Class conflict in historical and global perspective*. London: McGraw-Hill.

Kim, Y. J., Kim, K., & Lee, S. (2017). The rise of technological unemployment and its implications on the future macroeconomic landscape. *Futures, 87*, 1–9.

Klawitter, E., & Hargittai, E. (2018). “It’s like learning a whole other language”: The role of algorithmic skills in the curation of creative goods. *International Journal of Communication, 12*(2018), 3490–3510.

Kohler, T. A., Smith, M. E., Boggaard, A., Feinman, G., Peterson, C., Betzenhauser, A., Pailes, M., Stone, E. C., Marie, P. A., Dennehy, T. J., Ellyson, L. J., Nicholas, L. M., Faulseit, R. K., Styring, A., Whitlam, J., Fochesato, M., Poor, T. A., & Bowles, S. (2017). Greater post-Neolithic wealth disparities in Eurasia than in
North America and Mesoamerica. Nature, 551(7682), 619–622. https://doi.org/10.1038/nature24646. Epub 2017 Nov 15.

Krueger, A., & Zhu, P. (2004). Inefficiency, subsample selection bias, and nonrobustness. American Behavioral Scientist, 47, 718–728.

Krusell, P., Ohanian, L., Rios-Rull, J. V., & Violante, G. L. (2000). Capital skill complementarity and inequality: A macroeconomic analysis. Econometrica, 68, 1029–1053.

Larrison, C. R., Nackerud, L., & Risler, E. (2002). Welfare recipients and the digital divide: Left out of the new economy? Journal of Technology in Human Services, 19, 1–12.

Lawson-Mack, R. (2001). The digital divide: Standing at the intersection of race and technology. Durham: Carolina Academic Press.

Lee, S. H., & Kim, J. (2004). Has the internet changed the wage structure too? Labour Economics, 11, 119–127.

Livingstone, S., Ólafsson, K., Helsper, E. J., Lupiáñez-Villanueva, F., Veltri, G. A., & Folkvord, F. (2017). Maximizing opportunities and minimizing risks for children online: The role of digital skills in emerging strategies of parental mediation. Journal of Communication. https://doi.org/10.1111/jcom.12277.

Losh, S. (2003). Gender and educational digital divide gaps 1983–2000. IT&Society, 1(5), 56–71.

Mann, G., & O’Neil, C. (2016, December 9). Hiring algorithms are not neutral. Harvard Business Review. Available at: https://hbr.org/2016/12/hiring-algorithms-are-not-neutral. Accessed 20 Mar 2020.

Marx, K. (1887). Capital a critique of political economy volume I book one: The process of production of capital. Moscow: Progress Publishers, USSR. Retrieved from https://www.marxists.org/archive/marx works/1867-c1/. April 2020.

McChesney, R. W. (2013). Digital disconnect: How capitalism is turning the internet against democracy. New York: The New Press.

McKinsey Global Institute. (2017). Jobs lost, jobs gained: Workforce transitions in a time of automation. Available https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Future%20of%20Organizations/What%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/MGI-Jobs-Lost-Jobs-Gained-Report-December-6-2017.ashx. Accessed 18 Mar 2020.

Mead, G. H. (1934). Mind, self, and society from the standpoint of a social behaviorist. Chicago: University of Chicago Press.

Merton, R. K. (1968). Social theory and social structure. New York: Free Press.

Mosco, V. (2004). The digital sublime: Myth, power, and cyberspace. Cambridge, MA/London: The MIT Press.

Myles, J. (2002). A new social contract for the elderly? In G. Esping-Andersen (Ed.), Why we need a new welfare state (pp. 130–172). Oxford: Oxford University Press.
Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. New York: New York University Press.

Novak, M. (1991). *The spirit of democratic capitalism*. London: IEA Health and Welfare Unit.

OECD. (2008). *Growing unequal? Income distribution and poverty in countries*. Paris: OECD Publishing.

OECD. (2010). *Off to a good start? Jobs for youth*. Paris: OECD Publishing.

OECD. (2011). *Divided we stand: Why inequality keeps rising*. Paris: OECD Publishing.

OECD. (2014). *Does income inequality hurt economic growth?* Paris: OECD Publishing.

Orloff, A. S. (1993). Gender and the social rights of citizenship: The comparative analysis of gender relations and welfare states. *American Sociological Review*, 58(3), 303–328.

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.

Paull, G., & Patel, T. (2012). *An international review of skills, jobs and poverty*. York: Joseph Rowntree Foundation.

Pickles, J., & Smith, A. (2011). Delocalization and persistence in the European clothing industry: The reconfiguration of trade and production networks. *Regional Studies*, 45, 167–185. https://doi.org/10.1080/00343401003601933.

Piketty, T. (1997). The dynamics of the wealth distribution and interest rate with credit-rationing. *Review of Economic Studies*, 64, 173–189.

Piketty, T. (2014). *Capital in the 21st century*. Cambridge, MA: The Belknap Press of Harvard University Press.

Prodnik, J. (2012). A note on the ongoing processes of commodification: From the audience commodity to the social factory. *tripleC: Communication, Capitalism & Critique*, 10(2), 274–301.

Prodnik, J. A. (2014). A seeping commodification: The long revolution in the proliferation of communication commodities. *TripleC - Communication, Capitalism and Critique*, 12(1), 142–168.

Ransbotham, S., Fichman, R., Gopal, R., & Gupta, A. (2016). Ubiquitous IT and digital vulnerabilities. *Information Systems Research*. https://doi.org/10.1287/isre.2016.0683.

Reskin, B., & Padavic, I. (1994). *Women and men and work*. Thousand Oaks: Pine Forge Press.

Rosenberg, N. (1969). The direction of technological change: Inducement mechanisms and focusing devices. *Economic Development and Cultural Change*, 18(1), 1–24.

Rosés, J. R., & Wolf, N. (Eds.). (2016). *The economic development of Europe’s regions: A quantitative history since 1900* (Routledge explorations in economic history). London: Routledge.
Ross, G. (1995). Assessing the Delors era in social policy. In S. Leibfried & P. Pierson (Eds.), *European social policy: Between fragmentation and integration* (pp. 357–388). Washington, DC: Brookings Institution.

Rubery, J., & Grimshaw, D. (2003). *The organization of employment*. London: Palgrave.

Scholz, T. (Ed.). (2013). *Digital labour: The internet as playground and factory*. New York: Routledge.

Schwab, K. (2016). *The fourth industrial revolution*. New York: World Economic Forum, Crown Business.

Sen, A. (2000). *Social exclusion: Concept, application, and scrutiny*. Asian Development Bank. Available at http://www.adb.org/publications/socialexclusion-concept-application-and-scrutiny.

Shavit, Y., & Blossfeld, H. P. (Eds.). (1993). *Persistent inequality; changing educational attainment in thirteen countries*. Boulder: Westview Press.

Solow, R. M. (1957). Technical change and the aggregate production function. *The Review of Economics and Statistics, 39*, 312–320.

Spencer, D. (2018). Fear and hope in an age of mass automation: Debating the future of work. *New Technology, Work and Employment*. https://doi.org/10.1111/ntwe.12105.

Stiglitz, J. (2012). *The price of inequality: How Today’s divided society endangers our future*. New York: W.W. Norton.

Stiglitz, J. E., Sen, A., & Fitoussi, J. P. (2009). Report by the commission on the measurement of economic performance and social progress.

Susskind, R., & Susskind, D. (2015). *The future of the professions: How technology will transform the work of human experts*. Oxford: Oxford University Press.

Taylor, M., Marsh, G., Nicole, D., & Broadbent, P. (2017). *Good work: The Taylor review of modern working practices*. Available at: https://www.gov.uk/government/publications/good-work-the-taylor-review-of-modern-working-practices. Accessed Mar 2020.

Terranova, T. (2000). Free labor: Producing culture for the digital economy. *Social Text, 18*(2), 33–58.

Therborn, G. (2013). *The killing fields of inequality*. Cambridge: Polity Press.

Therborn, G. (2006). *Inequalities of the world*. London: Verso.

Tilly, C. (2006). Labour market inequality, past and future: A perspective from the United States. In L. Gonas & J. Ch Karlsson (Eds.), *Gender segregation: Division of work in post-industrial welfare states*(pp. 13–28). Burlington: Ashgate.

Valian, V. (1998). *Why so slow? The advancement of women*. Cambridge, MA: MIT Press.

Wadhwa, V., & Salkever, A. (2016). *The driver in the driverless car: How our technology choices will create the future*. Oakland, CA: Harper Collins India.

Wagner, D. G., Ford, R. S., & Ford, T. W. (1986). Can gender inequalities be reduced? *American Sociological Review, 51*(1), 47–61.
Waters, R. (4 February, 2020). *Alphabet chief lifts the covers on earnings, Financial Times.* https://www.ft.com/content/bdf307a-4714-11ea-aeb3-955839e06441?shareType=nongift. Accessed 15 Feb 2020.

Weber, M. (1949). *The methodology of the social sciences.* New York: Free Press.

WEF. (2018). *Digital transformation initiative. In collaboration with Accenture.* Available at: http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-executive-summary-20180510.pdf. Accessed 20 April 2020.

Werfhorst, H., & Hofstede, S. (2007). Cultural capital or relative risk aversion? Two mechanisms for educational inequality compared. *The British Journal of Sociology, 58,* 391–415. https://doi.org/10.1111/j.1468-4446.2007.00157.x.

Wilkinson, R. (1996). *Unhealthy societies: The afflictions of inequality.* London: Routledge.

Wilkinson, R. G. (2006). Ourselves and others – For better or worse: Social vulnerability and inequality. In M. Marmot & R. G. Wilkinson (Eds.), *Social determinants of health* (2nd ed., pp. 256–272). Oxford: Oxford University Press.

Wilkinson, R., & Pickett, K. (2008). Income inequality and social gradients in mortality. *American Journal of Public Health, 98*(4), 699–704.

Wilkinson, R., & Pickett, K. (2009). *The spirit level: Why more equal societies almost always do better.* London: Penguin.

Wilkinson, R., & Pickett, K. (2010). *The spirit level: Why equality is better for everyone.* London: Penguin.

Wilkinson, R., Kawachi, I., & Kennedy, B. (1998). Mortality, the social environment, crime and violence. *Sociology of Health & Illness, 20,* 578–597.

Williams, B. A., Brooks, C. F., & Shmargad, Y. (2018). How algorithms discriminate based on data they lack: Challenges, solutions, and policy implications. *Journal of Information Policy, 8,* 78–115. https://doi.org/10.5325/jinfopoli.8.2018.0078.

Winseck, D. R. (2011). The political economies of media and the transformation of the global media industries. In D. R. Winseck & D. Yong Jin (Eds.), *The political economies of media: The transformations of the global media industries* (pp. 3–48). London/New York: Bloomsbury Academic.

Wood, A. J., Graham, M., Lehdonvirta, V., & Hjorth, I. (2019). Good gig, bad gig: Autonomy and algorithmic control in the global gig economy. *Work, Employment and Society, 33*(1), 56–75.

World Economic Forum. (2018). *Christine Lagarde: 3 priorities for the global economy.* Retrieved from https://www.weforum.org/agenda/2018/04/fix-theroofnow-three-priorities-for-the-global-economy/. Accessed Mar 2020.

World Health Organization. (2011). *The World Bank. World report on disability.* Geneva: World Health Organization.

Wright, E. O. (1997). *Class counts, comparative studies in class analysis.* Cambridge: Cambridge University Press.