CHAPTER 2

The Liberal Commons

2.1 Introduction

Liberalism is a moral philosophy built on the concept of negative freedom, which dates back to Thomas Hobbes, who defined freedom as the absence of external impediments to the pursuit of one's preferences. Negative freedom does not attribute to freedom a positive content, but is rather synonymous with freedom of individual choice. Negative freedom has thereafter become the backbone of liberal political thought, as demonstrated in the work of John Locke and John Stuart Mill, up until its most contemporary versions such as the work of John Rawls (1971), Robert Nozick (1974) and Friedrich Hayek (1944), to mention some of the most prominent figures. Variations of negative freedom depend on how one defines 'interference', but all agree that to be free is, more or less, to be left alone to do whatever one chooses (Carter et al. 2007, 3). As such, negative freedom encapsulates the core of modernity's legal rights, which demarcate the bounds between the private and public sphere along the lines of property, ethical pluralism and tolerance. Liberalism is associated with the modern state founded on the rule of law and the separation of powers, both constitutive of representative democracy. The fundamental normative principle of liberal democracy is the sovereignty of the people, exercised in the public sphere through the freedoms of speech, assembly and press, and under conditions of transparency and accountability.

In its economic meaning, liberalism champions free trade and market capitalism. The common good identifies with the social welfare generated by the 'invisible hand' of the market regulated by the democratic state. The common good consists in the harmonious coordination of the private and the public sphere for the benefit of the capitalist market, which lays the moral foundation of society. What should be considered private and public is subject to acute political controversy within and beyond liberalism. Very schematically,

liberals and libertarians argue for a minimal state, left-liberals and social democrats argue for increased state intervention, leftists argue for a socialist state and anarchists argue for the abolition of the state.

The last decades have witnessed the emergence of a liberal discourse that seeks to revitalise the concept of the common as the self-instituting power of the people. Whereas the common stands for the collective capacity for self-management, the commons are the concrete instantiations of the common, manifested in local and global (digital) commons. This part covers the liberal argument on the commons, as articulated in the work of Elinor Ostrom, Lawrence Lessig and Yochai Benkler. The criterion by which I classify their work under the term 'liberal' is that all three place the development of the commons in parallel with state and market operation. They advocate for the coexistence of the commons with the public (its associated state and institutions) and private sector. The task of this part is to critically examine the liberal argument and trace out convergences and divergences in the scope of the commons vis-à-vis state and market operation.

Section 2.2 deals with Ostrom's work on local commons. Ostrom addresses the problem of collective action by elaborating the model of polycentrism, whereby the dichotomy between privatisation and/or government regulation is overcome through a combination of state, market and community-based mechanisms governing common-pool resources.

Section 2.3 focuses on the work of Lawrence Lessig and Yochai Benkler who expand Ostrom's work from the local to the global commons of the Internet and free/open source software. They introduce the term 'digital commons' to describe a non-market sector of information, knowledge and cultural production, not treated as private property, but as an ethic of sharing, self-management and cooperation between peers who have free access to online platforms. Similarly to Ostrom, they both consider commons-based peer production as complementary to state and market operation. Benkler often crosses his liberal lines by pointing to the autonomous development of the commons beyond capitalism and the state. Yet this underlying goal generally conforms to the liberal tradition.

The crux of the argument here is that the liberal approach to the commons falls short of connecting local and global commons and, thus, envisioning an autonomous existence of the commons even within the liberal-democratic framework of market capitalism. This shortcoming is coextensive with the broader lack of the political introduced by Alexandros Kioupkiolis to stress the impotence of the liberal commons to address the contradictions of capitalism and the state.

2.2 Local Commons

In his seminal article, Hardin (1968) stressed the problem of the free-rider with regard to the management of common pool resources such as a pasture. The absence of clear property rights results in overgrazing and pasture depletion.

Hardin concludes that the most efficient solution to 'the tragedy of the commons' is either state management or privatisation. When it comes to privatisation, Hardin's argument is consistent with the dominant neoliberalism of our times (Castree 2010, 14). Hardin's metaphor of the grazing commons has been used to explain various situations where the 'tragedy of the commons' is likely to occur, ranging from international relations and state politics to climate change and Internet broadband access.

The 'tragedy of the commons' is commensurate with the problem of collective action posed by Marcun Olson (1965) to describe the action of benefiting from the commons without contributing back (Hess and Ostrom 2007, 10). The 'tragedy of the commons' has also been formalised as a prisoner's dilemma game, in which interdependent decisions by rational agents lacking communication produce irrational outcomes when self-interest prevails (Ostrom 1990, 3). However, all three models are but simplified versions of social dilemmas, the diversity of which surpasses a one-size-fits-all solution (Hess and Ostrom 2007, 11–12). Hardin's argument, in particular, is mistaken for four reasons (Hess and Ostrom 2007, 11). First, he utilises a limited view of private property. Secondly, he presupposes that people act only on self-interest. Thirdly, he identifies common-pool resources with open access commons, taking for granted the absence of rules in the use of the resource in question. Fourthly, he argues that there are only two ways to avoid tragedy: privatisation or government intervention.

But these are not the only options. Ostrom (1990) introduced the analytical distinction between open access and common-pool resources. Whereas open access commons feature the absence of rules in the use of resources, common-pool resources are self-managed according to the norms and rules of the communities involved. Ostrom was awarded the Nobel Prize in Economics in 2009 for having examined numerous successful cases of self-managed natural resources such as forests, fisheries, pastures, groundwater basins and irrigation fields, stretching across the globe from Switzerland to Spain, Nepal to Indonesia (Ostrom 1990). She proved that not only is cooperation possible in hundreds of cases of common-pool resources, but locally developed institutions and practices occasionally outperform market or state-driven systems governed by private property control and expert regulation respectively.

Private property rights have combined with common property regimes for centuries. In the Swiss Alps, for example, plots are individually owned by farmers, while the summer meadows, forests, irrigation systems, paths and roads connecting individually and communally owned plots are managed collectively (Ostrom 1990, 61–65). Mixed regimes of private and common property apply in cases with no clear boundaries, or with a cultural hostility to private property rights. On the other hand, private property rights are most effective in cases where there are clear boundaries to a resource, and the community is highly mobile and heterogeneous.

Hardin neglects several cases where privatisation or government regulation of common-pool resources have had disastrous effects due to rent-seeking mechanisms of the market, combined with government corruption and

deficient knowledge of particular circumstances in time and place (Van de Walle 2001; De Alessi 1998). Ostrom has demonstrated that hierarchies, prices and property are 'lossy' in processing information under conditions of uncertainty and complexity. The plethora of limited-access commons thriving across the globe for centuries evince that there is no single model of ideal organisation. There is vast diversity consistent with polycentricity. Redundancy, resilience and experimentation with the freedom to cooperate often produce better practices. Exclusive property, by contrast, limits exploration.

Ostrom's work on the commons breaks the dichotomy between 'privatisation' and/or 'government regulation' by pointing to 'polycentric' systems of governance, where 'a rich mixture of public and private instrumentalities' is employed across a vast diversity of institutions (Ostrom 2012, 60–61). 'We have found that government, private and community-based mechanisms all work in some settings' (Ostrom 2012, 70). Polycentricity refers to a diversity of institutions governing common-pool resources via quasi-autonomous and overlapping decision centres relating to different types and scales of resources. The large scale of climate change, for example, demands the involvement of all three sectors (public, private and the commons) to effectively address the problem, whereas the parcelling out of a meadow in a village for the purpose of grazing involves the villagers and the municipality alone. Ostrom's model of polycentricity manifests today, among other places, in urban commons wherein public-common-private partnerships co-administer common-pool resources such as land, buildings, food, energy, culture and knowledge (Foster and Iaione 2016).

Polycentricity differs from a misconceived sense of anarchism that assumes the total absence of rules, since common-pool resources are governed by well-established rules. After extensive field observations, Ostrom came up with a set of design principles governing the commons, such as the demarcation of clear boundaries, the matching of rules with local needs and conditions, the modification of rules by those directly involved, the monitoring of resources and the imposition of sanctions on free-riders.

2.2.1 A Typology of the Commons

Hess and Ostrom later expanded this research to include intangible goods such as knowledge and information. What followed was a typology of property classified along two axes: exclusion and rivalry (Table 2.1). In neoclassical economics, scarcity produces rivalry and exclusion. A good is scarce and, thus, rivalrous if its use by one person subtracts from the total available, thereby excluding others. Property is the legal form of exclusion rendering a good private. We can distinguish between three types of goods: private, public and common. Private goods are marked by high rivalry and exclusion. An apple or book cannot be used by two people simultaneously and such goods are subject to the economics law of supply and demand. Public goods, on the other hand,

Table 2.1: Typology of property (adapted from Hess and Ostrom 2007; Birkinbine 2018).

		Rivalry	
Exclusion	high	high private goods (scarce resources)	low intellectual property (knowledge, language, software)
	low	common-pool resources (forests, irrigation fields, groundwater basins, fisheries, forests, etc.)	public-common goods (defence, highways, parks, airwaves, knowledge, language, free software, etc.)

exhibit low rivalry and exclusion. All citizens can make use of public education, national defence, parks and highways simultaneously. Some common goods, sometimes also referred to as public goods, can be excludable and rivalrous, and others can be non-excludable and non-rivalrous (Kostakis and Bauwens 2014; Benkler 2006; Ostrom 1990). Grazing lands, fisheries and water can be rivalrous and occasionally excludable. But nobody can be excluded from walking on a mountain, swimming in the sea, or breathing the air. Information, language and knowledge – not 'enclosed' by intellectual property rights – are non-rivalrous and anti-rivalrous, meaning respectively that the cost of reproducing an additional unit is near zero, while its use by more people increases its value overall. The more people use a language or software, the more valuable it becomes. Public and common goods thus often blur. The criterion for distinguishing between them is their type of governance. Whereas the former are managed by state governance, the latter are self-managed by communities (Quilligan 2012).

We can further distinguish between two main types of common goods: material/rivalrous (natural resources) and immaterial/non-rivalrous/anti-rivalrous (language, information, knowledge, culture). Depending, then, on the context, the commons can be regulated or unregulated. De Angelis (2017, 62–64) has highlighted the relational/contextual character of the commons. Commons and free access are not always opposed, as Ostrom claims, since they often identify or interrelate. The commons are often open access as in the case of free/open source software and the digital commons (De Angelis 2017, 146).

2.2.2 Institutional Economics vs Neoclassical Economics

Ostrom's work on the commons can be broadly situated within institutional economics, focusing on the impact of incentives on the functioning of institutions and the dissolution of social dilemmas. As such, it adheres to the liberal tradition for a number of reasons. First, she adopts the liberal theory of property rights, albeit in a twisted fashion. Let us recall that John Locke justifies

private property on the grounds of individual labour. An apple becomes the private property of the farmer who laboured to produce it. Yet, for Ostrom, property rights do not necessarily equate to individual property rights, but apply to mixed regimes of private and common property rights. Ostrom makes the distinction between exclusive private property rights, and a bundle of rights most pertinent to the use of common-pool resources, such as the right to access and usage (to enter a defined physical area and enjoy non-subtractive benefits), withdrawal (to obtain resource units or products), management (to regulate internal use patterns), and exclusion and alienation (to sell or lease management and exclusion rights) (Hess and Ostrom 2007, 11). In Ostrom's account, property rights define authority over a range of possible actions.

Secondly, she examines common-pool resources through the lens of rational choice theory, employing the methodological individualism of liberalism to solve social dilemmas. In this context, individualism evolves from Hume's and Bentham's utility theory into the self-interested maximiser of neoclassical economics who uses a cost–benefit analysis to maximise her utility by satisfying her preferences. Ostrom, however, challenges the dominant neoclassical model of individual agency in that she considers incentives more complex and varied than a zero-sum game. She rejects the idea that rationality translates solely into selfishness and opportunism. Economic behaviour has always been dependent not only on competition, but also on cooperation in solving day-to-day collective problems (Ostrom 2000, 143). Finally, motivations are often shaped by collective norms and institutional arrangements.

2.2.3 The Critique of Polycentrism

Ostrom's work is attuned to the liberal tradition, given that her polycentrism model situates the commons in parallel with state and market operation. Most importantly, the self-institutionalisation of common-pool resources is foreshadowed by the power of the state and the market, thus limiting the self-instituting power of the people. Dardot and Laval (2014, 143) correctly mention that Ostrom's non-mainstream use of institutional economics and game theory cannot help but conceal the exploitation and power asymmetries inherent in capitalism and the state. In a similar vein, Alexandros Kioupkiolis (2019, 47–48) argues that Ostrom neglects the political as antagonism, struggle and power structures. Within a state-governed polity, any communal autonomy remains at the discretion of the central sovereign authority, while neoliberal capitalism is bent on colonising both the state and the commons. Ostrom fails to see the contradictory logics that bring the commons into conflict with capitalist markets and the modern state.

Benkler (2002b, 378) holds that her studies focus on relatively limited groups of participants, putting her work in tension with large-scale, non-proprietary, open access commons, such as public infrastructures (Frischmann 2012) and the digital commons. Benkler (2013a, 1518–1519) meets De Angelis from the

opposite direction: not only do limited access and open access commons depend upon each other, but they often contrast. The asymmetric use (excludability) of common-pool resources – owing to their inherent scarcity – contradicts the open access character of highways and the Internet, for example.

A wide chorus of scholars (Carlsson and Sandström 2008; Dowsley 2008; Harvey 2012; Ostrom and Andersson 2008) have objected that the non-hierarchical self-governance of common-pool resources is politically debilitating at higher levels. It cannot translate into solutions for large-scale problems. Conventional economics considers Ostrom's local commons to be developing at the periphery, thereby not touching the core of the world economy, where the model of the self-interested maximiser reigns supreme (Benkler 2013a).

Nonetheless, Ostrom's empirical work offers significant insights into how formal and informal norms can structure collaboration along the lines of non-property-based schemes. She shifted the discourse on incentives from the methodological individualism of neoclassical economics to the institutional structure of collective agency. In other words, she brought to the fore the concept of the common as the self-instituting power of the people by reinvigorating the democratic elements of participation and inclusion in the collective management of resources. Ostrom inspired a new school of economic thought that works today on applying her design principles to various fields, ranging from rural and urban commons to the digital commons. Yet all these efforts need to integrate into a broader, more coherent political perspective that seeks to move the terrain of discussion from the liberal commons to a post-hegemonic account of the commons. Thus, this book seeks to radicalise the commons and pave the way for a holistic, post-capitalist, commons-orientated transition.

2.3 Global Commons

The notion of the commons was introduced into the contemporary legal debate by Carol Rose with her paper entitled 'The Comedy of the Commons' (1986), spurring a revival of commons scholarship. Rose reversed the so-called tragedy of the commons by highlighting the 'inherently public property' of goods such as roads, navigable waterways and open squares. These sorts of goods are not amenable to private or state management, since they are governed by 'custom' or norms within the relevant communities. Nor can they be classified as limited access commons, since they are open access commons. The unique feature of these goods is that their value is proportional to the increasing number of users. Rose introduced an early version of 'network effects': open access systems that increase their value through the permissionless use of the resource by an indefinite amount of users. This is the case when the value from increased participation outweighs the costs from increased utilisation, thereby reversing the tragedy of the commons into a comedy. Efficiency and welfare would suggest opening relevant resources to public use instead of enclosing them with property rights and state regulation.

Network effects apply today *par excellence* on the Internet and the digital commons, following Metcalfe's law (1995): 'The value of a communications network is proportional to the square of the number of its users.' The more people use a network, the more valuable it becomes. Jodi Dean (2012, 130–131), however, criticises Metcalfe's law with respect to scale (larger networks may be more prone to crashes and delays) and the suppositions between the links. The problem is magnified if one considers the information asymmetries (Grossman and Stiglitz 1980) inherent in networks due to the power asymmetries between corporations, institutions and non-institutional agents. Network effects are exploited today by platform capitalism instead of contributing to a robust and decentralised peer production.

Inversely proportional to the comedy of the commons is the tragedy of the anti-commons, introduced into the legal literature by Michael Heller (1998). In contrast to the tragedy of the commons resulting in the potential overuse of a resource, the tragedy of the anti-commons is a type of coordination breakdown where excessive intellectual property rights and overpatenting (for example, in biomedical research) results in the underuse of a resource. Take the example of AIDS patents preventing the use of drugs by millions of Africans dying of AIDS simply because they cannot afford to buy the medicine. Anti-commons property is the mirror image of commons property. Yet identifying a case of anti-commons does not necessarily induce open access commons or common property regimes, since this could also translate into refined property rights. When the market misallocates resources, the latter can be stuck in low-value uses at either end of the property rights spectrum. Whether this misallocation results in overuse or underuse, the common denominator is waste (Heller 1998, 626). It then depends on the scope and definition of the resource whether this tragedy can be solved by means of better-defined property rights or better-designed commons (Benkler 2013a, 1498–1499).

An intermediary use of the commons lies in Henry Smith's term 'semi-commons' (2000), illustrating well-functioning mixed regimes of private property and commons, as in the case of wheat growing in private allocations within open fields used for animal grazing, the latter having both costs (trampling) and benefits (manure) for the former. A number of scholars have attempted to apply the use of semi-commons to telecommunications regulation, intellectual property and the Internet (Grimmelmann 2010; Heverly 2003; Smith 2005). Relevant policies would demarcate accordingly the private and commons part within the semi-commons, rather than posing the dilemma of either commons or private property. As regards intellectual property, for example, it would deal with the term of coverage or the definition of fair use.

Benkler (2013a, 1523), however, has shown the limits of this approach when it comes to the basic protocols of the Internet such as TCP/IP, HTML and HTTP, which are by default open access commons. Benkler and Lessig extend the legal analysis of the commons to the Internet and the digital commons, which represent a new model of information, knowledge and culture production, anchored

in openness, cooperation, mutual coordination and decentralised, bottom-up, techno-social innovation. This new mode of production was first named by Benkler (2006) 'commons-based peer production'. Unlike Ostrom's school of ecological commons, commons-based peer production encapsulates a broader paradigm shift facilitated by new technological development in the networked society (Castells 2000; 2009; 2010). The digital commons are not confined to small-scale communities and local ecosystems, but expand into open and plural shapes of networks that have the potential to occupy centre stage in economic, political and social life.

However, a number of thinkers such as Dardot and Laval (2014), De Angelis (2017) and Kioupkiolis (2019) argue that digital commons are beset with deficiencies similar to those of local commons in their grasp of the political. Additionally, they fail to connect with local commons and counter the contradictory logics of the state and the market. This failure is exacerbated by the current conditions of social fragmentation, exclusion, precarisation, individualism and collective disempowerment.

2.3.1 The Digital Commons

Lawrence Lessig (2001) wraps up the legal debate on the commons in the last decade to focus on the Internet and generalise to the online production of information, knowledge and culture. The Internet originated in the American scientific community and military, sponsored by research fellowships and licensing contracts from the American government. It dates back to the idea of Paul Baran, among others, of digitising communication by translating waves into bits chopped into packets that travel along the wires of a telephone network. Instead of waves transmitting from one line to another via circuits, data could now travel as packets via many lines simultaneously (Lessig 2001, 31). This idea was then implemented in the ARPANET project, funded by the United States Department of Defense, to create a telecommunications network that could withstand a nuclear attack. ARPANET was the first packet-switching network to apply the TCP/IP protocol that would allow computers to communicate with each other, thereby setting the technical foundation for the Internet, which then became the network of networks running in telephone lines (Lessig 2001, 34; Fuchs 2008). The Internet is based on the interoperability between decentralised sub-networks/computers using a generic addressing system (IP numbers and domain names) and technical standards (TCP/IP protocol and HTML) that take the form of open source software (Brousseau and Curien 2007, 5).

Control and freedom on the Internet

Lessig (2001, 23) draws on Benkler to illustrate the architectural design of the Internet. Benkler (2000) divides the Internet into three 'layers': 1) the 'physical'

layer consisting of the hardware, wires, cables and the radio frequency spectrum that link computers together on the Internet; 2) the 'logical' layer, that is, the code, the protocols and the software that make the hardware run; 3) the 'content' layer, that is, the data transmitted across the wires, including text, images, music, movies and the like. These three layers together make communication possible on the Internet. Much of these three layers is today either state or privately owned, or both. Yet the code – the instructions inscribed in both software and hardware – that accounts for the core structure of the Internet is still to some extent free. So, too, is much of the content delivered across the network.

Lessig (2001, 177) discovers a tension between control and freedom at all three levels, potentially pregnant with two contrasting tragedies of the commons. On the freedom side, the tragedy derives from potential congestion in the frequency spectrum, resulting in the overuse of the resources on the Internet and beyond (for example, traffic, electricity, etc.) (Lessig 2001, 83–84, 229). On the control side, the tragedy consists in the creation of digital monopolies that limit freedom by causing Internet underuse (Lessig 2001, 175). Lessig (2001, 200–202) argues for a balance between freedom and control on the Internet, tilting towards the protection of the free space across the three layers, which breeds the digital innovation commons, that is, the free and unrestricted production of applications and content by Internet users.

Digital freedom relies basically on the code that regulates the flow of content via the controlled physical layer of the Internet. Code consists in the basic protocols – TCP/IP, HTML, HTTP – that make for the core structure of the Internet, that is, the end-to-end principle, which locates intelligence at the ends of the network rather than at the centre, thereby sustaining a decentralised architecture devoid of central control. On the Internet, each user has the capacity to influence the flow of communication via digital technology's ability to encrypt information. In a digital system all information is coded in a sequence of digits, which can then be easily encrypted. Encryption permits a user to filter information and authorise access to all or part of the information depending on the identity of other users or other criteria (Brousseau and Curien 2007, 7–8). In short, encryption enables all Internet users to lay down 'norms' on the use of information and the subsequent flow of communication.

Internet use, of course, is neither always legitimate nor regulation-free. Given the Internet's effects on commerce, intellectual property, cyber-crime, national security, public freedoms, and so on, non-governmental organisations (NGOs) such as the ICANN (Internet Corporation for Assigned Names and Numbers), the IETF (Internet Engineering Task Force) and the W3C (World Wide Web Consortium), in concert with states, have progressively become involved to co-regulate the network (Brousseau and Curien 2007, 6–8). Thus, the self-organisation of the Internet does not lack an institutional framework completely. Rather, it employs 'framed' self-organisation.

Code is law

Code is law and architecture is politics inasmuch as it enables certain forms of social interaction, while disabling others (Lessig 2001, 35). Code embedded in the technical architecture of the Internet is the social engineering of information, knowledge and cultural production. The underlying political philosophy of the Internet is the liberal ideal of network neutrality that advocates for non-discriminatory traffic management by Internet service providers (ISPs) with regard to the content and applications running in the network. Network neutrality is enforced by the end-to-end principle, which epitomises unconstrained value creation. The Internet was initially designed to remain open and enhance freedom via interconnected networks and flexible applications built on top of basic protocols. Under conditions of uncertainty and complexity, plasticity – the ability of a system to evolve easily in a number of ways – is the optimal method to allow for the broadest range of development and innovation (Lessig 2001, 39). Internet architecture was the key to the explosion of new services and software applications. Cyberspace could, thus, be the dream of the libertarian who envisions the elimination of control.

The hallmark of freedom in the Internet is free and open source software (FOSS) invented in 1984 by Richard Stallman who introduced the GNU General Public License (GPL) as a legal hack in the traditional copyright system, allowing programmers to freely access, copy, modify and distribute software on the same copyright terms. The core defining feature of FOSS is the renouncing of exclusive proprietary control over the software in which one has copyright (Benkler 2013b, 221). FOSS is the collective reversal of the proprietary copyright system through the combination of contract law and copyright (Lessig 2001, 58). Far from meaning the abolition of copyright, FOSS establishes a 'copyleft' system on the basis of the traditional copyright system. While most licences limit the copies one can make, the GPL limits the restrictions on copying. Building on top of the GPL, Linus Torvalds in 1991 developed the Linux operating system, which supports a model of collaborative production of software developers, based on volunteering and sharing (Lessig 2001, 54). GPL/Linux is now the fastest-growing operating system in the world.

Jeremy Rifkin makes the case that the GPL could be considered a digital version of the regulation of the limited access commons, inasmuch as it incorporates many of Ostrom's principles: the conditions of inclusion; the restrictions of exclusion; the rights governing access; withdrawal, enhancement and stewardship of the resources; and so on (Rifkin 2014: 175). The difference here is that FOSS is open access rather than limited access.

Similar efforts are underway to implement Ostrom's principles on Blockchain, which is a decentralised ledger on the Internet, allowing for numerous applications with as yet uncertain potential (Rozas et al. 2018). Blockchain is one of the applications of peer production, which makes use of the end-to-end

principle of the Internet, allowing content (file sharing, processing cycles, etc.) to be delivered by equal computers along the network. FOSS, Blockchain and the digital commons are instances of peer production, supported by the architecture of the Internet.

The general idea behind distributed ledgers such as Blockchain is to use peer-to-peer networks to verify the authenticity of a token of value (money), an indicator of personal reputation, a recognised legal agreement among parties or a group encapsulated in smart contracts, or a tool for voting and decision making (Bollier and Helfrich 2019, 326). Distributed ledgers can support the creation of community currencies that enable people to coordinate the terms of their cooperation at scale, without the threat of enclosure. Instead of making decisions through rigid hierarchies with centralised direction and relying on property rights vested in a few people, distributed ledgers can support transparency and democratic decision making.

Holochain is another example of a lighter, far more energy-efficient and versatile set of software applications than Blockchain, since there is no single ledger in Holochain to store data. Holochain is based on an open data, distributed architecture that allows every user to have his or her own secure ledger to store their personal data (Bollier and Helfrich 2019, 326). The core idea of Holochain is to enable the 'renting out' of user-computing capacity in exchange for Holo Fuel currency to circulate within the network and kick-start a new parallel economy of services (Bollier and Helfrich 2019, 328–332). This establishment of Holo Fuel currency basically constitutes a mutual credit system backed by an asset (computing power). As more enterprises join Holochain and back its value with actual assets and services such as food, transport, energy or elderly care services, a commons-based economy will emerge. Holochain can be further used to build decentralised applications for peer governance, social networks, platform cooperatives, open supply chains, community resource management as well as tokenless mutual-credit cryptocurrencies and reputation systems. Thus, Holochain can express the flows of value that market prices cannot represent such as positive (social relationships and contributions to the commons) and negative externalities (waste, pollution).

*Cyber-communism, cyber-libertarianism and
firm-hosted peer production*

Free code builds a digital commons in the production of information, knowledge and culture thanks to the non-rivalrous/anti-rivalrous nature of information. The consumption of one ebook, for example, by one person does not subtract from the total available to others. On the contrary, it produces more information and creates new knowledge. The nature of information combines with the architecture of cyberspace, which, contrary to the physical world, allows users altogether to give away much more information than they can

receive alone, thus spontaneously creating a gift economy (Barbrook 1998). One ebook can be uploaded by millions at the same time, while a user can download a limited number of ebooks at a time. Jodi Dean (2012, 146–148) marks this unique feature of the web as a contradiction between the abundance of knowledge production versus the scarcity of human capacity for consumption. This is also the case with scientific research, innovation and culture in the physical world. Information breeds information in the networked social interaction, surpassing individual human limits. The difference with cyberspace is that the proliferation and abundance of information and knowledge can be faster and denser on the Internet, covering simultaneously multiple points in time-space. In purely economic terms, cyberspace carries a ticking time-bomb for the capitalist economy: an abundance of supply versus a scarcity of demand. In contrast with tomatoes which still cannot be cloned indefinitely, information is destined to reproduce information at zero marginal cost.

According to Vasilis Kostakis and Michel Bauwens (2014), FOSS sustains a sort of cyber-communism operating at the very heart of capitalism, where everybody can contribute and share according to their needs and skills. However, the most common political interpretations of FOSS tend to be libertarian rather than communist. Others have pointed to the political agnosticism of FOSS developers (Coleman 2004; Raymond 1999; Stallman 2002).

Richard Barbrook (1998) considers cyberspace a form of high-tech anarcho-communism, which is not only in conflict with digital capitalism, but coexists in symbiosis with the latter. Anarcho-communism is often sponsored by corporate capital. The free circulation of information among users depends upon the capitalist production of computers, software and telecommunications. Anarcho-communism is also symbiotic with the state that subsidises and regulates digital capitalism. Within the digital mixed economy, anarcho-communism blends with state democracy. The Internet user is a consumer in the market, a citizen of a state and an anarcho-communist within a gift economy largely co-opted by finance capital.

Alongside the proliferation of the digital commons, the last decades have witnessed the development of the capitalist commons, with several companies incorporating FOSS development within their operations. For Lessig (2001, 70–72), this offers a win–win partnership for both capitalism and FOSS production. Illustrative is the case of IBM which invested more than $1 billion to support the development of Linux and Apache. Most recently, IBM bought RedHat, one of the most iconic companies in open source development, for $34 billion.

The crucial questions here are, first, why does IBM pay for what it could get for free and, second, why does it give its improvements back to the public. IBM profits from the improvements made by millions of developers in the open source movement by incorporating them in the hardware and adding paid services on top of the free software. Instead of IBM paying ten programmers to produce software, it pays significantly lower salaries to a community of peer

producers to produce the same software with much better quality. If IBM participates and deflects from the open source movement, it becomes extremely costly to keep its software up to date, since it cannot compete with the work of millions of developers across the globe.

The limitations of the digital commons

Lessig (2001, 9) champions a mixed regime of private property and the digital commons. His core argument is that digital technology could enable more and more people to participate in the creative process, thereby democratising the production of information, knowledge and culture. Following Rose, he holds that FOSS and the digital commons demonstrate that the added value from increased production outweighs the cost from increased utilisation. Therefore, the Internet creates more wealth when held in common than in private (Lessig 2001, 86–88). As Lessig puts it:

> Where a resource has a clear use, then, from a social perspective, our objective is simply to assure that that resource is available for this highest and best use. We can use property systems to achieve this end. By assigning a strong property right to the owners of such resources, we can then rely upon them to maximise their own return from this resource by seeking out those who can best use the resource at issue. But if there is no clear option for using the resource – if we can't tell up front how best to use it – then there is more reason to leave it in common, so that many can experiment with different uses. Not knowing how a resource will be used is a good reason for making it widely available […] Where uncertainty is highest, network designs that embrace end-to-end maximise the value of the network; and where uncertainty is low, then end-to-end is not a particular value. (2001, 89)

Lessig (2001, 72) advocates that intellectual property rights must strike the right balance between free and controlled resources. Control makes sense in the case of scarce and, hence, rivalrous resources suited for commercial appropriation in the market, whereas freedom belongs to the world of ideas held in common. Strict property rights, he claims, burden innovation and creativity (2001, 139–140). Economists have long emphasised the costs of patents to information production, given the public goods nature of information (Arrow 1962). Strong patent protection increases the costs that current innovators have to pay for existing knowledge more than it increases the benefits of appropriating the value of their own contributions (Benkler 2006, 38–39). Strong intellectual property rights lead to commercialisation, concentration and homogenisation of information production rights, thus underutilising information and stifling innovation (Benkler 2002a; Boyle 1996; Samuelson 1990). On the flipside, the more open the access to information goods, the more the value for all.

Today, changes in the architecture of the Internet – both legal and technical – aim at increasing the scope for control of code and content (Lessig 2001, 15). Instead of the Internet promoting innovation, creativity and freedom, it turns into the most efficient censorship and surveillance mechanism, as evidenced in the cases of China and the USA. 'There is no "nature" of the Internet that will assure a continued commons at the code layer, no strong protection limiting the Congress to ensure that adequate resources remain free at the content layer' (Lessig 2001, 139). Some authors claim that we have entered the age of surveillance capitalism (Zuboff 2019). The Internet is not immune to potential gatekeepers and supernodes such as governments and corporations forestalling the openness of the network. Rather, the Internet sustains the political and economic battle of freedom and control, playing out on the interface of software and hardware.

Lessig (2001, 9) is pro-market. He does not question property per se, but only the scope of property. He demonstrates a liberal version of the commons, arguing for the coexistence of the commons with state and market operation across separate but entangled spheres of action. However, such an approach has two major shortcomings: not only does Lessig limit the commons to the digital commons, he also limits the latter with respect to state and market operation. Most importantly, Lessig's version of the commons is undermined by the contradictions of capitalism and the state, that is, the power asymmetries inherent in the core structure of managerial hierarchies, namely the division between directors and executants, managers and workers, representative and citizens, elites and the people. For the commons to provide a sustainable democratic paradigm shift, they need to integrate into a broader political debate that seeks to unify diverse projects under a holistic, post-hegemonic perspective that radically challenges the current neoliberal status quo.

2.3.2 Commons-based Peer Production

Benkler develops a more radical version of the commons compared to Lessig's innovation commons. He builds on Manuel Castells's (2000; 2009; 2010) concept of the networked society – which marks the shift from groups and hierarchies to networks as social and organisational models – with the aim of introducing a novel normative framework for refiguring civil collaboration with respect to the market–state nexus. He demonstrates a model of networked pragmatism/anarchism, based on the decentralised self-management of information, knowledge and cultural production, supported by the Internet and FOSS. The idea of decentralised self-management is not novel in economics and political theory. It is reminiscent of the work of numerous thinkers, related to diverse and often disparate strands, ranging from anarcho-capitalism and anarcho-communism to autonomous Marxism and radical republicanism. What is novel in Benkler's work is the technological substratum of a liberal critique of managerial hierarchies and market limitations on individual

freedom, participatory democracy and justice, ameliorated today by the emergence of a new organisational model termed 'commons-based peer production'.

The term 'commons' signifies a particular institutional form of structuring the right to access, use and control resources, which differs significantly from managerial hierarchies and markets. The distinctive features of the commons are: 1) decentralised self-governance through the utilisation of participatory, meritocratic (do-ocracy) and charismatic rather than proprietary or contractual models; 2) the centrality of non-monetary motivations; and 3) the permeation of state and firm boundaries (Benkler et al. 2015, 2–3; Benkler 2016a, 2). Highways, squares, shipping lanes, water, airwaves, scientific knowledge, ideas and the Internet are all commons. The main event for all these systems is open commons, which designate free access, use and control of common-pool resources under symmetric terms (Benkler 2013a, 1500). Open access commons differ from Ostrom's limited access commons in that they are not limited to a restricted number of people who cooperate at a local level, but expand to the global level.

Benkler (2006, 59–90) focuses on the Internet. He defines commons-based peer production as a non-market sector of information, knowledge and cultural production, not treated as private property, but as an ethic of open sharing, self-management and cooperation among peers who have access to fixed capital such as software and hardware. Commons-based peer production consists of open contributory networks of distributed tasks, set and executed online in a decentralised and autonomous fashion.

Benkler mentions that not all peer production qualifies as commons-based production. The term 'commons-based' denotes the absence of exclusive property:

> The salient characteristic of commons, as opposed to property, is that no single person has exclusive control over the use and disposition of any particular resource in the commons. Instead, resources governed by commons may be used or disposed of by anyone among some (more or less well-defined) number of persons, under rules that may range from 'anything goes' to quite crisply articulated formal rules that are effectively enforced. (Benkler 2006, 61)

The term 'peer production' signifies a subset of commons-based production practices, which 'refers to production systems that depend on individual action that is self-selected and decentralised, rather than hierarchically assigned' (Benkler 2006, 62). Similarly to Lessig, Benkler distinguishes between two basic modes of peer production: 1) commons-based peer production (FOSS and the digital commons); and 2) firm-hosted peer production (peer production incorporated into firms such as IBM and Google). The latter refers also to the online business models of the so-called sharing and gig economy (for example, Uber, Airbnb, Kickstarter, TaskRabbit and Upwork), which will be analysed later.

The quintessential instance of commons-based peer production is FOSS, which produces some of the core software utilities running the Web – servers, email, scripting, applications, plug-ins. FOSS accounts for 70% of web servers running on the Apache web server; more than 70% of web browsers (Firefox, Chrome); server-side programming languages (PHP); content management systems (Wordpress, Joomla and Drupal have more than 70% of servers); smartphone operating systems; enterprise software (Google, Amazon and CNN.com run their servers on the GNU/Linux operating system; 40% of firms engaged in software development contribute to FOSS development). In short, roughly half of the Internet runs on FOSS.

FOSS development, however, is not the only instance of commons-based peer production. The commons expand into large-scale collaboration in the networked information environment. They range from the scientific, digital and knowledge commons to non-professional information and cultural production taking place on entertainment sites and in grassroots movements, communities and interpersonal relationships (for example, families and friendships).

The digital commons, in particular, extend beyond FOSS development to distributed content production and sharing of processing, storage and communications platforms. Examples of distributed content production are the Nasa Clickworkers, Wikipedia, Kuro5hin, Multiplayer Online Games, Open Directory Project, Slashdot and Project Gutenberg. Examples of sharing of processing, storage and communications platforms are Napster, Gnutella, SETI@ home, Skype, Bitcoin and WiFi. The digital commons have proliferated globally in the last decade to a degree that largely escapes Benkler's own work. Recent research has documented hundreds of cases currently in progress (De Filippi 2015a; 2015b; De Filippi and Tréguer 2015a; 2015b; De Filippi and Troxler 2016). Also, Blockchain technology has arguably the potential to support both online and offline decentralised collaboration (De Filippi and Hassan 2016).

The explanation of commons-based peer production

In explaining the rise of commons-based peer production, Benkler draws on a number of sources. First and foremost, he uses Ronald Coase's transaction costs theory to argue that the rise of commons-based peer production is due to four basic features inherent in the networked information economy: 1) the primary inputs and outputs of production are open access commons – existing information, knowledge and culture; they are non-rivalrous/anti-rivalrous goods, since their marginal cost of reproduction is near zero; 2) there are cheap physical capital costs (cheap processor-based computer networks) coupled with the digitisation of information production; 3) the architecture of the Internet allows for the decentralisation and modularity of human–computer interaction; in addition, human creativity is more central and variable in information production than in other modes of production, meaning that it is more diverse,

flexible and, therefore, potentially more effective; and 4) there has been a dramatic decline in communication costs.

However, transaction costs theory alone cannot explain the rise of commons-based peer production. The latter features a diversity of non-monetary motivations, the centrality of which on the digital commons poses a puzzle for neoclassical economics, since it seemingly contradicts its main behavioural model of the self-interested maximiser. Benkler shows that there is no puzzle to solve, since the theoretical framework adopted to explain behaviour by neoclassical economics is simply flawed. The widely held assumption that self-interest motivates behaviour, that managerial hierarchies and markets are the best ways to produce goods, that property rights and contracts are the *sine qua non* for organising production, are not equally applicable to information (Benkler 2006, 41). FOSS forces us to re-evaluate these claims by placing intrinsic and social motivations, rather than material incentives, at the core of innovation; by questioning the centrality of managerial hierarchies and markets to the innovation process; and by challenging the centrality of property, as opposed to the interaction of property and commons (Benkler 2016a, 1).

Lerner and Tirole (2002) have listed a series of intrinsic and social motivations in FOSS production that testify to some combination of hedonic gain and indirect appropriation: the playful joy of creation, reputation, social-psychological rewards and increases in human capital are some of the indirect benefits for those participating in commons-based peer production. Given that two-thirds of the revenues of the software industry are service-based, the skills indirectly appropriated in free software development can be directly redeemed in proprietary projects (Benkler 2002b, 424–425).

Benkler draws on the work of Eric von Hippel (1988; 2005) to further argue that innovation is a collective process of knowledge production and learning. He invokes extensive empirical work to show that humans exhibit diverse pro-social motivations, responding to a range of non-material, non-self-interested motivations, from reciprocity to group identity through, in some cases, altruism (2016a, 8). Experimental and observational data has exhaustively documented that the effects of standard economic incentive tools such as material rewards and punishments are not only inseparable from but, in some cases, detrimental to the sum of motivations across the target population (Bowles and Hwang 2008; Bowles and Polania-Reyes 2012; Frey 1997; Frey and Jegen 2001). One cannot buy friendship and love with money. Not only is there often a tension between material rewards and pro-social motivations, but also between diverse pro-social motivations themselves. Individuals are driven by motivations that differ from each other in mixing motivational drivers.

Beyond neoliberalism

Benkler's goal is not merely to highlight the diversity of pro-social motivations inherent in commons-based peer production, but to question the current

dominance of neoliberalism by dispelling the myth of universal selfishness. His main intent is to help transform the commons into an autonomous and sustainable mode of production. His basic argument is that the Internet and FOSS bring to the fore the cooperative element of human nature, occasionally counterweighting self-interested motivations. To further back up this claim, he brings up evidence from evolutionary biology and the social sciences, illustrating the shift in the scientific understanding of human rationality from the model of the self-interested maximiser, driven by competition and separable motivations, to the model of *homo socialis* featuring cooperation and diverse pro-social motivations (Benkler 2011). Rationality does not always translate into self-interest, since humans often rationally pursue non-self-interested goals.

Benkler cites, in particular, Ostrom's work as a landmark in the social sciences, proving that cooperation at a local level occasionally out-competes traditional proprietary and state models. He points, though, to a tension between local commons and the scale at which the digital commons operate in modern complex economies (2013a, 1505). A challenge remains to unite local and global (digital) commons. Conventional economics has noted that Ostrom's work is limited to the periphery, thereby not touching the core of modern economies where the model of the self-interested maximiser still prevails. Yet this does not hold true for the digital commons, which account for a considerable part of the actual economy. FOSS, in particular, is an economically significant institutional and organisational strategy for both corporations and the commons:

> As of January of 2013, Apache held a 55% market share, Microsoft 17%; nginx, an alternative FOSS platform, 13%; Google's servers for its own machines, 4%; and the remainder was held by platforms bunched as 'other' (Netcraft Websurvey 2013). Server-side scripting languages are the primary languages used for programming functions of the Web. PHP, an open source language, is used by 78% of websites, while Microsoft's ASP.Net holds the remaining 20%; most of remaining languages, like Ruby or Python, are also open source (W3Techs 2013). Web Browser statistics are less clearly in favor of open source. Historically, Microsoft's Internet Explorer held over 95% of the market after it squeezed Netscape Navigator out of the market (illegally, according to antitrust adjudications in both the US and EU). Netscape then spun out Navigator to a non-profit, the Mozilla Foundation, as FOSS. Over time, Firefox gradually captured market share over the 2000s, and in 2008 Google released Chrome, and at the same time a parallel, FOSS project, Chromium. As of January 2013, competing methods identify IE as either having 55% of the desktop browser market or 31%; and Chrome and Firefox having either 18% and 20%, respectively, or 36% and 22% respectively (ZDNET 2013). By a different measure, almost 40% of firms engaged in software development reported spending development time on developing and contributing to FOSS software. (Benkler 2016b, 6–7)

The Internet has given the opportunity to individuals, groups and firms to produce a wide range of commercial and non-commercial products and services through a variety of strategies that combine exclusive to non-exclusive property rights applied both to market and non-market models. FOSS testifies to the fact that property (as opposed to a mixed infrastructure of property and commons) is not the sole determinant factor for growth. Commons-based peer production comes in a variety of licences (Ostrom's bundle of rights, GNU, Creative Commons) that do not entail the complete rejection of the property model, but rather the reimagination of it. Property and contractual relations are just elements in an institutional toolkit. Commons-based peer production can be individual or collaborative, commercial and non-commercial. The individual can be both part of and apart from the collective. Commons-based peer production does not dismiss market actors, but increases the diversity of actors, motivations and transaction forms. It decentralises authority where capacity to act exists, thereby diffusing power and freedom to the many.

Like Lessig, Benkler considers commons-based peer production as a third institutional model that offers substantial degrees of freedom and power in addition to state and market operation. The main question then, for him, concerns the scope and role of commons-based peer production in relation to state and market operation. To answer this question, Benkler juxtaposes commons-based peer production with capitalism in terms of information-processing systems. Similarly to Lessig, Benkler illustrates a number of trade-offs between managerial hierarchies (firms and state), markets and the commons, based on the core variables of uncertainty and complexity. His core argument is that commons-based peer production offers some significant information and allocation gains compared to managerial hierarchies and markets. In contrast to capitalism, which tackles uncertainty and complexity with clear property rights and pricing, commons-based peer production introduces more refined, flexible and cost-efficient information processing, better attuned to the variability of human creativity than managerial hierarchies (firms, state) and markets.

The fine-grained, diverse qualities of agents, resources and projects and the subsequent differences in input combinations or user interactions account for the impossibility of reaching managerial decisions or price clearance without significant loss of information, control and, ultimately, effectiveness (Benkler 2016b, 9). The divergence of the existing modes of production – peer production, markets and firms – from the ideal condition of 'perfect information' results in respective information opportunity costs. Human creativity is difficult to qualify/quantify for efficient contracting or management due to the diversity of talent, motivation, experience, availability, and so on. Perfect information is all the more unattainable due to the increased transaction costs inherent in the specification process. Therefore, markets and firms are costly and lossy compared to commons-based peer production. Property and contractual relations render agents and resources 'sticky'. That is, employees are not flexible enough to change information, collaborate and thus co-produce knowledge

and innovation. Commons-based peer production aspires to improve on markets and firms by correcting these two failures:

> Where the physical capital costs of information production are low and where existing information resources are freely or cheaply available, the low cost of communication among very large sets of agents allows agents to collect information through extensive communication and feedback instead of using information-compression mechanisms like prices or managerial instructions. (Benkler 2002b, 413)

Commons-based peer production has particular advantages for identifying and allocating human creativity to work on information and cultural resources, since it relies on decentralised information gathering and exchange to reduce uncertainty and complexity in information processing. Information exchange among large sets of agents who use existing information resources cheaply to freely communicate reduces uncertainty as to the likely value of various courses of productive action by creating substantial information and allocation gains. The latter overcome the information exchange costs due to the absence of transaction and coordination costs related to pricing, managerial direction, contractual relations and property rights (Benkler 2002b, 406–412). In short, information production in managerial hierarchies and markets is lossy, sticky and costly.

Given the uncertainty as to the value of various productive activities and the variability of human creativity vis-à-vis any set of production opportunities, decentralised coordination and continuous communication among the pool of potential producers and consumers can generate better information about the most valuable productive actions and the best human agents available at a given time. This way, peer production has the potential to identify who will best produce a specific component of a project.

Yet commons-based peer production will not always be successful or superior to markets and firms. This depends on a complex and varied function playing out in several trade-offs. The primary trade-off is between monetary and non-monetary motivations, and depends on two counterbalancing variables: the degree of information uncertainty and the degree of capital investment necessary for the realisation of a project. The more routine the tasks, and the more capital-intensive a project is, the more appropriate monetary 'incentives' are to motivating contributions, and, therefore, the bigger the role of markets and firms will be in organising production. The more complex and the less costly or capital-intensive a project is, the more likely it is to attract non-monetary motivations, and, therefore, the bigger the space for peer production (Benkler 2002b, 403–404). Benkler perhaps misses out in his hypothesis the superpowers of the corporations that have come to dominate the current economy. The vast majority of people are dependent on capitalism to the extent that they cannot easily leave to enter commons-based peer production.

The success of commons-based peer production depends on four additional variables: 1) the scale of peer production; 2) the degree of modularity and granularity; 3) the trade-off between waste and efficiency; and 4) the cost of integration. Commons-based peer production has an advantage over markets and firms in large-scale collaborations, which are costly to sustain. It would be extremely costly for a firm to produce Wikipedia or Linux. Moreover, large-scale commons-based peer production renders the motivations problem trivial, since monetary and non-monetary motivations coexist in non-exclusive ways (Benkler 2002b, 433–434). As Benkler (2002b, 434–435) puts it: 'The sustainability of any given project depends, therefore, not on the total cost but on how many individuals contribute to it relative to the overall cost.'

The sustainability of commons-based peer production depends also on the degree to which it can reduce the waste produced from duplication of effort. The problem disappears when duplication of effort produces more efficiency than waste. Redundancy, that is, the production of the same component by different people, makes peer production more innovative, robust and resilient.

Commons-based peer production is further limited not by the total cost or complexity of a project, but by its modularity and granularity. Modularity is the degree to which a project can break down into smaller components that can be independently and asynchronously produced and recombined. The higher the degree of modularity, the bigger the autonomy and flexibility of peer production. Granularity refers to the size of each module in terms of the time and effort needed to produce it. The smaller the size, the more people are likely to participate in peer production.

The remaining obstacle to commons-based peer production is the cost of integration, that is, first, the filtering out of incompetent and malign actors and, secondly, the combination of the modules into a whole. One could argue that commons-based peer production could result in various tragedies and Babels of the commons on the Internet and beyond. Benkler (2002b, 436–443) argues that these problems can be solved by a combination of four mechanisms: 1) iterative and modular peer production of the integration function itself (for example, moderation and meta-moderation on Slashdot); 2) technical solutions embedded in the collaboration platform (for example, Slashdot, Nasa Clickworkers project, Kuro5hin); 3) norm-based social organisation (for example, limited access commons, Wikipedia, Kuro5hin); and 4) limited reintroduction of hierarchy or markets to provide the integration function alone without appropriating the full value of the product (for example, IBM, Linux Kernel, Apache). Benkler puts it very succinctly:

> Where the physical capital requirements of a project are either very low, or capable of fulfillment by utilising pre-existing distributed capital endowments, where the project is susceptible to modularisation for incremental production pursued by diverse participants, and where the diversity gain from harnessing a wide range of experience, talent,

insight, and creativity in innovation, quality, speed, or precision of con-
necting outputs to demand is high, peer production can emerge and
outperform markets and hierarchies. (Benkler 2016b, 10–11)

To sum up, commons-based peer production is an information, innovation and
knowledge production system that, under certain conditions, bears an organi-
sational advantage over firms, governments and pure market clearance. Its suc-
cess has additional implications for politics and economics. It requires that we
modify our conceptions about motivations and incentives; it recalibrates the
role of property and contract in the domains of information-dependent pro-
duction and innovation; and it requires adaptations to the theory of the firm
and organisational management (Benkler 2016b, 2). What would, therefore, be
the role of firms, governments and markets in relation to the potential future
development of commons-based peer production?

Future scenarios of peer production

One plausible scenario is that firms would continue to prevail under conditions
of high capital costs and rent-extraction opportunities that give an advantage
over firm-hosted or commons-based peer production. The role of firms in
innovation becomes then contingent and path-dependent, rather than effi-
ciency or growth-orientated (Benkler 2016a, 7).

   Firms might move also from information product-based business models to
information-embedding material products and service-based business mod-
els, thereby gradually shifting towards firm-hosted peer production. Jeremiah
Owyang argues that, to avoid disruption by peer production, companies must
adopt the collaborative economy value chain. He defines the collaborative econ-
omy as an economic model where ownership and access are shared between
corporations, start-ups and people (Owyang 2013, 4). Given that people are
empowered today by digital platforms, companies must change their business
models by becoming a company-as-a-service, motivating a marketplace, or
providing a platform (Owyang 2013, 1). Rather than sell goods the traditional
way, companies can offer products and services to customers on demand or
through a subscription model; foster a community around a brand and enable
customers to resell or co-purchase products, swap goods or even lend and gift;
or transform consumers into partners by enabling them to build products and
new services on their platform (Owyang 2013, 10–13). A third scenario would
be the transition from firm-hosted peer production to a broader collaborative
economy that embraces peer production more openly by adopting a coopera-
tive model rooted in sustainability and reciprocity (Benkler 2016a, 8).

   Benkler limits commons-based peer production to information, knowledge
and cultural production, arguing that decentralised social production cannot
apply to large-scale material goods such as the manufacturing of automobiles,

steel or aeroplanes. Commons-based peer production, he claims, is not always the most efficient model even for the production of information, knowledge and culture. It can be prone to failure due to insufficient contributions or to large parts of the population being sceptical about non-market models of provisioning goods (Benkler 2013b, 244). The crux of his argument is that commons-based peer production has certain advantages over the state, markets or firms in identifying and allocating human capital and creativity (Benkler 2002b, 381). Yet commons-based peer production will not replace state and market operation.

Following Jürgen Habermas (1996), Benkler incorporates commons-based peer production into civil society, aiming to broaden the scope of individual and collective autonomy by surpassing the limits of managerial hierarchies and market limitations on freedom, participatory democracy and justice. His core argument is that the commons offer additional degrees of freedom and power for the individual and collectivities. Benkler, thus, abides by the liberal notion of negative freedom inasmuch as he conceives of the commons as an alternative institutional space within the bounds of civil society: 'Freedom inheres in diversity of constraint, not in the optimality of the balance of freedom and constraint represented by any single institutional arrangement' (Benkler 2006, 145–146).

In contrast to positive freedom which gives a meaning to an action, negative freedom consists in a diversity of contextual constraints for actors, opening up more opportunities for action. The role of the law, then, would be to implement policies that diversify the set of options available to all (Benkler 2006, 152). Like Lessig, Benkler expands state neutrality to the digital commons, arguing that the state would do better to enhance commons-based licensing rather than strengthening intellectual property rights (Benkler 2002b, 444–446). Network neutrality would be supported by a liberal state that could play constructive roles in the digital economy through the municipal funding of neutral broadband networks, state funding of basic research, and possible strategic regulatory interventions to negate monopoly control over essential resources in the digital environment (Benkler 2006, 21). In this sense, commons-based peer production is compatible with various theories of democracy and justice in the liberal tradition (Benkler 2006, 184–185; 2003).

Paradoxically, Benkler holds that it is worthwhile to continue building on the successes of commons-based peer production, and trying to control as much of our world as possible with its mutualistic modality of social organisation (Benkler 2013b, 216). However, he points out that the basic problem for a political theory dealing with the emergence of commons-based peer production is the unfeasibility of removing power from even a reasonably well-functioning democratic state and market economy (Benkler 2013b, 242).

But if it is unfeasible to remove power from the state and the market, how can commons-based peer production control as much of our world economy as possible? Benkler himself wonders how generalisable the commons can be

beyond constituting a mere hack, beneficial only under particular circumstances and overlaid on the background of a liberal state with a reasonably liberal property and market system (Benkler 2013b, 242). One can, therefore, identify a tension between Benkler's liberal commitments and his anarchistic vision of the commons. On the one hand, he defends the moral values of negative freedom, individual autonomy and pluralism, as embedded in modern capitalist markets and state democracies. On the other hand, he advocates the expansion of propertyless, decentralised and stateless commons-based peer production. Benkler's anarchist side deviates from libertarianism in that the latter acknowledges property rights and a minimum state. Anarchism, instead, rejects property rights, contracts, managerial hierarchies and the state.

Benkler overstates the collective and non-monetary features of commons-based peer production. The work of Lerner and Tirole on FOSS at best shows that extrinsic motivations combine with intrinsic motivations rather than being overshadowed by the latter. Despite Benkler (2002b, 444–446) admitting that commons-based peer production faces a critical design challenge for balancing out motivations, he does not see that monetary motivations still prevail by and large. The need for most parts of society to pay the bills and make a living in a capitalist economy overtakes non-monetary, pro-social motivations. As mentioned earlier, there are no easy exits from capitalism – if any.

A number of authors have identified the co-option of FOSS by capital over the last decades rather than its quasi-autonomous development on the model of the capitalist commons (Bauwens and Kostakis 2014; Birkinbine 2018). Capitalism is capable of adapting and enclosing the commons for its own benefit. Whereas commons-based peer production seems to encapsulate both social and environmental sustainability, it still cannot reproduce itself (Bauwens and Pantazis 2018). Commons-based peer production has difficulty in capturing value creation and providing a steady income for its participants. It is unclear, then, how and to what degree commons-based peer production can sustain a livelihood or create a viable enterprise. Hence, claims about the sustainability of commons-based peer production still rest on thin conceptual and empirical foundations.

Benkler is being realistic when addressing the current premature development of commons-based peer production. He draws attention to the fact that commons-based peer production is still in its infancy and suffers from several imperfections. Further qualitative and quantitative studies are needed to yield better outcomes regarding how central or peripheral a phenomenon this is (Benkler 2002b, 444). At the same time, Benkler is utopian when pushing further the boundaries of commons-based peer production to control as much as possible of the world economy. Alas, he does not illustrate a clear path towards a commons-orientated transition that connects local with global (digital) commons. This is due to the general syndrome that plagues the liberal approach to the commons: the lack of the political.

2.4 The Lack of the Political I

The liberal approach to the commons suggests the quasi-autonomous coexistence of the commons with state and market operation. Ostrom succeeded in shifting the discourse in political science from the methodological individualism of neoclassical economics to polycentric institutions that combine private and public management with collective self-management of common-pool resources, ranging from natural resources to knowledge commons. Lessig introduced the innovation commons of the Internet in the production of information, knowledge and culture, defending the loosening of copyright law in order for the digital commons to unleash freedom and creativity. Along with Benkler, he expanded Ostrom's local commons to global (digital) commons on the model of commons-based peer production, operating in tandem with the state and the market.

All three have contributed to rethinking the common in the singular, meaning the democratic self-instituting power of the people, exercised both on the local and global level. Contrary to local eco-commons, the communities of the digital commons are open, plural, voluntary and dispersed, reaching across social and national boundaries, across geographical space and political divisions. Hierarchies tend to be flat and reversible, with the type of affiliation binding the commons being loose and fluid. The ground of the common is not any ethnic or local identity, but a shared sense of purpose and an ongoing interaction and collaboration along symmetric rules and ethical lines.

Benkler highlights the potential of the digital commons to democratise politics, the economy and culture. The commons can, indeed, bypass the filter of marketability and decentralise the production of information and knowledge. Like Lessig, he stresses the battle over the institutional ecology of a new digital environment:

> The pattern of information flow in such a network is more resistant to the application of control or influence than was the mass media model. But things can change. Google could become so powerful on the desktop, in the email utility, and on the Web, that it will effectively become a supernode that will indeed raise the prospect of a reemergence of a mass-media model. (Benkler 2006, 261)

To avert the corporatism of cyberspace, Lessig and Benkler propose the expansion of commons-supporting licences and copyrights enforced by adequate lobbying, litigation and legal reforms to support the production of open source knowledge and peer-to-peer networks. Rather that clashing head-on with capitalism, commons-based peer production is anticipated as rendering predatory capitalism obsolete through superior working anti-models, running code and a healthy commons that will trump polemics. Historical transformation is projected into a long, incremental, technological development that will

establish new social relations of production. Notwithstanding the absence of the revolutionary flame, this immanent transformation of society is actually reminiscent of Marx, who postulated that technological evolution is bound to replace capitalism with communism.

2.4.1 ICTs and Deliberative Democracy

A similar line of argument, drawing often on Habermas, has developed in the last decades to introduce a model of participatory or deliberative democracy anchored in the effective participation of people in decision making (Barber 1984; Bohman 1996; Dryzek 2000; Fishkin 1991; Held 1987; Pateman 1970; Yankelovich 1991). A number of authors have advocated for digital democracy or tele-democracy, supported by ICTs (Arterton 1987; Coleman and Gotze 2001; Grossman 1995; Hague and Loader 1999; Hill and Hughes 1998; van Dijk 2006; Ward 1996). The Internet and mobile applications, it is claimed, can bring about the massification of discourse and prototype the democratisation of media. Push-button voting, tele-referenda, tele-polling, free access to online databases and registers can now provide a higher degree of citizen involvement in political and legislative procedures. Technology can now ensure greater transparency, openness and inclusiveness (Vesnic-Alujevic et al. 2019).

A number of analysts argue that ICTs facilitate the participation of citizen-amateurs in formerly professionalised activities, thus signalling the 'open sourcing' of journalism (Gillmor 2004), politics (Castells 2007; Jenkins 2006), science (Benkler 2002b) and culture (Jenkins 2006; Lessig 2004). The power of 'everybody' (Shirky 2008), the 'crowd' (Surowiecki 2004) or the 'mob' (Rheingold 2003) is giving rise to a new populist renaissance of democratic participation and inclusion.

However, freedom of expression, direct voting and easier access to the media, public services and digital interaction do not automatically translate into a participatory democracy. Lessig and Benkler have warned of the dangers inherent in mass media concentration. With information filtered out by mass media to serve the interests of elites, the manufacturing of consent (Herman and Chomsky 1988) could be even stronger in the case of direct participation in decision making, bringing closer to reality the Orwellian nightmare of Big Brother. The massification of discourse, as manifested on the Internet and social media, can easily result in fake news, delusional narratives and straightforward propaganda.

The pipe dream of a free and 'unbiased' Internet runs the risk of techno-populism, orchestrated by elites for the sake of power, money and dominance. Liberal democracies in concert with capitalism portray the semblance of a pluralistic market democracy. E-populism and fragmentation can be channelled into authoritarian democracies, particularly at times of crisis. Majoritarianism can take various turns: socialism, outright fascism, economic nationalism,

social democracy, neoliberalism, and so on. Capitalism has proven resilient enough to accommodate technological change in the ever-expanding cycle of capital accumulation by commodifying even contradictory narratives and lifestyles.

2.4.2 Critique of the Digital Commons

Marinus Ossewaarde and Wessel Reijers (2017) build on a number of authors as diverse as Georg Simmel, Peter Sloterdijk, Martin Heidegger, Katherine Gibson, Julie Graham and Antonio Negri to argue that the digital commons produce an 'illusion of the commons', thereby giving rise to cynicism, which in turn can be interpreted as a contemporary form of false consciousness. The term 'false consciousness' dates back to Friedrich Engels and came to be conceptualised later by the Frankfurt School, Antonio Gramsci and Karl Mannheim, among others, as the compulsive belief that capitalism is an unalterable natural condition based upon widespread consent (Ossewaarde and Reijers 2017, 18). False consciousness resonates today within the widespread belief that there is no alternative to capitalism.

Simmel showed that the monetary economy has the unique capacity to homogenise a diverse order of worth under a single price, thereby reducing particular social values (such as sharing, empathy, solidarity, etc.) into quantitative logic (Ossewaarde and Reijers 2017, 20). Sloterdijk holds that Simmel's analysis reveals the cynicism of money as a particular form of false consciousness that cannot be unmasked through a critique of ideology in the style of Georg Lukács, Gramsci and Mannheim (Ossewaarde and Reijers 2017, 20). It requires, instead, a critique of technology. Jacques Ellul (1967), Herbert Marcuse (1964), Cornelius Castoriadis (1991a) and Andrew Feenberg (2002), among others, expanded the critique of ideology in the field of technology to unmask the so-called neutrality of techne. Contrary to the presumption that technology bears its own autonomous scientific logic, they demonstrated that technology embodies the one-dimensional, calculative logic of capitalism, showing that technology is primarily shaped by sociohistorical values. In contrast to this critique of technology, Sloterdijk targets the modern individual as the incarnation of cynicism in the elevated superstructure of capitalism (Ossewaarde and Reijers 2017, 20).

Ossewaarde and Reijers (2017, 19–20) extrapolate the cynicism of the modern individual into a technologically mutated false consciousness in the digital commons. Digital commons, they claim, depend on implicit and explicit pricing mechanisms that draw the practices of digital communing towards the monetary economy, thus being co-opted finally by capitalism. Digital commoners are actually disillusioned by the power of technology, turning eventually into an undifferentiated swarm of cynical 'embittered loners' and 'mass figures'. They share the same false consciousness as employees, consumers and managers acting in the monetary economy. Rather than resisting the

neoliberal hegemony, they internalise the new spirit of capitalism, which has succeeded in dissolving the Marxist ideology critique of industrial capitalism (alienation, domination, the calculative logic of technoscience) into a utility satisfaction deriving from a bunch of commodities. Cynicism manifests itself in conformism to the neoliberal hegemony. Therefore, contrary to the ecological, non-digital commons, there is little emancipatory potential in the digital commons given their apolitical principles. Ossewaarde and Reijers (2017, 26) advocate instead for a free relation with technologies through which the digital commons will supplement emancipatory practices embedded in the ecological, non-digital commons. They consider the digital commons as the 'mirror image' of the ecological commons.

Ossewaarde and Reijers's critique reads like a technological update of the classical ideology critique of capitalism turned against the digital commons. However, they conflate the digital commons with the so-called sharing economy of platform capitalism (for example, Airbnb, Uber, Couchsurfing, etc.). It is a mistake to identify the digital commons with top-down capitalist enterprises operating in terms of profit maximisation. Ossewaarde and Reijers make the same error that the classical ideology critique did: they reproduce a generalised argument that fails to acknowledge a nuanced reality. While it is true that the digital commons have been largely co-opted by platform capitalism today, it is not true that they are apolitical and lack a cooperative ethos. Digital commoners exhibit diverse motivations actualised into hybrid contexts, whether apolitical, libertarian, anarcho-communist, leftist, ecological, hipster, and so on. Ossewaarde and Reijers discard a number of successful cases of platform and open cooperatives which demonstrate the opposite. Vasilis Kostakis (2018) is right to argue that the digital commons have both an immanent and a transcendent aspect vis-à-vis capitalism. In the first scenario, capital and state subsume the commons under a commons-centric, crowdsourced capitalism. In the second scenario, the commons become dominant, forcing capital and the state to adapt to their interests.

2.4.3 Castoriadis and the Political

This book mounts the case that, instead of patiently waiting for post-capitalism to replace capitalism, the paramount political task for the commons would be to form a counter-hegemonic power against and beyond neoliberalism. The current impotence of the liberal commons vis-à-vis capital and the state lies, among other things, in the absence of a link between local and global commons. This absence is indicative of the broader lack of the political that accounts for the failure of the liberal commons to band together dispersed initiatives into a coherent social movement capable of challenging the current neoliberal regime. Dardot and Laval and Kioupkiolis correctly argue that the liberal approach to the commons cannot address the contradictions of capitalism and the state.

Contrary to liberal and illiberal democratic regimes, ICTs today enable the self-instituting power of the people, elaborated in multiple variants of radical democracy. The concept of the common as the self-instituting power of the people put forward in this book stems basically from the work of Cornelius Castoriadis, best recognised for his articles published in the journal *Socialisme ou Barbarie* from 1949 to 1965. In the 40 issues of the journal, Castoriadis developed a radical critique of capitalism and Marxism, resulting in the redefinition of the content of socialism. Castoriadis conceives of socialism as the self-institutionalisation of society by collective management, established first and foremost at the level of production. Socialism presupposes the abolition of the division between directors and executants, penetrating both capitalism and Leninism-Stalinism. It consists instead in the expansion of individual and collective autonomy at all levels of society (Castoriadis 1988, 92–95).

In his later writings, Castoriadis engages in the contemporary discussion over *the political* and *politics* (Marchart, 2007) to enrich his concept of autonomy, which now sets out in two stages: *the instituting* and *the instituted* (Castoriadis 1991b). *The instituted* signifies the radical ground-power, or primordial power, necessary for the self-preservation and self-perpetuation of the human species. It constitutes an explicit power, termed *the political* and manifesting in law, language, religion, and so on. By 'power' Castoriadis (1991b, 149) refers to 'the capacity for a personal or impersonal instance (*Instanz)* to bring someone to do (or to abstain from doing) that which, left to him/herself, s/he would not necessarily have done (or would possibly have done) […]'.

The instituted is nurtured by *the instituting* of the radical and social imaginary. The instituting transcends the instituted by virtue of the autonomy of the anonymous collective to transform the political (Papadimitropoulos 2019). Whereas societies have mostly evolved under conditions of instituted heteronomy, with the essential constituent being the representation of an extra-social source of nomos (whether myth, tradition, religion, class, etc.), autonomy identifies with *politics* that constantly challenges *the political*. Politics conditions the self-institutionalisation of society according to the democratically established rules of the anonymous collective. Democratic politics introduces the concept of the common as the self-instituting power of the people. The common aims at the abolition of heteronomy by establishing the autonomy of the people by/ for the people.

Castoriadis's stance on democracy breaks with the liberal separation of politics and the economy by restoring democracy to the roots of the economy. Real democracy cannot exist without economic democracy; without people having an equal say in the production process and planning of the economy; without people regaining their individual and collective autonomy through the self-management of the means of production, the redistribution of surplus value, the division of labour, working conditions and so forth. Real democracy cannot but be direct democracy expanding from production across all spheres of society. Castoriadis, thus, defines the common as the democratic power of

the people geared towards the abolition of state capitalism and the establishment of socialism.

It is not, therefore, enough to consider the colonisation of democracy by capitalism as a legitimation crisis, as Habermas (1988) argues. Nor does the contribution of digital commons to an 'ideal' speech situation settle the issue once and for all. The crisis of democracy reflects the structural failure of capitalism to address the real wants and needs of people. The main contradiction of capitalism is not that between owners and non-owners of the means of production, as Marx would have it, but the division between directors (managers) and executants (workers), spreading from the economy to the state and all spheres of society (Castoriadis 1988). Communism is not the final stage of state ownership of the means of production, but the self-management of the commons by people themselves.

In capitalism and the so-called socialism of the Eastern Bloc, workers participate in the production of the enterprise insofar as they do not interfere with the management; citizens participate in state management insofar as they do not govern. The division between directors and workers, representatives and citizens renders power and knowledge inaccessible and secret. The management of the economy and society becomes an affair of experts, a Marxist ideology, a liberal or post-political technocratic consensus, a game theory, a postmodern narrative, a neoliberal competition. Democracy is a sham, a rigged process, a win–win deal, a communication marketing of competing elites in a corporate society. The individual blindly obeys the party or retreats into her private sphere of conformism, becoming a self-interested maximiser and a consumer. Society turns into a cluster of hobbies and lobbies, with populism, nihilism and cynicism representing the new disorder of things.

The division between directors and workers constitutes the core of the rational mastery of capitalism, driving the unlimited expansion of the economy and technology in society and nature (Papadimitropoulos 2018a). Rational mastery echoes the Weberian rationalisation of bureaucracy. But while Castoriadis was calling for the abolition of the division between directors and executants and the establishment of direct democracy at all levels of society, Weber (1978/1922) was arguing for the inevitability of bureaucracy in modern societies and the impracticability of direct democracy. For Weber, direct democracy is functional only locally and among relative equals. The complexity of contemporary societies renders direct democracy inefficient and potentially dangerous in the long term.

2.4.4 The Challenges of Direct Democracy

Daniel Kreiss, Megan Finn and Fred Turner (2011) build on Weber to designate the limits of commons-based peer production. They draw attention to the merits of bureaucracies such as explicit rule making, precision, credentialing,

expertise and efficiency that may be undermined by commons-based peer production. They claim that bureaucracies are important in retaining democratic values such as equality, transparency and inclusivity, whereas commons-based peer production is prone to opaqueness, 'benevolent dictators' and gatekeepers. They warn of the danger of commons-based peer production being absorbed by firms and managerial bureaucracies and, finally, extending their mechanisms. In this scenario, the digital commons turn out to intrude into privacy by coercively expanding the workplace into everyday life, thereby technologically reproducing previous forms of social and economic organisation. Rather than offering a revolutionary alternative, they are co-opted by capitalism and the state.

However, the authors are uncritically taking for granted certain bureaucratic values, while omitting the bureaucratic defects that the commons are coming to fix. They abstain from situating bureaucracies in a broader political framework. They dismiss the fact that bureaucracies have been controlled by elites, often lending a helping hand to colonialism, fascism and modern liberal oligarchies. Their argumentation, finally, culminates in fragmented generalisations for both bureaucracies and peer production. A more nuanced and rigorous approach is necessary to unravel the complex dynamics of bureaucracies and peer production. The authors are right to claim that scholars need to examine peer production more thoroughly by posing a new set of research questions regarding the scope of bureaucracies and peer production and their interdependencies. One can begin by asking: Is direct democracy limited solely to locals and equals?

Ostrom proves Weber partially wrong. Lessig and Benkler expand the self-instituting power of the people from local to global (digital) commons. But they cannot offer a holistic alternative for a commons-orientated transition that would clash head-on with neoliberal capitalism. Castoriadis (1988, 121) was one of the first to stress that information technology can support direct democracy on a large scale. He called for the abolition of capitalism and the state through the establishment of the self-instituting power of the people across all spheres of society. Instead of patiently waiting for technology to progressively transform capitalism into post-capitalism, Castoriadis calls for radical social change. The problem with Castoriadis is that he rejected the current political system *in toto*, relying solely on the autonomous activity of individuals and collectivities. However, the commons face today multiple external and internal constraints. They depend largely on financial and technological systems managed by corporate capital and neoliberal state policies. In Castoriadis's terms, the commons are still largely heteronomous rather than autonomous.

For the commons to evolve into a sustainable mode of production, state support is necessary. The state can facilitate the transition to a decentralised and self-managed economy by various means: funding, education, infrastructure, law reform, and so on. Autonomous movements, however, should not resort to any sort of state paternalism to sustain themselves. Heteronomy is not the

necessary counterpart of autonomy in order for the latter to abolish the former in the long run. Individual and collective autonomy cannot depend on a flawed representative democracy subject to the neoliberal dictates of capitalism.

Dyer-Witheford (1999; 2015) and Kostakis and Bauwens (2014; 2019), whose work is examined in detail later on, call for the de-statification or commonification of the state. De-statification devolves administrative power to a multiplicity of associations. The role of government is redefined to support collective initiatives rather than substitute for them; diffuse rather than concentrate power; and nurture social transformation from the bottom up rather than engineer it from the top down.

The state should transform into mini-states of commons-based peer production ecosystems that implement direct democratic procedures and practices. This political task requires the institutional reconfiguration of the separation of powers. Post-hegemony is the vision to create a holistic political alternative to neoliberal state capitalism out of self-perpetuating, autonomous, commons-based enterprises and organisations, supported by reticular market and institutional mechanisms aligned around the commons. To this end, Ostrom's polycentric model needs to transform into the post-hegemony of the commons. The main challenges for post-hegemonic politics today are how to connect local with global commons; how to bring together and coordinate dispersed, small-scale civic initiatives; how to confront established social systems and power relations in the market and the state; and how to create a counter-hegemonic power that fosters a commons-orientated, sociopolitical transition against and beyond neoliberalism.