Thinking of data as an economic good: what it can (not) teach us about data governance

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1. Introduction

Data governance has been on top of the European regulatory agenda for a decade, starting with the 2012 data protection reform and culminating in the avalanche of other regulatory instruments proposed and adopted in the past two years.[1] Much of data governance literature[2] informing those and future initiatives builds analyses of governance options such as data sharing based on assertions about the nature of data as an economic good: data is either characterised as a club good, or more recently as a common-pool resource, infrastructure, labour or capital.[3] Economic models associated with those classifications are often adopted as recipes for successful data governance. What this literature is often missing is a more nuanced view of "data as an economic good" way of thinking where the advantages of using the economic classifications to achieve regulatory objectives are balanced with critical reflections on the limitations of those classifications.

This contribution has two aims: first, we critically review various perspectives adopted in the literature towards data as an economic good and interrogate to what extent and for which purposes those perspectives are useful or unproductive to guide governance efforts. Second, we reflect on what our analysis means for data governance.

2 Agreeing on terms: good, data, information, and knowledge

This section introduces some key terms of significance for the analysis: good, data, information, and knowledge. The function of these definitions is to provide a starting point for

[1] Data Governance Act, Data Act, Digital Markets Act, Digital Services Act, **[something on public information / data – pls check]**, proposed regulation of the European Health Data Spaces **[check if the name is correct]**

[2] We understand "data governance" broadly as a multidisciplinary body of literature addressing various aspects of how data should be dealt with in relation to societal goals, from innovation to ensuring production in data-driven economy to protection of privacy.

[3] **[ADD RELEVANT FOOTNOTES]**

our analysis of how "data as a resource" literature engages with data, a conceptual context to our analysis.

We use the term "good" the way it is understood in economics, where it has a very broad meaning. A "good" stands for "all desirable things, or things that satisfy human wants," both material and immaterial.[4] In this sense, economic good is anything of value and is different from the colloquial use of the word "good," which means an object of sale or another market exchange. Notably, despite the market connotations that the word "good" has in its colloquial meaning, the focus of this paper on data as a good, despite the very real nature of data markets, does not imply that we advocate for data to be sold or otherwise be an object of commodification.

Another key term is "data." Modern understanding of data is closely intertwined with the computer, information technology, and information theory.[5] In the digital context, which is increasingly a default setting of discourses on data governance, data is understood as a digital representation of information[6]: a result of quantification of information,[7] or "information in numerical form."[8] This is the definition of data that is primarily adopted by the data governance and economics literature[9] and in this paper.

There exist many classifications and categorizations of data: e.g., metadata, raw vs processed data, synthetic vs "real" data, personal vs non-personal data, and personal data, etc. These distinctions are without relevance for this analysis.[10]

The notions of data and information are closely linked, as data is defined through information. It is not easy to provide one definition of information. An entire branch of economics called "information economics" and, in particular, game theory addresses how information and different information structures shape the interaction of economic actors.[11] More general economic theory, which this paper reviews in the following sections, considers information as an economic good. Yet, economics does not have its own definition of information. This void

[4] Alfred Marshall "Principles of Economics: Unabridged Eights Edition" (2009 Cosimo Classics, New York), 45.

[5] Rosenberg D (2013) Data before the Fact. In: Gitelman L (ed) Raw Data Is an Oxymoron, pp. 15–40. The MIT Press, Cambridge, MA; London, 34.

[6] We realise that the term "representation" might suggest that data is a realistic, mirror-like representation of the world, which might be at odds with some (e.g. critical data studies) literatures where the performative role of data is emphasised. **[ADD SOME EXAMPLES HERE data feminism book]**. While it is important to acknowledge the performative role of data in the world, it is of no consequence for characterising data as an economic good.

[7] Raphael Gellert "Comparing the definitions of data and information …" Regulation & Governance 2020, available online https://onlinelibrary.wiley.com/doi/epdf/10.1111/rego.12349.

[8] Rosenberg D (2013) Data before the Fact. In: Gitelman L (ed) Raw Data Is an Oxymoron, pp. 15–40. The MIT Press, Cambridge, MA; London, 33.

[9] E.g. "[d]ata is information that can be encoded as a binary sequence of zeroes and ones." In Maryam Farboodi and Laura Veldkamp, "A growth model of the data economy" NBER Working paper Series, Working Paper 28427, published February 2021, available online at http://www.nber.org/papers/w28427, last accessed 4 December 2021, 2; [**MORE EXAMPLES]**

[10] Our analysis is agnostic of these distinctions and typifications of data for a number of reasons. First, some of these distinctions and dichotomies are problematic (see XXX on why there is no such a thing as raw data; Purtiva "Law of everything" arguing that the distinction between personal and non-personal data is increasingly hard to maintain; add some criticism about synthetic data). Second, this paper focuses on data as a phenomenon and not particular data types.

[11] Eric Rasmusen, Games and Information: An Introduction to Game Theory Wiley-Blackwell 3rd ed. 2001.

is filled by many other disciplines as diverse as philosophy, psychology, biology, cybernetics, and many others that offer their own definitions of information, resulting in conceptual chaos or what Burgin calls 'information studies perplexity'.[12] While the existing definitions of information are dozens, they can be roughly classified into three approaches: semantic, syntactic, and functional.[13]

Within the semantic approach, information is contingent on the presence of meaning. The meaning of information is relative and depends on the receiver of information. Hence, information is contingent on the presence of human cognition. When the meaning is understood and internalised, this results in knowledge. Within this school of thought, several analyses have adopted a General Definition of Information ('GDI'): *'information is data + meaning'.*[14] An example of how economists operate with a semantic understanding of information is the work of Hess and Ostrom where they define data as "raw bits of information, information being organized data in context."[15]

Within the syntactic approach, whether information has meaning is irrelevant. A notable example of syntactic understanding of information is Shannon's mathematical theory of information (originally called "theory of communication") formulated in the context of signal transmission. It defines information as "the statistical probability of a sign or signal being selected from a given set of signs".[16] Another example of the syntactic approach to information is the so-called naturalisation of information in the works of physicists, engineers and biologists, where information is seen as belonging to the natural world, expressed in the specific biological structures,[17] the building material of the universe[18] and not anthropocentric.[19]

The third approach, which we call "functional", reconciles syntactic and semantic approaches and defines information not by what it is but what it does. Information affects reality by either changing the knowledge about it, constituting or changing it. For instance, according to Floridi, information refers to three mutually compatible phenomena: information *about* reality (semantic information); information *as* reality (e.g. "as patterns of physical signals" such as DNA, or fingerprints); and information *for* reality ("instructions like genetic information,

[12] M Burgin, Theory of information. Fundamentality, diversity and unification (World Scientific Publishing, 2010) 6.

[13] It exceeds the scope of this paper to provide a comprehensive review of the information literature and all possible definitions of information. For a comprehensive overview of the various meanings of the term 'information' across disciplines see Rafael Capurro and Birger Hjørland, 'The concept of information' in Theorizing information and information use, 343-411 and M Burgin, Theory of information. Fundamentality, diversity and unification (World Scientific Publishing, 2010). For an alternative brief overview of the various approaches to information see Raphael Gellert "Comparing the definitions of data and information …" Regulation & Governance 2020, available online https://onlinelibrary.wiley.com/doi/epdf/10.1111/rego.12349.

[14] L Floridi, 'Is Information Meaningful Data?' (2005) 70(2) Philosophy and Phenomenological Research 351–370.

[15] Hess & Ostrom 2007, p. 8

[16] Machlup, F. (1983). Semantic quirks in studies of information. In F. Machlup & U. Mansfield (Eds.), The study of information: Interdisciplinary messages (pp. 641-671). New York: Wiley, p. 658)

[17] Küppers, B.-0. (1996). The context-dependence of biological information. In K. Kornwachs & K. Jacoby (Eds.), Information. New questions to a multidisciplinaryconcept (pp. 137-145). Berlin, Germany: Akademie Verlag.1996, p. 140, quoted in Capurro.

[18] Burgin 33, and in-text references

[19] Capurro 358 and 360 et seq.

algorithms, orders or recipes").[20] Capurro and Hjørland similarly argue that the syntactic and semantic definitions of information are not mutually exclusive but have a common core, i.e. selection: "we state a resemblance between interpreting meaning and selecting signals. The concept of information makes this resemblance possible."[21] Therefore the various definitions of information should not be considered in terms of correct or incorrect, but in a relationship of Wittgensteinian "family resemblance"[22] and where each conceptualization is not correct or incorrect, but rather more or less useful in a certain context.[23]

We use "information" in the latter, functional, meaning which lends itself well for analysis of the economics literature: on the one hand Game Theory relies on the semantic understanding of information as it concerns itself with the decision makers that *know* that their decisions affect each other and engage in strategic reasoning on the basis of information available to them. On the other hand, the general economic theory concerning the classification of goods as rival and excludable is agnostic of whether information has meaning. Therefore this analysis is based on the functional understanding of information.

Knowledge is information received and processed by a recipient.[24]

3. Economic classification of goods: a brief introduction

A major way of classifying goods in economics has been along two axes: 1) rivalry of consumption of a good and 2) the possibility to exclude others from enjoying the benefits of a particular good.[25] A good is rival if consumption by one individual prevents others from consuming the same good at the same time (or even at all). A good is "excludable" if its consumption can be prevented, e.g. because of not having paid for it. According to Cornes and Sandler, historically speaking, economists distinguished two types of goods which were diametrically opposed in both of these dimensions: pure private and pure public goods.[26] Pure private goods, mostly tangible goods, are rival as well as excludable. If one eats an apple, that apple is not available to anyone else, and it is easy to exclude people from a possibility to consume an apple, e.g. by making it physically not accessible for consumption. The fact that consumption of such a good is rival as well as the ability of one consumer of the good to exclude others from consumption implies that they can be enjoyed by one person alone without interference by others or enjoyment spillovers to others. Hence, their utility cannot be shared. However, the good (and the benefits that come along with it) could be fully or partially

[20] Luciano Floridi, The Philosophy of Information, OUP 2011, p 30
[21] Capurro p. 368
[22] Capurro p. 368
[23] Capurro p. 358
[24] **To add later: section on knowledge.**
[25] There are other classifications of goods in economics. There is a classification into experience, credence and search goods based on how easy or difficult it is for a consumer of the good to assess its quality either prior to or after consumption. In this paper we only focus on the classification along the axes of rivalry and excludability of consumption, since this classification is used the most to inform policies regarding governance of economic resources.
[26] **<Footnote Cornes and Sandler>**

transferred, e.g. sold, to someone else who would then be enjoying the (share of the) private good.

Pure public goods are non-rival and non-excludable.[27] National defence is often used as an example of a pure public good: the fact that one individual enjoys the benefits of national defence does not make any less of it available to others, and it is prohibitively costly to prevent country residents from using national defence benefits. Despite its name, a public good can be provided both by the public or private sector, or simply already exist independently of any action by anyone (e.g. sunlight). However, when a public good needs to be actively (and costly) provided, a free rider problem arises. Because no one can be excluded from enjoying the benefits of a public good, also those that do not contribute to the provision of the public good (the "free riders") benefit from it. Hence, there are no strong incentives for any individual to contribute to the provision of the public good leading to an under-provision of public goods. To solve the free rider problem many public goods are indeed provided by the public sector as the state can exercise coercive power for contributions via taxation and then fund the desired public good.

With time, however, empirical research demonstrated that some resources do not easily fit within this binary – public vs private – classification. Many public goods, for instance, only exhibit the characteristic of non-rivalry and non-excludability to a certain extent, such as within a certain group or space (e.g. a particular country), or for a limited time. Consider for example a street musician. While in principle, everyone who walks past can enjoy the performance, i.e. the music is a public good, this would not continue to be the same if everyone stops and stays around. Eventually, the crowd would become too large for a new passerby to still enjoy the performance and its consumption becomes rival. On an even larger scale, there also exists de facto exclusion of people that do not walk by during the performance or live too far away to pay a visit. Thus, public goods may only fulfil the two conditions on some level, rendering them so-called "local public goods".[28]

To reflect this, some changes were made in the classical classification of goods.[29] "Rivalry of consumption" was replaced with "subtractability of use", and subtractability and excludability were operationalized as varying from low to high as opposed to binary, 1 or 0, characterizations. Goods displaying characteristics of both public and private goods were initially considered impure public goods but eventually were distinguished into two new categories: club (or toll) goods and common-pool resources. The resulting economic classification of goods is presented in Figure 1.[30]

On a global scale only a few things, such as world peace, may truly fulfil the two criteria of a public good and could therefore be called a "global public good". Nonetheless, the framework of a public good still provides an accurate picture or at least a sufficiently close approximation of the incentives people face in many situations. For stronger deviations, though, the framework of club goods and common-pool resources can be used.

Club or toll goods are non-subtractable but excludable.[31] A walled garden, golf club, and toll roads are examples of club goods. It is easy for the gardening- or golf club members or drivers

[27] Cornes and Sandler The Theory of Externalities, Public Goods, and Club Goods (1999) 5 et seq.
[28] **[Footnote]**
[29] Ibid., p. 644 et seq.
[30] See also N. Purtova "Heath Data for Common Good", 182 et seq.
[31] Buchanan, J. M. (1965). An economic theory of clubs. Economica, 32, 1–14.

who paid the toll charges to enjoy a garden, golf club or road without diminishing the quality and quantity of those goods available to other club members.[32] It is equally easy to prevent the non-members from enjoying the club good benefits. Due to the wide array of possible sizes of a club (from a few people to supra-national entities) some goods, such as public defence or clean air, may be considered public goods at some levels of aggregation but are better understood as club goods at other levels. Think for example about the benefits of a supra-national entity such as the European Union. From the perspective of an EU citizen, many of them may be considered a public good, as effectively no one within the club can be excluded. However, they are still excludable as the EU membership and the resulting EU citizenship are only given to a number of countries and their citizens.

		Subtractability of use	
		High	*Low*
Difficulty of excluding beneficiaries	*High*	Common-pool resources	Public goods
	Low	Private goods	Club (toll) goods

***Figure 1: Four types of goods*[33]**

Common-pool resources (CPRs for short, but also called "commons") are subtractable but not easily excludable. Natural resources such as forestry, water basins or fisheries are typically named as examples of CPRs. Hardin was among the first who on an example of grazing lands articulated how common use of shared resources moved by self-interest and lack of communication led to overgrazing and ultimately resource deterioration. This has become widely known as the "tragedy of the commons".[34] According to Hardin, the tragedy can be avoided either by establishing a market through allocation of private property rights and allowing their efficient exchange or through centralised management of the resource by the government.[35] Further field studies of the common-pool resources by Elinor Ostrom and her followers demonstrated, however, that the commons did not have to end in tragedy and other

[32] Although increase in number of club members beyond a certain point may lead to deterioration of enjoyment of a good by club members. Think of an overcrowded toll road, or a walled garden attended by too many club members at a time, resulting in more noise, litter, damage to grass and other plants and overall less enjoyable experience of the garden per club member.
[33] Elinor Ostrom, 'Beyond Markets and States: Polycentric Governance of Complex Economic Systems', American Economic Review vol.100, 2010, p. 645
[34] Hardin, Garrett, 'The Tragedy of the Commons", Science, Dec. 13 1968, Vol.162, Issue 3759, 1243–1248
[35] Hardin, 1244 et seq.

regulatory options beyond the traditional dichotomy 'market vs state regulation' were possible, notably, collective resource governance.[36]

In addition to their subtractability and difficulty to exclude from, another characteristic of the CPRs is their complexity. As we explain elsewhere, CPRs are "system resources, meaning that they comprise entire 'resource ecosystems', a combination of interrelated and interdependent elements that together form a common-pool resource."[37] Natural CPRs like fisheries typically have a two-fold structure: stock (e.g. a fishing pond and the population of fish inhabiting the pond) and benefits, or 'flow units', produced by the stock (e.g. individual fish).[38] But other CPRs may have a more complex structure.[39]

When a CPR resource is present, we speak of a CPR situation. When the CPR resource is not used sustainably, we deal with a CPR problem.[40] To help analyse the CPR problems and inform their solutions, Gardner et al. group the commons problems into two types: the problems of provision and of appropriation.[41] As noted elsewhere,

> *the access to or allocation of the benefits of the resource is problematic in the appropriation problem, whereas the provision problem has the preservation, quality and sustainability of the resource stock at the heart of it.*[42]

While traditionally the CPR framework has been applied to natural resources, its relevance has expanded to other contexts such as wildlife and animal species[43] considered "global commons", cyberspace,[44] world oceans, atmosphere, Antarctic,[45] knowledge[46] and privacy.[47] One of the attractions of using the CPR framework across contexts is undoubtedly the Institutional Analysis and Development framework that Ostrom and her followers developed

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[36] Michael D. McGinnis and James M. Walker, 'Foundations of the Ostrom workshop: institutional analysis, polycentricity, and self-governance of the commons', Public Choice, vol.143, 2010, 293–301, p. 296.

[37] Purtova, "Health data for common good", p. 183

[38] Ostrom, Elinor, 'Beyond Markets and States: Polycentric Governance of Complex Economic Systems', American Economic Review vol.100, 2010, p. 641–672.

[39] E.g. see discussion of Hess & Ostrom in 4.2(iii) on ideas, facilities and artefacts in relation to scientific knowledge.

[40] Gardner, R., E. Ostrom, and J. M. Walker. 'The Nature of Common-Pool Resource Problems.' Rationality and Society vol. 2, 1990 pp. 335–358); Ostrom (n 15), 641–672.

[41] Gardner et al., p. 346.

[42] Purtova "Health data for common good", p. 188, citing Ostrom, E., R. Garder, and J. Walker, Rules, Games, and Common-Pool Resources, Michigan, The University of Michigan Press, 1994, p. 9.

[43] Michael D. McGinnis and James M. Walker, 'Foundations of the Ostrom workshop: institutional analysis, polycentricity, and self-governance of the commons', Public Choice, vol.143, 2010, 293–301.

[44] Priscilla Regan 'Privacy as a common good in a digital world', Information, Communication & Society, vol.5, no. 3, 2002, pp. 382-405.

[45] http://www.unep.org/delc/GlobalCommons/tabid/54404/

[46] Hess, C., & Ostrom, E. (2007). Introduction: An Overview of the Knowledge Commons. In C. Hess & E. Ostrom (Eds.), Understanding Knowledge as a Commons: From Theory to Practice (pp. 3–26). The MIT Press. http://www.jstor.org/stable/j.ctt5hhdf6.4; Governing Knowledge Commons (Oxford University Press, 2014) (ed. Katherine Strandburg, Michael J. Madison and Brett M. Frischmann)

[47] Governing Privacy in Knowledge Commons (Cambridge University Press, 2021) (ed. Katherine Strandburg, Madelyn Rose Sanfilippo and Brett M. Frischmann). For a detailed account of the patterns and reasons of expansion of the CPR paradigm see D. Bollier 'The Growth of the Commons Paradigm' in Charlotte Hess and Elinor Ostrom (eds.) Understanding Knowledge as Commons Hess, MIT Press, 2007, p. 31.

to diagnose and solve problems of collective action for sustainable governance of a shared resource.[48]

To conclude the account of the economic classification of goods, it is important to acknowledge the role of technology in the characterization of a good. To begin with, technology impacts the general availability of something as an economic good. For instance, the deep seas, the atmosphere, the electromagnetic spectrum, or space could only be seen as objects satisfying human needs when the technology to capture their benefits became available.[49] Finally, technological developments can cause a fundamental change in the nature of the resource, e.g. "with the resource being converted from a nonrivalrous, nonexclusionary public good into a common-pool resource that needs to be managed, monitored, and protected, to ensure sustainability and preservation,"[50] thus shifting the resource from one category to another.

This section started with a recap of the economics' accounts of resources based on their natural characteristics. However, the work of Ostrom and others opened up room for considering factors external to the resource itself, e.g. technology developments, for defining its nature and most appropriate mode of governance. This shift will be important in the upcoming sections.

4. Data as an economic good

In this section we critically review most prominent perspectives adopted in the literature towards data as an economic good and interrogate to what extent and for which purposes those perspectives are useful or unproductive to guide governance efforts in the digital society.

4.1 Conservative view: non-rival information and data, data as a club good

Given the close relationship between information and data discussed above and that data is defined through information as its digital representation, we review the economic literature both on data *and* information. The conventional economics accounts of information and data overwhelmingly agree that information and data are non-rival.[51] While there is some disagreement as to the excludability of information, making it either a public or a club good, data is generally considered excludable, making it a club good.

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[48] Ostrom, Elinor. "Background on the Institutional Analysis and Development Framework: Ostrom: Institutional Analysis and Development Framework." Policy Studies Journal 39, no. 1 (February 2011): 7–27. https://doi.org/10.1111/j.1541-0072.2010.00394.x.**[double check; design principles]**

[49] Hess and Ostrom (n 10), p. 10.

[50] Charlotte Hess and Elinor Ostrom (2007) 'Introduction: An overview of the knowledge commons' in Charlotte Hess and Elinor Ostrom (eds.) Understanding Knowledge as Commons Hess, MIT Press, 2007, p. 10.

[51] Note that some information goods, such as consulting and education, are considered rival and excludable (e.g. Roxana Mihet and Thomas Philippon, (2019) "The economics of Big Data and Artificial Intelligence" in Choi, J.J. and Ozkan, B. (Ed.) Disruptive Innovation in Business and Finance in the Digital World (International Finance Review, Vol. 20), Emerald Publishing Limited, Bingley, pp. 29-43. https://doi.org/10.1108/S1569-376720190000020006). However, these can be seen as services for provision of information rather than purely information.

Varian considers information goods in general as public goods because exclusion is too costly and the information is "inherently nonrival" due to low costs of reproduction.[52] Stigliz agrees:

> *The fundamental breakthrough in the economics of information was the recognition that information was fundamentally different from other 'commodities.' It possesses many of the properties of a public good – its consumption is nonrivalrous, and so, even if it is possible to exclude others from enjoying the benefits of some piece of knowledge, it is socially inefficient to do so; and it is often difficult to exclude individuals from enjoying the benefits.*[53]

According to Moody and Walsh, information is infinitely shareable and not depletable.[54] Newman joins the characterizations of information as non-rival because the marginal cost of distribution and reproduction is zero or very low. However, he argues, the excludability of information is not a static characteristic and is "determined by the feedbacks of previous public policy decisions, which shape information asset characteristics,"[55] making information a club good when existing regulations enable excludability and a public good when they do not. Duch-Brown et al make a similar point, namely, that excludability of information depends on technical and legal intervention.[56] Ciuriak notes that although knowledge is temporarily excludable by innovative firms e.g. by means of patenting, it eventually passes to the public domain when patents expire.[57]

More recent economics literature aiming to contribute to discourses on digital economy rather than information governance generally focuses on data. Since data is understood as digital representations of information, in these later accounts it also inherits its non-rivalrous nature. But, unlike information, data is always excludable. There are no deviations in this assessment among the economists. To name a few examples, Koutroumpis et al write:

> *Ideas, patents, and data are non-rivalrous in use, in that a single idea or datum may be usable by many individuals and replicated at low marginal cost.*[58]

According to Jones and Tonetti, data is rival since it is infinitely usable, and excludable since access to data can be blocked by technical means, such as encryption,[59] next to legal

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[52] Hal Varian, 'Markets for Information Goods' <http://people.ischool.berkeley.edu/~hal/Papers/japan/>.

[53] Joseph E Stiglitz, 'The Contributions of the Economics of Information to Twentieth Century Economics' (2000) 115 Quarterly Journal of Economics 1441, 1448.

[54] Daniel Moody, Peter Walsh, Measuring the value of information: An asset valuation approach. Proc. European Conf on Information Systems, ECIS'99 [online] https://www.semanticscholar.org/paper/Measuring-the-Value-Of-Information-An-Asset-Moody-Walsh/677d018aa724aef71e2ba4a363f7ba1748ea5bfe

[55] Amraham L Newman, 'What You Want Depends on What You Know: Firm Preferences in an Information Age' (2010) 43 Comparative Political Studies 1286,1288

[56] Duch-Brown, Martens, Mueller-Langer (2017) "The economics of ownership, access and trade in digital data JRC Digital Economy Working Paper 2017-01

[57] Dan Ciuriak (2018) "The Economics of Data: Implications for the Data-Driven Economy" in "Data Governance in the Digital Age," Centre for International Governance Innovation, 14 et seq. available online https://issuu.com/cigi/docs/data_series_special_report last accessed 8 December 2021

[58] Koutroumpis, Pantelis; Leiponen, Aija; Thomas, Llewellyn D. W. (2017): The (Unfulfilled) Potential of Data Marketplaces, ETLA Working Papers, No. 53, The Research Institute of the Finnish Economy (ETLA), Helsinki

[59] Charles I. Jones and Christopher Tonetti "Nonrivalry and Economics of Data" American Economic Review 2020, 110(9): 2819–2858

measures to enable excluding from access to digital data. Farboodi and Veldkamp,[60] Varian,[61] Dosis and Sand-Zantman,[62] Duch-Brown et al,[63] and many others make the same observations about data. In other words, non-rivalrous nature and excludability of data are broadly accepted as well-established truths and not questioned among economists.

Classification of data as a club good accurately reflects the characteristics of data at present. Perhaps due to its digital nature and hence strong ties to a physical carrier, such as a hard drive, a website or a data centre, data is excludable. Even when data is stored in a "cloud" which suggests something ethereal, there is always tangible hardware involved, and one can be excluded from access to that tangible hardware. The current realities of data access are full of examples of data pools managed as walled gardens, or clubs, where access is granted, e.g. to paying customers while everyone else is excluded from data benefits. To name just a few of such examples, data of Facebook users is generally only available via a specific API to those who pay for access, and Google controls who can place third-party cookies via its Chrome browser and access the data of the browser users.[64] There are cases of web scraping where data is accessible to all without any barriers. However, such barriers *can* be erected both in the form of security measures, as well as legal prohibitions, which make data excludable. Data is also generally not subtractable as the quantity or quality of data does not generally diminish with use. It is suggested that the NFT technology– through the use of blockchain – can make a digital object unique by preventing it from being copied or transferred more than once.[65] This makes the replication of data impossible or very costly. It can be argued that under some circumstances data can become rival or subtractable and hence can also be a private good. However, making data not transferable is not a dominant tactic in the data economy, rather the opposite is true, and hence in most cases, data remains to be a club good.

The chief criticism of the conservative view on data as a club good is that it considers data in isolation from its context: where the data comes from and what impact its extraction and further processing have on society. Data is a function of human activities and their environments are increasingly mediated and captured through digital technologies. Once harvested, the data shape those activities and environments through nudging, algorithmic decision-making and

[60] Maryam Farboodi and Laura Veldkamp, "A growth model of the data economy" NBER Working paper Series, Working Paper 28427, published February 2021, available online at http://www.nber.org/papers/w28427, last accessed 4 December 2021, 2

[61] Hal Varian "Artificial Intelligence, Economics, and Industrial Organisation" in Ajay K. Agrawal, Joshua Gans, and Avi Goldfarb, eds., The Economics of Artificial Intelligence: An Agenda, University of Chicago Press, 2018.

[62] Dosis and Sand-Zantman (2019) "The Ownership of Data," July 2019. University of Toulouse, unpublished manuscript, available online at <https://www.tse-fr.eu/publications/ownership-data> last accessed 6 December 2021.

[63] Duch-Brown, Martens, Mueller-Langer (2017) "The economics of ownership, access and trade in digital data JRC Digital Economy Working Paper 2017-01

[64] Although Google intends to exclude third-party cookies altogether in 2023 ("Google tracking cookies ban delayed until 2023" BBC News published on 25 June 2021, available online at< https://www.bbc.com/news/technology-57611701 >

[65] NFT (non-fungible token) technology makes it possible to sell digital objects as unique. For instance, the first Tweet of Jack Dorsey was sold as an NFT (Elizabeth Howcrift "Twitter boss Jack Dorsey's first tweet sold for $2.9 million as an NFT" Reuters, March 22, 2021 available online at < https://www.reuters.com/article/us-twitter-dorsey-nft-idUSKBN2BE2KJ >, last accessed 20 December 2021.

other forms of algorithmic governance,[66] often without concerning individual and societal effects. The conservative economic theory disregards this context. This narrow view is akin to considering fish sold on the market as a purely private good and in isolation from how it was caught, if it is an endangered species and the possible impacts of fishing on the biodiversity, preservation of the ocean ecosystem or local fishing communities. Such an account would not be inaccurate but also not complete. Some of the the avant-garde conceptualizations of data in terms of the commons discussed below aim to address this shortcoming of the conventional economics classification.

But looking at data and governance of digital society through the prism of a club good has another significant limitation. The rationale of the economic classification of goods along the axes of subtractability and excludability is to recommend governance mechanisms that would ensure the provision of a sufficient quantity and quality of that good.

For instance, market and private property have traditionally been seen as the most effective governance mechanisms to create incentives for the production of private goods because the efforts of producing and maintaining private goods are rewarded when a private good is sold or otherwise exclusively enjoyed. To illustrate, general consumer and other goods deficit in the USSR has been ascribed to the absence of a market economy and private property in the country.[67] Privatization of state property and creation of market economy in the late USSR and post-soviet Russia eventually solved this deficit. At the same time, public goods such as street lighting or a lighthouse signal are best provided by the state and would fall prey to free-riding or not be provided at all if left to the market forces, since lack of excludable benefits does not create incentives for the members of the public to contribute.

Following this logic, if the purpose of one's analysis is to find ways to ensure that sufficient quality and quantity of data is available, e.g. to enable innovation or generate wealth, one needs to focus on data and its characteristics as an economic resource to construct the governance scheme that would create incentives to create data production or availability. For instance, data possesses the characteristics of a club good, i.e. it is non-subtractable and excludable. The ability to exclude and hence exclusively benefit from data creates enough incentives to create the data at least for the actors of the so-called "data industry", e.g. by capturing consumers' behaviour online to build an effective search engine or behavioural advertising ecosystem. Although data is a club good, it does not seem to be prone to the congestion problem as some other club goods, e.g. toll roads, are. So no regulatory intervention seems necessary to incentivize data production or prevent congestion. Some authors point out that the problem is not so much with data creation as with data sharing or pooling: while sharing data results in economies of scope and scale (aggregated data may be used for new purposes by new data holders and bigger data pools will supposedly render more value, e.g. for training AI), the costs of sharing may outweigh the benefits, especially for the data holders whose activities do not depend on the availability of data.[68] Think of hospitals who routinely generate electronic health records, do not immediately benefit from data analysis but will incur additional costs of infrastructure, legal compliance and labour to provide access to their data to someone else. For others whose business models are directly tied to

[66] Zuboff, "the Big Other" **[FIND EXACT QUOTE & PAGE NUMBER]**

[67] [@Douwe: could you please find a paper to support this?]

[68] Carballa-Smichowski, B. Duch-Brown, N. and Martens, B. "To pool or to pull back? An economic analysis of health data pooling", JRC Digital Economy Working Paper 2021-06, Seville: European Commission, 2021

data analysis, the disincentive might be that once the data is shared, even with a limited "club" of users, the benefits of data use are not excludable, i.e. all club members are able to extract the same insights from the same data pool, which might undermine one's competitive advantage. A good illustration is Google which is not sharing its search data with competing search engines voluntarily. Regulatory intervention is necessary to eliminate those costs and disincentives.[69]

At the same time, this "data as an economic good" frame of reference is not productive if one's objective is not to ensure the production or availability of *data*, but something else. Attempting to propose solutions to societal problems – even connected to data – by applying the economic goods analysis to data is fated to miss the target because this type of the analysis is wired to produce solutions for the production or availability of *data* and nothing else. Therefore, if one wishes to use the economic goods frame of reference, e.g. to achieve provision of privacy, democracy or other "goods" (since economics defines a "good" broadly), one needs to redefine what the good in question is.

4.2 Data as a common good: from naturalism to ways of being

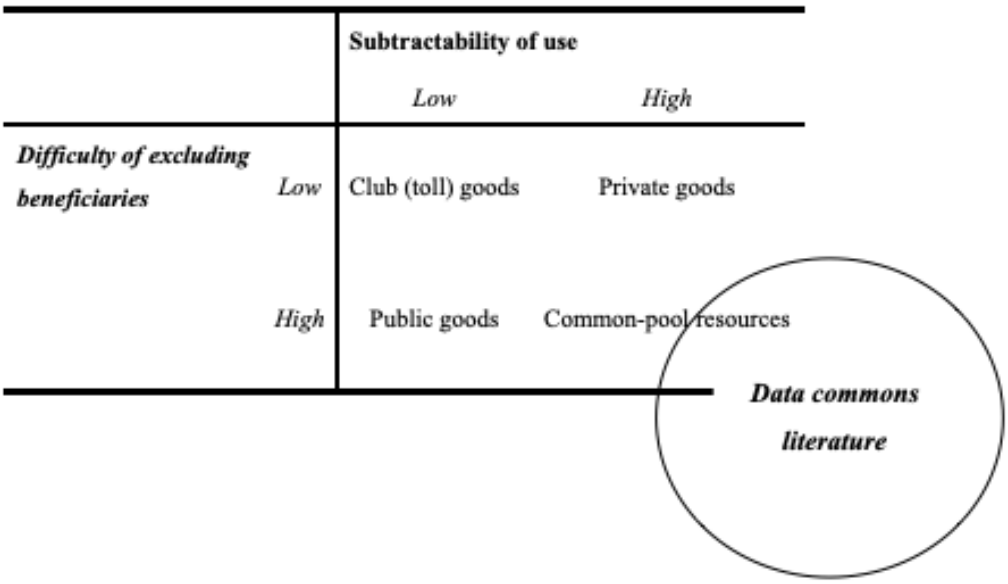
In addition to the conventional economic classification of data as a club good, there is an avant-garde and flourishing body of scholarship, which could loosely be labelled "data commons", originating in the late 2010s.[70] In one way or another, it rests on or responds to the commons analytical framework developed by Ostrom and her followers for sustainable management of the Common-Pool Resources. We roughly divide this literature into five strands. We review these strands in the order from the closest to more remote in relation to the neo-classical classification of economic goods reviewed in 4.1.

The classification we offer might be not fully satisfactory in the sense that some literature we discuss does not neatly fit under just one of the identified streams. Yet, we believe that this classification helps identify the principal uses of the framework of the commons in relation to data and hence can introduce some order to the perplexity of the data commons scholarship that exploded in recent years. Here we briefly present and offer critical reflections on each stream of the data commons literature.

[69] The JRC provided those recommendations in ibid.

[70] E.g. N. Purtova 2017 "Health Data for Common Good" **[ARE THERE MORE EXAMPLES OF EARLY WORKS ON EXACTLY DATA COMMONS?]** Compare Stalder 2010.

Figure 2



i. Hess and Ostrom: scholarly knowledge as a CPR

Although Elinior Ostrom, the founding mother of the modern commons theories, has not explicitly considered data as a common-pool resource, she was, together with Charlotte Hess, the first to apply her CPR analytical framework to information.[71] We consider this account relevant for data as well, first, because data and information are related (see our definition of data as a digital representation of information and Hess and Ostrom's discussion of data as a part of the scientific knowledge commons) and because, as will appear from the subsequent sections, Ostrom's CPR framework has been formative to a big part of the data commons scholarship.

Hess and Ostrom described scholarly information and knowledge as a common-pool resource. Similar to the natural CPRs, scholarly information is a complex resource, but this complexity cannot be easily described in the conventional terms of "stock and flow units" . Therefore, Hess and Ostrom propose a three-way distinction between artefacts, facilities, and ideas.[72]

An *artefact* is a "discreet, observable, nameable representation of an idea or set of ideas"[73] and can be "physical" (such as books and paper articles) or non-physical (digital). Physical artefacts are excludable but can be used sequentially by multiple people,[74] and so are only temporarily subtractable, but also replenishable (a book that is worn out can be replaced).[75] A *facility* is where the artefacts are stored and made available. Think of a library or an archive, but also the Internet. They are excludable and many artefacts such as libraries and archives have well-established policies of access. They are subtractable as they are subject to

[71] Hess, Charlotte and Elinor Ostrom, 'Ideas, Artifacts, and Facilities: Information as a Common-Pool Resource.' Law and Contemporary Problems vol.66 nos. 1&2, 2003
[72] Hess & Ostrom 2003, p. 129
[73] Ibid.
[74] Ibid.
[75] Ibid., 133

deterioration if not maintained.[76] The *ideas* are the "intangible content" of the artefacts, "innovative information and knowledge". They are "non-physical flow units". While the use of an idea by one person does not subtract from it, it is possible to exclude from an idea, e.g. by keeping it secret.[77]

Hess and Ostrom observe that digitization caused a substantial change in how scholarly information is being made available to the scientific community and produced. While in the pre-digital age libraries played a key role in the scholarly communication and provided easy access to physical books and journals to the scientific community, the shift towards digital publication squarely put the scientific publishers in the driver's seat and gave them, among others, through legal protection of intellectual property, control over what artefacts are available via the libraries' indexes and under what conditions. This led to exclusion of particularly smaller libraries (and their users) from access to scientific knowledge.[78] To counter the exclusion, collective scientific information management initiatives have emerged, leading to the emergence of new institutions enabling scientific communication, such as self-archiving and open access movement.[79]

While Hess and Ostrom do not articulate this explicitly, they seem to suggest that the shift to the digital forms of scientific communication with the big publishers controlling access to ideas made the scientific knowledge subtractable, i.e. subject to deterioration. The subtractability is manifested in the form of both appropriation and provision problems: the publisher-controlled mode of scientific communication makes it much more difficult for the smaller libraries and their users, often from poor communities, to get access to the body of scientific knowledge (appropriation); at the same time, restricted access to the existing body of scientific knowledge (ideas published in books and journals and other artefacts) will logically inhibit production of new ideas and thus to the impoverishment of the knowledge commons (provision).

[pros and cons to be inserted later]

ii. Naturalist approaches: Subtractable data as a common-pool resource

The analyses arguing that data by its nature is a common-pool resource are a fringe part of the economics of data scholarship and are not many. Yet, they rely on a very distinct and consequential set of arguments and therefore warrant examination. These accounts are based on the work of Ostrom and use the CPR analytical framework. One recent and clear example of this is Zygmuntowski, Zoboli and Nemitz.[80] They argue that "[i]t is not collective

[76] Ibid. p. 129-130
[77] Ibid. p. 130
[78] Ibid. 134 et seq.
[79] Ibid. p. 143
[80] Zygmuntowski, Jan J., Laura Zoboli, and Paul F. Nemitz. 2021. "Embedding European Values in Data Governance: A Case for Public Data Commons." Internet Policy Review 10 (3). https://policyreview.info/articles/analysis/embedding-european-values-data-governance-case-public-data-commons.In a recent policy proposals, Zygmuntowkis and his colleagues from the NGO Open Future present a complicated different version of the argument in which resource-oriented, institution-oriented, and public-value oriented arguments are confusingly blended together in such a way that the authors end up making a case for something that resembles more of a data bank or data trust, than a data common in any of the understandings discussed in this paper. We therefore consider a, extended discussion of the argument presented there beyond the scope of this paper. See: https://openfuture.eu/wp-content/uploads/2022/07/220723data-commons-primer.pdf

management or sharing itself that constitutes data as [a] CPR, but the nature of data."[81] While data is replicable, non-rival and hence a "pure public good", technological developments, in particular expansion of surveillance apparatuses, have changed it into a subtractable good where subtractability refers to the negative consequences of data use for individuals and society, but also undersupply, pollution, lack of quality and findability of data itself.[82]

This naturalist perspective is valuable because, following Hess and Ostrom's lead, it pushes one to think about the broader societal, technical and economic context of production and use of data, yet it is not entirely convincing.[83] While the presence of negative effects of data practices on society and individuals is undeniable, such negative effects are not sufficient to argue that the data itself, being the resource under consideration, is subtractable, i.e. diminishes in quality or quantity as a result of (unsustainable) use.[84] In fact, something else seems to be deteriorating according to this analysis: privacy, trust in digital systems, or some other interests of the data subjects.[85] This failure to show how the deterioration of these goods relates to the substractability of data itself, makes this naturalist approach to data as commons internally inconsistent and hence not productive.

In addition, the same limitation of engaging with data as an economic good that we discussed under conservative view (4.1) applies here: the economic models behind the classifications of data as a good have been designed to suggest strategies for provision of that good, be it a club good or a common-pool resource. This "data as a common-pool resource or common good" frame of reference is not productive if one's objective is not to ensure the production or availability of *data*, but something else.

iii. From Ostrom to data protection-focused commons

There is another stream of scholarship where Ostrom's CPR framework is applied to (personal) data less literally compared to the naturalist approach, but still with broader societal goals in mind, e.g. data protection. We will review two authors whose workn is representative of this literature strand.

Purtova was first to apply Ostrom's CPR framework to the broader context of regulating digital society.[86] Her analysis closely follows Ostrom's work on the CPRs as a type of economic good. The starting point of the analysis is defining what a CPR is. She concludes

[81] Zygmuntowski et al, 16
[82] Zygmuntowski et al, 15-16
[83] **<Check criticism Dardot & Laval 20-21>**
[84] Zygmuntowski et al acknowledge this as well (15-16) and argue that the current data practices lead to poor data quality and limited findability (citing Dulong de Rosnay, M., & Stalder, F. (2020). Digital commons. Internet Policy Review, 9(4). https://doi.org/10.14763/2020.4.1530). However, they do not demonstrate convincingly the causal link between data practices and poor data quality. Also, the fact that less data is available (or "findable") because of the capture by Big Tech does not mean that less data is being or can be generated. It merely shows that a few powerful actors have been effective in excluding others from the data, which supports a conclusion that data functions as a club good (easily excludable) rather than is by its nature subtractable and hence a common-pool resource akin to e.g. fisheries.
[85] E.g. see Zygmuntowski et al, 15-16
[86] Nadezhda Purtova (2017) "Health Data for Common Good: Defining the Boundaries and Social Dilemmas of Data Commons" S. Adams et al. (eds.), *Under Observation: The Interplay Between eHealth and Surveillance*

that it cannot be health data or personal data generally, as both these categories are too dynamic (any personal data can become health data and any data can become personal) while successful governance of a CPR requires stable resource boundaries.[87] Instead, Purtova proposes to consider data as a "system resource", and "to look beyond data, more precisely, at the 'data ecosystems'".[88] She argues that "personal data does not exist in isolation and presents itself as, or forms a part of, a system resource that includes various 'reincarnations' of personal data on various stages of the data flow, but ultimately also people as the 'human livestock' where personal data is 'extracted' from, and digital platforms used for the data harvesting".[89] Seeing that CPRs are complex resources, within this version of the data commons, "people and data inherent in the very fact of them existing are the core resource, and the data collected about or in relation to them is simply a benefit generated by the core resource."[90]

In line with Ostrom's CPR theory, Purtova argues that the data commons is subtractable, however subtractability should be understood broader than physical exhaustion or corruption of data:

> *[T]he data commons the sustainability dilemma should be interpreted broader than physical exhaustion or extinction of a common good, and instead should be understood in terms of the long-term effects of commoditization of personal data and modern data processing practices, compromising survival of certain social values and hence leading to 'extinction of society' as we would like it to be, taking the shape of 'data poaching'.*[91]

Specifically, the CPR problems of the data commons are altering the fabric of the society (provision) and data enclosure by big tech (appropriation).[92]

This particular paper only "aims to redirect the focus of the health data commons debate [from advocating for data sharing] to the social dilemmas and to the politics of data sharing"[93] and stops short of proposing solutions to the data commons dilemmas. Yet, in subsequent work Taylor and Purtova argue that Ostrom's IAD principles can be used as a roadmap to sustainable data commons governance.[94]

A more recent attempt to further data protection through applying the CPR analytical framework has been made by Wong et al.[95] It is clearly inspired by Ostrom, although uses the CPR framework selectively. Specifically, they apply the IAD principles from the CPR framework without first demonstrating why those principles are applicable, or, in other words,

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[87] Purtova 2017, p. 189 et seq.
[88] Purtova 2017, p. 195
[89] Purtova 2017, p. 195
[90] Purtova 2017, p. 196.
[91] Purtova 2017, p. 200.
[92] Purtova 2017, p. 200, 203.
[93] Purtova 2017, 180.
[94] Taylor, L., & Purtova, N. (2019). What is responsible and sustainable data science? *Big Data & Society*, *6*(2). https://doi.org/10.1177/2053951719858114
[95] Wong, Janis, Tristan Henderson, and Kirstie Ball. 2022. "Data Protection for the Common Good: Developing a Framework for a Data Protection-Focused Data Commons." Data & Policy 4. https://doi.org/10.1017/dap.2021.40.

why data (or anything else data-related) is a CPR. Nevertheless, their analysis does have value as they highlight advantages of the collective decision-making about data.

Wong et al. discuss the many different data governance models currently proposed in policy circles (data trusts, stewards, foundations, etc.), and contrast those with the commons governance model, which is potentially more advantageous. While the data commons practices so far have "prioritiz[ed] data sharing, data curation, and reuse, over data protection,"[96] Wong et al construct another version of the data commons that would prioritise data protection. Wong et al. critique of the data commoning practices resonates with our critique of some of the economics accounts of data as a resource, including some commons arguments: the inevitable consequence of the governance focus on data as a good is that the outcome of those governance strategies being provision of data and nothing else and does not directly result in the provision of other goods, such as privacy, health, or justice.

As a responce to this critique, Wong et al. construct a data commons that is aimed at furthering of data protection. Wong et al.'s data protection-focused data commons is a mixture of parts of Ostrom's CPR framework and what can be labelled as deliberative democracy. Commons, in their argument, are seen as "consensus conference[s]" that "encourage dialogue among data subjects, experts, and policy-makers and ordinary citizens, creating new knowledge together for the common good".[97] The commons as a data governance method is thus combined with ideas about the value of collective discussions, knowledge-sharing, and decision-making, which will help individual members of the commons to make better decisions about their 'data protection preferences'.[98] Instead of having to decide by yourself whether you consent to the processing of your data, a data protection focused data commons transforms this individual decision-making process into a collective one.

While the data protection-focused commons proposed by Wong et al can indeed play a role in educating and decision-support of the data subjects, the usefulness of this data commons model is limited by a number of factors. First, it is not clear how collective data governance can aid data protection which first and foremost secures individual rights and interests with regard to personal data and is ignorant of the collective dimensions of data processing.[99] Second, while they claim that their version of the data commons is not about data pooling, but common decision-making, still the premise silently underlying Wong et al's analysis is that data pooling is beneficial and can serve the common good. This suggests that this version of the data commons, despite the name, is not strictly data protection-oriented. If this is so, and the aim is to both pool data, *and* collectively decide on its use in a privacy-minded manner, Wong et al do not explicate how to balance the production and sharing of data on the one hand, with the data protection on the other.

Common to both Potential:

- Recognizes collective aspect of data processing and proposes collective tools to address those;
- Recognizes connectedness of data to the broader social context;

[96] Wong, 11 (e.g. medical data pooled for medical research).
[97] Wong, 8
[98] Wong 12-13
[99] E.g. see Viljoen's critique of data protection as an individual-centric legal regime. Add another ref to a source criticising GDPR as individual-based

- Something else?

Limitations:

- If commons are governed by communities, how to determine the boundaries of the communities? Algorithmically constructed communities are the affected stakeholders of data processing but too unstable and opaque to function as decision-making institutions;
- Scale of the commons: data commons is global (or in any case has a global level). Can we successfully manage commons on the global level?
- In case on the local data commons, they cannot isolate themselves from the surroundings and be "islands of privacy" or of data justice, as they are often dependent on external factors (platforms, infrastructure, laws, etc.).
- Unclear why common governance is superior to public regulation (especially on the national, international and global level).

iii. Governing the knowledge commons

Another notable approach towards the governance of information goods including data is the "governing the knowledge commons" framework (GKC). It has been authored by Frischmann et al. and applied by numerous other scholars in contributions to a series of books edited by the GKC intellectual founders.[100]

While clearly having its intellectual roots in Ostrom's work, its authors present the GKC as an updated and improved version of Ostrom's IAD framework. According to the GKC authors, the IAD framework is better suited for governance of the natural CPRs but not for the governance of intangible resources such as knowledge, information, and data.[101] According to Madison, Ostrom's IAD principles do not apply well to the intangible information resources because these resources are not excludable and not depletable, and hence are not CPR's, which is the precondition for the IAD framework to be used.[102]

The GKC framework clearly distinguishes itself from Ostrom's CPR analysis as it turns around the relationship between resource and its governance: while Ostrom argues that the characteristics of a common-pool resource (difficulty to exclude and subtractability) dictate the best governance mode (collective institutions), for the proponents of the GKC not the nature of the resource determines the best mode of governance, but institutions themselves determine the characteristics of the governed resource. In short, what makes a resource a commons is the fact that it is governed by a collective.[103] This makes the GKC framework suitable for a much broader range of goods and governance contexts, such as privacy[104] and data.

[100] Frischmann et al. (ed.), Governing the knowledge Commons; Strandburg, Frischmann, and Madison (ed), Governing Medical Knowledge Commons; Sanfilippo, Frischmann, and Strandburg, Governing Privacy in Knowledge Commons; Dekker and Kuchar (ed.) Governing Markets as Knowledge Commons

[101] Madison 35

[102] Madison 35; See for a more extended argument on the limitations of applying IAD to knowledge, Frischmann, Madison, and Strandburg, chapter 1, 17

[103] Madison 31; Frischmann, Madison, and Strandburg, chapter 1, 17

[104] Sanfilippo, Frischmann, and Strandburg, Governing Privacy in Knowledge Commons

Unlike Ostrom, the GKC framework does not prescribe how a resource is best governed, but "supplies a means of describing the breath of the field in a systematic way."[105] The study of the commons through the GKC is "embodying a set of strategies that solve coordination problems [of collective action]".[106] This is done with the help of a set of questions to be asked about the studied commons that accompany the framework.[107] While the GKC seems to be based on an idea that knowledge should be governed in common, the reasons for this do not have a prominent place in the framework,[108] and the contributions to the edited volumes comprising the GKC legacy are descriptions of collective governance in individual contexts.

Madison, one of the GKC key authors, applies the GKC to data. Key to his analysis is the claim that the characterization of data is a metaphorical act.[109] Metaphors are to be seen as tools with which one can describe reality in such a way that it is of use for the project one's engaged in. Madison illustrates this by presenting two different ways of describing data. Data can be seen as 'data form' and as 'data flow'. Data as form has to do with seeing data as a thing or fixed object which you can own and control, and which can be an object of regulation. "That characterization of data-as-form seems most apt when data and datasets are subject to commodification and commercialization efforts."[110] Data as flow has to do with seeing data as wave-like and fluid.[111] Rather than trying to pin-down the essential characteristics of data, according to this understanding, we should expect that data are constantly changing, and of value at different places and at different moments.[112] The key point, according to Madison, is to see data as *simultaneously* flow and form. "No one, single description of data exists on which we may ground some correct regulatory system."[113] Therefore it is not productive to try to build governance systems based on the supposed origins and functions of data.

Madison is critical of how usable Ostrom's distinction between the resource systems and flow units is in the context of data. Instead, he submits that the identification of the relevant attributes of the system must be part of the governance process, rather than its starting point. Institutions define the resource, not the other way around. This is key for understanding the GKC's version of the data commons.[114]

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[105] Madison 36

[106] ??

[107] Frischmann, Madison, and Strandburg, chapter 1; Frischmann, Madison, and Strandburg, Conclusion

[108] Frischmann, Madison, and Strandburg, chapter 1, compare traditional IP regimes to more common ways of governing intellectual resources, and suggest that IP regimes are empirically inadequate for dealing with contemporary processes of knowledge production and consumption. Commons approaches are better capable of dealing with the more complicated social dilemma's present in the latter - according to the authors. In the end the argument for GKC seems to be based on the incapacity of IAD to deal with the more complex knowledge 'environments', and thus, on the belief that there are relevant differences between natural, and knowledge or intellectual commons.

[109] 31

[110] 30

[111] 30. See also: "Data might be form, but are not. In practice, as a consequence, data are flow." (p. 32); "Data-as-flow and data-as-form are rhetorical and propositional statements, but they are not pre-theoretical. They are not ontological statements about the true state of data. They are, by virtue of their metaphorical origins, judgements about the world, offered by their utility." (p. 33)

[112] 30

[113] 31

[114] 35

Consequently, within the GKC framework, the data commons are to be understood primarily as forms of institutional governance. As Madison writes,

> *commons means not fully open, unmanaged access to a resource, but instead collective institutional governance of a resource, embodying a set of strategies that solve coordination problems, known as social dilemmas.*[115]

Alternatively, "[c]ommons means groups that engage in managed resource sharing."[116]

Similarly to Ostrom's CPR framework, the GKC has a relatively limited prescriptive character. The framework does not aim to prescribe *how* institutions should govern their resource: "(...) commons governance is collective management of a shared resource by or in a group. The role of the collective is largely to define its own governance system relative to dilemmas associated with specified resources, producing a form of institutional governance in context."[117] This makes the GKC framework primarily a descriptive tool to be used for researchers studying commons empirically,[118] rather than a theory of how best to engage in the governance of resources in common.

While the GKC model of data commons may be attractive for its wide reach and low threshold of application ("collective governance makes data a commons"), it suffers from a number of significant limitations. The first limitation has to do with internal (in)consistency of Madison's application of the GKC framework. Recall that one of the key motivations for existence of the GKC separate from Ostrom's CPR analytical framework has been the claim that, unlike Ostrom's IAD principles, the GKC was better suited to deal with intangible resources such as knowledge, information, and data that are "neither excludable, nor depletable."[119] However, this reasoning only holds when one conceptualises data as a thing (as 'form') to which it makes sense to apply categories of excludability and depletability. If, in contrast, data is a flow, these categories are hardly applicable.

This complicates the tangibility/intangibility-distinction used by the proponents of the GKC to distance themselves from Ostrom. What if, data are not best characterised as form, but as flow, then the application of categories like rivalrousness to data does not make sense because data *are* not.[120] Madison's argument that data are neither excludable nor depletable, in other words, already amounts to the transformation of data into a particular metaphorical form, namely, as 'form'.[121] Since the authors do not want to prescribe how knowledge/data ought to be treated by collectives, their argument for the advantages of the GKC framework

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[115] 35
[116] 35
[117] 36
[118] This with the help of questions to be asked when conducting empirical research. Frischmann, Madison, and Strandburg, chapter 1
[119] Madison 35
[120] Compare Mol; compare Prainsack; see also Lijster p. 72. On the materiality of information, see Dourish, Paul, and Melissa Mazmanian. 2013. "Media as Material: Information Representations as Material Foundations for Organizational Practice." In How Matter Matters, edited by Paul R. Carlile, Davide Nicolini, Ann Langley, and Haridimos Tsoukas, 92–118. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199671533.003.0005.
[121] Madison is not completely unaware of this. He writes: "Both the identity and the attributes of data, databases, and datasets, including attributes implicating exclusivity and shareability, are matters of design as well as physics or economics."Madison, p. 39

over Ostrom's IAD, becomes unstable because it can only be built on a specific metaphorical act to treat knowledge/data as such – which is a commons' task to do.

This ambiguity illustrates the limitations of being relatively 'neutral' to how resources should be seen, treated, and governed. While the GKC framework thus presents an interesting and updated version of Ostrom's IAD, its moral-political neutrality with respect to the character of the commons makes it susceptible to the criticisms that it is overinclusive — everything can be a common — *and* to criticisms pointing at the inability to recognize the drawbacks related to governing data as 'form' or resource, at the cost of seeing data-as-flow (or as something else).[122] Maybe the question GKC prompts boils down to if one can be neutral with respect to (data) governance? Obviously one *can*, but it is to be doubted whether one *should* when many have shown the potential damage and harm done by problematic forms of data gathering, processing, or governance.[123] Process-oriented values present in GKC - independence, legitimacy - are on their own insufficiently to help researchers differentiate between good and bad forms of (data) governance.

iv. Commons-based peer production

The CBPP data commons discourse has its origins in the late 90s-early 00s and is rooted in the work of Benkler, who observed the rise and highlighted the value of a new way of production which emerged in addition to the conventional market and authority-based models. He called this new production mode the 'commons-based peer production' (CBPP).

The emergence of the CBPP production model is tied to the novel forms of technology-based production and organisation. According to Benkler, the development of the 'information economy' combined with the growth of digital communicative capacities led to the emergence of a 'networked information economy' where goods such as information, culture, knowledge and ideas are produced in new ways.[124] The networked information economy is, among others, characterised by 'peer production', i.e. a "process by which many individuals, whose actions are coordinated neither by managers nor by price signals in the market, contribute to a joint effort that effectively produces a unit of information or culture."[125] An illustration of this technology-enabled shift to peer production of information goods is the free and open software movement where the software has been produced by "collective effort of individuals contributing towards a common goal in a more-or-less informal and loosely structured way."[126]

According to Benkler, in addition to its decentralised nature, the peer-based production differs from the market- and authority-based production in terms of the *kind* of goods it produces, which are information goods, broadly defined: software, books, ideas, etc. Benkler understands information (and information goods) as a public good which is nonrival, i.e. it has zero (re)productive costs.[127] Once information is public, e.g. a book is published, the costs of reproducing it are reduced to almost nothing in the networked information economy, provided that the licensing regime under which the book is published allows for such reproductions. The

[122] We come back to this below.
[123] footnote
[124] Benkler freedom commons 1251
[125] Freedom 1256
[126] Benkler + nissenbaum 395
[127] Freedom 1252

use of free and open licensing formats in the commons-based peer production supports and stimulates the reuse of information for the production of new information.[128] According to Benkler, the production of such goods through CBPP is more efficient in comparison with market or hierarchy-premised types of production.[129]

Beyond the availability of information goods, producing goods via CBPP is conducive to a variety of social-democratic values, notably democracy, individual autonomy, and social justice. Democracy, *for instance*, is promoted through the expansion of the number of individuals capable of participating in the production of informational goods.[130] Citizens participating as peers in the production of newsworthy information do not have to rely solely on a handful of information intermediaries, and by doing so, decentralise and diversify knowledge production.

Important here to Benkler's argument is lastly the need to think beyond the production of resources: doing commons-based peer production necessitates the construction of 'core common infrastructures' – sets "of resources necessary to the production and exchange of information, which will be available as commons"[131] – and *hence* also encompasses the infrastructures required to be able to share, produce, and distribute the commonly-produced resources. Consider removing cumbersome market and hierarchy-oriented legislation that prevent free distribution of information, and the creation of ownerless and publicly-funded infrastructures.

The influence of Benkler's thinking, often combined with some of the other commons theorists, can be found back in recent contributions that present arguments for digital or data commons.[132] It is, however, valuable to be mindful of at least four characteristics of CBPP when trying to import or use it within to argue for the value of data sharing in the contemporary digital economy. First, CBPP was premised on specific (and optimistic) ideas on how the market, the public sphere, and public institutions function, and how the sharing of certain informational goods could foster specific social-democratic values. These are empirical presuppositions that need to be argued for rather than presupposed, especially when reusing the argument within the context of the sharing and disseminating of *data*. Second, it is important to note here the move from types of commons focusing on a broad collection of resources like 'culture', 'information', and 'knowledge', to 'data' as the resource to be produced and disseminated in more recent publications. To what extent, are knowledge and data to be treated similarly, and to what extent do the moral-political values attributed to the opening of culture, information, and knowledge, apply equally to data?[133] Third, the openness and accessibility of the resources to be (re)produced in CBPP warrants scrutiny. It is good to differentiate between open data and data commons for conceptual, moral, and practical reasons. Conceptually speaking, commons do not necessarily have to be accessible for all

[128] Freedom 1253

[129] Note here the fact that he thinks that market, state, and commons are comparable in that way. This is a particular ('functionalist') way of comparing the value of the commons vis-a-vis the state and market. As we shall explain below, the commons are sometimes understood to be more than a mere management or governance solution and hence not to be evaluated on the basis of their capacity to solve a governance problem.

[130] Freedom 1262-63

[131] 1273

[132] E.g. Birkinbane, incorporating the digital commons; Bauwens & Kostakis & pazaitis

[133] Openness capitalism; tckaz; thesis van maanen

and it is good to reflect on what kind of resources should be opened up, and which not, and for which reasons.[134] Morally speaking, for instance, is openness a rather limited moral-political aim.[135] The question might less be whether data as resource are open or not, but whether they can be used to produce or stimulate what (good). Fourth, peer production is a mode of production where specific participants ('peers'), with specific skills and interests work voluntarily with and on the production and dissemination of specific goods. Even *if* it is assumed that the market and public sphere function like Benkler presupposed, and even *if* CBPP produces the goods and values it promises to deliver, the special character of CBPP cannot be generalised and applied to all forms of data governance. Not everyone is a peer, not everyone works with open data and open software, and not all forms of data governance result and should *result* in the production of values like individual autonomy. Data governance, in other words, is not to be conflated with this specific understanding of how information, data, the economy, and society relate, and should relate.

v. The relational commons

For Dulong de Rosnay and Stalder digital commons are "a subset of the commons, where the resources are data, information, culture and knowledge which are created and/or maintained online."[136] They understand the commons themselves as "a plurality of people (community) sharing resources and governing them in their own relations and (re)reproduction processes through horizontal doing in common, commoning".[137] By drawing from the work of De Angelis and Bollier & Helfrich, Dulong de Rosnay and Stalder situate their argument in specific strand of commons literature wherein neither resources, nor institutions, but specific relationships and processes are crucial in understanding what commons are, and why they could be of importance. Though Dulong de Rosnay and Stalder do not explicate that in their paper (in which they also draw from other strands of commons literature), these more 'critical' strands in the commons often reconceptualize the nature of the communities that are engaged governance of resources (or 'commoning'), and combine this with a fundamental criticism of many of the economic presuppositions - e.g. about 'goods', sharing, and exchange - present in much other strands of commons literature. As such, this last strand of commons literature has moved outside of the matrix (figure 2) devised and used by economists to categorise and govern the world. To explain what this relational strand of commons literature encompasses, and how it could change our thinking about data governance, we discuss their reconceptualization of the 'commons', and their criticism of the dominant economic paradigm.

When recent contributions to the digital or data commons debate make use of commons' authors such as Bollier, De Angelis, or Federici, they often do not seem to realise that the kind of commons argued for by these authors is different than that of for instance Ostrom. The authors working in this strand of literature aim to fundamentally rethink the relations we as individuals and collectives have with ourselves, with each other, and with the world. Bollier and Helfrich, for instance, present a full-blown reconceptualization of human nature as a form of 'commoning' which includes among other things a different conceptualization of human individuality, and language.[138] One of the key characteristics of the commons, from this

[134] Rosynay and stalder 16
[135] Topaz 2012
[136] Dulong and de Rosnay and Stalder, p. 2
[137] Dulong and de Rosnay and Stalder, p. 2; quote from De Angelis p. 10)
[138] Bollier and Helfrich, Free fair & alive: the insurgent power of the commons

perspective, is a deep relationality of everything, with everything.[139] This inherent relationality of everything with everything implies a certain degree of mutual dependency of everything on everything. Instead of seeing the commons as the management or the governance of a resource or resource-system, the *relationships* and the *dependencies* that accompany them are granted analytic priority.[140] The commons, accordingly, are better described as a 'life-form' than the management of goods, things, or resources: it matters more what kind of community is related to a certain resource, and in what way, than the specific governance model or set of rules to be applied to that resource.[141] From this relational understanding of the commons follows that the unit of analysis, or the 'thing' to which scholars should pay attention, is neither the good or resource, nor the institution or the collective, but the *social practices* that characterise and define a commons.[142] For many scholars working in this strand, these social practices have a specific character, which both defines and allows the commons to 'reproduce' itself, and the 'commoners' to live well.[143] This specific character can be understood as the explicit political component of a relational understanding of the commons, and amounts to a non-reciprocal sharing of goods with whoever is part of one's common for the sake of reproducing the relationships one has with one another.[144] That does not mean that objects such as data cannot be part of a relational common, but that they are not valued for their price or 'exchange-value'.[145] Goods considered to be important for the viability of a common are to be valued for their long-term benefits, and not for the price one would pay for them on the market.

The reason for this implicit rejection of 'exchange-value' as a mode of valuing goods like data that, has to do with the fact that resources when they enter the markets transform into goods deprived from the social relationships out of which they emerged.[146] Processes of commodification transform these into commodities, and in the case of data often assets, or capital, that merely reinforce the capitalist practices data commons sought to provide solutions force.[147] The character of the goods or resources fundamentally changes in this process, and stopped having the value it arguably had for the common from which it was extracted. Market-exchange, in other words, degrades or at least reduces the quality of the relationships

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[139] Bollier and Helfrich, Free fair & alive: the insurgent power of the commons

[140] Bollier, think like a commoner: "They come to depend on each other and love this forest or that lake or that patch of farmland. The relationship between people and their resources matter."

[141] Bollier, think like a commoner: "… commons are not just things or resources. … but they are more accurately defined as paradigms that combine a distinct community with a set of social practices, values and norms that are used to manage a resource. Put another way, a commons is a resource + a community + a set of social protocols. These three are an integrated, interdependent whole."

[142] See also, Dardot & Laval, 158; Graeber; Lijster; De Angelis

[143] Note here that the aim of commoning changed: from the provision of resources, to the living of the good life.

[144] E.g. Dardot & Laval, 10; Graeber, 94; Stalder, 153; Lijster 84-85, 108

[145] Bollier thinking like a commoner, chapter 7

[146] Bollier, FFA 53-54; Bollier thinking chapter 10; Lijster, 108

[147] Birch, Kean, Margaret Chiappetta, and Anna Artyushina. 2020. "The Problem of Innovation in Technoscientific Capitalism: Data Rentiership and the Policy Implications of Turning Personal Digital Data into a Private Asset." Policy Studies 41 (5): 468–87. https://doi.org/10.1080/01442872.2020.1748264. Sadowski, Jathan. 2019. "When Data Is Capital: Datafication, Accumulation, and Extraction." Big Data & Society 6 (1): 2053951718820549. https://doi.org/10.1177/2053951718820549. West, Sarah Myers. 2019. "Data Capitalism: Redefining the Logics of Surveillance and Privacy." Business & Society 58 (1): 20–41. https://doi.org/10.1177/0007650317718185.

members of the commons have with one another, and thus potentially endangers the quality of their lives and well-being.

Unsurprisingly, the commons in this relational understanding are, according to several contributions to this debate, opposed if not incompatible with more market-oriented forms of evaluating the value of goods, and in our case, data. Notion as 'goods' and 'resource' themselves are sometimes even frowned upon by scholars. As Bollier for instance writes (quoting Quiligan):

> "Commons scholar James Quiligan helps us understand this when he writes: "The notion of 'goods and services' in traditional economics is a reduction of the social relation among individuals - and of the individuals themselves - into commodificable and fungible things. But a commonsbased econonomics raises the possibility of experiencing value through the practical relationships that arise among individuals, the resources of the world, and that which exists between people and the world."[148]

By rejecting the value and relevance of a 'goods' oriented conception of the commons, relational data commons position themselves outside of the economists matrix with which this paper started.[149] What does this imply for the 'governance' of data in common?

There are two different ways of conceptualizing a more relation-oriented data common. First, small-scale community-oriented forms of data governance in which the data is less considered to be a good, but as an inherent part of the well-being of the concerned community. Though not explicated in this terms, recent proposals for community rights could possibly be reformulated as such.[150] The challenges with this proposal are similar to many of the other commons already discussed, and for instance revolve around the delineation of the community. An extra challenge, conceptually, is to present a convincing argument that the data and the community are indeed related in such a way that the quality of the former interdepends with the well-being of the latter.[151] This in itself is an complicated theoretical challenge. Second, and more prominent in more 'relational' contributions to data governance debates, are arguments for ownership of data, platforms, or infrastructure under the heading of the 'data commons'.[152] While morally praiseworthy, it is a question to what extent it makes sense to label such proposals specifically as 'data common', and not as, for instance, 'platform communism'. A last challenge with attempts to 'commonalize' or 'democratize' big tech has to do with the aforementioned worry about the incompatibility of the commons with capital. To what extent is it desirable to try to democratize something so completely alien to a relational common, according to its proponents, should work?

5. What does it teach us about data governance?

The academic discourse on data as an economic good and how it should be governed is ridden with complexity and terminological confusion which stands in the way of its productive

[148] Thinking like a commoner chapter 10; see also boller FFA 53-54 on the concept of resource, and 165-166 for that of commodity.
[149] Bollier FFA, chapter 7; see also Graeber, theory of value p. 9
[150] https://itforchange.net/sites/default/files/add/DGN_Data-commons.pdf
[151] On more relational understandings of data in general, see Viljoen
[152] Lijster, 133; Muldoon, *platform socialism*

use both in academic, policy and practical contexts. This paper offered a systematic way to look at this perplexity and make sense of it, which will allow our readership to use the reviewed literature more productively. However, we have drawn our own lessons about data governance and present them here.

5.1 We should adopt a dynamic characterisation of data as an economic good.

While data has conventionally been thought of as a club good and more recently a common pool resource, none of these classifications on their own accurately reflect the nature of data as a resource. The conventional thinking about data as a club good adequately reflects data's characteristics (it is excludable and low in subtractability) but disregards the societal context and consequences of data production and use. The more avant-garde literature on data commons either fails to convincingly demonstrate that data is subtractable and hence is a common-pool resource (the naturalist approach) or skips the step of showing that data is a CPR altogether and proceeds immediately to applying the commons governance framework to it (the GKC). Yet, a useful account of data in terms of the commons can be constructed, if data is seen not as a CPR itself, but as a part of another larger common-pool resource ecosystem and is instrumental to its sustainability. Hess and Ostrom have constructed such an account where data is seen as a part of a larger commons of scientific knowledge, but other things can be conceptualised as this larger CPR, e.g., privacy, community values, innovation, etc. The choice depends on the purpose of analysis and what - from the perspective of a given analysis - has to be preserved.

To accurately speak of data in terms of the economic goods, we argue that one does not have to pick sides (whether one sees data as a club good or a part of another larger common-pool resource) but instead should accept a dynamic classification of data as both a club good and a part of one or several other common pool resources at the same time. This classification is dynamic because one can switch between the options depending on the purposes of one's analysis. The club good characterisation and respective economic models will provide suitable guidance if the purpose of analysis is to ensure that enough data of sufficient quality is produced and available to the members of the club. The commons analytical framework is a better match where not the data but something else needs to be provided or maintained, and where data is instrumental to its sustainability.

5.2 Focusing on data as an economic good as a target of governance can only ensure provision of data.

At the same time, this "data as an economic good" frame of reference is not productive if one's objective is not to ensure the production or availability of *data*, but something else. Attempting to propose solutions to societal problems – even connected to data – by applying the economic goods analysis to data is fated to miss the target because this type of the analysis is wired to produce solutions for the production or availability of *data* and nothing else. Therefore, if one wishes to use the economic goods frame of reference, e.g., to achieve provision of privacy, democracy or other "goods", one needs to conceptualise those as goods and apply the economic models to those other things. Data may or may not play a role in the governance solutions those economic models will suggest.

5.3 Focusing on data as an economic good as a target of governance degrades the common

We thus see that an economic treatment of data *as an economic good* relates most strongly with ideas and ideals to *provide* for data, and not or to lesser degree to the furthering of other values or goods. But not only is a strict economic treatment of data as a good prescriptively limited, the act of producing data 'as a good' might be problematic for a different reason. The argument that conceptualising and treating data as good might or could be harmful has been put forward by especially the last strand of commons authors discussed above. Remember that the kind of theory of the commons presented by these authors is different from the more good or resource-oriented theories developed by scholars such as Ostrom, in the sense that the goods and resources present in these commons have a different role or function. While for some strands of the commons literature, the characteristics of the goods being governed determine to greater and lesser degree the kind of governance to be developed, relational understanding of the commons emphasise that who and what the commons are, is inherently interdependent with the practical activity of non-commercial forms of sharing, where those activities (or ways of being or living) are considered to be inherently valuable activities. Relational commons thus prioritise the well-being of communities over the provision of goods on the basis of the moral-political idea that being together in that way, has moral-political value. From the perspective of this conceptualization of the commons, the value of resources such as data is mutually dependent on the well-being of the community (or commoners). This moral-political rendering of what the common(s) mean is accompanied with an analysis of processes that endanger the viability of such commons, of which 'enclosure' is one of the central dangers. The history of practices of enclosing is long, and can in general terms be summarised as the act of transforming relationships into goods. Instead of seeing data, for instance, as an important (or even existential) component of the practice of commoning that is taking place in a data common, data is seen as isolated from these relationships, and hence isolated and extracted from the context where it was being valued. Though this transformation of a 'relationship' into a 'good' (in the way as defined above), does not *necessarily* amount to its transformation what is called a 'commodity', 'asset', or 'capital', it is a first step into a process of commodification.[153] The argument to be made from a relational understanding of the commons, subsequently, is that an economic rendering of data as a good, firstly abstracts away from the relationships that are of existential importance to the commons as a community engaged in collective activities. This transformation of relationships into goods, secondly, makes it easy and attractive (under capitalism) for actors to transform these data (as goods) into commodities, assets, or capital, to be shared, sold and governed in a way that is fundamentally opposed to the roles these data played when they were part of their common.[154] And this, thirdly, endangers the capacity of the commons to engage in their commoning, because the 'use-value' they attach to do the data, is being encroached upon by the 'exchange-value' other actors attach to the data.[155] Data, in sum, starts to play a different and problematic role, when being abstracted from their social contexts, the labour that was needed to bring it into being, and the relationships for which it was important, and made and treated as good, and (subsequently) commodities, assets, and capita.

[153] Lijster 108

[154] Birch; Sadowkski

[155] The problem thus is that data is being used differently, when seen as removed from a real-life context.

5.4 Beyond focusing on data as an economic good

What does this relational worry then mean for the governance of data? A first response would be to emphasise the importance of treating data as an important component of what it means to engage in 'commoning'. Data is then *not* treated as a good to be shared, sold, and traded, but on the basis of the use-value it offers from the community for which it is of importance. One possibly interesting route to walk is to explore types of data governance that emphasise the moral/political/legal rights of communities to the (exclusive) usage of relevant data-sets.[156] Such types of governance would then help communities to safeguard themselves against exploitative enclosures by commercial actors. Whatever the exact details of such forms of 'data commoning', there are at least two limitations to such approaches to data governance. The kind of commoning for which data could play such a role will (almost) by definition be relatively small, and the types of data(sets) that can meaningfully related to a relatively well-defined and circumscribed community will be limited. While the governance of data in a common way could thus be of great importance and value for such communities, we should not exaggerate our expectations about the viability and impact of 'data commons' as a governance model if we understand commons in this more relational way.

A second response would be to take a step back and reflect once more on the felt need for the commons as an alternative form of data governance. What makes it that data are considered to be things to be regulated or governed in the first place? Why are scholars looking for *alternative* governance models in which communities of citizens are burdened with the tasks to govern data, and themselves. One way of explaining the attention spent on data as a regulatory object is to understand the problems big tech poses as a form of dispossession where commercial actors take or steal data that was previously owned by citizens or communities.[157] 'Taking back control' by arguing for data ownership, sovereignty, and B2G data sharing becomes a natural response from this understanding of the problem. But, as Dardot and Laval suggest, maybe the problem is not so much that commercial actors take something (back) from someone or something, and by doing so harm them, but that they fundamentally transform the relationships we as individuals and communities have with one another, as a means to create new 'territories' in which data capitalistic practices can expand.[158] Seen from this interpretation of the problem, the enormous attention spent on the need to govern data better, might be more of a symptom than a solution to the problems posed by our increasingly digitised societies. Similarly, the felt urgency to think about ways to govern *data* as individuals and collectives in a better or more democratic way might be indicative of a regulatory failure to curb the influence of commercial actors' agenda's and interests over our lives, rather than a failure of our self-governance. The fact that data are part of the problem, does not necessarily mean that it is part of every solution, and most importantly, that all regulatory efforts should focus on data as the good to be governed, rather than all sorts of other goods and values that could be strengthened and which do often have a meaningful, identifiable, and tangible importance for concerned individuals and collectives (e.g. freedom, or health).

Interestingly, both the starting and end points of our paper - Ostrom, and the relational commons - also hinted at such goods and values, by conceptualising governance (or living)

[156] ITforchange
[157] Dardot & Laval, 87
[158] Dardot & Laval, 87

in a more-than-goods-oriented way. While Ostrom hinted at the importance of the ecosystem wherein a commons was part, someone like Bollier the quality of ‘life’ itself to be part of what is to be governed in common. In contrast to many of the other strands of commons literature, are good and resources for them mere instruments to the furthering of these aims.

5.5 Fixing our digital societies is not (only) about data governance

Data governance is (often) a red herring that distracts us from what we should care about, which hardly is the production and sharing of data. And yes, looking at data might be relevant, and sharing it could have its benefits, but these (expected) benefits should not be confused with the strengthening and furthering of values and goods that do have direct societal importance - data governance shouldn't try to hit two birds with one stone.