

# KNOWLEDGE AS A PUBLIC GOOD AND KNOWLEDGE AS A COMMODITY\*

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In order to shed some light on the issue of public knowledge, particularly scientific and technological knowledge, I will first examine the thesis that *incremental* in the sense of ‘new’ knowledge is rarely found in the public domain. Additional knowledge mainly produced in the scientific community and by research outside of science tends to be treated as a commodity. The restriction on a wide distribution of new knowledge may be based on a number of factors. I will concentrate on contemporary legal restrictions, especially, modern patenting laws. The second part of my observations deals with some of the complexities linked to the thesis that knowledge is a public good. I conclude with remarks about the link between the ownership of knowledge and social inequality.

**Keywords:** proprietary knowledge, common knowledge, patenting, knowledge monopolies, social inequality

# ЗНАНИЕ КАК ОБЩЕСТВЕННОЕ БЛАГО И ЗНАНИЕ КАК ТОВАР

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Автор стремится пролить свет на проблему статуса публичного знания, в частности научного и технологического знания. С этой целью он рассматривает тезис о том, что *добавочное* (новое) знание редко обнаруживается в публичной сфере. Новое знание создается, в основном, научным сообществом в рамках научных исследований, а вне науки оно обычно рассматривается как товар. Ограничения в распространении нового знания могут иметь различные основания. Автор рассматривает текущие правовые ограничения – а именно современное патентное право. В статье также выявляются некоторые сложности, связанные с тезисом о науке как общественном благе. Статья завершается рядом замечаний относительно связи между владением знанием и социальной несправедливостью.

**Ключевые слова:** патентованное знание, общее знание, патентование, монополии знания, социальное неравенство

It would appear to be almost self-evident that in a society in which knowledge becomes the dominant productive force that knowledge – or at least certain types of knowledge – turns into a commodity and can be appropriated, recognized, treated and traded as property. Of course, any

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effort to understand knowledge as a commodity is influenced or possibly hindered by the fact that knowledge has both market-relevant attributes and non-marketable values that do not disappear by treating knowledge as a commodity and having an exchange value.

In order to shed some light on the issue of public knowledge, particularly scientific and technological knowledge, I will first examine the thesis that *incremental* in the sense of new knowledge is rarely found in the public domain. Additional knowledge mainly produced in the scientific community and by research outside of science tends to be treated as a commodity. The restriction on a wide distribution of new knowledge may be based on a number of factors. I will concentrate on contemporary legal restrictions, especially, modern patenting laws. A further limit much older was identified by the economist Kenneth Arrow. Contrary to the optimistic assessment of the World Bank [1991, p. 1], “knowledge is like light. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere”, Arrow notes (in [Stiglitz and Greenwald, 2014, p. 507]; my emphasis), although “knowledge is a free good. The biggest cost in its transmission is not in the production or distribution of knowledge, but in its *assimilation*”. Georg Simmel’s [(1917) 1970, p. 44]<sup>1</sup> sober observation “what is common to all can only be the possession of who possesses less than anyone else”, about the minimum commonality of human attributes across collectivities, on the other hand, refers in addition to a kind marginal law of knowledge distribution, that is, the last individual who still shares in a specific knowledge determines the common world of knowledge in a population. It is not the middle or the average, but the lower limit of any “participation” that determines the degree of the dissemination of knowledge. The second part of my observations deals with some of the complexities linked to the thesis that knowledge is a public good. I conclude with remarks about the link between the ownership of knowledge and social inequality.

## Knowledge as a Commodity

It is a mistake to consider the question of knowledge as a commodity and knowledge as a public good to be a modern question. In fact, the suspicion that knowledge is traded as a commodity has played a role in the 18<sup>th</sup> century. Exemplary for this are considerations by Adam Smith in a preliminary work of his classic *The Wealth of Nations*. Smith refers to the following context:

Let any ordinary person make a fair review of all the knowledge which he possesses [...] he will find that almost every thing he knows has

<sup>1</sup> „Was allen gemeinsam ist, kann nur der Besitz des am wenigsten Besitzenden sein“.



been acquired at second hand, from books, from the literary instructions which he may have received in his youth, or from the occasional conversations which he may have had with men of learning. A very small part of it only, he will find, has been the produce of his own observations or reflections. All the rest has been purchased, in the same manner as his shoes or his stockings, from those whose business it is to make up and prepare for the market that particular species of goods.

The acquisition of knowledge, in the end, does not differ according to Adam Smith from buying any other product; as “with the trade of material goods, there are individuals whose particular task it is to create knowledge and prepare it for the market” [Valenza, 2009, p. 11]. Not only can knowledge become a commodity, but there is a parallel intellectual division of labour between producers and consumers of knowledge.

Knowledge has always had its price and was never available in an unlimited supply, that is, knowledge has been, not unlike other commodities, scarce, and in order to utilize it, one had to sometimes buy it. However, what precisely determines the value of knowledge is by no means self-evident. The value of knowledge depends, for example, not merely on the utility it may represent to some individual or firm but is linked to the ability or inability of others actors, for example competitors, to utilize and exploit it to their advantage as well.

In the context of traditional economic discourse, knowledge is treated in a peculiar and often less than plausible fashion ranging from assuming “perfect” knowledge of market participants to treating knowledge merely as an exogenous dimension or efforts to argue that knowledge can be treated in a reductionist manner, that is, as a conventional economic category to which orthodox concepts such as utility, fixed and variable costs apply with benefit and without restriction<sup>2</sup>. It would seem that economists tend to prefer a conception of the value of knowledge which closely resembles their conception of value in the case of any other commodity, namely, value derives from the utility of the “product” knowledge (use-value), although there remains a considerable range of indeterminacy when it comes to the expected value of knowledge.

For a significant part, the service sector of society lives off selling knowledge. The educational system employs millions who make a living

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<sup>2</sup> In an effort to arrive at ways of determining the value of information as an economic good, Bates [1988, p. 80], for example, argues that there is an inherent imbalance in the fixed cost and variable cost component of producing (and re-producing), information. The production of information has an exceptionally high component of fixed and a very low, even nonexistent variable cost component (the costs associated with the replication of the information), because information is infinitely reproducible and consumes all other resources. Such a treatment of “information”, of course, is only plausible as long as one is convinced that reproduction is virtually unproblematic (e.g. transcends the initial conditions of production including the costs associated with it), and can be repeated at will because production is definitive and does not require any intermediaries or subsequent interpretation.



by disseminating socially necessary knowledge. The control of the free circulation of knowledge cannot only be hampered by limited access to the pre-conditions for its acquisition but also, in a legal way, by assigning property right to it. One only has to refer to patent and copyright laws. In many countries, patent and copyright laws are no longer confined to technical artifacts and processes but include intellectual ownership in art, music, literature, and increasingly, scientific inventions.

Since the 1980s, the policy for legal protection of intellectual property (patents, trademarks, copyrights) has changed radically, and lawsuits for violations of patent law have increased (for example, the patent dispute between Apple and Samsung over smartphone design). With the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) as part of the constitution of the World Trade Organization (WTO), signed in Marrakesh in April 1994 as the conclusion of the so-called Uruguay Round, new binding obligations were put into effect for all WTO members with regard to their national policies for the protection of intellectual property. More than one hundred countries signed the treaty. Developing countries signed TRIPS in return for the promise of liberalizing world trade. In spite of the broad assent to the TRIPS rules, the standards continue to remain controversial. Critics from peripheral states, for example, complain that the special economic and political interests of the developed world and its multinational corporations are protected rather than global health and economic prosperity<sup>3</sup>. Important to note is in addition that the TRIPS agreement extends the life of a patent over what many countries stipulated; the patent protection is granted for 20 years.

Depending on the patented resource and in terms of economic impact it may have, patents on knowledge capacities confer (1) market power and patents can (2) impede the ability to produce new knowledge by effectively blocking market access by protecting relevant, needed knowledge with patents (see [Drahos and Braithwaite, 2002]). (3) Market power influences the risk behavior and investment in research and development of these companies. In addition, patents can (4) influence the labor market of a company up to the possibility of monopolies, i.e., only one buyer for certain special knowledge emerges. The power over the labor market, in turn, has a number of economic and social consequences, which can range from determining the income of employees to consequences for

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<sup>3</sup> Writing on the history of intellectual property laws, Hannes Siegrist [2019, p. 32] notes, that the “concept of intellectual property emerges from the formative periods of modern culture, science and economics. It was developed in the eighteenth and nineteenth centuries in American and European culture-producing states with the objective of protecting the individual creative and commercial work of certain groups of the affluent and educated middle classes and protecting their special entitlements and special position during the transition from traditional aristocratic and profession-based society to modern class society”.



the educational system. Patents can (5) increase the degree of market concentration and encourage a lack of competition for access to the market. (6) have an impact on the economic cycle (see [Pagano, 2014, pp. 1416–1420]); (7) increase the differentiation of individual earnings and generally observed, (8) Internationally sanctioned patents help co-determine the income and wealth inequality of modern society through unearned income. The wealthy classes of society earn a substantial part of their income not as a result of their work, but as a function of their assets.

The protection of intellectual property in the sense of intellectual property law (copyright and related rights; Intellectual Property Rights, IPR) should, if this is indeed the case, create incentives for innovation [Stiglitz and Greenwald, 2014, pp. 429–456]. The counterpart to copyright-protected intellectual property is the public domain, intellectual property as common property or, the global community of knowledge. However, there is a not unjustified suspicion or even fear in companies that patent laws promote exactly the opposite (see also [Stiglitz, 2002, p. 245]), namely the increased monopolization of knowledge progress. This suspicion is reinforced by the fact that the most important resource of present and future inventions is knowledge [Henry and Stiglitz, 2010, p. 240]. Restrictive patenting leads to knowledge monopoly capitalism [Stehr, forthcoming]. The essential difference between knowledge monopoly capitalism and monopoly capitalism is the fact that the monopolistic position is not primarily due to the market power of a company, but to the legally secured cross-border control over knowledge.

## Knowledge as a Public Good

As we have seen, the fact that knowledge is treated as a commodity and is traded is not a new phenomenon. However, some observers would assert that we are witnessing, as the result of technological rather than the legal transformations, especially in conjunction with the proliferation of information-processing machines, a radical “exteriorization” of knowledge with respect to the “knower”. With it, the relationship of the “suppliers and users of knowledge to the knowledge they supply and use [...] will increasingly tend to assume the form already taken by the relationship of commodity producers and consumers to the commodities they produce and consume – that is, the form of value. Knowledge is and will be produced in order to be sold, it is and will be consumed in order to be valorized in a new production: in both cases the goal is exchange” [Lyotard, (1979) 1984, p. 4]. What counts according to Lyotard, therefore, is the exchange and not so much the use-value of knowledge. None the less, there is still not an economic theory of knowledge in analogy to a theory of location for land as a factor of production, capital or labor. Economists



have treated knowledge, as have most of their fellow social scientists, in a taken for granted manner and often introduced it as an exogenous or external factor.

If there is answer to the question whether there can be a just price for knowledge, this answer should be: The lack of a price tag for knowledge as a public resource may be the best indication of a just price for knowledge. In order to escape the possibility that any stratified access to knowledge offers huge advantages to those with such privileged opportunities and therefore enhances social inequality formations in society not only through its role as an economic resource but also as a foundation for social power and authority, knowledge should be without a price. In other words, the rewards that accrue to the use of knowledge should be impartially distributed throughout society while the benefits that follow from the discovery of knowledge might be dispersed according to contribution or merit<sup>4</sup>. Joseph Stiglitz [1999a] enlarges the thesis that knowledge is a public good in a dual sense. He describes why knowledge is not merely a public good but a global public good. In addition, Stiglitz designates human rights, political, economic and environmental goals as public goods<sup>5</sup>.

Most if not all discussions about knowledge as a public good are normative or political in nature. Economists tend to strongly defend either the idea that knowledge should be available to all (for different reasons, obviously) or the idea that knowledge, for example additional knowledge, needs to be protected and hence carry a price tag (again for different reasons but mainly to ensure that the propensity to generate additional knowledge is not discouraged).

But first, we need to inquire in more detail into what exactly is a public good and why the idea of a public good is related to the issue of the price of knowledge? As we have already seen in the case of the definition of a public good by Joseph Stiglitz, public goods can refer to rather diverse phenomena. Economists consider products, knowledge, services, ideas, and information that are produced or available in a society to be public goods if access to them is not regulated and can in principle be shared by all members of a community. In other terms, public goods are goods which nonpaying people cannot be kept from using: Street names,

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<sup>4</sup> For as John Maynard Keynes argues, a just price is a matter of equity not equality. Just prices “are those which correctly reward talents and efforts” (see Skidelsky, 2010: 145–146).

<sup>5</sup> Joseph Stiglitz [1995] specifically identifies a total of five global public goods: “international economic stability, international security (political stability), the international environment, international humanitarian assistance and knowledge”. A definition of global public good that is not merely confined to listing examples of global public goods but also considers their *availability* concludes that “global public goods might usefully be defined as those goods (including policies and infrastructure) that are systematically underprovided by private market forces and for which such under-provision has important international externality effects” [Maskus and Reichman, 2004, p. 284].



social trust or safety are public goods. Public goods, therefore, emerge as a result of certain social norms (such as, for instance, peace, civic order, environmental safety and good governance) or are physical phenomena (such as, for instance, carbon-absorbing forests, algae or air).

Environmentalists prefer to distinguish public goods from “commons” goods (*Gemeingüter*). The difference between public goods and commons resources is considered to be significant with respect to access and governance of goods. Commons goods are as a rule not freely accessible and available for use [Hess and Ostrom, 2007]. Commons goods, for example, solar energy co-operatives or the lobster fishing industry in Maine (can be made) subject to rules and formal and cultural norms negotiated freely among the individuals who use these goods collectively (user communities; cf. [Acheson, 2003]). In a “constructed commons” much of the value pertains to embedded knowledge and information such as patented discoveries.

However, neither the extent, the nature nor the value of knowledge and information in constructed commons goods is readily transparent and available. The focus of constructed commons analysis has focused on the social organization of such associations rather than the value constructed by such communities. The intellectual interest in carrying out these studies was, after all, driven by the desire to promote the establishment of commons communities, for example, in contrast, and opposition to the institution of private property [Madison, Frischmann and Strandberg, 2010].

The price of private in contrast to public goods is negotiated in the market place. Market places are also seen as the most efficient context for furthering the propensity to produce private goods. The propensity to produce is further secured by conditions extraneous to the market, for example, property or intellectual rights; but producers for markets rely also on public goods or non-market goods such as the air to breathe, the climate, national defense, a tax system or gravity.

Public goods are freely available by definition, they are not subject to property rights, and their burdens or benefits cannot be restricted to an individual or a collectivity. As far as their use or utility is concerned public goods are non-excludable. Moreover, the consumption of a public good is non-excludable if unauthorized actors (free-riders) cannot be prevented from enjoying the benefits or incurring the costs of being exposed to it. The non-excludability of a good, a service or an environmental condition is a contingent matter; for example, “it is easier to exclude individuals from the use of a bike than it is from national defense” [Drahoš, 2004, p. 324].

If many individuals and organizations can enjoy a public good without depleting it and if its consumption or enjoyment does not come at another person’s expense, a public good is non-rival. From an individual perspective, the consumption of public goods carries no restrictions. A mathematical theorem “satisfies both attributes: if I teach you the theorem, I continue to enjoy the knowledge of the theorem at the same time that you do”



[Stiglitz, 1999b, p. 308]. Once the theorem is published, no one can be excluded, anyone can utilize it.

Joseph Stiglitz [Ibid., p. 309] also makes the point that the nonrivalrousness of knowledge implies, for example, that there is zero marginal cost for an additional individual or organization that benefits from available knowledge. Even if it would be possible to prevent someone from taking such knowledge on board, it would be undesirable to impose restrictions since there are no marginal costs associated with sharing the benefits that come with the knowledge in question.

Conflating knowledge and information, Stiglitz [Ibid., 309] argues that “if information is to be efficiently utilized, it cannot be privately provided because efficiency implies charging a price of zero – the marginal cost of another individual enjoying the knowledge”. However, as Stiglitz is quick to add, “at zero price only knowledge that can be produced at zero cost will be produced”. In this case, private markets “would not provide them at all or would do so at deficient levels relative to those demanded by citizens” [Maskus and Reichman, 2004, p. 284]. Hence, the probability that additional knowledge will be generated is also close to zero. If additional knowledge is without price, the supply of new knowledge will dry up. The idea that the acquisition of new knowledge comes at no cost of course describes an ideal typical condition. After all, the actual transmission and acquisition of additional knowledge requires some resources, however small or significant.

Nonexcludability also has implications for the price of knowledge. Since such knowledge is available to everyone, the price would approach zero. We have already discussed patents and IPR as ways of restricting the number of users. Depending on the legal frame of patenting, the patent application makes a considerable “amount” of the relevant innovation publicly accessible. Whether this knowledge can in fact be appropriated is not dependent on its mere availability, however.

The probability of fabricating incremental knowledge and enjoying the economic advantages that flow from such knowledge is, of course, a stratified and contingent process. Within technological regimes, techno-economic networks [cf. Freeman, 1991; Callon, 1992] or theoretical “paradigms”, the advantage goes to those who already have produced, and therefore command, significant elements of incremental knowledge. Technological regimes or paradigms may be embedded within a company or in a network of firms, research institutes, etc. In analogy to Robert Merton’s (1995) observations about the operation of the Matthew effect in the process of accumulating standing and prestige in science, it is possible to stipulate a similar principle for the stratification of incremental knowledge. Generating incremental knowledge is likely to be easier for those who can disproportionately benefit from what they already know; for example, due to the capacity of combining local and global knowledge [cf. Stiglitz, 1999, pp. 317–318].



The competitive advantages that may accrue to individuals or firms that generate and manage to control incremental knowledge is, without question, limited in terms of time, especially but not only due to the time limits of the protection granted by patents or copyrights. Thus, such companies must continuously strive to stay ahead in the fabrication of knowledge: “Once their intellectual advantages are imitated and their outputs standardized, then there are downward wage and employment pressures” [Storper, 1996, p. 257] as well as a decline in profitability.

In contrast to incremental knowledge, the general, mundane and routinized stock of knowledge consists mostly of knowledge that is non-rival as well as non-excludable; that is, these forms of knowledge may very well constitute public goods<sup>6</sup>. But even the general mundane stock of knowledge is hardly ever completely excludable or without rivalry. Such protection may be based either on legal norms or on some other apparatus in which knowledge may be inscribed, preventing its use by others. Once a certain capacity to act has been discovered it usually can be used again and again and at relatively low transaction cost, if any. From a collective point of view, for example from the perspective of all consumers or a community, the use of public goods, as noted early (see [Hume, (1739) 1961; Hardin, 1968]), may give rise to the free-rider problem.

It might be useful to distinguish between pure public goods and quasi-public or impure public goods. Quasi-public goods would refer to conditions of action, for example, from which a consumer or an employer benefits even though she has not incurred any of the cost of the discovery and the explication of the intangible asset. The publicly accessible infrastructure of a country would be an example, or an employee’s training and education that is not entirely paid for by the employer but nonetheless of great benefit to the corporation.

Inge Kaul, Isabelle Grunberg and Marc Stern [1999] point out, financial stability has “public good qualities. A bank or financial institution can generate much profit through risky lending. All it stands to lose is its capital if fails. But in a complex and interdependent financial system, the cost of a single institution defaulting is much higher – often a multiple – because one default can lead to more failures and defaults”. Technically, such a possibility is known as a case of negative externalities. But it is better known as a way of socializing costs. In the case of what is seen as global public goods, the risks, costs and benefits, the externalities, are shared or borne across the world.

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<sup>6</sup> These characteristics of knowledge allow for a decoupling of the “cost” of the fabrication of knowledge from the benefits that accrue to those who use it. As a result, the non-rival and non-excludable attributes of knowledge constitute a disincentive to invest in the production of knowledge [see Dosi, 1996, p. 83]. Geroski [1995, pp. 94–100] discusses various strategies that might be instrumental in overcoming the appropriability problem of incremental knowledge.



## Conclusion

To what extent is, can – and maybe even should – knowledge generally be accessible around the world? Is knowledge a public good whose opportunities for example in the field of health care can be *equitably* and globally exploited? Is knowledge universal? One of the implications of the universality of knowledge assertion is the apparently close affinity of the of this thesis and the idea of the unrelenting globalization process in the modern world. The economic implication of perfect mobility of knowledge would a gradual but persistent trend toward full equality of knowledge capacities and human capital across countries. As Thomas Piketty ([2013] 2014, p. 70) remarks, “no small assumption”. Nonetheless, what convergence in the economic growth among countries may have taken place, the “principal mechanism for convergence at the international as well as domestic levels is the diffusion of knowledge”. However, successful convergence of knowledge depends on many factors; it does not occur more or less automatically transcending all social, economic, legal and political hurdles. The most pertinent barrier as I have attempted to indicate, are modern patenting laws that impede access to new knowledge and the benefits associated with incremental knowledge.

The assertion of a *laissez faire* global world of knowledge is also diametrically opposed to the observation that knowledge is tacit and sticky. Knowledge is “reluctant” to travel because it clings to the knower. Knowledge is produced locally and remains local without efforts to overcome its parochial nature. The opinion that it should be otherwise is perhaps largely nourished by the ease with which data and information are believed to circulate. Nonetheless, knowledge as non-rival good does leave its origins for obvious reasons; the producer desires that her creation departs, and not merely as “fugitive knowledge” but at times as a rival commodity. But if this is not the case, that is, if new knowledge is fenced in, it will have significant consequences for social inequality within and across nations.

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