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Knowledge and Inequality: An Exploration

Dev Nathan*

Abstract

The paper looks at how knowledge, a good whose use is non-rivalrous or non-subtractable, can be made into a factor creating inequality. The key process is that of the monopolization of knowledge which yields higher returns, in prestige, incomes or rents. The paper argues that the organization of the knowledge economy with monopolization of socially valued forms of knowledge, in conjunction with processes of exclusion, including gendered exclusion, creates an inequality regime. The paper explores how this process can be analyzed in a variety of socio-economic formations, ranging from small-scale societies of indigenous peoples, the Indian caste society, to capitalist economies. The scales of inequality in these different socio-economic formations, however, are very different. While discussion of ways of dealing with inequality has focused on ex post taxation systems, the paper points to the need to consider modifying the organization of the knowledge economy itself in order to deal with inequality.

Introduction

Many economists writing on inequality have mentioned that the spread of knowledge is a factor for equality. Thomas Piketty held that the spread of knowledge is “the key to overall productivity growth as well as the reduction of inequality both within and between countries” (2013, 20), and even the “principal force for convergence” (2013, 22). On the other hand, knowledge is also seen as a key structural factor in the creation of inequality, usually in globalization (Tyson and Spence 2017, 171) and, more specifically, in the context of the contemporary globally-splintered organization of production (Durand and Milberg 2019; Kaplinsky 2019; Nathan 2020) also identified as global monopsony capitalism (Kumar 2020; Nathan et al. 2021).

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Piketty's elegant inequality, $r > g$, or the rate of return on capital greater than the rate of growth of the economy, should be seen as “dependent on a variety of mechanisms” and not as absolute logical necessity (2013: 361). In this possible variety of mechanisms, this paper is an exploration of the processes through which knowledge becomes a factor—even a key factor—in producing inequality. In Dev Nathan (2018) unequal knowledge was put forward as a basis of imperialism; while Akeel Bilgrami (2020) had added knowledge to the ownership of capital or other properties as a source of inequality. The key process through which knowledge leads to inequality is the formation of a monopoly in the use of knowledge, through the creation of barriers to entry, buttressed by sanctions. This monopolized knowledge can be used to generate and capture rents, or excess income, over that from non-monopolized knowledge.

In this paper, these processes are looked at not only in the context of today's global capitalist economy, but even of earlier economic formations such as small-scale gatherer-hunter societies and patriarchal agriculturist societies of indigenous peoples. Such a historical exploration would provide insights into contemporary issues, as in restricting inequality created through the interaction of knowledge economies and social, including economic, processes.

Knowledge and Technology

Before going on to the analysis of the interaction of knowledge and inequality, it is necessary to set out the usage of some terms and the framework of analysis. It is necessary to distinguish between information, knowledge and wisdom. In this triad, information are the facts provided or learned about someone or something. Knowledge is the ability to process information in order to create a theoretical or practical understanding of a subject. Wisdom is the ability to use knowledge and experience to make good decisions and judgements (Cambridge English Dictionary). To give an example of wisdom, nations have shown wisdom in deciding not to use their knowledge to develop and produce chemical and biological weapons; but have not shown the same wisdom in continuing to use knowledge of nuclear physics to develop nuclear weapons.

Knowledge, in economic analysis, is usually taken to be what Simon Kuznets called “useful knowledge” (quoted in Mokyr, 2002), and termed it the base of economic development. Joel Mokyr uses the distinction between propositional knowledge (the “what”) and instructional or prescriptive knowledge (the “how”) to distinguish between the former as knowledge that is used to create the latter, that is, knowledge of technology or techniques (2002). In a sense, knowledge can be called the meta-resource that is used to create knowledge of the use of resources.

Thus, knowledge is not just one of the resources, as it is in Charles Tilly's list of 10 resources over which control can be exerted to create inequality (2005, 114). It is the meta-resource that enables the use of resources. To give an example, the crude oil under the Arabian desert was not a resource until the creation of knowledge (and then the technology) about the use of petroleum as fuel, particularly in internal combustion engines. Knowledge is what turns things into resources; and, consequently, is on another level of existence compared to other resources.

While identifying knowledge as a meta-resource, it is also necessary to go beyond the notion of knowledge as restricted to Kuznets' useful knowledge or some form of knowledge directly usable in economic production knowledge. Spiritual and religious knowledge also counts as knowledge in many situations. Some of what we identify as spiritual knowledge, such as the chants or various rituals of indigenous peoples, are in fact ways of memorizing and transmitting practical knowledge in oral, small-scale societies, as seen in much anthropological literature, well-summarized in Lynne Kelly (2015).

Therefore, it is necessary to have a broader definition of knowledge—something that includes not only what is useful knowledge, but also ritual, spiritual and religious knowledge. These, too, can be the subject of processes of monopolization and the creation of inequality. There may also be interactions between the different parts of knowledge, both in their creation and use. Propositional and prescriptive knowledge interact with each other; as does production and ritual knowledge.

Knowledge Economies

Knowledge is produced and used in various social and economic processes. Knowledge, which is the base of technology, exists in every human society, and in non-human animal or even tree groups, as argued by Peter Wohlleben (2016) and Suzanne Simard (2016). Of course, there is a difference in the extent or intensity of knowledge use in various living groups.

In contrast with the conceit involved in declaring that the current era of IT-based technology alone is a knowledge economy, one needs to recognize that all human societies are knowledge-based and have their own ways of creating, distributing, accessing, and using knowledge. All societies have a knowledge economy, comprising, "the ensemble of its social institutions and processes producing and reproducing the knowledge at its disposal, and, in particular, the knowledge on which its reproduction as a society relies" (Renn 2020, 7).

A knowledge economy includes the manner in which knowledge is created, diffused and utilized. How is the knowledge on which a society's reproduction depends acquired and utilized? In a preliminary manner, I would categorize knowledge economies on the basis of the learning and training required to acquire and utilize particular forms of knowledge. For instance,

1. Transmission of knowledge of gathering, hunting, agriculture and domestic housekeeping through the young participating with elders, girls with women and boys with men.
2. Learning specialized rituals and knowledge, whether of seed selection, the timing of agricultural operations, and other matters of environmental interaction, crafts and social rites, including cultural and religious products, through apprenticeship and long years of training in specialized schools.
3. Formal schooling for the whole population in industrialized societies.
4. Extending formal schooling to tertiary education, as in the current IT-based knowledge.

In the above schematic manner, it is possible to identify the intensity of knowledge required or utilized in a society and distinguish them, as above, on the basis of increasing intensity of knowledge. A turning point in this increasing intensity is that of capitalist development. Based on market competition, capitalism, as Marx pointed out (), brought about the constant revolutionizing of the means of production. This revolutionizing, termed creative destruction by Schumpeter (ref.), incessantly brought about the growth and destruction of monopolies. The monopolization of the new methods of production, based on the monopolization of the technology developed by the application of knowledge, earned rents, or surplus profits above the usual, competitive rate of profit. Not that societies before capitalism were technologically stagnant, but there was not that constant revolutionizing of technology that capitalism brought about. Since revolutionizing technology depended on the application of knowledge, there is a sustained demand for the development of knowledge itself in the competition between firms and countries to get ahead or stay ahead.

In the analysis of the knowledge economy there is a crucial difference between tacit as against codified knowledge, first put forward by Michael Polanyi (1966). Codified knowledge is easily transmitted and, thus, it is difficult to restrict its use. Of course, formal intellectual property rights could result in the restriction in the use of

codified knowledge in order to create a monopoly. Tacit knowledge, on the other hand, is difficult to transmit and thus its use can be easily controlled; though, the advent of Artificial Intelligence (AI) is said to threaten the exclusivity of tacit knowledge.

Inequality Regimes

The knowledge economy interacts with the political-economic formation to create different forms of inequality. These different forms of inequality can be characterized as inequality regimes. Joan Acker had first used the term inequality regime in the context of inequality in organizations. She defined an inequality regime as, “loosely interrelated practices, processes, actions, and meanings that result in and maintain class, gender, and racial inequalities within particular organizations” (2006, 443). Thomas Piketty extended this concept to the macro-level, when he defined an inequality regime as, “a set of discourses and institutional arrangements intended to justify and structure the economic, social, and political inequalities of a given society” (2020, 2). These give us two areas of analysis: institutions that produce a structure of inequality and discourses around justifications of inequality. I would add a third area of analysis: the political economy analysis necessary to understand why certain inequality structures arise and how they change.

What are the main processes involved in a knowledge economy becoming a factor of inequality? Six processes have to be analysed:

1. The process of turning a good whose consumption is non-rivalrous (Romer 1990) or non-subtractable (Ostrom, et al, 1994) into one whose consumption is excludable. In brief, this is the process that restricts access to knowledge and turns it into a monopoly—a situation where access to some forms of knowledge is available only to those who belong to a defined group, whether it be a gender, caste, guild, class, or corporation. Even where persons have acquired the competence to utilize certain forms of knowledge, they may still be constrained in their use of that knowledge by social, including gender, restrictions. Through all the above processes, knowledge monopolies create what Tilly termed durable inequalities (2005).
2. The sanctions or punishment for those who transgress the boundaries, so that the punishment is a way of protecting boundaries, though such attempts may often be futile and boundaries become porous.
3. From durable inequalities in the access to or use of knowledge we proceed to the process of social valuation which provides a higher valuation for production

that is based on certain, monopolized forms of knowledge, while according lower valuation to production based on non-monopolized and therefore widely spread forms of knowledge. The differential social valuation must be manifest in some forms of differential returns or inequalities in the economic, social, or political realms.

4. Next is the justification of inequalities. As Piketty points out, every society has to have a manner of justification or ideology of inequalities.
5. What are the ways of dealing with inequalities? This can include ways of preventing them from rising and also dealing with them after they have risen.
6. Finally, there is the political economy analysis of different inequality regimes. What coalition of forces brought about a particular inequality regime and how did it or can it change?

Therefore, the process of exclusion or monopolization, the ways of protecting boundaries, social valuations, related differential remuneration, justifications of inequality, ways of dealing with inequality, and the political economy of different inequality regimes are the focus of analysis. These factors and processes create a system of inequality, or an inequality regime.

This exploration of knowledge and inequality starts by looking at the processes of social exclusion that create a monopoly in access to certain forms of knowledge.

Creating A Knowledge Monopoly

Knowledge is essentially non-subtractable, namely, its consumption by any person does not diminish its availability for consumption by another person. This makes it a public good. How then is knowledge turned into a private good? Apart from being non-subtractable, knowledge is also excludable, so it is possible to exclude some people from access to that public good through forms of social exclusion. These forms of social exclusion turn a public good into a private one. There have been a number of forms of exclusion in history. Some of them are dealt with here.

There is a form of gender exclusion to knowledge. In the process of formation of patriarchy or the domination of men over women in key economic, religious, and political spheres, there has been a gendered exclusion of women from these key spheres. For instance, in indigenous Mundari agriculturist societies in central India, women are forbidden from knowing the names of clan spirits or from participation in various forms of rituals (see Kelkar and Nathan 2020 for an extended analysis

of this phenomenon). In other small-scale societies, there are certain types of performance of music from which women are excluded. To cite another example, among the Warlis of western India, women are forbidden to overhear men learning ritual chants and prayers. These are all gendered exclusions, creating a category of men with access and women without access to specific parts of social knowledge.

Social exclusion can take a caste-based form, as seen in India. The lower castes were forbidden from having access to the Shastras and from learning to be either a warrior or a priest. Guilds in Western Europe were also a form of exclusion. Only members of a guild could learn and practice a particular craft. Unlike castes, however, guild exclusion was not determined by birth; a person could join a guild he was not born into, unlike what could happen in the caste system.

A second form of exclusion is that of maintaining secrecy. Business secrets exist, not only now, but also in history, in small-scale societies. The author recalls a discussion with a Hani woman in Xishuangbanna, China; a traditional doctor famous for treating bone injuries. When asked how her knowledge did not spread, she said that she had two practices to keep her knowledge secret. One was to take back from a patient any unused materials. The other was to add some harmless and useless materials, so that the patient would not get any idea of what really worked. Thus, she maintained her monopoly of the specialized knowledge of treating bone injuries, a secret she would pass on to her daughter-in-law or daughter.

Studies of Native American societies, such as those summarized by Lynne Kelly (2015) point out that there is institutionalized secrecy in the acquisition of certain forms of knowledge, such as that of knowing about phases of the sun or about seed types. Among the Pueblo, for instance, knowledge of the many types of corn seeds was stored in ceremony and song, and reproduced through ritual practices of the clan elite. Even though there were hereditary ranks, members of the elite were required to acquire the restricted knowledge of these ritual practices. These were kept secret from others. As Hopi specialists stated, “Power talked about is power lost” (Couch 1981, 594–7, quoted in Kelly 2015, 28).

A third form of exclusion works through the cost of acquiring knowledge. To be a Bobolizan (a village priest and leader among the Rungus of Sabah, Malaysia) required a woman to put in many years of apprenticeship to learn the performance of intricate two-day rituals, which needed to be conducted without a single mistake (Porodong 2001). Learning these required the woman to abstain from productive labour, due to which not all households could support women wanting to learn

these rituals. In the contemporary world, to become a doctor or an IT engineer requires an investment that excludes the poorer class. These are exclusions working through the simple operation of the economic mechanism of cost of acquisition.

A related form of exclusion is that of knowledge which has a high implicit knowledge content. For example, design (such as that of garments) has a higher implicit content, which cannot be codified, than subsequent manufacture. In Africa, in early agriculturist societies, specialists such as iron smelters or medicine men had knowledge of their craft that was both “complex and esoteric” and, consequently, not accessible to others (Kelly 2015, 22).

In contemporary capitalism there is the legal exclusion from using production knowledge through the intellectual property rights (IPR) regime. With the spread of global production organized through the system of the World Trade Organization (WTO) with its requirement that all participating nations subscribe to a very restrictive Trade-Related Intellectual Property Rights (TRIPS) system, there is a fairly uniform exclusion about the manner in which knowledge is manifested in technology.

Punishment for Transgression of Boundaries

The exclusions discussed earlier are forms of social exclusion either on the basis of gender, caste, or economic rights. Certain kinds of knowledge are defined as being the province of certain social groups—and also corporations in the capitalist world. Others are forbidden from accessing or using that knowledge without permission or payment. Furthermore, there are social sanctions that follow any attempts to transgress these exclusions. A woman who tried to acquire knowledge of the rites and rituals of men could be denounced as a witch (Kelkar and Nathan 2020). In Indian myth, Eklavya, who belonged to an indigenous community, had to lose his right thumb for learning to be an archer; while Karna, supposedly from a low caste, was cursed with forgetting his illicitly acquired knowledge at a key moment in battle.

In current-day capitalism, there are no legal barriers to the acquisition of knowledge as such; though there are gender-based and other social barriers, such as caste or race. The economically critical barrier is in the unlicensed use of the technology developed from that knowledge. Transgressions of IPR law can be punished by fines and other legal actions.

Social Valuation

So far, we have seen that knowledge can be turned from a public into a private good by excluding certain social groups from its access or use. The process of exclusion

could be through the formation of social norms; it could also be through the straightforward economic means of cost. Social or legal exclusion is a strong form of exclusion, while exclusion through cost would be a weaker form of exclusion.

Exclusion creates a monopoly in the access or application of that knowledge in production or social life. Such monopolization of knowledge existed in gatherer-hunter and small-scale agriculturist societies. In current large-scale capitalism, we have global monopolies created by IPR protection.

The next question would be: are there any benefits of such monopolization of knowledge? In the absence of such benefits, it would be difficult to argue a case for *durable inequalities* being created by the monopolization of knowledge. The benefits could be economic (higher income), or social (greater prestige), or political (more hierarchical power). Before coming to the benefits of monopolization of knowledge, we need to see if there is a social valuation where monopolized knowledge is valued more highly than non-monopolized knowledge.

Societies have different forms of valuation. Take the relation between production and ritual knowledge in a small-scale agriculturist community. Ritual knowledge is difficult to acquire, often requiring many years of apprenticeship, while production knowledge is more easily acquired through working with elders. Ritual knowledge is monopolized while production knowledge is spread widely, though in differing degrees. More importantly, ritual knowledge is supposed to be the condition for the fructification of production knowledge manifested in labour. Without the former, the latter is considered to be unproductive. Whether it is the village priest (*pahan*) among indigenous peoples in central India or the Brahmin priest in caste-based villages, without ritual observances, production is regarded to be at risk of not bearing fruit. This gives ritual knowledge a higher social valuation than mundane production knowledge. It becomes “an incarnated sign” (Appadurai 1984; Appadurai 2013, 42), which makes it “a special class of intellectual property” (Harrison 1992, 226). Such knowledge as intellectual property becomes a source of power. “The ethnographic evidence is consistent across a range of unconnected non-literate societies: oral specialists in small-scale cultures maintain power through the control of knowledge,” (Kelly 2015, 24).

In a capitalist economy the ranking of knowledge is much more straightforward and even banal. The knowledge that is prized is that which yields more income or higher returns. Money, overcoming all other forms of valuation, is the measure of all goods, including knowledge, in a capitalist economy.

The last step we need to take for knowledge to yield inequality is that there must be a higher return (in some form or the other) for monopoly knowledge which is higher than for non-monopolized knowledge.

Benefits of Monopolization

In a capitalist economy, monopolized knowledge yields a higher return than non-monopolized knowledge. Firms founded on a knowledge monopoly can be price-setters in the market, while those founded on non-monopolized knowledge are not. The former can—due to this price setting power—earn monopoly profits, usually called rents. The latter only earn competitive profits—lower profits which are necessary to remain in business.

In non-market economies, the yields to the holders of monopoly knowledge could also bring in higher economic returns. For instance, the village priest among indigenous peoples in central India usually has a somewhat larger or more fertile piece of land. In addition, he also gets a higher share of sacrificed meat, including the prized heads of goats. The Hani woman specialist in treating bone injuries commanded a premium over the rates paid to other healers.

The higher return for monopolized knowledge, however, is limited by the overall productivity of the economy. In a subsistence economy, there is a narrow limit to the extent of economic inequality. “When mean income is just above subsistence level, an increase in more than a small extent of inequality will threaten existence, triggering Malthusian responses” (Milanovic, 2016: 52). With higher overall productivity in post-Industrial Revolution economies, the extent of inequality can also increase. The overall productivity of the economic system, determines what Milanovic, Lindert and Williamson call the inequality possibility frontier (2011).

With narrow limits to inequality, more important than these economic rewards is the higher social regard for priests and healers, especially in non-market economies. Turnbull pointed out that among the indigenous peoples in Australia, “knowledge is the primary mark of status and an item of exchange” (quoted in Kelly, 2015). Along with an increased social status, there were also economic returns from trading in monopolized knowledge, even in small-scale societies. In Australia, songs, dances, and even entire ceremonies are traded in exchange for desired goods, including ceremonial artefacts (Kelly 2015, 29). In Africa too, songs were traded (Jack Goody 1977, quoted in Kelly, 2015).

However, it should be emphasized again that there are vast differences in the benefits of monopolization in small-scale societies and contemporary hyper-scale

enterprises with operations around the globe. In the gatherer-hunter and early agriculturist societies, the scale of operations of monopolized knowledge was relatively small, limited to either a band or a village or a group of villages. The inequalities that resulted from monopolized knowledge were also relatively limited, limited by low average income. The village priest would have got the sacrificed chicken or the prized part (often the head) of the sacrificed animals. These did not amount to something that could be accumulated as wealth and used to acquire a return, leave alone compound interest. Such consumption inequalities should be contrasted with the accumulation of wealth in the hands of the chief shareholders of hyper-enterprises such as Amazon or Microsoft, or even China's Alibaba and India's Reliance.

Justifying Inequality

While we have seen that knowledge-based monopolies have existed in different social formations, it is also necessary to look into the social justifications of created inequalities. Issues related to the social and economic justification of inequalities and the limits of allowable inequality need to be dealt with before one can take up discussions of policies for dealing with inequalities and growing knowledge-based monopolies.

The French Rights of Man of 1789, quoted by Piketty, declared that "Social distinctions can be based only on common utility" (Piketty 2013, 1). The social justification usually given for inequalities is that they are important as incentives for innovation or are rewards for investment of time and effort in acquiring the necessary knowledge. What these justifications assume in the background is Rawls's 'difference principle', in which the justification for inequality is when it benefits those who are worse-off in society (Rawls, 1993, 5-6).

The possibility of earning large monopoly returns is what drives Schumpeter's creative destruction as the engine of capitalist development. It is likely that much smaller inequalities were sufficient incentives for the development of specialized knowledge in the small-scale societies considered earlier in this note. However, the justification of incentives for current knowledge monopolies is, to say the least, vastly overblown. The main point is that much of the investment in developing and, as Marianna Mazzucato (2011) points out, commercializing technologies, is borne with public money. For example, key technologies of the iPhone such as the touch screen and the personal assistant Siri were developed with public money for the US Department of Defence.

In the case of justifying pharmaceutical patents, reference is made to the need to remunerate corporations for the high costs of product development. The cost of a new drug was US\$473m in 1991—a cost that went up to US\$802m in 2001 (Di Masi et al. 2003). Had all or much of those UD\$800m been private money, there could possibly have been some case for a drug price that would allow a reasonable return on investment. However, a combination of government and public programmes along with tax subsidies accounted for as much as 84.2 per cent of the US\$52.7b spent on basic research. With another \$3.85b provided by charitable foundations, just 12 per cent of the research funding came from industry sources (Light 2006).

Supposed incentives for knowledge creation and application become a way of justifying the outsize returns from the commercialization of knowledge-based technological innovations funded by public money. In a profit-enhancing arrangement, US National Institutes of Health carry out the basic research, license the results to the pharmaceutical majors, and allow them to earn the monopoly profits based on the commercialization of monopolized knowledge. The state works to subsidize the creation of monopolized knowledge, with which the monopolies generate inequalities.

Capitalist Modification of the Knowledge Economy: The Just Deserts of Merit

Rawls's Difference Principle justifies inequality (only?) when it is necessary, probably as an incentive, to subsequently provide benefits to the worse-off. There is another justification for inequality as resulting from a reward for merit or, as in philosophical discussion, receiving one's just deserts. Merit, put in its simplest form by Michael Young, is "Talent + Effort = Merit" (Appiah, 2018).

Merit-based reward pays attention to agency in the knowledge economy. But simultaneously does it also overstate the individual's responsibility for, and thus claim over, rewards? There are two problems in this relationship between merit and reward. One, is regarding the measure of reward. Merit makes a moral judgement about what people deserve (Sandel, 2020: 126). And in arguing for what is deserved it is very easy to slip into the neo-classical equation of what is earned on the market, ignoring that this is also a matter of power and monopoly, as being morally deserved. In Mankiw's justification of supposed merit payment, "People should get what they deserve. A person who contributes more to society deserves a higher income that reflects those greater contributions" (Mankiw, 2010: 16). And how is contribution to society measured? By contribution to GDP, or the income earned. This is followed

by the moral judgement that the income earned is “rightfully his” (ibid).

The other problem is regarding the attribution of merit solely to an individual. Rawls had rejected “just deserts” arguing that natural talent is a “common asset” and, thus, it is necessary to share in the benefits of the talent-based distribution of income (Rawls, 1971: 102). In dealing with talent or merit, there is a line to be drawn between recognition of an individual’s agency and negation of collective contributions to the work of individuals.

How to reward agency through merit-based recognition, is an enduring problem that an analysis of knowledge and inequality will have to deal with. The solutions under discussion range from the collectivist approach of Rawls, which has antecedents in indigenous peoples’ and some Asian and African attitudes that deny a woman agency in the use of her own income (Chapter 11 of Kelkar, Nathan 2020), to the market fundamental analysis, that glorifies the market determined distribution of income as having a moral basis.

From a society’s point of view, the problem with merit-based rewards is that the meritocracy becomes self-perpetuating, a new class. Merit played a role in dismantling the elite of the old aristocracy in Europe and America. However, as seen briefly below, the same did not happen in India where the old ascriptive hierarchy of patriarchal knowledge-bearers has been re-created in the new form of merit, as in the title of Ajantha Subramanian’s book *The Caste of Merit* (2019).

Further, the new meritocracy pass on their privileges to their children, by equipping them with the advantages that determine success in the meritocratic society (Sandel, 2020: 166 and Markovits, 2019). Pierre Bourdieu’s concept of academic capital as the product of the combined efforts of cultural transmission by the family and the school (1984) allows an analysis of the mechanisms whereby the meritocracy becomes a class; or, also, how caste privilege can become transformed into and continued as merit.

“Meritocracy has created a competition that, even when everyone plays by the rules, only the rich can win” (Markovits, 2019). Worse than the resulting economic inequality, however, is the denigration of those who do not make it? If what a person achieves is due to merit, then what about those who are excluded? Do they not possess any merit? “Meritocracy frames this exclusion as a failure to measure up, adding a moral insult to economic injury” (Markovits, 2019). Or, as the creator of the term meritocracy, Michael Young put it, “In a society that makes so much

of merit, it is hard to be judged as having none. No underclass has ever been left as morally naked as that” (2001).

The analyses referred to above are of the meritocracy in countries of the Global North. The trajectories in the formation of the meritocracy in the mainly post-colonial countries of the Global South are likely to be somewhat different and require analysis of the factors influencing these trajectories. In India, the upper castes transformed their “caste capital into modern capital” (Deshpande, 2013: 33). Subramanian’s book (2019) shows, with the detailed of the Brahmins of Tamil Nadu, how the upper castes were able to utilize the IITs (Indian Institutes of Technology) to turn caste privilege into merit, with mass examinations and global market success playing their roles in this transformation. As in the case of those excluded being judged as having no merit, those who secure admission into the IITs through reservation are the “other” who are “supposed not to have the intellectual capacity to do well” (Dutt, 2019; also, for an early analysis of this problem in IITs, see Kirpal and Kelkar, 1976).

The manner in which the knowledge economy is constructed and transformed through merit and how this interacts with policies of affirmative action, such as in independent India or post-apartheid South Africa, needs to be looked at in understanding the transformation and recreation of meritocracies.

Dealing with Inequality: Levelling Mechanisms

Along with higher returns for monopolized knowledge, societies also have some redistributive levelling mechanisms to deal with inequalities. Levelling mechanisms can be of two types. The first type seeks to reduce inequality after it has occurred. There can also be institutional arrangements that seek to eliminate the monopoly of knowledge itself, altering the knowledge economy. There can be a change in the knowledge economy, not allowing the monopolization of knowledge and, thus, pre-exempting inequality.

In small-scale oral societies, oral specialists, priests, and village heads who acquired higher consumption rights also had greater social obligations than ordinary members of the society. These social obligations would have used up any surpluses. Furthermore, they were counter-balanced by levelling mechanisms based on redistributive consumption. In the agriculturist tribes in Central India, any family that became better off would be forced to redistribute its surplus through forms of feasting (Kelkar and Nathan 2020). The Native Americans of the North-West coast of the America had their well-known competitive feasting or potlatch systems.

In contemporary capitalism, levelling mechanisms are much weaker and are of the taxation variety. There may be progressive taxes on income or property taxes on inheritance. These have been applied differentially. These have been more effective in restricting inequality in the Scandinavian countries, but least effective in the USA. Taxes feature as a critical feature of redistributive mechanisms to reduce inequality, whether in Piketty or Oxfam's influential inequality reports (Oxfam, 2021).

These measures are all post-facto mechanisms to eliminate or reduce inequality after they have come about. There are also mechanisms that seek to eliminate the monopoly of knowledge and prevent the appearance of inequality even before it occurs. The open-source software system is one such mechanism to prevent advanced knowledge from becoming a monopoly that exists and even grows.

Political Economy of Knowledge Economies

The next point in this exploration is to look at the political economy of different knowledge economies. This is important for understanding how knowledge economies are set up and how they might change.

There are two key concepts in political economy analysis, that of rents, or the deals space, as Lant Pritchett, Kunal Sen and Eric Werker (2018) call it, and the political settlement, which is about how to utilize the rents. However, there is need to treat the political settlement as not just one between sections of elites, such as between landlords and capitalists in the repeal of the corn import duty in mid-nineteenth England. In electoral systems in particular, it is necessary to bring non-elite actors into the analysis. In an electoral system, voters play a crucial role in influencing the political settlement. In international matters, ethics-based organizations can also play a role in modifying a political settlement or even in arriving at a very different political settlement. The resulting political settlement which would include elites and non-elites would be part of what can be more broadly called the social contract.

One can look at the political economy of knowledge in the case of drugs especially that of anti-retrovirals (ARVs) used in the treatment of AIDS. The manner in which knowledge-based monopolies operated during the AIDS pandemic became an issue of international politics. As mentioned earlier, the US knowledge economy relied on basic research on new drugs carried out by the public sector National Institutes of Health (NIH) and then the resulting patents were licensed to the pharmaceutical majors, who would commercialize and market the drugs. In the case of ARVs to treat AIDS, with this publicly-funded but corporate monopoly

knowledge economy, the cost of original treatment came to more than USD 10,000 per person per year. This was clearly something that put the drug out of reach for treatment in Africa, the epicentre of the AIDS pandemic, and also other countries of the Global South.

At that point, when India only had process but not product patents, Indian pharmaceutical firms reverse-engineered the ARVs. They also carried out some innovations in reducing the cost of production (Athreye and Godley 2009) and developing paediatric dosages and fixed-dose combinations (Waring et al. 2010). The Indian ARVs were sold at below USD 150 per patient per year compared to the USD 10,000 per patient per year in the USA.

Under WTO rules, these generic ARVs could be sold within the country of production, India, but could not be exported. Being able to export the India-produced generic ARVs was crucial to saving lives in Africa and elsewhere in the Global South. The US and EU pharma majors blocked exports of generic Indian ARVs. The matter went to the WTO, which, in the Doha Declaration of 2005, allowed, on public health grounds, the export of generics for communicable diseases.

There are a couple of points to note about the political economy of knowledge-based monopolies and the WTO decision to allow world-wide exports of cheap generics, at least in the restricted case of communicable diseases. The first is the original political settlement, based on market-fundamentalist principles of allowing whatever price a monopoly producer could secure. Secondly, a coalition of emerging countries and generic producers in the Global South, in alliance with ethics-based civil society organizations (CSOs), was able to change the pharmaceutical knowledge economy to allow the production and export of generics.

What this episode demonstrates is that the interaction of the knowledge economy with broader social processes can result in different outcomes. There is not just one fixed outcome in this interaction. There is a variability of outcomes in the interaction between knowledge economies and the economic and social processes. This is discussed here in terms of the concept of articulation.

Articulation: The Interaction of Knowledge and Social Processes

There are a number of ways in which the interaction of knowledge economies and social processes can be analysed. One of the ways, which is characteristic of mechanical materialism, is to see knowledge as a superstructure merely reflecting the economic base. It was about this kind of analysis that Marx had remarked that

materialism neglected the analysis of the active element in development. Looking at the role of knowledge and the creation of monopolized knowledge in the creation of an inequality regime obviously brings the active element of knowledge into the analysis of inequality. However, knowledge does not work as an auto-generating system to influence social processes; there is an interaction between the two.

Another way of looking at the interaction of knowledge and inequality is through the concept of articulation, where there is a need to establish and not assume two-way links between knowledge economies and other spheres of society. Initially formulated by Harold Wolpe (1980) in the context of economic relations between different modes of production—that of kinship-based reserve economies that produced labour power and the industrial-mining sector in apartheid South Africa—the concept of articulation was extended to inter-relations between culture and other social spheres by Stuart Hall (1985). In articulation analysis, the product—say, an inequality regime—is the product of both the knowledge economy and the initial social and economic conditions. Even with some knowledge being available and accessible, the results of its interaction with an economy also depend on that economy's own internal relations or structures. As Amy Kapczynski (2010) put it succinctly, “knowledge is not an object that can be simply downloaded from North to South” (2010, 47). This would also make knowledge economics more complex than information economics.

This kind of analysis has mainly dealt with the impact of knowledge on the economy in the form of developments in inequality regimes. However, there is also a reverse interaction, where social developments, whether in the polity or economy, influence the direction of the development of knowledge.

For instance, there is the analysis of what is called the military revolution in Europe in the early modern or pre-Industrial Revolution period from the fifteenth century to the end of the seventeenth century (Parker 1988). The military revolution involved both armaments and tactics-cum-formations. This was argued to have been developed during this period of incessant warfare between European states, while comparatively less warlike Asian empires in India and China went through a period of a low-level competence trap (Sharman 2017, 498)—or, as one might say, a low-level knowledge trap. Was it this inequality in military knowledge¹ that enabled

1. In an email exchange in 2018, Gerry Rodgers had asked whether, in my analysis in Nathan (2018), knowledge had replaced gun-boat diplomacy as the base of imperialism. To this I had replied that unequal knowledge was the base of gunboat diplomacy. The military revolution analysis pushes this unequal development of military knowledge to the early modern period, from the fifteenth to the seventeenth century.

Europe to dominate the seas even before the Industrial Revolution—a historical inflexion point that further increased the knowledge gap between West and East?

The development of knowledge and its application as technology, however, are not just a matter of endogenous development and that too of national development alone. Given the geographically well-connected Eurasian landmass, knowledge travelled well across the European and Asian countries. They also travelled across countries and regions in Africa. Further, the development of knowledge itself depended on the social valuation or, in terms of evolutionary theory, fitness criterion on the basis of which types of knowledge and resulting technology are developed.

To give an example of this connected (but also uneven) development of technology there are, in the early modern period, the Mysorean rockets deployed in the Anglo-Mysore wars. These were taken back to England and then developed as the Congreve rockets in the Woolworth Arsenal (Anievas and Nisancioglu 2017), and applied with devastating effect in the Anglo-Chinese wars.

However, in the uneven application of knowledge, it is necessary to take note of the demand for knowledge from within different parts of the connected regions. For instance, in the contemporary organization of global production through the splintering of segments across countries, Rodrigo Arocena and Judith Sutz (2010) distinguish between different demands for knowledge created by the division of labour between the product monopolies of the lead firms in the Global North and manufacturing suppliers in the Global South. There is a high demand for advanced knowledge from lead firms in the form of design and branding as they compete over market share, while there is a relatively low demand for advanced knowledge in the supplier countries of the Global South. The demand for advanced knowledge is measured by the share of R&D to GDP and of R&D to firm revenues; in both of them, there is a marked difference between the Global North and the Global South (Arocena and Sutz 2010) The fact that there is a weak demand for the use of advanced knowledge in the Global South is also pointed out by Mario Cimoli, Giovanni Dosi and Joseph Stiglitz (2009, 12).

The Interaction of Knowledge and Other Resources

In this paper, I have identified knowledge as a meta-resource, i.e., a resource that enables the use of resources. However, once a thing has been transformed into a usable resource, that resource gets an existence of its own. For instance, once the Windows monopoly of computer operating systems is established, the resulting

monopoly profit becomes a resource by itself. In the terms used by Piketty, income earned through work can become inherited wealth (2013). This wealth could be used to buy access to knowledge. This is a manner of acquisition of knowledge not in an organic manner, but in an inorganic manner through acquisition, such as of WhatsApp or Instagram by Facebook. In an earlier age, royal courts could secure the use of various types of specialized knowledge holders, for instance the knowledge of the Brahmin in caste India.

Thus, it is necessary to study the manner in which knowledge and other resources interact in the creation of inequality. This is a very brief statement of a complex issue, but obviously something that must be part of any research programme on knowledge and inequality. In this interaction, however, it is the hypothesis in this paper that knowledge is the primary force in creating inequality, though not the only force.

Inequality Patterns

The interaction of knowledge with inequality can take place at the firm (micro) level or industry (meso) level. This depends on the extent to which monopoly is established by a firm in knowledge as technology. How does one explain the interaction of knowledge and inequality at the macro-level, both national and international?

Piketty's theory of macro-economic inequality is of capital, with $r > g$, as bringing about an inexorable rise of inequality, other than the special performance in the period 1918-1980, when a combination of factors of political economy (such as, war and taxation, the competition with socialism and the New Deal social contract which increased the share of wages) reduced inequality within the developed capitalist countries. Nothing happens within the knowledge economy that moderates or increases inequality. Could one extend this approach to the inter-country level, where inequality would be based on differences in the amount of capital per person in different countries?

In contrast to this, Branko Milanovic proposed neo-Kuznetsian waves of rising and falling inequality. He sees rising inequality in the 18th and 19th centuries, followed by the decline in inequality between 1918 and 1980; and then another increase in inequality after that. The current rise in inequality, however, needs to be decomposed into two parts. One is the decline in international or between-country inequality, largely brought about by the increase in per capita income in China and, to a much

lesser extent, in India and other populous emerging economies, such as Indonesia (see Nayyar, 2019 on the rise of Asia). The second part is that of the rise within-country inequality; again, typified by the rise of inequality within China, India and other emerging economies.

An important point for the analysis of inequality is that it is a connected or relational history spanning countries and continents. The analysis needs to explain both inter-country and within-country inequality. It needs to explain both the Great Divergence and the current Great Convergence (Baldwin, 2017 and Nayyar, 2019) and the continuing inter-country inequality. The analysis also needs to explain the concurrent rise of inequality in these converging countries of the Global South, such as China and India.

Thinking of waves of inequality immediately draws attention to Kondratieff long waves, reformulated by Carlota Perez (2002 and 2010) on the basis of technological revolutions, or developments in general purpose technologies, as *great surges of development*. New technologies do not just appear randomly. Rather, inter-linked technologies are created in linked waves of technological revolutions. These inter-linked technologies in a technological revolution have a base in the same areas of propositional knowledge in science and prescriptive knowledge in technology. Perez identifies five key technological revolutions in capitalist development from the 1770s to 2000s: the Industrial Revolution; steam and railways; steel, electricity and heavy engineering; oil, the automobile and mass production; and the current information and telecommunications technology.

Reminding ourselves that all technology is based on knowledge, would there tend to be rising inequality in the first phase of development of a technology, when its use is restricted by IP protection or the complexity of the knowledge required for its operation? And a declining inequality when there is a diffusion of that general purpose technology, both between countries and within countries? This is a hypothesis well worth considering. For instance, the post-Second World War Golden Age of Capitalism was based on both the spread of mass production and a full-employment, high-wage Social Contract; while the reduction in inter-country inequality between countries of the Global South and Global North from the 1990s onwards, was based on the diffusion of standardized or commodified manufacturing technologies across East-Southeast Asia and, to a lesser extent, in South Asia. At the same time, the reduction in inter-country inequality has been accompanied by an increase in within-country inequalities in countries of the Global South, such as in China and India.

The development and application of new technologies would increase productivity and, thus, push outward the inequality possibility frontier (Milanovic, Lindert and Williamson, 2011) but not determine the extent of inequality. The hierarchical distribution of profit rates, higher for monopolized technology and lower for commoditized or non-monopolized technology, along with policies that affect wage rates and middle-class incomes, would determine the inequality trajectory in each segment of Perez's great surges of development. The manner in which knowledge-based technological revolutions, interact with international diffusion of technology and, in each country, with wage and other policies to create inequality waves. is a pattern well worth analyzing. It could explain both inter-country inequality and within-country inequality over long periods of time within a capitalist mode of production.

Contemporary Global Inequality

I next turn to look, in a little more detail, at the manner in which differences between the power and returns of firms based on monopolized knowledge and of firms based on widespread, commoditized knowledge can be seen in the manner of functioning of global value chains (GVCs). GVCs are the characteristic form of organization of global production, with GVC-based trade accounting for 70 per cent or more of international trade in 2017 (WTO, ILO, 2017).

In a stylized representation, GVCs consist of lead firms from the Global North and supplier firms from the Global South. The lead firms are monopolies in the product market, with their monopolies protected by intellectual property rights of various types. These monopolies then appear as monopsonies in the market for inputs and manufactured goods and services, produced by supplier firms. The combination of monopoly-cum-monopsony provides super profit to the lead firms; while the suppliers, functioning with relatively easily acquired knowledge and technology, earn just about the profits needed to remain in business.

To summarize data on profit rates in GVCs, Apple in consumer electronics and Ralph Lauren in garments secure profit rates in excess of 50 per cent. Electronics contract manufacturers, such as Hon Hai (better known as Foxconn) secure profit rates of less than 5 per cent (Raj-Reichert, 2018, 38-39). Indian garment manufacturers' profit rates lie between 8 to 10 per cent (Nathan, et al, 2021). As expected, monopoly-based lead firms earned high profits, while suppliers' profits were not more than one-fourth of lead firms' profit rates.

However, not all GVC relations are of this strict monopsony type. Where input suppliers have established their own intellectual protection, including that of establishing brands, they are able to secure higher rates of return. Indian IT service suppliers have established a degree of monopoly through their brand reputations, in addition to the IP protected products, such as their banking software, TCSbanks or Infosys' Finnacle. With their brand reputations, the major Indian IT service suppliers, such as TCS and Infosys, are able to secure margins of around 23-25 per cent and they do not accept contracts with lower margins.

A higher level of knowledge protection is that of Microsoft, with its Windows operating system having a virtual monopoly in personal computers. Similarly, some auto component suppliers, e.g., Bosch in spark plugs, have their own patented products. The point is that to the extent that a producer, whether of a final product or an intermediate input, is able to establish IPR protection for its product, to that extent it becomes a price setter, and is, thus, able to earn a higher return.

What the above shows is that contemporary international or inter-country inequality has a critical knowledge dimension. Supplier firms with low rates of return for their non-IP protected manufacturing systems, are mainly located in the Global South. Lead firms with their IP protected products are mainly located in the Global North. Product segments with non-IP protected technology are easy to enter; while product segments with IP protected technology are difficult to enter. This results in product monopolies also becoming monopsonies in the input market. Knowledge incarnated in IP protected technology then becomes a key factor in contemporary inter-country inequality.

In the contemporary world, this IP-protected knowledge has been able to utilize the new global economies of hyper-scale (Nathan, 2020). Platforms, such as Google with its protected search engine, and Facebook or Amazon, have established themselves as monopolies in more than one sector. Amazon is not the only retailer in the world, but also the biggest operator in computer cloud services. The platforms with their combination of IP protection and global scale, have resulted in what has been called a 'Winners take all' economy (Giridhardas, 2018) and, as a consequence, become a new source of an increase in inequality.

Before proceeding, it should be mentioned that some countries of the Global South, mainly China but also, to some extent, India, are developing their own lead firms with IP protected technologies or brands. This development too, however, is through the route of developing or acquiring IP protected technologies and brands.

Conclusion

Based on this analysis, we see that knowledge or the technology based on knowledge can be turned into a monopoly and that this is a factor creating or exacerbating inequality. This knowledge-based inequality is not something new, only coming up with what James Boyle (2003) named the ongoing “Second Enclosure Movement”. It existed even in pre-state, small-scale, agriculturist indigenous societies. A knowledge-based division of labour is the production basis of India’s caste system and leads to unequal returns for different types of knowledge. In the capitalist system, there is also a long history of knowledge-based monopolies earning much higher profit rates than firms using non-monopolized knowledge.

What is set out in this note is, in a sense, a research programme for looking into the nature and role of knowledge-based monopolies in the creation of inequalities in different social formations. Such a research programme would link the process of the creation of knowledge monopolies, ways of protecting the boundaries created by the monopolies, with the social valuations that provide differential returns to monopolized and non-monopolized knowledge or to different types of knowledge economies and their articulation with inequality regimes in different socio-economic formations. This approach could be used to study both inter-country and within-country inequalities. It could also be used to study a specific inequality, such as that of gender inequality, relating women’s exclusion from acquiring or using forms of knowledge and the inequalities created by knowledge in interaction with other factors, such as gender roles. The analysis would draw attention to ways of dealing with inequality, not only in terms of ex post policy for income and wealth inequality, but also with ways of modifying the knowledge economy itself.

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