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Knowledge and Global Inequality

By Dev Nathan

This paper argues that the global capitalist economy has been and is built on the monopolization of advanced technological knowledge through trade secrets and intellectual property rights protection, controlled by companies and countries of the Global North. Companies and countries in the Global South use commoditized knowledge or knowledge in the commons. In the colonial period this was largely confined to the production of agricultural commodities and now to carry out the bulk of production functions. This division of knowledge and the difference in returns to monopolized knowledge and knowledge in the commons drives global inequality. The paper points out that countries of the Global South that moved out of the middle-income trap did so by advancing from just using knowledge to also creating knowledge. Finally, it argues that there is a need to reform the system of intellectual property rights in order to promote inclusion and not exclusion.

Le présent document soutient que l'économie capitaliste mondiale a toujours été et reste fondée sur la monopolisation des connaissances technologiques avancées via la protection des secrets commerciaux et des droits de propriété intellectuelle, sur lesquels les entreprises et les pays du Nord exercent un véritable contrôle. Seuls des connaissances monopolisées ou relevant du domaine public sont accessibles aux entreprises et pays du Sud. Durant l'ère coloniale, ces connaissances étaient largement limitées à la production de denrées agricoles et, aujourd'hui, à la réalisation de l'essentiel des fonctions de production. Cette division du savoir et les écarts de rendement qui subsistent entre les connaissances monopolisées et celles relevant du domaine public sont à l'origine des inégalités dans le monde. Le document souligne que les pays du Sud qui sont sortis du piège du revenu moyen l'ont fait en privilégiant non pas l'utilisation, mais la création de connaissances. Enfin, il affirme qu'il est nécessaire de réformer le régime des droits de propriété intellectuelle afin de promouvoir l'inclusion et non l'exclusion.

Este documento sostiene que la economía capitalista global ha sido y sigue siendo construida sobre la monopolización del conocimiento tecnológico avanzado a través de los secretos comerciales y la protección de los derechos de propiedad intelectual, bajo el control de empresas y países del Norte Global. Las empresas y países del Sur Global utilizan el conocimiento mercantilizado o conocimiento en el dominio común. En la época colonial, esto se limitaba en gran medida a la producción de bienes agrícolas, y en la actualidad, a la realización de la mayor parte de las funciones de producción. Esta división del conocimiento y la diferencia en los rendimientos del conocimiento monopolizado y del conocimiento en el dominio común impulsan la desigualdad global. El documento señala que los países del Sur Global que lograron salir de la trampa de ingresos medios lo hicieron al avanzar de solo utilizar el conocimiento a también crearlo. Por último, argumenta que es necesario reformar el sistema de derechos de propiedad intelectual para promover la inclusión en lugar de la exclusión.

Introduction

I propose a new, one might say, a Global Southern way of looking at global capitalist economic history since 1800 - highlighting the importance of the creation of, command over and exclusion from knowledge. Inequality in this development process arises from the enclosure of technological knowledge and the difference between returns to such enclosed or monopolized knowledge and commoditized, or widely available, knowledge. Economic units, firms and countries, with monopolized knowledge secure monopoly returns, while firms and countries with commoditized knowledge secure much lower, competitive profits. This analysis goes counter to mainstream theories of economic development, which assume an unimpeded flow of technological knowledge across the world.

While emphasizing the role of the enclosure of knowledge, the analysis does not rule out other factors in the analysis of global development. Institutions, as recent Nobel Prize winners point out, are important in setting or changing development trajectories. So too, is imperialism, whether explicit as colonialism or as a matter of degrees of power. I would, however, argue that there is an interaction between these three factors and give primary place to the creation and enclosure of knowledge. Further, the differential returns to different forms of knowledge as the basis of global inequality means that we must look at not just the institutions in the two sets of countries, as in the analysis of Daren Acemoglu and James Robinson (2012), but also the relations between these countries. The institutional analysis is inadequate because it does not go into the relations between the two sets of countries and the differential returns they secure to their knowledge, whether monopolized or commoditized.

For instance, Indian and China's defeat by the British and other European powers between the 17th and 19th centuries can be attributed to falling behind the West in military knowledge (Parker, 1996). If so, knowledge can be recognized as the base of colonialism. This was accompanied by a development policy based on supposed comparative advantage, a policy resulting in the 'Great Specialization' (Findlay, 2019), which was earlier termed 'the imperially imposed division of labour' (Bagchi, 1976, p. 23).

In this social process, however, knowledge is not only an input, as into military superiority, imperialism, or the global division of labour. It is also an output. Knowledge is an output of the set of institutions that form what has been called the knowledge economy (Renn, 2019). Thus, if a country is to move from being a user of knowledge to becoming a creator of knowledge, it must develop its knowledge economy to provide high-level technological knowledge as an output, only then can it enclose or monopolize this knowledge; or, if the development paradigm changes, put this high-level technological knowledge in the commons.

Inter-country Inequality in Two Eras of Globalization

There have been two eras of capitalist globalization. The first during the colonial period from about the end of the 18th century to 1950, which was a globalization based on trade in commodities, e.g. manufactures exchanged for raw materials. The second period of globalization is that of the post-colonial period, from about 1950 to the present. In this second era of globalization there has been a splintering of production in global value chains, with the pre-and post-production, high-value capturing tasks of design, branding and marketing concentrated in headquarter (1) firms in the Global North and manufacture concentrated in supplier firms in the Global South (Gereffi, 2016).

I look at the way the enclosure of knowledge has played out in these two periods of global capitalist history. I use the terms Global North and Global South to denote two sets of countries that have largely remained stable (with few exceptions that we will explain) across the global economy. This characterization of the *longue durée*, or long duration, of the capitalist world economy is supported by Isabelle Weber *et al.*'s (2022) finding that the sophistication or, in our terms, the knowledge content, of a country's exports, such as of manufactures vs. primary goods, in 1897-1906, was a good predictor of its international rank in per capita income not only in the first era of globalization but also, with few exceptions, in 1998-2007, or during the second era of globalization.

(1) The terminology of headquarter and supplier firms is taken from Richard Baldwin (2016).

The common features of the explanation of both divergence and limited convergences are: the difference in returns between enclosed knowledge and knowledge in the commons; the structures of the world economy created through such knowledge differentiation; and the movement in development from being mainly users of knowledge to becoming creators of knowledge that is, in turn, monopolized. We look at the way this knowledge differentiation played out in the two eras of capitalist globalization.

Adverse Specialization

In the colonial period, there was what is known as the Great Divergence (Pomeranz, 2000), when per capita incomes in, say, China and India went down from about 40 to 50% of those in Europe in 1800 to below 10% in 1950 (Nayyar, 2019). The income divergence between North and South in the colonial period resulted from differences in growth rates between Europe and its colonies from 1820 to 1950, as seen in Table 1.

Table 1: Growth of Per Capita GDP in Europe and Colonies, 1820-1950

	1820 - 1913	1913 - 1950
Britain	0.96	0.80
France	1.13	1.12
Italy	0.90	0.90
Netherlands	0.86	1.07
China	-0.08	-0.62
India	0.25	-0.23
Indonesia	0.42	-0.20

Source: Adapted from Maddison (2007, Table 2.2b).

There are two factors in the divergence of rates of growth over this colonial period. The first is the creation and monopolization of the technology of mechanization, the core of the Industrial Revolution. As Ha Joon Chang

(2000) put it, using a picturesque phrase, the colonial countries carried out a policy of 'kicking away the ladder.' They tried to confine the knowledge and benefits of the Industrial Revolution to themselves. Countries that were independent, such as Germany or later the United States of America and even Japan, however, adopted policies to copy the then-advanced technology, such that the USA in the 19th century was known as a 'pirate nation' in the area of knowledge (Vaidhyathan, 2017).

The second factor that created adverse specialization was that of the imposition of free trade policies based on development according to factor availabilities, capital and labour, according to the Ricardian doctrine of comparative advantage. Increased productivity from mechanization required growing markets. Britain, the dominant manufacturing economy, and other European economies, required both markets for their products and sources of raw materials. Both these requirements were fulfilled by confining colonies of the Global South to the production of agricultural and other raw materials.

In the 1950s, the Prebisch-Singer (Prebisch, 1950) analysis pointed to the adverse trade effects of what we are calling adverse specialization in the world economy. The adverse movement in the terms of trade is based on the difference between monopoly markets for manufacturing, allowing for excess profits; and to use a concept created by Joan Robinson (1933), monopsony in markets for agricultural commodities. This was also a trade between monopolized and commoditized knowledge. This adverse specialization resulted in the deterioration of the terms of trade. As Hans Singer pointed out, "By 1938, the relative prices of primary goods had deteriorated by about 50 points, or one-third, since (the 1870s) and by about 40 points, somewhere less than 30 percent, since 1913" (quoted in Toye and Toye, 2008, p. 449).

Decolonization and the Growth of Low-return Manufactures in the South

Drawing lessons from adverse specialization in agriculture and raw material production, countries of the Global South took up industrialization in the post-colonial period. In the early decades from 1950 to 1970, this seemed to hold out promise. There was a manner

of industrialization, though based on capital good and technology imported from the North, which created a division of labour between those who created technological knowledge and those who used it. Further, as pointed out by Raymond Vernon (1966) the developed economies (of the Global North) exported older technologies, those that were no longer monopolized but had become commoditized.

Contemporary industrialization, however, faces a new form of exclusion – that from high-value knowledge within the manufacturing process. In the contemporary form of global production in global value chains (GVCs), the headquarter firms of the Global North specialize in value-capturing, knowledge-intensive activities, such as design, branding and marketing. On the other hand, the supplier firms of the Global South specialize in the low-value capturing activities of manufacture and raw material production, both based on knowledge in the commons. In the well-known example of iPhones, Apple, with its intellectual monopoly capital, secures profits of more than 50%, while assemblers get profits in single digits. The same stories are played out in garments or footwear, with profit margins over 40 or 50% for the big brands and around 10% for manufacturers. Table 2 below shows the distribution of profit rates between headquarter firms and supplier firms.

Table 2: Gross Profit Margins — Headquarter and Supplier Firms

Name of Corporation	Gross Profit Margin (%)	
	2009	2021
USA		
Ralph Lauren	58.2	66.7
Levi Strauss	48.0	58.3
Nike	44.4	46.2
Apple	41.3	43.3
Dell	17.2 (2016)	21.4

HP	23.6	20.7
Intel	55.6	54.3
Cisco	64.4	63.1
IBM	45.7	54.4
Accenture	30.4	32.3
Europe		
Zara/Inditex		60.1
H&M		52.8
Adidas		50.2
LV		68.9 (2022)
C & A		48.13 (2022)
India		
Garment Manufacture (50 firms)		10-12 (2016-2017)
China		
Electronics — Hon Hai (Foxconn)	5%	

Source: U.S. and European data from <https://www.macrotrends.net/stocks/charts/LEVI/levi-strauss/gross-margin> (and for for each company in the table). Garment manufacturers from own survey in Nathan *et al.* (2022), and electronics from Raj-Reichert (2018).

The above table deals with firms, whether headquarter or supplier firms. We need to move from firms to economies. Several studies have shown a relation between knowledge intensity or knowledge complexity and per capita income. At times complexity of exports is taken as an indicator of complexity of the overall

economy. This is a reasonable assumption given that exports are usually the most globally advanced parts of the economy. The study by Isabelle Weber *et al.* (2022) showed that the complexity of exports was a good predictor of per capita income rank. This predictor role went back more than a century, as complexity of exports in 1895 was a good predictor of per capita income in 2011.

The former World Bank chief economist, Justin Yifu Lin (2012), showed that the contribution of TFP or total factor productivity (which we can interpret as the contribution of knowledge) was higher at 28% for countries that moved from middle to high-income countries (HICs) as against 10% for those that remained middle-income countries (MICs). Further, measuring complexity in exports by value added, he showed that HICs have a higher share of more complex goods in their export basket as against MICs which had more of mid-complexity goods in their export basket. An Asian Development Bank study (ADB, 2020) showed that HICs have a larger share of more complex goods in their export basket, while MICs had a larger share of mid-complexity goods in their export basket. Complexity of goods was measured by the share of value added.

These findings are in line with the analysis of the GVC-based study of Milberg and Winkler (2013) that there was a correspondence between participation in different GVC segments with different knowledge complexities resulting in value-capturing abilities related to per capita income status – HICs specialized in high-value tasks like design and branding, MICs had a mix of firms of various knowledge complexities, while low-income countries (LICs) were specialized in low-knowledge complexity tasks such as assembly.

Differences in the income earned or captured in typical value chains (garments, footwear, automobiles, consumer electronics, pharmaceuticals and information technology services) can be shown by per capita output or labour productivity. We look at this from 1995 to 2015 for four countries, three of them (China, India and South Korea) initially supplier economies in 1995 and the USA, a headquarter economy. Labour productivity in the supplier economies as a percentage of that in the headquarter economy, the USA, indicates the income difference between these economies (Table 3 based on Nathan *et al.*, 2024).

Table 3: Per Capita Real Output in Three Asian Economies as % of USA, 1995 and 2015

	China		India		South Korea	
	1995	2015	1995	2015	1995	2015
Garments	4.5	84.2	14.7	29.7	39.3	205.0
Shoes	5.0	46.5	16.8	14.0	42.4	120.0
Automobiles	3.9	14.9	1.7	4.8	14.7	18.5
Electronics	7.3	41.1	12.4	63.2	13.9	142.5
Pharmaceuticals	3.6	21.7	11.8	4.9	33.7	59.7
IT Services	53.8	20.0	25.6	52.2		13.7

Source: Nathan *et al.*, (2024).

In China in 1995 all manufacturing sectors in Table 3.1 were only single digit percentages of per capita output in the USA. Other than automobiles, in India per capita output was below 20% that of the USA in manufacturing sectors. Korea too was in double digits, though generally Korean percentages of US productivity were higher than in India. However, by 2015 Korea's per capita output was more than those in the USA in electronics, garments and shoes. China remained in double digit percentages, though generally higher than in India. It was only in IT services that India did better than its Asian competitors, with productivity in 2015 reaching 52% that of the USA.

Low productivity, or low value capture, are the norm in the South; while high productivity, or high value capture, are the norm in the North. From this value capture, however, there is a further division between profits and wages. With low value capture we would expect low profits in the South and the opposite in the North. The reasons for these differences in development outcomes will be discussed in the next section on the middle-income trap.

Middle-income Trap

With all the attendant inequalities, movement from agriculture to manufacturing and some processing of materials has enabled supplier economies to move from low-income to middle-income status in the global economy. But most economies have been stuck in what has come to be known as the 'Middle-income Trap'. I identify the factor that has enabled a few economies, most notably South Korea, as having the capability to move from being users to becoming creators of knowledge and, in the process, developing their own brands. Some, like Singapore and Poland, have developed higher-knowledge-based services. The critical factor, however, is the movement to becoming creators of knowledge that can then be monopolized for higher returns.

Knowledge creation is a complex process. But for the purposes of a broad analysis, we can take money spent on research and development (R&D) as an indicator of both the input into knowledge creation and also the success in knowledge creation. This is shown in Table 4 below.

Table 4: R&D Expenditures by Country Groups

Economy Group/Country (1)	R&D Expenditures as % of GDP 2010-18 (2)	R&D Expenditures as % of GDP 2020 (3)
Low Income	-	-
Lower Middle Income	0.58	
Upper Middle Income	1.75	1.65
High Income	2.59	2.95
India	0.65	0.65
Brazil	1.26	1.15
South Africa	0.83	0.60
China	2.19	2.41
Korea	4.81	4.80

USA	2.84	3.47
Germany	3.09	3.13
Japan	3.26	3.27

Source: World Development Indicators, 2020, Science and Technology, <http://wdi.worldbank.org/table/5.13>.

What this table notes is formal R&D expenditure. It does not include the countless knowledge creations and innovations which are mainly carried out in improving production processes. These are of the type called *jugaad* in India and are of the tinkering variety, or what has been called 'below the radar' innovations. They do not fall into the category of knowledge that can be monopolized or provide excess profits.

There is a correspondence between R&D expenditure as a percentage of gross domestic product (GDP) and income status; but this is a two-way relationship. Increasing R&D expenditure is necessary for increasing income status, particularly for low- or middle-income countries; at the same time, income status also affects the ability to devote expenditure to R&D. China, with an R&D-to-GDP ratio of 2.19 per cent, which is higher than the average for upper-middle income countries and close to the average of 2.59 per cent for high-income countries, exhibits a clear policy of moving from knowledge utilization to knowledge creation—just as Korea, Singapore, and Taiwan did earlier. Brazil, India, and South Africa, on the other hand, are all lagging in investment in knowledge creation.

China clearly is in the process of developing not just production knowledge, such as solar panels and electric vehicles, but general-purpose technology, such as Artificial Intelligence (AI), challenging US domination of the new core technology of the Age of Artificial Intelligence. Further, such technological knowledge development is not only necessary to move out of the Middle-income Trap but also becomes the basis for great power rivalry. In general, increased emphasis on knowledge creation is what propels movement out of the middle-income trap.

Reforming the Knowledge Economy

Any analysis of global inequality must necessarily deal, even if partially, with ways of dealing with or reducing global inequality. An important deduction from the above analysis is that it is necessary for countries of the Global South to advance in creating technological knowledge. In brief, development policy must explicitly address issues of developing the knowledge economy, building networks, linking the different circuits of knowledge, incorporating diversity and cosmopolitanism, and accepting the necessary limitations of any knowledge system. Development, then, is not just a matter of accumulating capital and developing capabilities. It is also, and more so, a matter of absorbing and creating knowledge.

But, if such developments continue in the present manner of monopolization of the knowledge created, it would lead to an intensification of global rivalry and the re-creation of spheres of influence. Can there be the formation of another type of knowledge system, not promoting exclusion but inclusion?

The current intellectual property regime, developed over at least 400 years, allows the owners of these rights to create intellectual monopoly capital. Knowledge and technology creation do require some incentive. But one can propose a form of compulsory licensing, one which will provide returns, including for risks taken in the creation of technological knowledge, but not provide a monopoly or restrict the spread of that knowledge. We can start with a system of compulsory licensing in matters of providing global public goods, such as those required to deal with pandemics and climate change. Success in providing such easily recognized public goods can then be possibly generalized across the global economy. Thus, while developing the knowledge economies in the Global South, it is also necessary to consider different forms of organization of that knowledge that prioritize inclusion, rather than the current system of exclusion and connected great-power rivalry.

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Author: Dev Nathan, Institute for Human Development, Delhi; Southern Centre for Inequality Studies, WITS University, Johannesburg; and GenDev Centre for Research and Innovation, Gurgaon.

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For more information, please contact Anna Bernardo of the South Centre: Email abernardo@southcentre.int, or telephone +41 22 791 8050.