What happens as technology travels on the global value chain?

By:

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The importance of technology transfer in holding together the links and processes of the global value chain tells us a lot about value accretion and control of the chains. The concept of the global value chain, especially as it is portrayed in documents like the *Global Value Chain Development Report 2019* and in the 2020 World Bank's *Trading for Development in the Age of Global Value Chains* is non-hierarchical. The image of the chain evokes an interconnected equality in which each link is as important – and as valued and valuable - as the next. However, studying the currents of technology transfer as they take place on the global value chain undermines this image. This is because the transfer of technology on the global value chain tends to be inherently hierarchical and facilitates the accumulation of value in some links at the expense of others.

Technology may, of course, be passed along the chain by way of exchange. An example of a non-hierarchical transaction of this type might be the transfer of technology from one undertaking in the global North to another in exchange for

complementary technology or as part of a technology pool. But when we are talking about the role of global value chains in development then, typically and overwhelmingly, we are talking about technology being passed down the chain from undertakings in the global North to those in the global South by a series of strictly controlled private licensing transactions. And this direction of travel is critically important to understanding the functioning of global value chains. This is because technology transfer creates hierarchical relations that mirror the hierarchical relations between the global North and South that have been created everywhere in the legal, political and economic landscape of the post-colonial world.

Something that is evident in reading the *Global Value Chain Development Report 2019*, even if it is not explicitly acknowledged, is that technology transfer is a constant in global value chains outside the particular context of the diffusion of high-end information technologies that are specifically considered in its chapter 4. The idea of a series of parts of a final product manufactured and then gradually assembled along the value chain, for example, implicates a series of transfers of technologies relevant to manufacture and assembly. Many of these technologies will also be proprietary, in the sense that they are subject to intellectual property rights. These rights will typically be patents, but the transfer of technology down the global value chain also implicates trademarks, design rights, copyright and trade secrets/confidential information.

The saturating presence of intellectual property rights in the technology transfer transactions that take place on the global value chain receives little direct attention in the *Global Value Chain Development Report 2019*. Instead, the *Report* tends to separate questions around the transfer of technology from those that relate to technology licensing. This gives a misleading impression. It underrates the extent to which even relatively unexciting technical processes that are used in a global value chain are likely to be proprietary. And it also suggests that the type of technology transfer with which global value chains are concerned is exciting high-end info-tech. However, when we think of transfer of technology in a global value chain, we can't just think of the transfer of high-end info-tech that might – or might not – thrive in an open innovation environment, as described in chapter 4 of the *Report*. Despite the success, claimed in the *Report*, in creating such an environment in China, in practice we cannot separate technology transfer from the control of proprietary technology,

nor can we ignore the fact that even the creation of open innovation environments in high-end info-tech depends upon the transfer of a vast amount of proprietary technology, such as patented parts of computer hardware and the copyright protected programmes that run it.

All this means that the value accruing as a result of the transfer of proprietary technology runs back up the global value chain to the owner of the intellectual property right(s). This is partly a consequence of the fact that the licensing of this technology is critical to the distributed and fragmented transactions that make up the global value chain. But it is also the case that if the technology becomes more valuable as the chain lengthens, its value as an asset to be licensed in other transactions is increased. The value here does not accrue in each link of the chain. The links in the chain are not equal in this respect.

How does this relate to the overall distribution of benefits in the global value chain? And how does it relate to the ultimate control of a global value chain? Does it make any sense at all to think of global value chains as facilitating the participation on more equal terms of so-called developing countries in the global economy where the property rights that underlie the entire structure of these chains mainly reside in undertakings in the global North? It is true that the international distribution of proprietary rights in technology does differ between industries and sectors, but the WIPO statistics on the distribution of ownership of registered intellectual property rights – patents and trademarks – internationally make it clear that wherever they are registered they are overwhelmingly owned by undertakings in the global North.

The fundamental and interdependent role of technology transfer and intellectual property licensing in holding up the superstructure of global value chains ensures that the global North not only continues to win the international competition for mobile capital, but has enhanced its capacity in this respect. At the same time, the human and social costs of enhanced levels of capital accumulation are hidden behind a plethora of national borders with the result that the hyper-accumulation of surplus profit is functionally – in legal and political terms – separated from the exploitation of labour.

This state of affairs is intimately connected with the way in which countries from the global South have been locked into the World Trade Organization’s

(WTO) global trade regime. The WTO has always justified the imposition of the Agreement on Trade-Related Aspects of Intellectual Property Rights regime on the so-called developing world on the basis that it facilitates the transfer of technology and that this is essential to the development process. This position rolls together two hypotheses, both of questionable validity. The first hypothesis, which postulates a link between intellectual property regimes and the transfer of technology, has been the subject of probing critiques, including those in reports commissioned by the WTO itself (for an early example, which unfortunately failed to change the course of already-set-in-stone WTO thinking, see WTO Committee on Trade and Environment, *Factors Affecting Transfer of Environmentally-Sound Technology* (1996, WT/CTE/W/22). The second hypothesis, that there is a link between the transfer of proprietary technology and development, tends to be negated by the fact that the transfer of proprietary technology is inherently hierarchical in ways that usually benefit undertakings in the global North.

Overall, in assessing the developmental benefits that might arise from global value chains generally and, more specifically, from the multiplicity of fragmented acts of technology transfer that characterize them, there are two factors in particular that are worth taking into account. These are: first, the enhanced opportunities that they provide for relocation of capital from the global South to the global North in a context that depends upon the hard separation (by national borders) between capital accumulation and the exploitation of labour; and, secondly, the control over the global value chain that is a consequence of the ownership of the intellectual property rights that are fundamental to its operation.

One wonders, in the end, what developmental benefits are left for the global South from all these fragmented acts of technology transfer that make up, and are essential to the operation of, the global value chain. Those who argue for a more positive take on the international transfer of proprietary technology suggest that these benefits lie in the building and diffusion of technological capacity and the improvements to the quality of life that follow in its wake. It is worth focussing for a moment on these benefits. The requirement to use proprietary technology in a global value chain may mean that part of the workforce obtains new skills, but it also tends to produce a polarization of workforce skills. Even where new skills are obtained opportunities to use them

outside the value chain for which they were transferred may be scarce. Proprietary technology rarely diffuses much, especially when its use is strictly limited under the terms of the licence to the execution of one function in a chain of acts. In any case, for diffusion of technological capacity to be useful the technology has to be appropriate to the existing level of technological development of the country in question.

The high-end infotech, on which the 2019 *Report* focuses in its consideration of technology transfer, may improve the quality of life in some respects (although it seems fair to say that with the current transition to an almost totally online world, one might raise some doubts about this). However, this is only the case where the infrastructure to support its operation is in place. It is, for example, fairly useless where there are no reliable supplies of electricity and of limited use where there is no Internet coverage or mobile phone signal. This is not to deny the value and importance of some types of technology transfer.

However, in the context of the North/South developmental divide, the relationship of technology to the enhancement of the quality of life might be more evident in things like water purification, access to lifesaving medical technology, remediation of polluted environments, and developmentally appropriate environmentally cleaner technologies. This type of technology might be transferred in a global value chain but its diffusion is far from guaranteed and, in any case, the social costs of participation in the global value chain might cancel out any benefits they bring.

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