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The central role of technology in the take-off and subsequent consolidation of international trade is clear to anyone with a little historical perspective. With the sole interruption of the interwar period, trade flows have grown dramatically since 1820, supported by various industrial revolutions and advances in the fields of transport and information and communication technologies (ICT). In the most recent phase, the enormous ICT advances seen since the 1990s have allowed companies to slice up their production processes and place different parts in different countries to take advantage of the specialisations of each. This has given rise to what have become known as *global value chains* (GVCs), which have driven international trade to volumes that were unthinkable a few decades ago.

Whether this trend will continue is less clear. The relentless evolution of information and communication technologies – now embracing 5G and blockchains – may continue to encourage international trade to grow as it has over the last two hundred years. But other recent technological advances, such as those in automation, the electric car and 3D printing, could reverse some GVCs and reduce trade.

As well as new technologies, other factors also have the potential to significantly impact trade flows and, with them, the production processes of some goods and services. The US policy of decoupling from China and the impact of COVID-19 are two notable examples.

This multitude of forces makes it difficult to forecast the evolution of international trade. Still, it is worth trying. And that is the purpose of this chapter.

1. Automation: favouring reshoring

Automation is a process that has been underway for centuries. But today's robots, equipped with artificial intelligence and at costs that have fallen substantially in recent decades, represent a full-blown revolution.¹ The improved productivity these new robots offer may see manufacturing processes shifted over the past three decades to emerging countries in search of lower labour costs return to advanced economies. In other

1. The price of robots in real terms has halved over the last 30 years (McKinsey, 2017).

Automation could put 10%–15% of such trade at risk in the coming decade.

words, the trend towards *offshoring* may recede in favour of *reshoring*, which would substantially reduce trade flows.

What volume of trade are we talking about? It seems clear that automation could put 10%–15% of such trade at risk in the coming decade. This is a simple first approximation based on the results of a couple of relatively recent analyses. Specifically, one study estimates that adding one robot per 1,000 workers represents a reshoring of offshored activities of between 2.5% and 3.5% (see Krenz et al., 2020). Add in the potential 50% rise in automation in the manufacturing sector over the next ten years, and the most recent International Federation of Robotics estimates placing the number of industrial robots per 1,000 workers at 8.5 globally, and we reach that 10%–15% range.² It also fits with the estimate of 10% made by the McKinsey group in one of its 2019 analyses.

Finally, it is worth noting that it is not only the manufacturing sector that will be affected by this reshoring. Services like call centres are already returning to advanced countries thanks to chatbots. Many countries' labour cost advantages pale in comparison to the savings offered by the new software that uses artificial intelligence and natural language processing.³

2. ICT: supporting trade flows, just not always

The continued evolution of ICT via 5G and blockchain technology will reduce logistics costs and encourage trade in both goods and services. Digital platforms and the development of electronic commerce have made it possible to quickly and cheaply connect buyers and sellers around the world. 5G will encourage the development of the internet of things, allowing shipments to be tracked faster and more securely in the case of goods, and improving connections for trade in services. Blockchains, meanwhile, have the potential to greatly facilitate international payments. Analysis by McKinsey claims that these factors could increase trade by between 6% and 11% in the next ten years.

However, ICT advances have also changed consumers, with high levels of global connectivity increasing the volatility of trends in sectors like fashion. Celebrities on Instagram and TikTok set and change trends in an instant – at the speed of a hashtag; production processes must be sped up and CVGs shortened to bring them closer to the final consumer. On the other hand, consumers are also increasingly responsible in their purchasing decisions and demand more sustainable, local products, which again reduces international trade flows. In short, ICT may drive nearshoring and even reshoring in certain areas. This could benefit countries with low labour costs that are physically closer to more advanced economies: Turkey, for its proximity to Europe, and Mexico, for its proximity to the USA (see McKinsey, 2018).

3. Digitalisation and the data revolution: a new player in the city

Trade flows have been joined by a new player in recent years: data. The explosion of data exchanges has gone hand in hand with the ongoing ICT evolution (or revolution) mentioned above. In the last ten years, for example, internet traffic has multiplied by 12, and mobile traffic by more

2. The 50% rise in robots in the manufacturing sector is based on estimates made by Boston Consulting Group.

3. Even so, it is worth noting that compared to the relocation processes in manufacturing the offshoring that occurred with services like call centres was negligible. In many cases, its scale was more anecdotal than really having the capacity for macro-economic impact.

than 30. These data flows have not only facilitated classic commercial exchanges of goods and services, they also constitute a highly marketable flow in themselves. The enormous digital advances have opened the door to a world where data itself is a product whose use can substantially improve a company's competitiveness.

Data flows are ever more important, but remain a long way short of full capacity. Mainly, this is because the technology needed for their exploitation is in its infancy. But it is also true that such flows of information pose risks to privacy if the countries trading in them lack the protection systems of the data's country of origin.

The continued evolution of ICT via 5G and blockchain technology will reduce logistics costs and encourage trade.

4. 3D printing and the electric car: more and less

Finally, we come to some technological advances that also have the potential to significantly impact trade flows, specifically 3D printing and the electric car.

As mentioned at the start of the chapter, 3D printing is a technology that can shorten GVCs and thereby prompt the reshoring of some manufacturing activity. Indeed, the technology removes the need to send the physical products at all – possessing the files for their manufacture is enough. Nevertheless, a World Bank study shows a sharp rise in trade flows following the adoption of 3D technology in hearing aid production (see Freund et al., 2019). While this is a highly specific case, it reveals interesting effects that should be considered. The hearing aid industry adopted 3D printing for virtually all of its parts when it became technologically feasible about ten years ago. Since then industry-related trade flows have risen by 60%. The main reason for the rise is that 3D printing has led to a huge fall in the production cost of hearing aids as well as improvements in terms of quality, causing a sharp rise in demand for the product. And with higher demand, the international trade in hearing aids has grown.

Another case worthy of special attention is that of electric cars, which have the potential to considerably reduce international trade. Classic combustion engine cars require a multitude of parts and gears that are usually manufactured in different countries in order to take full advantage of the competitive advantages of each. In fact, the automotive sector is responsible for a large chunk of the trade in intermediate goods. The electric car, on the other hand, has much simpler mechanics, with many fewer parts that are also less subject to wear and tear, and as such could change the sector and the trade.

5. The coronavirus: trend accelerator

There is no doubt that beyond the devastating short-term effects on economic activity, the current coronavirus crisis will trigger structural changes in many respects. Notable among them is a strategic shift towards more robust CVGs. While it is difficult to generalise about what "robust" means here, production chains are likely to be shorter and therefore less globalised, more redundant in their key links, and with more controls at all stages of production (see Canals, 2020).

3D printing electric cars has the potential to considerably reduce international trade.

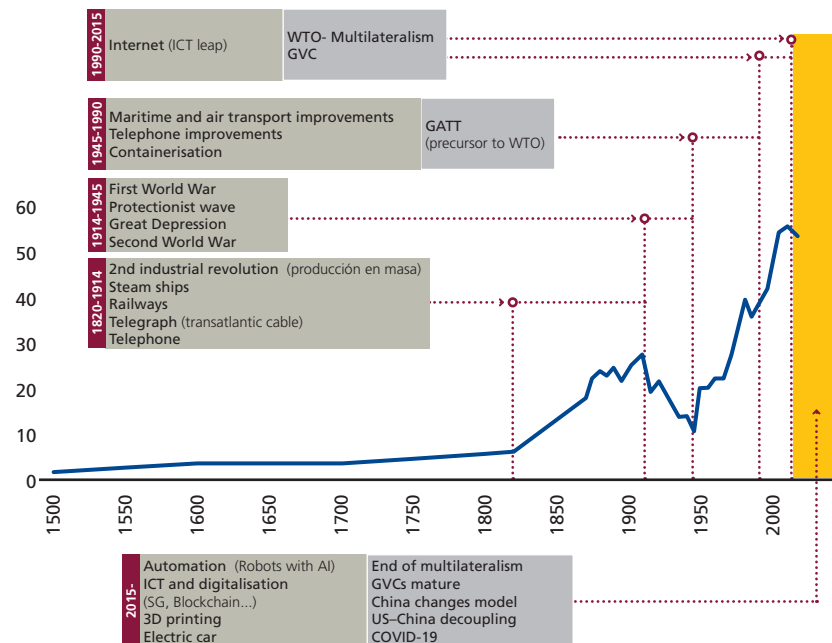
As well as this direct effect of the pandemic on trade flows, the coronavirus crisis will impact international trade indirectly by accelerating some technological trends. The COVID-19 crisis has shown that more digitalised and automated companies are more resilient in disruptive contexts such as the current one. In this sense, in the medium term companies are likely to increase investment in automation and digitalisation. As mentioned above, this is likely to promote reshoring, with a contractionary impact on many classic trade flows (see Chernoff and Warman, 2020). Nevertheless, the advances in digitalisation also have the potential to encourage new forms of commerce, above all those based around data flows.

6. Geopolitics: always present

Finally, it should not be forgotten that geopolitics has always played an essential role in international trade. In fact, for decades, international trade flows and investment relationships between economies have been conceived, in part, as instruments for promoting civil and political liberties and, ultimately, as deterrents to armed conflict. After all, the more integrated two countries are from an economic point of view, the higher the cost of a war between them.

But this view of international trade as a factor of cohesion between countries is increasingly scarce. Particularly since China's clear challenge to the hegemony of the US, leading defender of this liberal economic vision. This is the context of the trade tensions that emerged in 2018 between the two powers and which were calmed slightly by the "first phase" trade agreement reached in early 2020, as well as the battle in the technological field, which is currently in full swing.

International Trade. Index of trade openness (exports + imports/global GDP)



Source: Compiled by author using Our World in Data (various articles and databases)

There can be no doubt that the US policy of decoupling from China, which has broad bipartisan support in the country, will lead to a gradual change in global trade relations. After all, China is the world's leading goods exporter and the US its largest services exporter (see Canals and Singla, 2020).

In short, after years of production chains being hyperglobalised through technological, communication and logistics advances, the various 4.0 technologies may end up having the opposite effect on trade flows. ICT and digitalisation will continue for the most part to encourage trade growth, but automation and advances in the electric car may turn back the globalisation of goods and services. Factors like the coronavirus crisis combine with this contractionary trend, exacerbating the automation and digitalisation dynamics already underway. We do not expect the adoption of new technologies to cause a radical, abrupt change in trade relations. Rather, we expect them to mark a change of trend in the flows over the coming years that ushers in a new paradigm: international trade 4.0. History reminds us that technological development and international trade are not immune to what happens in the geopolitical sphere. And on this front, the commercial-technological tensions between the US and China will play a decisive role.

The coronavirus crisis will impact international trade indirectly by accelerating some technological trends.

References

Canals, Clàudia. "Cómo la COVID-19 cambiará nuestra manera de producir". *Informe Mensual CaixaBank*, April 2020 (online). [Accessed on 12.01.2021]: <https://www.caixabankresearch.com/es/economia-y-mercados/actividad-y-crecimiento/como-covid-19-cambiará-nuestra-manera-de-producir>

Canals, Clàudia and Singla, Jordi. "El conflicto tecnológico entre EE. UU. y China: una primera visión" *CaixaBank Research*, October 2020 (online). [Accessed on 12.01.2021]: <https://www.caixabankresearch.com/es/economia-y-mercados/actividad-y-crecimiento/conflicto-tecnologico-entre-ee-uu-y-china-primera>

Chernoff, Alex W. and Warman, Casey. "COVID-19 and Implications for Automation". *National Bureau of Economic Research*, No. w27249, 2020.

Freund, Caroline, Mulabdic, Alen and Ruta, Michele. "Is 3D Printing a Threat to Global Trade? The Trade Effects You Didn't Hear About". *The World Bank*, 2019 (online). [Accessed on 12.01.2021]: <http://documents1.worldbank.org/curated/en/152701569432061451/pdf/Is-3D-Printing-a-Threat-to-Global-Trade-The-Trade-Effects-You-Didnt-Hear-About.pdf>

Krenz, Astrid, Prettner, Kraus and Strulik, Holger. "Robots, Reshoring, and the Lot of Low-Skilled Workers". *Global Labor Organization (GLO)*, No. 443, 2020.

McKinsey. "Automation, robotics and the factory of the future", 2017 (online). [Accessed on 12.01.2021]: <https://www.mckinsey.com/business-functions/operations/our-insights/automation-robotics-and-the-factory-of-the-future>

McKinsey. "Is apparel manufacturing coming home?" 2018 (online). [Accessed on 12.01.2021]: <https://www.mckinsey.com/industries/retail/our-insights/is-apparel-manufacturing-coming-home>

McKinsey. "Globalization in transition: The future of trade and value chains", 2019 (online). [Accessed on 12.01.2021]: <https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains>