

Industrial Policy and Covid Crisis: Mobilising All Levels of Government for Smart Complementarity

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Abstract

A coherent industrial strategy at all levels of government (regional, national and European) would help European industry restructure after the Covid crisis, in line with the previous structural trends.

The Covid Crisis has hit European industries in a period of deep structural changes that already put pressure for them to upgrade or branch into new activities, adopt new technologies and redefine their business model.

This paper shows these long-term trends already affecting industry pre-covid and suggests that the pandemics essentially reinforce these previous trends. The need for industrial policy at all levels of government is therefore stronger, and the paper suggests the main issues to be addressed.

Keywords: Industrial Policy; Covid 19; Regional Government; National Government; European Government; Structural Changes

1. Structural Changes in Industries pre-Covid: Industry 4.0 and Globalisation

Industrial policy has been back on the agenda of policy makers and scholars at the beginning of the years 2000 due to the intensification of worldwide competition induced by globalisation. The latter phenomenon is the rise in global trade observed for many decades but which has experienced an acceleration in the 1990s, for various reasons including the growth of emerging countries (BRICS) and the transition of many countries into market economies open foreign exchanges (Bianchi and Labory, 2011, 2018, 2020).

Globalisation has also led to the diffusion of a new form of production organisation, namely global value chains, characterised by the realisation of the different phases of the production process in different countries, exploiting the most convenient conditions for their realisation. GVCs have been mainly driven by the search for low labour costs, so that offshoring (outsourcing of some production phases in foreign countries) was realised essentially in emerging and developing countries, particularly China.

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Many studies have documented this trend (Timmer et al., 2012), with a specific database, the World Input-Output Database, in order to measure this phenomenon. These scholars use input-output databases to find out how much value is extracted at each production phase and where the phases are realised. These data for instance allowed to show that only about a third of the value of a Porsche Cayenne was realised in Germany in 2005. Imported intermediate inputs as a share of total intermediate inputs in manufacturing increased from about 22% to 36% in Germany in the period 1995 to 2008; the increase was about 20 to 30% in France, 25 to 33% in the UK, in the same period.

The GVC form of organisation is not sustainable from a social and environmental point of view: from a social point of view, it essentially exploits poor working conditions in developing countries, so that this model excludes social inclusiveness. From an environmental point of view, besides the lower environmental standards in countries where some production phases were offshored, this organisational model implies higher use of transport logistics since parts and components, as well as semi-finished products are transported over long distances, using ships or other transport means that increase global emissions.

The disadvantages of GVCs have been increasingly stressed over the last 10 years. First, many companies had quality problems, leading to defective products that affected negatively on the company's reputation. In addition, especially after the financial crisis many individuals realised that most of the products they found in shops were made in other countries, while unemployment was rising in theirs. Some governments therefore started to ask their industries to reshore, like President Obama and his "Reshoring Initiative" already in 2012. Meanwhile, wages were starting to rise even in developing and emerging countries, making this model of production organisation less profitable. Another factor against it was the fact that producing in geographical proximity conveys a number of advantages, particularly the creation of an "industrial commons", a knowledge base shared by the local community that benefits the whole world of production, as stressed in the literature.

In the meantime, another driver of transformation has been important, namely, the new technological paradigm that is having such a great impact that the consensus has become that it is the basis of a fourth industrial revolution. The width and breadth of technological change induced by the fourth industrial revolution is now well documented (Santos et al., 2017; OECD, 2019; Bailey and de Propris, 2020). The fourth industrial revolution is caused by many discoveries and innovations in different scientific and technological fields, including nanotechnologies, genomics, biotechnologies, new materials, quantum computing, artificial intelligence, and more. Many new products and production processes can be introduced, changing industries, economies and societies: the smartphone was introduced in 2007 and after a decade this product had become indispensable for many consumers and businesses, as a tool to work, buy, access services such as home repair, and maintain social relations.

A key aspect of this transformation is hyper-connection: all individuals, but also machines and objects constantly collect and exchange data via sensors in smartphones, computers, industrial equipment and many other things. A large part of information thus become digitalized, namely transformed computer-readable format. All business processes can be digitalized, and this has been having a large impact on organisations and on industries. All product information, organisational

processes, consumer and market information are turned into big data that can be analysed and processed in order to improve all the firms' functions, which efficiency can be improved by big data analytics. Physical products are increasingly bundled with services, and service content of products generates increasing value. Examples are numerous, especially in the mechanical engineering sector where machines and vehicles can be improved even after sales thanks to sensors sending data to the engineers of the producing firm who can improve the software built in the product. Smart textiles will soon allow health monitoring in real time.

In this context, institutions also have to adapt in order to favour structural changes in specific directions. As argued in the next section, territories must provide enabling conditions for the adaptation of their industries, coherently with the society; but higher levels of government also have a role to play especially in terms of guaranteeing a level-playing field.

2. Industrial Policy pre-Covid

The fourth industrial revolution reinforces the trend towards reshoring. The smart factory is highly automated and requires large fixed costs. It also induces vertical integration, or close control of suppliers, which have access to all the data of the firm. With smart manufacturing and 3D printing value chains become digital, and have to be controlled by the company: rather than exporting and importing unfinished goods, parts or components the products or part specification will be digitally communicated or traded to the firm's division in different regions of the world, or to outside suppliers, thereby eliminating or substantially reducing the need for physical transport of parts and goods, especially those over long distances.

Production organisation is already experiencing important changes. In particular, companies can personalise products on a large scale, leading to mass customisation as characterising the prevailing production process (Bianchi & Labory, 2019b). Robots in smart factories that can be located anywhere provided there is access to energy, high capacity Internet and materials increasingly perform manufacturing. Territories able to pool and develop key resources for this type of production process will attract firms. Companies will be willing to locate their activities in these areas if they have access to infrastructure, especially for high and rapid communication, as well as low energy costs, and innovative capacity, with highly qualified human capital and appropriate research facilities, namely hubs of knowledge creation, consisting in dense networks of universities, research centres, and other. In this manner, ensuring the availability of R&D capabilities is very important.

Investment in skills is also important because the digitalised and smart production processes require them. Firms are likely to localise therefore in territories with dense knowledge bases (manufacturing experience and R&D capabilities) and high skills, at medium to high levels. This means that regional governments have an important role to play in attracting and developing skills, ensuring a good living environment (territories paying attention to the environment and with social services) for attraction of talents, and institutional density. Good education institutions networked with other institutions, as well as with businesses and other stakeholders, to provide an appropriate 'milieu' or fertile ground for innovations and industrial applications to emerge.

In this context, regions must provide enabling conditions for the whole socio-economic system to adapt (Bianchi & Labory, 2019a). These include developing autonomous capabilities, especially in R&D but not only, developing networking capacity, both within and outside the region. Infrastructure must also be provided: generally, given the large investment necessary this is generally dealt with at higher levels of government, especially the national one but, as mentioned in the previous section, the European level might also have an important role.

When the national level lacks capacity or accumulates delay in favouring the necessary transformations, the regional level can take the initiative and mobilise higher levels of governments, as shown in the case of the Emilia Romagna region in Italy. The regional government has indeed invested in order to make the capital city, Bologna, a national and European big data hub, supported by the regional socio-economic system. For this purpose, it built on previously existing capacity and mobilised resources at national level to extend this capacity, allowing the creation of an Italian network of big data storage and analytics, that will so important to support the digitalisation of businesses in all sectors. The hub is also European, contributing to the European big data infrastructure proposed by the European Commission (2016). It starts from research capacity but is also strongly focused on industrial applications of research, by involving firms, so that it could have an important impact on industrial and economic development.

Even less developed regions have a chance to catch up in the current context. Whereas in previous industrial revolutions companies could not make jumps but had to go through different steps in industrialisation, the new technologies allow to make such jumps. Digitalisation indeed regards all activities, from the most basic and simple to the most sophisticated. For instance, agriculture is deeply transforming (precision agriculture, use of robots, etc.); craft production can adopt the new technologies directly, without going through mass production or flexible production.

However, some enabling conditions are necessary for this to happen: infrastructure (especially communication ones, such as 4G and 5G); capabilities (skills and knowledge, allowing to have absorptive capacity); networking (relationships with developers of new technologies, with or without the intermediation of universities).

Given the deep transformations implied by Industry 4.0, we argue that all levels of government must mobilise in order to provide the enabling conditions for the adaptation of the socio-economic systems at all levels. Industrial development arises from the bottom, so territories, generally regions but it could be different administrative units depending on the size of the country, must become hubs of relevant knowledge and competencies for their economic activities. It is in this sense that smart specialisation is important. However, territories cannot realise this aim on their own, they have to be supported by higher levels of government, that provide resources and help them build smart complementarities with other territories, in the same country or abroad, especially in Europe where synergies between countries should be further exploited.

Another issue regards the new monopolies. For instance, cloud-computing services are relatively cheap and even SMEs can access them. However, accessing them also means making all data regarding the business activities available to the cloud-computing provider. The confidentiality of these data must be ensured. More

importantly, these services become strategic in that any business cannot carry on its activities without accessing them. Providers therefore have an important market power, and hence scope for opportunistic behaviour, for example by raising the price of their services.

This issue is particularly important for public organisations, such as those of the National Health Service, which put all citizens' private health data in the cloud managed by some private company.

In this context, some companies may gain very large market power, not only by managing cloud-computing services but also by controlling the final interface with consumers, and collecting and analysing big data on their characteristics, preferences and behaviour. Big data is thus a strategic asset in the new era: players with largest market power are those both holding big data about the market and able to analyse these data, especially in the development of machine learning or other artificial intelligence programmes.

The European Commission has consulted the scientific community and other stakeholders and has proposed the creation of a European cloud infrastructure that would guarantee security and independence, in a 2016 Communication (European Commission, 2016). Europe currently lacks capacity to store and analyse big data, therefore risks being dependent on other countries for this essential service. The next section argues that this type of actions is also key for industrial policy post-Covid.

3. Industrial Policy Post-Covid

The Covid crisis has accelerated the trends mentioned in the previous sections. GVCs have been completely disrupted given the closing of many frontiers in the world. All companies relying on long distance transport have had problems. Companies that had already reshored did not face these problems. Other companies are likely to reshore in the near future in order to avoid such risks.

In addition, digitalisation has accelerated, confirming that what is happening now is a digital globalisation, namely international exchange of data rather than trade of intermediate or final goods (Bianchi & Labory, 2018). The companies providing digitalisation services, from the production of devices to the provision of connection, of cloud services and software, are gaining market power. Especially the GAFAM, the new monopolies, but not only. For instance, cloud services are becoming essentially to all firms in all sectors, since they have to digitalize all their processes by transforming all information into computer-readable format, store and manage them via the cloud. Companies providing cloud services have an enormous market power because they can potentially control all these data. Better having different sources of cloud services, namely different suppliers of cloud services in order to be less dependent on one single source; however, the cloud market is already highly concentrated, since only three companies, Amazon, Microsoft and Alibaba hold about 71% of the market, the first one (Amazon) having almost half the market (47.8%), according to Gartner consultants¹. Antitrust laws were adopted in the USA in the end of the 19th century because the enormous market power of trusts such as Standard Oil also represented a threat to democracy; there are political economy issues also in the case of companies controlling such huge amounts of data. The

commercial war between the USA and China and the dispute over the leadership of Huawei also goes in this sense.

As in each industrial revolution, the battle for leadership is completely open and the leader will gain large political power and wealth. However, there are also important issues of security and independence that have to be addressed: cybersecurity, and access to – ownership of the big data that are so strategic in the digital age. This is a national issue, but in Europe given the both the long history of the cooperation between European countries and the fact that no European country compares with the scale and dimension of China or the USA, this is also – rather - a European issue. A big effort has to be made in order to develop key technologies and have a capacity to produce and use them.

The necessary structural changes can also be orientated towards specific development paths, and environmental sustainability is a key choice now. From this perspective, the Green Deal proposed by the European Commission and endorsed by all Member States is extremely welcome.

Making industrial and more general development paths greener has to start from the bottom, especially in regions, which are closer to citizens and entrepreneurs and can make strategic choices towards sustainable paths, building narratives in favour of the new orientation, initiating institutional change and convincing stakeholders. Regional stakeholders and government should also look outside the region for this purpose, in order to access information and find potential for smart complementarities.

In case of institutional failure or other barriers to development that may also prevent an appropriate design of policy for new path development, higher policy levels should intervene to try to provide incentives and initiate particular projects that may spread to other initiatives once results are achieved. The national level, but also the European one might have a useful role in this, mapping similarities and potential complementarities.

In addition, the national and European levels should deal with specific issues related to the industrial revolution, particularly of two kinds. One the one hand, developing big projects to develop capacity in the new technologies, especially the key enabling technologies such as now artificial intelligence, big data analytics, but also renewable energy, batteries, new health treatments and so on. On the other hand, addressing the issue of the new monopolies, since previous industrial revolutions have tended to generate new monopolies as the fourth one is doing, particularly in the field of digital platforms. Ensuring fair competition and avoiding abuse of dominant position is always key for industrial development, and this may require the application of antitrust rules in new domains, or the adoption of new regulation.

In short, industrial policy post-Covid should comprise complementary actions at regional and higher levels: regions can adopt industrial policies to favour particular development paths; national and supranational levels have a role especially in levelling the playing field and mitigating the tendencies for monopolisation.

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Notes

- ¹ www.gartner.com