

# The Global Value Chain in Coronavirus Era: An Impact Approach

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## *Abstract*

*Global Value Chains (GVC) play a particular role in the mechanisms of world economy and any disruption of them has strong unwanted consequences on their operation. Our research aims to identify and characterize the negative impact of COVID-19 on GVCs and, in particular, the effects caused by their disruption. The research first analyse the determinants of growing importance and contribution of GVCs. This is subsumed by growing needs of ensuring a more accelerate and qualitative development process in developing countries, in the first place.*

*The increasing use of GVCs has as a result outstanding contributions. General contributions are the result of specific ways in which they improve the economic development. The access to high-tech technologies and export through GVCs bring new elements that support development. The durable firm-to firm relationships along the GVC support the diffusion of technology and access to capital and inputs. Participation in GVC has positive social impacts such as job delivering, income per capita growth, and poverty reduction. GVCs facilitate the access to higher-value added tasks and this could negatively impact the sources of environment deterioration and resources waste.*

*GVCs disruption as a result of COVID-19 action has direct effects of all sectors of any economy in terms of reduction of production, productivity, income, trade, and jobs. This leads to recession and declining GDP, hits the world trade and has a strong negative impact on jobs. At the same time, coronavirus pandemic is disrupting all economic sectors. Industries that depend on GVCs such as electronics, automotive, apparel, and textile that have a major contribution to GDP are among the most affected.*

*COVID-19 weakens the GVCs, so for the future they need to be rethought in order to maintain their contribution to the world economy. The main milestones of the proposed GVCs rethinking are strategic approach, higher resilience, reshoring and regulation.*

*Keywords: global value chain, COVID-19, contribution of GVC, impact of coronavirus, GVC rethinking*

*JEL Classification: F2, F6*

## **Introduction**

The value chain is a representation of the firm's functions that adds value to the good or service produced to market. The process of globalization also puts pressure on the globalization of the value chain.

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The global value chains are the result of connection of all processes which create the international value of any commodity, drawing on global channels of input and output in the market. They have become an important feature of the trade and investment landscape in the business world for a few decades and have changed the way the firms design, produce and distribute goods and services around the world. The global value chain is " the full range of activities - design, production, marketing, distribution and support - undertaken to bring a product or service from its conception to its end use across international borders" (Doherty and Verghese, 2018, p. 4). These three categories of defining elements, ie the sum of the activities, their purpose and international character are present in all GVC definitions. All these activities are carried out by numerous companies and workers placed in different geographical locations, in order to deal with products and services from the moment of their creation until the final utilization phase.

The GVCs allow production activities being undertaken by third parts with no equity links to transnational corporations that is known as international sourcing. These operations make more easier from countries to engage in backward to forward linkages. Backward linkages are created when a country A uses inputs from the country B for domestic production through direct or indirect inputs. These backward linkages are specific to buy-driven value chains where the key actors are the large buyers with core competencies in branding and marketing are diving actors in setting up these value chains. These channels typical for labor-intensive industries are highly relevant for developing countries in agro-food industries, textiles, garments, footwear, toys furniture and the like. Forward linkages are created when county A supplies inputs that are used for production in country B of final products or intermediate products which are exported further elsewhere for use as inputs. These are so called producer-driven value chains when key actors are producers in the chain that control vital technologies, which are of crucial importance for positioning in the final product market. They coordinate these value chains and take responsibility in the final product market. Production of components and parts for automotive industry in countries such as China, Poland and Romania for assembly in Germany by local manufacturers of German car brands. The firms that have international operations are driven by the comparative advantages of host countries, conditions of the domestic market and global competitive forces (Humphrey et al., 2020). These prerequisites create a global division of labor and new links between firms once they are fulfilled. Global value chains become more important, they having 60-70 percent of the global trade in value added terms (Doherty and Verghese, 2018, p. 4). These

estimates are confirmed by World Trade Organization (WTO) which estimates that more than two-thirds of world trade in 2017 represent the contribution of global value chains transactions which means that the production operations of a good or service pass at least one border and even more until the final assembly phase (Global Value Chain Report 2019, WTO, 2019). The last twenty years have witnessed a significant increase in trade specific to global value chains and this advance has materialized in the substantial economic growth of many countries. The contribution of this type of international trade was the reduction of transport and communication costs and the reduction of commercial barriers between the countries.

GVCs play a special role in the mechanisms of the world economy. Therefore, this research aims to highlights ways and mechanisms in which the new coronavirus can make its mark on today's civilization in general, but especially what are the causes and implications of GVC disruption. Based on the findings, we will try to develop a set of recommended directions for GVC reconsideration in order to better cope with similar events in the future.

The new coronavirus has suddenly appeared and its effects are already significant and difficult to assess. One thing is certain, however, that the impact of COVID-19 will be found in all components and aspects of life on the planet. The longer and stronger the negative implications of the coronavirus, the greater and unwanted consequences and more powerful the damages. They start with the social component because the virus attacks people, and they must proceed in different ways to diminish and eventually stop the negative consequences. The most drastic unfavorable implications on the other parts of the society have illnesses, social distancing, lockdown, closure of institutions, service providers such as medical and event organizers. These have repercussions on the entire economy, with entire sectors appearing that cease their activity, products and services that can no longer be obtained, as in the case of air transports, tourism, car components, electronics, etc. Employees loose their jobs, they no longer have money, the supply of some sectors is disrupted. As a result, there are financial implications in the form of the need for increasing amounts to combat the short-term effects (unemployment, aid for children, the elderly, the disabled, financial aid for partial recovery of losses by postponing credit installments or cancellation of taxes). We will focus on the impact the coronavirus has on GVCs by seeking to highlight both their contribution to international economy and the undesirable consequences and its impact on the economic sectors that rely most on the functioning of GVCs.

## 1. Global value chain contribution to international economy

### 1.1 Determinants of growing importance and contribution of global value chain

The existence and working on a larger scale of global value chains are stimulated by multiple and various factors.

*Amplification and diversification of international trade and investments at a global scale* has its contribution and further need numerous and various global value chains. These requirements are met by technological advances, the lowering of barriers to the movement of goods, services, investments, and personnel through free trade agreements.

*Bigger and urgent cut down of the costs and the optimization of the deliveries in international transactions.* Falling transport costs, advances in information and communication technology, and development of containerization have made easier to coordinate the production processes over large distances and ship inputs, parts and components as required.

*New solutions for speeding up the development processes in developing countries, access to technologies, processes and production optimization included.* GVCs allow developing countries specific tasks and plug into international production network to connect to new markets, better integrate with exports, improve technology and productivity and create jobs. Another powerful driver of development that is stimulated by GVCs is the productivity growth as a result of the relocation of labor from less to more productive activities. A key role is attributed to the manufacturing sector which provide abundant opportunities for capital intensification scale and technological change. Many other channels can be created in GVC, in order to stimulate the productivity growth and development. Such channels may be the result of specialization in core tasks, access to imported outputs, knowledge of spillovers from multinationals and the effects of global competition on increasing competitiveness.

*Increasing competition on international markets and and the emergence of new sources of it.* This determinant urges the developed countries to use solutions for lowering costs and especially the prices.

*Growing/Increased obstacles in maintaining the competitiveness.* The competitiveness became more difficult to keep pace with the challenges. Global value chains make easier to lower the level of many competitiveness factors. Among these factors,

lower costs decisively work for the firms that succeed in reducing them, at the same time with innovation, much more resources and resources they utilize.

All the above factors are leading to the growth of importance and contribution of the global value chains. "The global value chains are become an important feature of the trade and investments landscape for a few decades and have changed the way the firms design, produce and distribute goods and services around the world. The global value chains trade seemed to become 60-70 percent of the world trade in value added terms" (Doherty and Verghese, 2018, p. 4).

### **1.2 Favourable effects of global value chain**

The global value chains have outstanding contributions to many components of the economy and society, especially the development process and evolution associated to it.

*Global value chains have a contribution to the economic development of countries, becoming a part of the improved model of development. Before the global value chains showed up, the development model consisted of building products and export capabilities in an entire industry to produce a finished product. "This could involve massive investments in research and development, protecting the relevant domestic industry from import competition and choosing national champions to support. Japan which became a world leader in automobiles and Republic of South Korea which develop its ICT hardware industry are such examples"* (Doherty and Verghese, 2018).

The expansion and strong involvement of a country in participating in the GVCs supports its development process in many and various ways. A systematization of these main ways of contribution was performed by Taglioni and Winkler (2014, pp. 6-7) and Kummritz, Taglioni and Winkler (2017, pp. 7-8). GVCs participation generate demand and assistance effects in the host country. The transmission channels of these effects include backward links, that is, the GVC-linked purchases of international inputs, spurring production and productivity in various downstream sectors via an increased availability and quality of inputs and knowledge diffusion effect. The transmission channels include also forward links, that is, sales of GVC-linked local intermediates to international buyers, spurring production demand for more and better inputs and assistance extended to local suppliers. GVCs participation may have the effect of increasing competition on the markets. These can favourable influencing the extension from GVCs to other existing players on the market as the competition for limited resources and productivity increases.

The technology spillover has as effects the improvement of productivity of local firms through two mechanisms. On the one hand, knowledge and technology diffusion in the suppliers industry and on the other hand participation increases the availability and quality of inputs. Also, GVCs participation can attract investments in infrastructure because they become profitable and can stimulate the production and productivity in other sectors of the local economy as a result of minimum scale achievements for the least two-reasons. First, they amplify pro-competition effect and, second, increases a country's capacity to support GVCs participation. GVCs benefits also labor market. The operation of GVCs is conditioned by the skilled workforce provided by MNCs and other participants. If there is no qualified local workforce, MNCs and international buyers can bring the workforce of local businesses to the desired level. Furthermore, the knowledge of the workforce of international companies participating in GVC can benefit the local companies involved. Ultimately, however, the degree to which GVC participants from different countries benefit from the knowledge and technology is only the result of their ability to absorb and learn. This capacity is driven by the extent to which productivity can be improved and production and innovation increased, human resources included.

Also, successful integration into the GVCS mechanisms requires that each participating country be able to perform several tasks and various operations. Developing countries can earn significant income if they can provide and even export various services.

*Moving up to more high-tech links and sectors as a result of participation on major supply chains* could be another advantage of global value chains. Participation in GVCs constantly pursues new commercial opportunities and new technologies or production methods to increase the competitiveness of the entire chain. Developing countries aim to be involved in more high-tech links of GVCs and sectors as this move benefits their entire economy, especially more added value and profit. But the distribution of profits between the participants in GVCs is conditioned by the position and contribution of each participant. Therefore, GVCs participants are interested in having access to and using the most appropriate technologies. This access is ensured through technology transfer and learning so that that technologically weaker participants in GVCs can migrate to more high-tech links and sectors.

In the case of technology transfer a partner or lead firm which is located in a developed country transfers technology to a firm upstream in the value chain presumed to be in a developing country. Technology transfer in the GVCs can be done through several channels: foreign direct investments, licensing, imported

intermediates, and capital goods. At the company level, the absorptive capacity determines the extent to which it benefit from these flows of technology. As the firm participating in GVCs becomes technically and economically competitive in terms of operations and products it can be integrated into GVCs specific these more high-tech sectors.

*Exporting through the global value chains* has favourable effects for a country s economy. A helping hand can lend the durable firm-to-firm relationships along the value chain. They promote the diffusion of technology and access to capital and inputs along chains. But producing for global markets demands increasing the level of precision and adherence to quality standards which require more automation and less manual work. This makes it harder for developing countries to put their abundant unskilled labour in use.

*Global value chains deliver jobs.* The firms participation in global value chains „tend to be more productive and capital intensive than other firms and so their productivity is less job-intensive. But the enhanced productivity leads to an expansion in firm output and thus to increases in firm employment" (Trading for the development in the age of global value chains, World Bank Group, 2020).

*Participation in global value chains has a positive impact on income per capita and a reduction of poverty.* The gains from global value chains however are not automatic. The most robust effects are for upper-middle and high income countries, while low and lower-middle income countries appear to benefit less. On the other hand, the financial and business services tend to be upstream and high in value-added, while the links are less clear in manufacturing (Raei, Ignatenko and Mircheva, IWT Working Paper, 19/8). Participation in global value chains is associated also with *a reduction of poverty*, because they boost income and development growth. The gains in economic growth from global value chains tend to be larger than from trade in final products, thus poverty reduction from global value chains also turn out to be greater than that from standard trade.

*Global value chains could contribute to sustainable development.* Global value chains activities does not guarantee sustainable development. The firms from developing countries aim to upgrade by moving into higher value-added tasks to better capture the gain of participation. This could negatively impact the resources and pollution, for example. Global value chains do offer an opportunity to shift into more sustainable activities. Tangible progress can be made if the standards of MNEs participating in global value chains are meet by their various suppliers and partners from counties involved in global value chains activities.

## 2. Impact of new coronavirus on global value chains

### 2.1. Materialization of global value chain risks

The global value chains can be disturbed when several different risks become activated and diminish or call of their good effects. The risk in GVC case is given by the mismatch between supply and demand and its effects (Lessard, 2013, p.197). The sources of the risks are numerous and various. They make easy the evolution of a bunch of variables which can not be predicted with certainty and which impact on the global value chain out come variables. The different nature of the risks make complete a wide range of sources. The hypothesis that the cross-border operations that made up the global value chains are themselves exposed to disruption which in turn are shocks to the entire system helps for risks and their mechanisms identification. A systematized list of the sources of global value chain risks is that in Table 1.

**Table 1. Sources of risk for global value chain**

State	Macroeconomics	Customer dynamics	Man-made disruptions
Trade policy Regulation Fiscal policy Financial policy	Business cycles Financial crisis Demographic shifts	Local tastes Disposable income level Attitude toward social/ environmental impact	Armed conflict Labour unrest Terrorism
<b>Natural disruption</b>	<b>Firms innovation</b>	<b>Endogenous</b>	
Earth quakes Ash cloud Flooding Epidemics (ex coronavirus)	Technology Organization Business model	Commodisation Compliance/Reputation Inventory Financial	

*Source:* Lessard, 2013, p. 198

Of first importance are the so-called "systematic risks" in the global value chain system. These risks are able to seize GVCs and even disrupt them. The adverse effects of the 2008-2009 financial crisis and the aftermath of the 2011 tsunami, including the Japan nuclear disaster a whole grinds to halt are examples of systematic risks in the global value chain. The COVID-19 pandemic has all characteristics and more effects than ever which put it in the systematic risks category. The coronavirus effects are to be find in every link of the global value chain around the world. Many countries and firms were put abruptly facing with the increased demand of various products such as masks, medicine, tests, disinfectants which can not be immediately produced and transported at destinations which were mostly on other continents. On the other hand, different



parts for auto and electronics and so on are not needed as most final producers are closing their capacities.

## 2.2. Impact of the new coronavirus on world's progress

The value chains are essential engines for economic development having many other contributions to social life. When the risks materialize as in the case with coronavirus aggression, the result is various negative effects on the entire human existence, as a result of its impact. The world become and continues to change dramatically since coronavirus outbreak began. The COVID-19 pandemic has as consequences high and rising costs. Circulation of people and tourism have come to a screeching halt with the closure of the natural borders by nearly a hundred countries since March.

United Nations (UN) considers that "coronavirus will have devastating effects on labour" while the World Trade Organization (WTO) thinks that *"the coronavirus pandemic bring the deepest economic recession in our existence"*. The UN has estimated that the global economy may shrink by up to 1.0 percent due to the pandemic in 2020, a reversal from the previous forecast of 2.5 percent growth (Global economy could shrink by almost 1percent due to COVID-19 pandemic UN, April 2, 2020). The contraction could be even higher than 3.0 percent estimates the International Monetary Fund (IMF) as figures in Table 2 shows. As can be seen from the Table 2, all advanced economic countries will probably record decreases of the output more than 3.0 percent. Italy with a decrease of - 9.9 percent, Spain with - 8.0 percent, Germany with - 7.0 percent, United Kingdom with - 6.5 and United States with - 5.9 percent will probably have the worst contractions of their outputs.

Table 2. World output and trade volume projection 2020-2021

World output	Projections		World trade volume (goods and services)	percent	
	2020	2021		2020	2021
European Union	- 7.1	4.8	Import		
Low income developing countries	0.4	5.6	Advanced economies	-11.5	7.5
Middle East and North Africa	- 3.3	4.2	Emerging Market and Developing Countries	9.6	11.0
			Export		

			Advanced economies	-12.8	7.4
			Emerging Market and Developing Countries	-9.6	11.0

Source: World Economic Outlook, Chapter 1, IMF, April 14, 2020

China with +1.0 percent and India with + 0.9 percent will probably outperform, while the economies of other countries will fall with Mexico (-6.6), Brazil (-5.3), Russia (-5.5) and South Africa (-5.8) being the worst affected.

These figures illustrate the high dissimilarity of possible developments in global economic growth in the coronavirus era. The degree of disparity is associated with the specific ways in which the numerous factors influence each other and which are difficult to predict. Therefore, preventive measures are taken to prevent the spread of coronavirus such as quarantines, lockdowns, and social distancing that drastically affect travel and hospitality, entertainment and tourism. On the other hand, supply channels are disrupted and productivity decreases as a consequence of job closures. People spend less due to declining income, moving less for fear of contagion. All the disturbances in the economy and society should affect the working of GVCs and international exchanges which in turn exert pressure to accentuate the negative effects at national and international scale (World Economic Outlook, Chapter 1, IMF, April 14, 2020).

Coronavirus also has negative *impact on the Gross Domestic Product (GDP)*. The magnitude of this impact is difficult to evaluate but there are some attempts. The WTO Secretariat for Trade and Consensus makes a projection that uses an optimistic and a pessimistic scenario, in an attempt to get as close as possible to the future evolution of the GDP. Global GDP could fall by between 2.5 percent and 6.8 percent. All developed regions may face GDP declines over the global decline, while Asia and other regions may fall below these values. An earlier attempt to estimate GDP evolution in 2020 was performed by Roland Berger firm which used three scenarios for this purpose (K Fuest, Roland Berger, March 20, 2020).

**Table 3. Real GDP projection 2020-2021**

Real GDP at market exchange rates	percent			
	Optimistic scenario		Pessimistic scenario	
	2020	2021	2020	2021
North America	-3.5	7.4	-9.0	5.1
South and Central America	-4.3	6.5	-11.0	4.8
Europe	-3.5	6.6	-10.8	5.4
Asia	-0.7	8.7	-7.1	7.4
Other regions	-1.5	6.0	-6.7	5.2

Source: WTO Secretariat for Trade and consensus estimates for GDP, in D G Azevedo, 2020, April 8, 2020

Europe, could be particularly affected in 2020. The worst scenario presumes that GDP shrinks with 5.5 percent. In this case, production and in different sectors will be like electrocuted, meaning it will cease and the healthcare sector will not be able to meet all the demands. In the moderate scenario GDP will fall by 0.5 percent. This expected decline will be the result of poor functioning and even the disruption of some supply chains that are crucial for bringing production from Asia to Europe and even within Europe in the case of raw materials for pharma and electronics sectors. These developments may be accompanied by a temporary decrease in consumption and investment. The optimistic scenario shows a slight reduction of GDP with 0.3 percent. The smallest decrease in GDP will be caused by the selective impact on economic sectors, supply and production. Also, the demand will decrease less and only in a few sectors such as travel and tourism.

As a country that focuses heavily on its own market and services the United States is likely to face fewer difficulties than other states and regions. Worst scenario focuses on a -1.2 percent decline in GDP in 2020 as a result of a strong impact on NAFTA supply chains and a drop in consumption. In the moderate scenario GDP growth will be -0.2 percent. This will be the result of supply chains interruptions in selected industries only and fiscal and monetary stimulus are likely, given that this is an election year. The best-case scenario has as a result no change in GDP in 2020 (WTO Secretariat for Trade and Consensus estimates for GDP, in Azevedo, 2020, April 8).

China could meet one of the following three scenarios on GDP growth. Worst scenario shows a drop in GDP as much as -3.5 percent in 2020. This decrease would be the result of a drastic damage to the supply that will force many production units to remain closed and will cause numerous bankruptcies. A reduction with -1.0 percent of GDP proposes the moderate scenario. This decline is characterized by the shutdown and reduction of the number and rate of the infections doubled by maintaining quarantine which will reduce exports and domestic demand. The optimistic scenario sees lowering of GDP with -0.4 percent. These situation will be reached if the measures taken will have the expected effects which will allow to recover the delays in production.

**Table 4. Merchandise trade volume in 2020-2021**

World of volume merchandise trade	percent			
	Optimistic scenario		Pessimistic scenario	
	2020	2021	2020	2021
<b>Export</b>				
North America	-17.1	23.7	-40.9	19.3
Europe	-12.2	21.5	-32.8	22.7
Asia	-13.5	24.9	-36.2	36.1

World of volume merchandise trade	Optimistic scenario		Pessimistic scenario	
	2020	2021	2020	2021
South and Central America	-12.9	18.6	-31.3	14.3
Other regions	-8.0	8.6	-8.0	9.3
<b>Import</b>				
North America	-14.5	27.3	-33.8	29.5
Europe	-10.3	19.9	-28.9	24.5
Asia	-11.8	23.1	-31.5	25.1
South and Central America	-22.2	23.2	-43.8	19.5

Source: WTO Secretariat for Trade and Consensus estimates for historical GDP, in D G Azevedo, April 8, 2020

Just a little later the same WTO issues new projections which reduces the value growth of world trade volume to -11.0 percent in 2020. The exports of advance economies could be reduced with 12.8 percent and those of emerging markets and developing countries with 9.6 percent in 2020. The imports of developed countries will probably contract with 11.5 percent and those of emerging and developed countries with 9.6 percent in 2020 (see Table 2).

Since its appearance in China, the coronavirus has proved dangerous and has rise even greater problems as it has spread around the world. Its undesirable effects have also amplified and one of them is proving to be the steepest decline in trade in sectors that are based on global value chains such as automotive and electronics industries. The OECD Trade Value Added database certifies that „the share of value added in the case of exports of electronic products was around 10 percent for US, 25 percent for China, more than 30 percent for Korea, greater than 40 percent for Singapore and more than 50 percent for Mexico, Malaysia and Vietnam. Imports of key production inputs will likely to be interrupted by social distancing which caused factories to temporarily close in China and which is now happen in Europe and North America” (D G Azevedo, April 8, 2020).

*COVID-19 has a strong impact on jobs.* Its negative effects have a contribution to the impressive number of people who are in danger to losing their livelihoods. It estimated that 1.6 billion people live on the brink of survival „especially migrant workers who are most at risk of loss of livelihood. This gigantic number is more than half of the world's workforce and their missing jobs are less likely to reappear after the crisis. As the coronavirus caused the closure of billions of jobs they were left without any certainty about their reappearance. If in April 2020 the global unemployment was over 190 billion it increased rapidly even if differentiated by sectors. Demand for cars, clothing and footwear fell sharply after the lockdown was instituted which affected jobs of other sectors. In the United

States more than 33 million people representing more than 15 percent of employees have been seeking unemployment benefits since May 2020. The lack of jobs was accentuated in Western Europe, Africa and South America. The situation of China was slightly different because here unemployment began to decrease since April, if you do not take into account the approximately 300 million migrants (Tenko, 2020).

The International Labor Organization (ILO) says that more than four of five people i.e. 81 percent in global workforce of 3.3 billion are affected by the potential or full workplace closures. The ILO considered the impact as such that an empirical equivalent of nearly 200 million full-time workers could take a hit in April, May and June.

In the countries involved in global value chains, unemployment will decisively be dependent on its development in the developed countries. The longer are the shutdowns in developed countries, the more uncertain the future of workers in link 1 and link 2 of the value chains around the world. For example, the textile factories from countries as Pakistan, Cambodia and Vietnam depend on orders from developed countries. That is why garment makers have asked big buyers like Walmart not to cancel orders. A special situation arose in Bangladesh where Western owners of major clothing brands have canceled orders. These decisions have sent more than a million workers unemployed, 80 percent of whom are women. (Coronavirus hits jobs, million face unemployment and poverty, April 10, 2020).

The future is unclear since nobody can not say how many jobs will permanently abolish or not. The causes will be found in the evolution of the US and Chinese economies because they are most involved in international trade and production, global value chains included.

### **2.3 Global value chains of economic sectors affected by the new coronavirus pandemic**

The reality shows that COVID-19 has a negative impact on all components specific to the sectors. As a result all sectors are affected albeit in different proportions regardless it is about manufacturing, transportation, travel, retail, technology, high-tech, communications education, non-profit activities. Statista, a German portal for statistics, conducted a worldwide survey on the impact of coronavirus in the main components of the main sectors included in Table 5 which results was released in March 2020.

Table 5. Coronavirus impact index by industry 2020

Sector	Supply chain index
Manufacturing	5
Travel & transportation	5
Retail	5
Energy & resources	5
High Tech & Telecommunications	5
Health care	4
Non-profit	1
Media & entertainment	2
Banking; financial services and insurance	1
Public sector	1

Source: Coronavirus impact index by industry 2020, [www.statista.com/statistics](http://www.statista.com/statistics)

Note: Impact scale: 1 = minor impact; 2 = moderate impact; 3 = significant impact; 4 = major impact; 5 = sever impact

The elements of each field on which the research was carried out are personnel, operations, supply chain and revenue. The results obtained show that the index of projected impact is maximum for the sectors that depend on the value chains.

**Manufacturing** includes a large number of sectors such as electronics, mechanical engineering, automotive, textile and apparel and so on that have a major contribution to GDP and trade. „Over two thirds of world trade occurs through GVCs, and the COVID-19 pandemic has already hit three major hubs which are China, the EU and U.S., creating an unprecedented combination of supply and demand shocks. The decreased demand for inputs by the three hubs factories will lead to lower exports of raw materials and components by their partners”(www.intracen.org/covid19/Blog/THe-Great-Shutdown-How-COVID-19-disrupts-supply-channels).

"The factory shutdown in the EU will have the strongest repercussion for the supply-chain exports. Of other countries, because the EU is the largest importer of manufacturing inputs, China is the Largest exporter and is highly integrated into global value chains. Estimates suggest that the EU imports of manufacturing inputs will drop by USD 148 billion, of which USD 97 billion is intra-EU trade, and USD 51 billion is import from other regions. China and the U.S. come second and third, with shutdowns in China and The US triggering the reduction of imports of manufacturing inputs by USD 43 and USD 37 billion respectively. The combined reduction amounts to USD 228 billion, or 24 percent of total manufacturing imports by the three hubs, or 11 percent in only GVC trade is considered " (Story: The Great Shutdown, 04/23/2020).

**Technology.** At the beginning of 2020 a huge number of electronics, telecom and semiconductor companies relied on manufacturing units in China. Due to the lockdown and other disruptions, major disruptions of the supply chains have recorded by Chinese companies. The result was missed production deadlines such that of Apple's new iPhone and decline in mobile phone production. Disruptions in supplies from optic fibre companies adversely affected on short term the China's forthcoming 5G telecommunication network. Semiconductors also have undergone a heavy shortage in supply due to coronavirus. As a result of the outbreak the export of electronic components from China to North America countries, specifically the U.S. and Mexico, has declined by more than 50 percent. The smartphone production had a 12 percent decline while smartwatch production recorded a decline of about 16 percent (Jette, 2020). Laptops, PCs and smart speakers are some other products that have recorded major declines. Because the decline in production and supplier numbers lead to sales and financial worries for the tech giants, firms for various business verticals are expected to turn to other countries, opening opportunities for the rest of the world.

**Automotive industry.** The global automotive industry relies heavily on global supply chains, in order to producing parts, components and pieces. More than 80 percent of world auto supply chain is connected with China (Becker, March 20, 2020) and more than \$34 billion is the imports value of motor parts from this country (Harbour L., March 13, 2020). COVID-19 significantly impacts by slowing or halting production, resourcing products and reevaluating revenue. The reduction of supplier contractors capacity forces the final automakers to reduce the production at the beginning of pandemic and stop it later. The sales of subcontractors has lowered by 92 percent in February 2020, having as main reason the situation from China. An assortment of automakers operating in or near Hubei, including foreign makers such Nissan, General Motors, Volkswagen, Kia, Peugeot, Honda, were forced to halt their production due to coronavirus impact. The tool and die industry has experienced a 30 to 60 day production delays already in February. All these events have had a negative impact on global auto industry and market which might experience the bigger downturn.

The gross value added in 2020 could fall according to a tree scenarios prevision made by Roland Berger on March 11, 2020 (K. Fuest, March 25, 2020) as follows. In the worst scenario the vehicle sales will diminish by 10.6 percent on their forecast levels and no run-ups will be possible due to supply chains problems. The moderate scenario shows a lowering of 2.4 percent, with a significant ply chain problems in Q1 2020 due to component shortages and supply chain followed by

a ramp-up in Q4 2020 minimizing the full-year effect. The recovering scenario suggests a slight drop of 0.9 percent in sales volume in H1 2020 that will be followed by a compensatory ramp-up in H2 2020.

The evolution of automotive industry shows that it is facing a sharp drop in demand and investments. Restrictions on the movement of people and the stoppage of economic activity are expected in sector's output. „This is having negative multiplier effects on the economy through backward and forward linkages, particularly in countries such as Canada, China, Germany, Japan, India, Republic of Korea, Mexico, Morocco, South Africa and United States of America where the automotive industry is a major driver of economic growth. Small and medium enterprises which account for the bulk of employment in the sector and provide inputs and services to multinational car makers are expected to be severely affected (backward linkages). Sectors likely to be affected by the close down in the automotive industry through forward linkages include transportation e.g. freight, ground passenger transport, charter buses and services e.g. passenger car rental and car repair " (COVID-19 and the automotive industry, [www.ilo.org](http://www.ilo.org)). UNCTAD estimates 2 per cent reduction in exports of parts and other intermediate inputs from China to automotive manufacturers in the EU, North America, Japan, Republic of Korea and other major automotive producing economies that could lead to a USD 7 billion reduction in automotive exports from these economies to the rest of the world (COVID-19 and the automotive industry, [www.ilo.org](http://www.ilo.org)).

**Tourism.** The tourism sector is one of the hardest-hit by the outbreak of coronavirus with impact on both supply and demand. This represents an added downside risk to the context of a weaker world economy, geopolitical, social and trade tensions. „As UNWTO estimated at the beginning of April, during 2020 the global international arrivals could decline between 20-30 percent, down from an estimated growth of 3-4 percent forecast in early January 2020. This could translate into a loss of \$30 to 50 billion in spending by international visitors,, (COVID-19 and its impact on global economy, March 11, 2020; COVID-19: Putting people first, April 7, 2020). Many countries continue to curtail the inbound tourism especially counties with a high number of coronavirus cases. The European Union s industry chef estimates EURO 1 billion loses per month in the tourism sector do to the virus s impact. The cruise operators expect a bigger hit than initially anticipated, as a result of trip cancellation of operations in Asia and other geographic areas.

**Pharmaceutical and health care.** Coronavirus has a strong impact on the demand of specific medicines for its healing. This sudden increase in demand adds



to that of the drugs needed to treat other diseases. As a result, production and supply delays occur because the time associated with drug manufacturing can not be reduced. At the same time, the transport capacities are exceeded because of the need to transport large quantities in a short and very short period of time.

The pharmaceutical industry has a median inventory for about 180 days. However, given the long lead times associated with drug manufacturing, the effect take time to cycle through the supply chain. Missed deliveries can be punitive for pharmaceutical companies due to penalties by purchasing entities. The pharmaceutical industry as a whole lagged other industries were in supply chain started becoming a focal point. As demand for face masks and hand sanitizers has significantly increased, the supply of these products most of which are sourced in China remained behind (M. Durbha, 17 03, 2020). This situation is logistical challenging, as transportation capacity has been taken away.

**Construction sector.** The construction industry is also affected by coronavirus including in the supply chains components. Singapore, Canada and United States were faced with disruption to supply chains which disrupted supplies such as solar panels, electrical and pumping fixtures, concrete boards and flooring tiles (How to prepare for coronavirus impact on the construction supply chain, March 30, 2020). Many of these basic construction materials come from China. The impact of coronavirus especially delays in shipping materials materialized in work stoppage. The duration of these stoppages is important because it will be much more difficult to come back from a longer shutdown. As a result, many development projects will be not able to be completed on time which will increase their costs. The impact may be multiform. The prices of material supply could increase as the demand will increase without being able to be satisfied on the planned terms. One of the consequences of such a situation may be the reorientation towards alternative materials and new sources of materials before prices rise too much (Lynch D, 03 23, 2020). Some builders may also reschedule certain projects until manufacturers can provide the necessary materials.

### **3. The future of global value chains: a total rethinking**

The way COVID-19 acts and its effects weaken the GVCs, a phenomenon that accompanies its impact on the entire economy and society. As a result, the whole issue of the future of GVCs must be thought of and included in the world's future approach. The whole range of GVC assumptions and implications they have forced a rethinking of the whole issue of GVC.

As there are many opinions on the effects of coronavirus, in the case of GVC rethinking there is a great debate. Against the background of the diversity of

suggestions, convergent proposal can be identified and they can represent a significant basis for the ways of GVC rethinking.

*The strategic approach of the GVC redesign* allows a rethinking of the entire issue. This rethinking of GVC should be the result of decisions based on complex analyzes developed by the firms participating in GVC and the authorities regarding the organization, geographic area, number of partners, inventories, costs, and so on (Chaturvedi H., 2020; Schieber, 2020). GVC reconfiguration supposes deploying scenario-planning techniques to develop visibility of the entire GVC, across primary, secondary and maybe tertiary players, in order to have a clear picture of the entire supply. This approach gives the opportunity of a systematic evaluation of the end-to-end value chain, establishing action plans and the ability to deploy rapidly. Developing a process for permanently identifying and monitoring risks in the GVC is another facility offered by the comprehensive strategic approach.

In order to optimize the operation of GVC, the number of links and suppliers within each link must be carefully established so that there are not too few but not too many, as well as the number of countries from which they come. Each supplier must be assessed on all links to have a clear supply. Procedures for testing and reviewing suppliers must be included in the oversight of the entire GVC. Information and permanent monitoring of the GVC are necessary to detect in time the possible seizures of its operation and various other risks. Addiction to a single source proved risky and damaging at the beginning of COVID-19 pandemic when demand for urgently needed medical products suddenly rose and virtually the only source of supply proved to be China.

Costs are the variable whose role in GVC architecture decisions needs to be reconsidered. GVC strategy must consider the most advantageous options in terms of results, depending on all costs involved. The lowest-cost supplier alternative must be replaced with the cost analysis of alternative suppliers to which is added inventories boosting, or investing in various ways of distribution.

*Higher resilience* to allow more flexible operation but also the anticipation of possible risks and disruption is an other big part of GVC rethinking. Adaptability increases if bimodal GVCs are used. "Mode one" is the traditional approach and "mode two" is the need for agility, speed and exploring new opportunities.

Lead firms have to identify alternatives, and leverage advanced manufacturing technologies. At the same time, they must develop a process for continuously identify any monetary risks and other risks in the GVC, disruption anticipating and building in quick responses. This involves a process called mapping in which firms engage suppliers in order to better understand their sites and processes. Mapping and re-designing GVC networks start from raw material suppliers to the

end product users. Such a map will allow a firm to take necessary precautions against potential disruptions. This mapping would also help identify potential bottlenecks or weakest links in a GVC, to support the design of more resilient networks.

GVC becomes more flexible if it uses digital technologies. They encourage GVC participation by reaching many of the barriers the firms face when attempting join and speed up GVC operation by reducing the fixed costs, facilitating the matching of buyers and sellers, diversifying the supply base and introducing flexibility in the manufacturing, enhancing management of inventories and logistics, and eliminate many documents and remove many business meetings. „Digital platforms and open distributed ledgers such as blockchain enhance verification and monitoring, thus reducing informational frictions and opening the door for countries with weak institutions. Digital technologies also speed up the operations and their flexibility” (Yildiz, Yan, 2020).

*Reshoring* is advisable as a mean of diversification and costs reduction for a country or firm or a company that is overexposed to foreign markets (Rausch, 2020; Javorcik, 2020; Fratocchi and Ancarani, 2014). It means moving manufacturing back to the country of its parent firm. When it comes to GVC, reshoring means bringing the production activities near or back to their county of origin. Opportunities may be created for countries that have not been on top of investors list before. By reshoring decision the firm has to choose among three alternatives (Fratocchi and Ancarani, 2014, p. 4). The first is to move production, either partially or totally, to an other country geographically far away from the initial host country. This was the case of textiles production that was relocated from Romania to China and other Asia countries by EU firms. The second alternative implies the transfer of production to an other country geographically closer to the home country and this is near shoring. This could be the case of moving the production of some medicine articles (masks, and so on) from China to Romania. The third solution of reshoring is to move the production back to the firm’s home country and this is back shoring.

Caution is recommended when near shoring and back shoring because when they mitigate the risk of external shocks they increase the internal shocks. So, firms and governments should be cautious and ensure that the potential benefits become real over a long period of time.

*Regulation of the functioning of GVC* adds to the efforts and solutions necessary for their transformation. The creation and operation of GVCs require efforts to ensure the legal framework, the necessary legal instruments and specific instruments. That is why the law on GVCs governance is particularly important. Governance includes the coordination of the relationships between participants and different

links in a value chain (Bair, Bars and Campling, 2016, p. 17). Redefining the entire GVC specific issue after the impact of COVID-19 requires that governance must be adapted to be more flexible to deal with especially unexpected situations.

Although international organisms cannot be legally directly involved, they must play a supervisory role in order to be able to signal risks and even help to face the difficulties generated by them.

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