Taking stock: Continental vs. global value chains

- As a consequence of the COVID-19 crisis continental value chains could gain in importance.

- Our network analysis illustrates the global trade network pre-COVID-19. We depict the global trade network of 90 countries as well as the most important intracontinental trade relationships.

- Trade links between Asian and American countries seem especially vulnerable to a reorganization of global value chains. The global aim to reduce CO₂ emissions, the trade dispute between the US and China and the rivalry for geopolitical leadership all point in that direction.

- From this perspective, the 2019 weights of Asian exports to American countries (3.7% of global trade) and American exports to Asia (6.4%) seems to be an upper limit.
A network is worth a thousand line charts

There is much talk about how COVID-19 induced reorganization of global value chains. In our view, continental value chains are likely to be strengthened whereas their global counterparts are efficient but also very vulnerable to shocks. Here our aim is the visualization of global trade before the pandemic ran its course. The five network charts below show how uneven global goods trade was distributed.

Our data basis: IMF Direction of Trade in 2019

Our analysis is based on the 2019 annual data from the IMF Direction of Trade database. The data contains goods exports and we focus on 90 countries which have around 8,000 bilateral trade links. Most bilateral trade flows have a very low weight and only a few weights are more salient. All weights are measured as the ratio of bilateral exports from one country to another in USD relative to total global trade in USD. The 90 countries account for more than 90% of all global trade flows in 2019. If we abstract from all bilateral trade links with a weight of less than 0.1%, the new network covers more than 50% of total global trade.

Top 10 global bilateral trade links

In total the first 10 most important links account for 14.4% of total goods trade in 2019. Among the top 10 most important bilateral trade links are two transcontinental links. First, it comes as no surprise that Chinese exports to the US are the most important bilateral link. It accounts for 2.2% of total global trade in 2019. Second, exports from Japan to the US ranked 10th with a weight of 0.75%. All other top 10 bilateral flows are intracontinental trade links, in particular within North America and between Asian countries, e.g. between China and Hong Kong and between China and Japan. Among the top 10 most important trade links is only one European link, i.e. Dutch exports to Germany.

2019 Global goods trade network

Figure 3 is a directed graph which shows the bilateral goods trade links between 90 countries. We use an algorithm which places countries with many trade links in the center of the network. Among the group are many G20 countries and therefore mainly Asian, European and North American countries. Countries which are less involved in global trade are placed at the periphery. The colors of the nodes mark key global regions and continents. In Figure 4 and Figure 5 we focus on the intracontinental and transcontinental trade links. In 2019 the intracontinental trade weights accounted for almost 53.6% of global trade and transcontinental for 37% of global trade. The remaining more than 9% account for the other roughly 100 countries mostly very small countries which fall outside the scope of this analysis. Intra-European trade accounts for more than one quarter of global trade, intra-American trade for roughly one sixth and intra-Asian trade for only one twelfth of total global trade.

The COVID-19 crisis taught us a lesson

Markets with their focus on profitability are often very vulnerable to unforeseen occurrences. As a consequence of the crisis it is often argued that the provision of goods that are essential for a well-functioning society should remain under national control and be domestically produced. In the aftermath of the COVID-19 crisis,
important production lines, probably not only in the medical sector, might be repatriated or at least relocated close to national borders of developed economies. Moreover, there might be much more sophisticated industrial emergency plans which guarantee a smooth production even in the case of a pandemic or another major global disaster which cripples at least some important sections or regions of the global economy. We think that a balanced approach between today’s global value chains and a complete repatriation of production lines could be a continental approach. That means continual value chains combined with higher inventory levels which may guarantee a good balance between efficiency and the newly increasing demand for safety. Such a shift of production lines would also reduce the potential economic fallout of global trade disputes and is likely to reduce our global CO₂ footprint. Hence, the foundations for continental value chains were already laid before the COVID-19 crisis.

Intracontinental networks have a three-level structure

The European, the Asian and the American trade network have a common feature, i.e. three levels of country groups. Figure 6 to 8 show that first there is an economic center in each intracontinental trade network. Second there is a group of countries closely linked to the center and among each other. Third there are peripheral countries with relatively low weights. This is exactly what gravity models and our everyday experience suggest. The hubs are Germany, China and the United States. On each continent, there also seems to be a second group of countries which have close ties to the center and among each other. For instance, in Europe Germany has relative large trade weights with three country groups. First, all large countries inside the EU (France, Italy, Spain) and outside the EU (the UK, Russia and Turkey). Second, many smaller neighboring countries (Switzerland, Austria, the Netherlands and Belgium) and third the Visegrad countries (Czech, Poland, Slovak Republic and Hungary) which become constantly more important as a production site for the German manufacturing sector. In Asia, the second level consists of Australia, Hong Kong, India, Japan, Korea, Singapore, Thailand and Vietnam which have close ties with China and among each other. In the Americas, Mexico, Canada and also to some extent Brazil are part of the second country group around the US. If continental value chains will gain in importance as we have pointed out above, these trade links might gain in importance in the future.

Exports between Asian and American countries likely to be reorganized

Trade links between Asian and American countries seem especially vulnerable to a reorganization of global value chains. The huge distance between both regions matters if the world tries to reduce CO₂ emissions. The rivalry for geopolitical leadership between the US and China is likely to be a key feature in the 21st century. In the last years, the more restrictive US trade policy already implied a less intensive bilateral export relationship between both nations. Likewise, in the last weeks the climate between both countries deteriorated further. The media reported tensions over pandemic-related issues as well as speculation about a renegotiation of the “Phase One” trade deal. All these developments point to less intensive trade relations. Therefore, going forward the 2019 weights of Asian exports to American countries (3.7% of global trade) and American exports to Asia (6.4%) seems to be an upper limit. This may have an impact on neighboring countries in both regions as well. For example, Mexico may become an even more important manufacturing hub for the US. Likewise, the Asian trend could be strengthened now that more and
more countries produce their consumer goods locally.

**Figure 3: Global trade**

Legend: Directed links = Exports from country X to country Y, Size of nodes = Value added of manufacturing sector to GDP in %, Size of edges = Trade weights in % of global trade.

Color of nodes = Global regions/continents. Middle East includes Persia. Asian countries include Australia and New Zealand and exclude Middle East and Persia.

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Source: Deutsche Bank Research, IMF
Figure 4: Intra- and transcontinental trade network

Legend: Size of nodes = Intracontinental trade weights, size of edges = Transcontinental trade weights. Color of nodes = Global regions/continents (cf. Figure 3). Middle East includes Persia. Asian countries include Australia and New Zealand and exclude Middle East and Persia.

Source: Deutsche Bank Research, IMF

Figure 5: Intracontinental and transcontinental trade weights

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Source: Deutsche Bank Research
Figure 6: 2019 European trade network (34 countries)

Legend: Directed links = Exports from country X to country Y, Size of nodes = Value added of manufacturing sector to GDP in %, Size of edges = Trade weights in % of global trade.

Country legend: AUT = Austria, BEL = Belgium, BGR = Bulgaria, BLR = Belarus, CHE = Switzerland, CRI = Croatia, CYP = Cyprus, CZE = Czech Republic, DEU = Germany, DNK = Denmark, ESP = Spain, EST = Estonia, FIN = Finland, FRA = France, GBR = United Kingdom, GRC = Greece, HUN = Hungary, IRL = Ireland, ITA = Italy, LTU = Lithuania, LUX = Luxembourg, LVA = Latvia, MKD = North Macedonia, NLD = Netherlands, NOR = Norway, PRT = Portugal, ROU = Romania, RUS = Russia, SVK = Slovak Republic, SVN = Slovenia, SWE = Sweden, TUR = Turkey, UKR = Ukraine

Source: Deutsche Bank Research, IMF
Figure 7: 2019 Asian trade network (17 countries)

Legend: Directed links = Exports from country X to country Y, Size of nodes = Value added of manufacturing sector to GDP in %, Size of edges = Trade weights in % of global trade.

Country legend: AUS = Australia, BGD = Bangladesh, CHN = China, HKG = Hong Kong SAR, IDN = Indonesia, IND = India, JPN = Japan, KAZ = Kazakhstan, KOR = Korea, LKA = Sri Lanka, MYS = Malaysia, NZL = New Zealand, PAN = Pakistan, PHL = Philippines, SGP = Singapore, THA = Thailand, VNM = Vietnam

Source: Deutsche Bank Research, IMF
Figure 8: 2019 American trade network (13 countries)

Legend: Directed links = Exports from country X to country Y, Size of nodes = Value added of manufacturing sector to GDP in %, Size of edges = Trade weights in % of global trade.

Country legend: ARG = Argentina, BOL = Bolivia, BRA = Brazil, CAN = Canada, CHL = Chile, COL = Colombia, ECU = Ecuador, MEX = Mexico, PER = Peru, PRY = Paraguay, URY = Uruguay, USA = United States, VEN = Venezuela

Source: Deutsche Bank Research, IMF
Appendix 1

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