ECO FLASH

N°20-14 8 July 2020

GERMANY: SUPPLY CHAINS AFTER COVID-19

Raymond Van Der Putten

In the past decades, German enterprises have been offshoring activities, in particular to Central and Eastern Europe and China.

Despite the slowing of the globalisation pace in recent years, German industry is still losing ground in textiles, chemical and pharmaceuticals, and computers, electronic and electrical equipment.

Despite China's dominance in global manufacturing production, Germany has remained an important global and regional player.

Supply chains disruptions related to Covid-19 have increased calls for a reassessment. However, it is unlikely to lead to radical changes in global supply chains.

Only in case of market failures, as seen in the field of pharmaceuticals, policies should be developed to correct them.

IMPORTED INTERMEDIATE INPUTS OF THE MANUFACTURING SECTOR

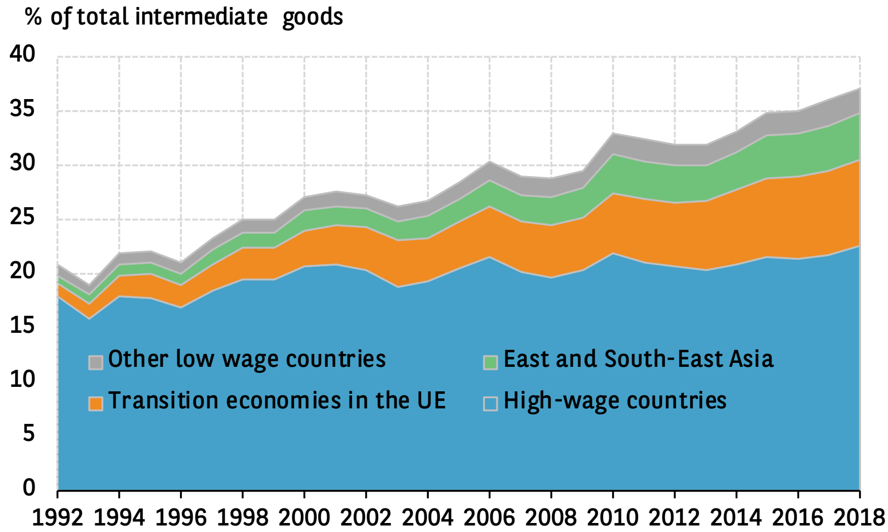

CHART 1 SOURCE: OECD, BNP PARIBAS

The Covid-19 has had a disruptive effect on supply chains. In Germany, even though manufacturers were not directly affected by lockdown restrictions, production lines had to be closed due to shortages of essential parts supplied from China. Given the central role German manufacturers play in Europe, this also led to shutdowns in other countries. Moreover, the country discovered that it had become very dependent on China and other Asian countries for goods such as medical drugs, respirators, and personal protective equipment.

These events are likely to bring about a rethink of our production model, characterised by the breaking up of production processes, just-in time inventory, and a single supplier. The Covid-19 crisis poses important questions, such as: has the risk of supply chain disruption been sufficiently taken into account and how could supply chains be made more resilient? Finally, supply chains are largely based on a cost/benefit analysis. Other concerns such as environmental and political strategic considerations are often completely absent in delocalisation decisions. Is there a role for economic policy to correct possible market failures? However, this discussion is a bit outside the scope of this paper.

FOUR DECADES OF GLOBALISATION

Over the past decades, German enterprises have been offshoring activities to low-wage countries to improve cost efficiency. Several events have contributed to this, such as the fall of the Iron Curtain, the development of container shipping, and China's integration into the WTO.

The development of global value chains has increased the interconnectedness of manufacturing sectors between countries. Between 1991 and 2018, imports of intermediate inputs of the German manufacturing sector grew by around 5% per annum (chart 1). In particular, trade with low-wage countries expanded quickly. In the early 1990s, only 3% of inputs were imported from these countries. By 2018, this had increased to almost 15%. The growth was mainly in imports from the European transition economies, growing to 8% in 2018, more than eight times as high as in early 2000 (see Stéphane Colliac (2020)) Also imports from the low wage countries in South and East Asia have increased rapidly. They amounted to 4.5% in 2018.

To what extent globalisation has continued in the past couple of years is still an open question. Using the OECD's inter-country input-output tables, Baldwin and Freeman (2020b) show that countries' total exposure (i.e. direct and indirect exposure), to each other is still increasing. By contrast, Kilic and Marin (2020) argue that the era of hyper-globalisation came to an end after the 2008/09 Global Financial Crisis owing to the subsequent rise of uncertainty that set in.

Using the OECD/WTO TiVA databank, we also note a stabilisation of Germany's value added share in final demand at a macro level (see table 1). Between 2005 (start of the series), and 2010, the German share in final demand declined 66.7 to 59.5. It remained around this level until 2015, the latest available data. During the period 2010-2015, the share of the transition economies in Central and Eastern Europe increased to the detriment of the rest of the EU and the East and South-East Asian countries. This could indicate that companies have been shortening their supply chains, as argued by Kilic and Marin.

However, it is more likely the result of diverse trends at sector level. In the sectors textiles (D13-15), chemicals and pharmaceuticals (D20-21), and computers, electronic and electrical equipment (D26-27), the share of German industry has gradually declined, while the countries in East and South-East Asia have strengthened their position. By contrast, manufacturers of machines and equipment (D28) have maintained their position while producers of transport equipment (D29-30) have even further strengthened their s market share. In the latter sector, companies have clearly relocated activities to Germany and the European transition economies. In 2015, the share of the East and South-East Asian countries only amounted to 3.5% in 2015 compared with almost 12% in 2010. This was probably not only due to supply chain disruptions caused by natural disasters but also to rising production costs in Asia.

GLOBALISATION OR REGIONALISATION

In table 2, we have mapped the interconnection of manufacturing sectors between the major countries and geographical areas based on value added contributions in 2005 and 2015[1]. The numbers are the shares of the column nations in the value added of the row nation's final demand. The calculations are based on the OECD-WTO TiVA data.

For example, in 2015, Germany contributed 59.5% to the final demand of its manufacturing sector and for 9.7% to that of the UK. For clarity reasons, we have deleted all contributions lower than 0.5%.

Comparing the two tables, the first fact is the decline of the contribution of each country to its own final demand (the diagonal of the table) with the exception of China, and the growing dominance of the latter in manufacturing production.

VALUE ADDED IN THE MANUFACTURING SECTOR (COUNTRY OF ORIGIN OF VALUE ADDED IN % OF FINAL DEMAND)

	2005	2010	2015
D10T33: Manufacturing			
Germany	66.7	59.5	59.5
Eastern Europe	3.7	4.5	5.3
Other EU	15.6	14.7	14.6
NAFTA	3.0	3.3	3.5
East and South-East Asia	5.5	11.2	9.7
Other	5.6	6.9	7.4
D13T15: Textiles, wearing apparel, leather and related products			
Germany	39.5	30.2	24.2
Eastern Europe	7.9	7.2	6.2
Other EU	20.3	15.6	14.9
NAFTA	0.9	0.8	0.7
East and South-East Asia	14.2	27.1	31.8
Other	17.1	19.1	22.2
D20T21: Chemicals and pharmaceutical products			
Germany	57.7	48.7	44.3
Eastern Europe	1.8	2.3	3.0
Other EU	24.7	24.6	24.9
NAFTA	4.5	6.2	6.9
East and South-East Asia	4.9	9.2	10.2
Other	6.5	9.0	10.7
D26T27: Computers, electronic and electrical equipment			
Germany	70.4	51.8	51.3
Eastern Europe	2.8	4.5	4.8
Other EU	9.1	10.2	9.6
NAFTA	3.3	5.4	5.8
East and South-East Asia	11.4	23.4	23.3
Other	3.1	4.7	5.3
D28: Machinery and equipment			
Germany	72.6	69.6	71.1
Eastern Europe	2.8	3.7	3.6
Other EU	12.7	11.7	11.7
NAFTA	3.3	2.9	2.6
East and South-East Asia	4.4	8.1	6.8
Other	4.2	4.1	4.2
D29T30: Transport equipment			
Germany	65.5	62.7	70.2
Eastern Europe	5.7	5.7	7.1
Other EU	16.1	14.0	13.3
NAFTA	5.2	3.4	3.7
East and South-East Asia	5.2	11.8	3.5
Other	2.2	2.4	2.3

TABLE 1 SOURCE: OECD/WTO TIVA, BNP PARIBAS

1 Freeman and Baldwin (2020a) made a similar calculation using the OECD's inter-country input-output tables.

CONTRIBUTIONS IN VALUE ADDED BY COLUMN COUNTRIES TO MANUFACTURING'S FINAL OUTPUT OF ROW COUNTRIES

2005

	CAN	MEX	USA	FRA	DEU	ITA	ESP	GBR	CHN	JPN	KOR
CAN	45.1	1.4	27.2	1.0	2.3	0.9		1.4	5.2	4.0	1.7
MEX	1.1	60.9	18.8	0.7	2.1	0.8	0.7	0.5	2.8	3.1	1.4
USA	3.3	1.5	69.9	0.8	2.2	0.9		1.1	4.7	4.1	1.5
FRA			3.9	50.3	9.4	4.6	3.5	3.0	2.8	2.3	1.1
DEU			2.7	3.0	66.7	2.4	1.2	1.8	1.8	1.6	0.9
ITA			2.2	4.1	7.7	61.4	1.8	1.9	2.1	1.3	1.0
ESP			2.3	5.9	7.2	4.2	55.8	2.7	2.5	1.9	1.2
GBR	0.6		5.3	4.0	7.3	2.7	2.1	49.8	3.3	2.6	1.1
CHN			2.8	0.6	2.0	0.5			74.8	5.6	3.4
JPN			2.8		0.8				3.8	84.1	1.1
KOR			5.2	0.6	1.9	0.7		0.6	5.6	8.7	66.4

2015

	CAN	MEX	USA	FRA	DEU	ITA	ESP	GBR	CHN	JPN	KOR
CAN	42.0	2.2	24.7	0.8	2.6	1.0		1.1	11.0	2.4	1.8
MEX	0.9	50.9	19.7	0.6	2.5	0.9	0.6		9.9	2.6	2.2
USA	2.2	2.5	66.4	0.7	2.6	0.8		0.9	9.0	2.8	1.9
FRA			4.9	42.7	10.8	4.0	3.3	2.5	7.1	1.5	1.0
DEU			3.2	2.7	59.5	2.2	1.2	1.7	5.7	1.3	0.8
ITA			2.3	3.2	7.7	57.2	2.0	1.6	5.4	0.8	1.0
ESP			3.3	4.6	7.8	3.2	50.2	2.3	7.0	1.0	0.9
GBR			5.4	3.2	9.7	2.4	2.1	43.0	8.5	1.5	1.4
CHN			2.5		1.8				82.1	2.4	2.4
JPN			3.1	0.5	1.2				9.1	75.0	1.4
KOR			4.9	0.8	2.7	0.8		0.6	11.5	5.0	62.0

Northern America *Europe* *Asia*

TABLE 2

SOURCE: BNP PARIBAS, OECD/WTO TIVA

In 2005, in terms of value added, China contributed 1.8% to final demand for Germany's manufacturing products. By 2015, this has grown to almost 6%, largely to the detriment of Germany's own industry.

Another aspect is that supply chains have remained rather regional. Only the US, Germany, China, Japan and Korea contribute significantly to all the countries' final demand. The Canadian and Mexican manufacturing sectors are very dependent on the US, the latter's value added contribution being 24.7% and 19.7% respectively. To a slightly lesser extent, Germany plays a pivotal role for manufacturers in the neighbouring countries.

During the Covid-19 crisis, Germany's manufacturing sector was immediately hit by the shutdown of the Chinese industrial apparatus in order to contain the virus. In March, 60% of Germany's mechanical engineering sector reported supply disruptions due to lockdowns in China and Italy[2]. Only 10% of producers were able to turn to other suppliers. More than 45% of machine builders made capacity adjustments, mainly through working time accounts and short-time work. In March, Germany also took lockdown measures. Manufacturing plants could remain open, but production was seriously hampered by the distancing rules and the sharp drop in demand as companies were cutting back on their investment plans. Car manufacturers stopped their production lines, as car sales plummeted. This had also major repercussions on subcontractors not only in Germany but also in the surrounding countries.

HOW MAY COVID-19 AFFECT GLOBAL VALUE CHAINS?

The outbreak of Covid-19 has reignited the discussion on the value of global value chains and the limits of globalisation. It has renewed calls for more resilient value chains. This could be achieved by increasing stocks and reducing the dependency on China or any other single country, and by diversifying the supplier base and repatriating part of the activity. In Germany, in a survey conducted among economists, 38% of the panel would favour a repatriation of the production of public health care-related goods, against 27% that would prefer maintaining the status quo (Blum 2020). Only 19% would recommend a further international diversification in this area.

The Covid-19 crisis is not the first crisis that has led to severe disruptions of global supply chains. Previous episodes include natural disasters such as the hurricane Katrina in the Southern States of the US in August 2005 and the tsunami and nuclear accident in Fukushima in March 2011. In addition, supply chain disruptions can be provoked by geopolitical events such as the US-China trade conflict and Brexit, although in these cases the disruptions are often not so abrupt as in pandemics and natural disasters. Supply disruptions can also been caused by cybersecurity attacks, but these disruptions are very short.

Intuitively, when uncertainty rises, enterprises might want to shorten the supply chains by repatriating activity (see Kilic and Marin 2020). However, as we noted above, this does not seem the case once we look at the sector level. Possible explanations are that supply changes take a long time to implement and the wide variety of possible disruptions makes it difficult to prepare for them. Finally, supply chains might be strengthened by diversification. By concentrating activity in a single country, repatriation is just the opposite what one should do to secure a supply chain.

The possibilities of repatriation are limited because of fierce international price competition that forces enterprises to keep production costs down. One cannot produce in Germany and pay German workers with Chinese wages. Increased robotisation could be part of the solution. However, Germany is already a leader in this area. In the German manufacturing industry, 309 robots are installed per 10 000 employees, compared with 189 in the US, 132 in France and

2 VMDA, 2. Blitzumfrage zum Coronavirus 2020, 25-27 March 2020.

79 in the UK[3]. Baldwin and Freeman (2020b) simply argue that supply chains are the way they are today for very good reasons. These include the costs of shipping and production, technological advancements in communication and transportation, labour market and environmental regulations and the coming down of trade barriers.

Moreover, it is questionable whether, relocation would have resulted in less supply chain disruptions during the Covid crisis. As it turned out, repatriation would not have been such a particular good idea, as the European economies locked down only a month after China.

Nevertheless, market failures do happen and in these cases policies should be developed to correct them. The Covid-19 crisis found many western countries scrambling to find the necessary medical supplies, such as respirators, personal protective equipment and drugs. Already before these events, some observers had raised concerns about the dominance of India and China in this area. In 2019, The US Food & Drug Administration raised the alarm about this situation in a report[4]. It attributed the shortage to a lack of financial incentives to produce less profitable drugs and recommended to better reward companies in order to achieve a greater reliability in production. The authors are pessimistic and fear that the impacts from drug shortages might have been underestimated. The Covid crisis may tilt the balance in favour of paying better prices for domestically produced drugs.

Raymond Van der Putten

raymond.vanderputten@bnpparibas.com

References

Baldwin Richard and Rebecca Freeman, 2020a, *The Covid concussion and supply-chain contagion*, Voxeu.org, 1 April 2020.

Baldwin Richard and Rebecca Freeman, 2020b, T*rade conflict in the age of Covid-19*, Voxeu.org, 22 May 2020.

Blum, J., M. Mosler, N. Potrafke and F. Ruthardt, 2020, *Bewertung der wirtschaftspolitischen Reaktionen auf die Coronakrise*, ifo Schnelldienst 73(4) 48-51.(in German).

Colliac, Stéphane, 2020, *European Union: Central Europe industrial future remains bright,* BNP Paribas EcoFlash 29 June 2020.

Kilic, Kemal and Dalia Marin, 2020, *How COVID-19 is transforming the world economy*, Voxeu.org, 10 May 2020

3 According to the 2017 World Robot Statistics, issued by the International Federation of Robotics (IFR).
4 FDA, 2019, Drug shortages: root causes and potential solutions.

William De Vijlder Chief Economist	+33 1 55 77 47 31	william.devijlder@bnpparibas.com

ADVANCED ECONOMIES AND STATISTICS

Jean-Luc Proutat Head – United States, United Kingdom	+33 1 58 16 73 32	jeanluc.proutat@bnpparibas.com
Hélène Baudchon France - Labour markets	+33 1 58 16 03 63	helene.baudchon@bnpparibas.com
Louis Boisset European Central Bank watch, Euro area global view, Japan	+33 1 57 43 02 91	louis.boisset@bnpparibas.com
Frédérique Cerisier Euro area (European gouvernance and public finances), Spain, Portugal	+33 1 43 16 95 52	frederique.cerisier@bnpparibas.com
Raymond Van Der Putten Germany, Netherlands, Austria, Switzerland – Energy, climate	+33 1 42 98 53 99	raymond.vanderputten@bnpparibas.com
Tarik Rharrab Statistics	+33 1 43 16 95 56	tarik.rharrab@bnpparibas.com

BANKING ECONOMICS

Laurent Quignon Head	+33 1 42 98 56 54	laurent.quignon@bnpparibas.com
Laure Baquero	+ 33 1 43 16 95 50	laure.baquero@bnpparibas.com
Céline Choulet	+33 1 43 16 95 54	celine.choulet@bnpparibas.com
Thomas Humblot	+ 33 1 40 14 30 77	thomas.humblot@bnpparibas.com

EMERGING ECONOMIES AND COUNTRY RISK

François Faure Head – Argentina	+33 1 42 98 79 82	francois.faure@bnpparibas.com
Christine Peltier Deputy Head – Greater China, Vietnam, South Africa	+33 1 42 98 56 27	christine.peltier@bnpparibas.com
Stéphane Alby Africa (French-speaking countries)	+33 1 42 98 02 04	stephane.alby@bnpparibas.com
Stéphane Colliac Turkey, Ukraine, Central European countries	+33 1 42 98 43 86	stephane.colliac@bnpparibas.com
Sara Confalonieri Africa (Portuguese & English-speaking countries)	+33 1 42 98 43 86	sara.confalonieri@bnpparibas.com
Pascal Devaux Middle East, Balkan countries	+33 1 43 16 95 51	pascal.devaux@bnpparibas.com
Hélène Drouot Korea, Thailand, Philippines, Mexico, Andean countries	+33 1 42 98 33 00	helene.drouot@bnpparibas.com
Salim Hammad Latin America	+33 1 42 98 74 26	salim.hammad@bnpparibas.com
Johanna Melka India, South Asia, Russia, CIS	+33 1 58 16 05 84	johanna.melka@bnpparibas.com

CONTACT MEDIA

Michel Bernardini	+33 1 42 98 05 71	michel.bernardini@bnpparibas.com

CONJONCTURE
Structural or in news flow, two issues analysed in depth

EMERGING
Analyses and forecasts for a selection of emerging economies

PERSPECTIVES
Analyses and forecasts for the main countries, emerging or developed

ECOFLASH
Data releases, major economic events. Our detailed views...

ECOWEEK
Weekly economic news and much more...

ECOTV
In this monthly web TV, our economists make sense of economic news

ECOTV WEEK
What is the main event this week? The answer is in your two minutes of economy

MACROWAVES
The economic podcasts

POUR RECEVOIR NOS PUBLICATIONS

SUBSCRIBE ON OUR WEBSITE
see the economic research's website

ET

FOLLOW US ON LINKEDINN
wsee the economic research's linkedin page

OU TWITTER
voir la page twitter des études économiques

Bulletin édité par les Etudes Economiques – BNP PARIBAS
Siège social : 16 boulevard des Italiens – 75009 PARIS / Tél : +33 (0) 1.42.98.12.34

Directeur de la publication : Jean Lemierre / Rédacteur en chef : William De Vijlder