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Lessons from the COVID-19 Situation: Rethinking Global Supply Chain Networks and Strengthening Supply Management in Public Procurement in Germany

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Abstract:

The COVID-19 crisis has identified several weaknesses and shortcomings of global supply chain networks. Due to the rapidly increasing demand of protective healthcare equipment, i.e. goggles, masks or equipment, it is visible that global supply chains have been significantly challenged. Furthermore, countries had to compete for available products, also leading to drastic price rises. The German government had to ask Multinational Companies (MNC) to procure healthcare equipment, as government procurement authorities were not experienced in dealing with global supply chains (Petersen, 2020). Moreover, even though machines for making masks and healthcare equipment are manufactured in Germany, there was no domestic supply. Under pressure to overcome the masks shortage in Germany, the government has promised state subsidies covering 30% of investment costs of companies venturing to launch fabric production. The funding will be capped at €10 million (\$10.9 million), but includes a purchase guarantee from the government. The situation displayed how fragile and disruptive global supply chains can be in crisis situations. Moreover, the case shows the dependency on imports from China and other countries for pharmaceuticals or medical equipment.

Keywords:

Public Procurement, Supply Chain Management (SCM), Procurement Strategy, Public Sourcing

COVID-19 Crisis and its Impacts on Supply Chain Management (SCM)

The Covid-19 crisis led to a lockdown in many countries. In Germany and other European states, the governments introduced severe lockdown and social distancing measures. The measures were accepted by the majority of people, even though there were concerns on constitutional rights. From Mid-May 2020 onwards, there are new regulations in Germany, as the numbers of infected people decreases and as the situation is slightly improving (Schuhmacher, 2020). As Germany has a federal structure, the reliefs are implemented in the states. The new regulations are as follows:

- A majority of Retailers will be allowed to open
- Schools will slowly re-open their doors
- Hair salons can resume business
- The ongoing rule that individuals may only meet with one person will be slowly relieved
- The rule keeping a minimum of 1.5 meters (5 feet) distance from others will be kept
- Bars, restaurants, day care centers, theaters, and cinemas will open slowly
- Religious gatherings are coming back with participants in small groups
- Protective masks are "strongly recommended" and mandatory in public transportation or supermarkets
- Strict controls at Germany's borders will stay in place for more days

Due to the rapidly increasing demand of healthcare equipment, i.e. goggles, masks or equipment, it is visible that global supply chains have been significantly disrupted. Furthermore, countries had to compete on products, affecting drastic price rises, too. The German government had to ask Multinational Companies (MNC) to purchase and procure healthcare equipment, as government procurement authorities were not experienced in dealing with global supply chains (Petersen, 2020). Moreover, even though machines for making masks and healthcare equipment are manufactured in Germany, there was no domestic supply. Under pressure to overcome the masks shortage in Germany, the government has promised state subsidies covering 30% of investment costs of companies venturing to launch fabric production. The funding will be capped at €10 million (\$10.9 million), but includes a purchase guarantee from the government. The situation displayed how fragile and disruptive global supply chains can be in crisis situations. Moreover, the case shows the dependency on imports from China and other countries for pharmaceuticals or medical equipment.

Global Supply Networks

Global Supply Networks or global Supply Chains are described as multi-layer, complex and international networks of manufacturers, intermediaries, service providers, warehouses and customers (Helmold & Terry, 2017). The growing interdependence of the world's economies, cultures, and populations, brought about by cross-border trade in goods and services, technology, and flows of investment, people, and information. Many industries like healthcare and other system-relevant industries are currently faced by fierce competition inside and outside Europe, mainly Asia and China. This is forcing manufacturing companies to concentrate on core competencies and to transfer the production of components, goods and services to external suppliers (Aberdeen Group, 2006). The number of value-adding activities has decreased over the last years constantly and now lies between 10 and 20 per cent in many industries (Helmold & Terry, 2017). Moreover, many activities have been shifted to Indian, Asian and Chinese manufacturers. Such a development has had a great influence on the structure of supply chains, strategic supply management and supplier relationships. Supply chains (the terms "supply chains" and "supply networks" are used synonymously in the literature) have become more complex and international, as pointed out by several authors. Christopher and Peck see the level of complexity increasing in the upstream supply chain management of manufacturing companies in several industries, a trend which is characterized by the growing transfer of activities to suppliers, high numbers of supply chain layers (tiers), and the ongoing

globalization of supply chains (Christopher & Peck, 2004). As a consequence, vulnerability and risk exposure have risen significantly. The rapid increase in supplier activities directly affects significant elements in supply (Helmold, 2020). In recent years, many companies have reduced their value-adding activities and implemented efficiency-oriented cost reductions, e.g. outsourcing, single sourcing, low-cost country sourcing, platform concepts, lean management, design-to-cost approaches (Gürtler & Spinler, 2010). SCM has become more important in core and peripheral business areas (Trkman & McCormack, 2009) and is aimed at building resilient supply chains (Christopher & Peck, 2004). Resilience is based on being able to anticipate, manage and prevent supply chain disruptions at an early stage. On the other hand, supply risks have risen due to increased dependency on supplier networks (Kersten et al., 2008). In their research “An Empirical Analysis of the Effect of Supply Chain Disruptions on Long-Run Stock Price”, Hendricks and Singhal (2005) found out that enterprises without operational slack and redundancies in their supply chains experience negative stock effects. The authors revealed the tremendous impact of supply chain disruptions on stock price performance and shareholder value. Supply disruptions can easily lead to high recovery cost, waste and sharp decreases in sales, as pointed out in the present study. External customers become dissatisfied and internal core functions (e.g. assembly) are disturbed. In most cases, supply disruptions have negative impacts on brand image, sales figures and the company's own financial situation (Tomlin, 2006). The wide-ranging effects of globalization are complex and often politically charged. As with major technological advances, globalization benefits society as a whole, while harming certain groups. Understanding the relative costs and benefits can pave the way for alleviating problems while sustaining the wider payoffs. Globalisation, coupled with the conventional KPIs that drive the behaviour of Procurement personnel, have led inevitably towards many instances of dependence on single, remote sources. This can work for stable businesses in stable times but can be a hindrance if the market is dynamic, and is disastrous in times of severe disruption such as that which we are experiencing now in the COVID-19 crisis.

The World is Very Reliant on China for Imports

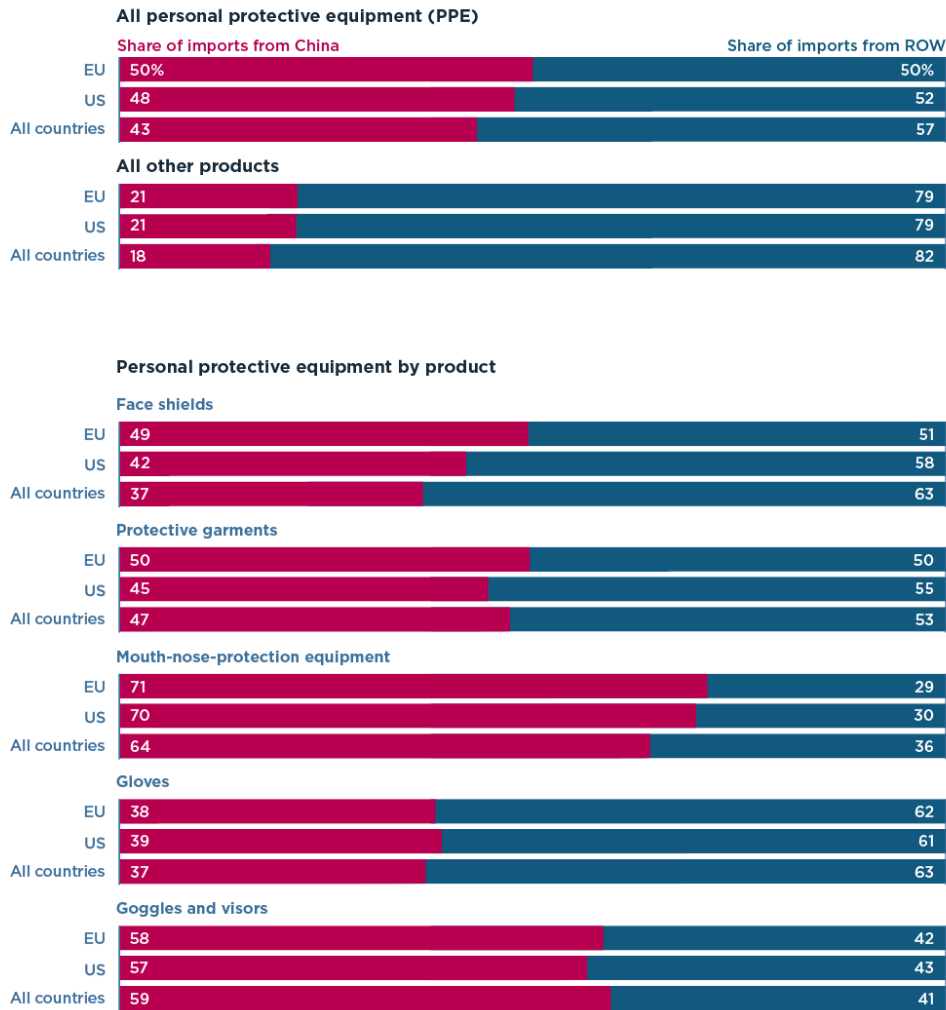
The entire world is currently very reliant on China for imports of personal protective and healthcare equipment. China provided according to the Peterson Institute for international Economics (PIIE) 43 percent of world imports of face shields, protective garments, mouth-nose-protection equipment, gloves, and goggles in 2018 (see figure 1). Many countries also produce these medical gears locally. But as a share of imports, China is a major player. China was the source of 50 percent of EU imports of these products from outside the bloc in 2018, including as high as 71 percent of EU imports of mouth-nose-protective equipment. Similarly, for the United States, China was the source of 48 percent of imports of PPE in 2018, providing 45 percent of US imports of protective garments. For the EU, the United States, and many other countries, imports of these critical supplies could have been disrupted if China's exports had shut down in early 2020 (PIIE, 2020).

Figure 1: Chart from the PIIE (2020)

Figure 1

Much of the world's imports of personal protective equipment come from China

Imports by product and source, 2018



ROW = rest of world; EU = European Union; US = United States

Note: ROW data for EU are extra-EU imports only. All other products are imports of all products, not only medical products.

Source: Constructed by the author from 6-digit Harmonized System import data, available from UN Comtrade accessed via World Integrated Trade Solutions, matched to personal protective equipment definitions from Commission Implementing Regulation (EU) 2020/402 of 14 March 2020 making the exportation of certain products subject to the production of an export authorization, *Official Journal of the European Union*, L 0771, 15 March 2020.

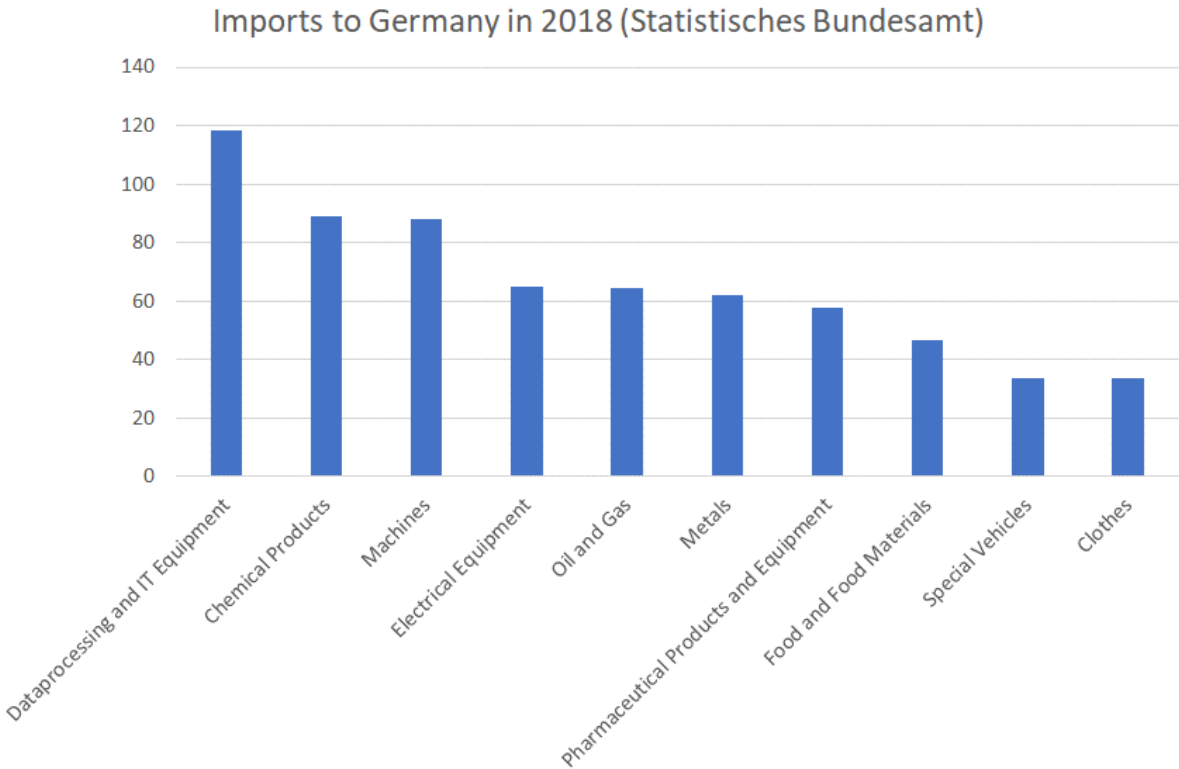
Source: PIIE (2020)

As the coronavirus spread globally in February and March, many countries feared their medical workers would suffer shortages of crucial equipment to treat the growing number of patients. With demand spiking in China, reports on conditions there stoked more concern, given how important it is as a global supplier of hospital gear. Take five pieces of personal protective equipment (PPE) critical to the fight against COVID-19.

Germany’s Dependency on Healthcare Products

The statistics in figure 2 show the 10 most important imported goods to Germany in 2018. In total, goods and goods worth around EUR 1.09 trillion were imported into Germany in 2018. The chart shows, that in 2018, pharmaceutical and medical equipment worth around 57.65 billion euros were imported to Germany.

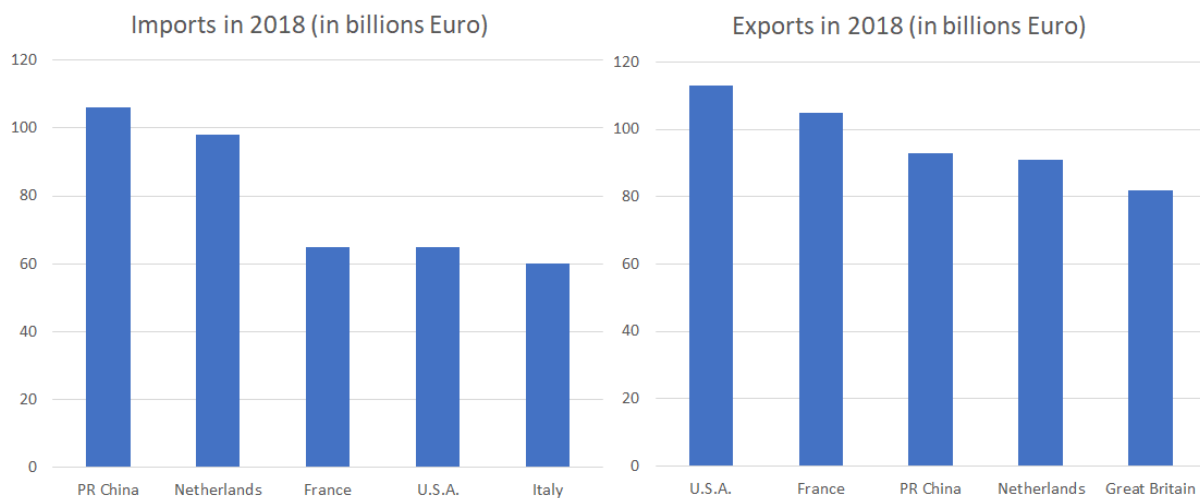
Figure 2: Imports to Germany in 2018



Source: own figure based on data from Statistisches Bundesamt

China is for Germany one of the most important trading partners as the figure 3 shows. Measured by total trade volume - i.e. exports plus imports - China has been Germany's most important trading partner for three years now. The total trade volume between the two countries reached around EUR 199.3 billion. In this ranking, the Netherlands is in second place with goods traffic of 189.4 billion euros, followed by the United States with a trade volume of 178.0 billion euros.

Figure 3: Germany's Imports and Exports



Source: Author, figures come from the Statistisches Bundesamt (2020)

Rethinking Systems-Relevant Supply Chains

However, the past situation on disruptive global supply chains has shown, that it is necessary to rethink supply strategies for specific commodities. Figure 4 illustrates, that supply for selected core and systems-relevant products should be secured via domestic, national supply (or in some cases European supply chains). It is also thinkable, that safety stocks (Germany has safety stocks for oil, FAZ 2020) can be built up to secure supply. Oil is stored as a reserve in Germany for 90 days, this is handled by the "Erdölbevorratungsverband" (English: Raw oil buffer stock association), which is a public government body in Hamburg. These commodities should consist of health care equipment or certain pharmaceutical products. Emphasis must be put on supply chain transparency and resilience, so that supply is always secured and a required ramp-up can be initiated within a few days. A steering committee from politics, society and economy should carefully select the commodities. The authors believe that the liberalisation of markets and free international trade are beneficial for economies and people, however, systems-relevant commodities or products must be considered in a different way to preserve the economy and society. Taking into account, that German companies often depend on exports, it is crucial to carefully elaborate on commodities, which fall under the core commodities in figure 4. Quantitative and qualitative criteria are needed for such selection. In relation to goods that do not rely on high capability Supply Chains, but nevertheless possess significant strategic importance, it is crucial to focus on building Strategic Suppliers while performing concise "Make or Buy" analysis. In the specific case of Germany, establishing European or even National Supply Networks observing constant Supply Management is essential to achieve resilient, strong Supply Chains (A-Category: Strategic – See Figure 4). Leverage and Non-Critical Items may equally benefit from European Sources, although in these cases constant benchmarking could enact a more far-reaching role in their Strategic Procurement. Moreover, legal elements need to be considered (Vergaberecht). However, the example of defence products or oil are also based on specific regulations, which allow or disallow certain things.

The scenario for securing strategic supply and for establishing resilient supply chains for systems-relevant products can be described as follows in 10 recommendations:

10 Recommendations for Public Procurement and SCM:

Striving for Organisational Excellence and professional Processes

1. Strengthening Public Procurement to Public Procurement 4.0
2. Simplification of Procurement Processes for systems-relevant Products
3. Qualification Initiative of Procurement Professionals in Public Procurement

Strategic Supply Management and strategic Commodity Management

4. Selection and Segmentation of system-relevant Commodities (e.g. Energy, Defence, Health Care, Telecommunications)
5. Pro-active Management of Suppliers and Supply Disruptions
6. Strategic Commodity and Supplier Segmentation for system-relevant and non-system relevant Products

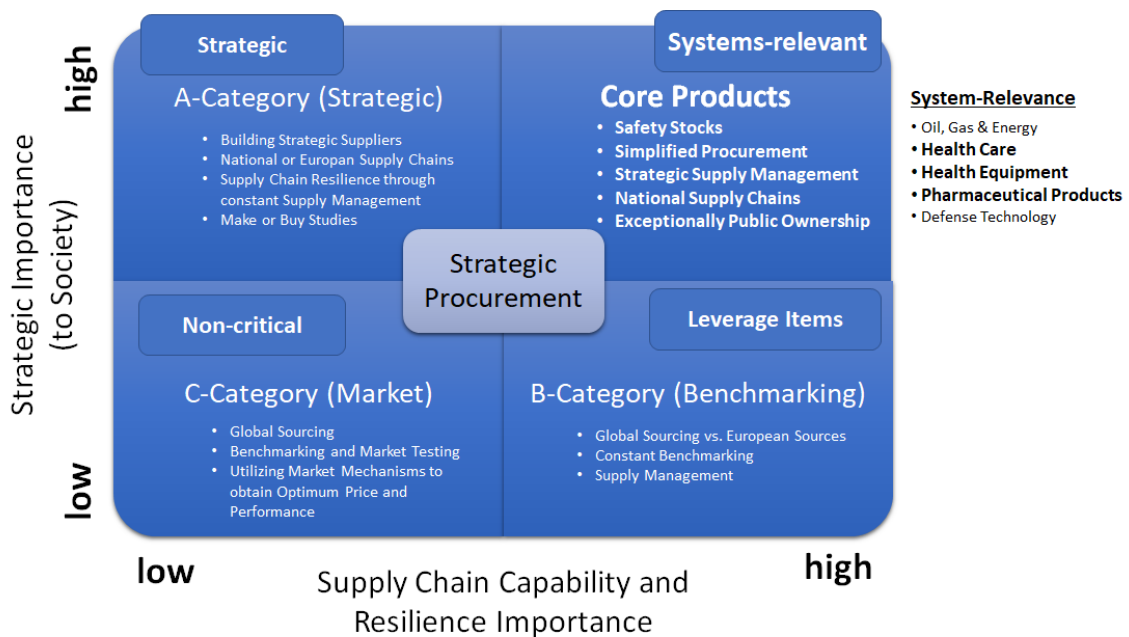
Supply Chain Resilience by using European- and Germany based Supply Networks

7. Government Contribution and Stake in systems-relevant Commodities
8. European and Germany-focused Supply Chain Networks (Make vs Buy vs Buy Globally)

Supply Chain Capacity Management and Supply Evaluation

9. Pro-active Capacity Management of critical Products including safety buffers and ramp-up scenarios
10. Supplier Evaluation and Supply Chain Network Evaluation including the end-to-end supply analysis

Figure 4: Supply Matrix for Core and other Products



Source: Authors

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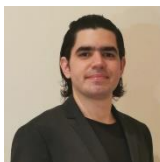
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