17.1 COVID-19 and Its Impacts on Global Trade

The Covid-19 crisis led to a lockdown in many countries on a global scale. 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 March 2020 onwards or earlier, there were severe regulations in Germany, as the numbers of infected people increased significantly (Schuhmacher, 2020). As Germany has a federal structure, the measures were implemented in the federal states. There were severe lockdown regulations like:

- Majority of Retailers had to lockdown their stores
- Schools were closed and changed to Home Schooling
- Distancing Rules were implemented in all areas of life
- Bars, restaurants, day care centres, theatres and cinemas had to close
- Airlines were forced to ground their aircrafts
- Religious gatherings were suspended temporarily
- Protective masks were “strongly recommended” and mandatory in public transportation or supermarkets
- Strict controls at Germany’s borders were put in place for several weeks

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 situation shows the dependency on imports from China and other countries for pharmaceuticals or medical equipment.

17.2 New Work: Qualification Excellence Initiative in Public Procurement

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% 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, Hohrath, & Winter, 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. Globalization, 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.

17.3 Dependency on China and Other Countries

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% of world imports of face shields, protective garments, mouth-nose-protection equipment, gloves and goggles in 2018 (see Fig. 17.1). 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% of EU imports of these products from outside the bloc in 2018, including as high as 71% of EU imports of mouth-nose-protective equipment. Similarly, for the USA, China was the source of 48% of imports of PPE in 2018, providing 45% of US imports of protective garments. For the EU, the USA 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).

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.

The statistics in Fig. 17.2 show the ten most important imported goods to Germany in 2018. In total, goods and goods worth around EUR 1.09 trillion were
Fig. 17.1 Dependency from China for healthcare products. (Source: Author’s Source. Data from PIIE (2020))
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.

China is for Germany one of the most important trading partners as the Fig. 17.3 shows. Measured by total trade volume—i.e. exports plus imports—China has been Germany’s most important trading partner for 3 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 USA with a trade volume of 178.0 billion euros.

**Fig. 17.2** Imports from Germany. (Source: Author’s Source)

**Fig. 17.3** Germany’s exports and imports. (Source: Author’s Source, Statistisches Bundesamt)
## 17.4 Rethinking and Redesigning 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 17.4 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 (Fehr, 2019). 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 liberalization 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 Fig. 17.4. Quantitative and qualitative criteria are needed for such selection. 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.

### Figure 17.4 Supply matrix for core and other products. (Source: Author’s Source)
17.5 New Work as Chance for Best-in-Class Public Procurement

The scenario for securing strategic supply and for establishing resilient supply chains for systems-relevant products can be described as follows in ten recommendations. Ten recommendations for Public Procurement and SCM can be listed as follows:

1. Striving for Organizational Excellence and Professional Processes
   - Strengthening Public Procurement to Public Procurement 4.0
   - Simplification of Procurement Processes for systems-relevant Products
   - Qualification Initiative of Procurement Professionals in Public Procurement

2. Strategic Supply Management and strategic Commodity Management

3. Selection and Segmentation of system-relevant Commodities (e.g. Energy, Defence, Health Care, Telecommunications)

4. Pro-active Management of Suppliers and Supply Disruptions

5. Strategic Commodity and Supplier Segmentation for system-relevant and non-system-relevant Products

6. 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)

9. Supply Chain Capacity Management and Supply Evaluation

10. Pro-active Capacity Management of critical Products including safety buffers and ramp-up scenarios

11. Supplier Evaluation and Supply Chain Network Evaluation including the end-to-end supply analysis

17.6 Case Study: Deutsche Bahn Excellence Programme in Procurement

The Deutsche Bahn (DB) received the award for its innovative, holistic change concept in corporate purchasing. With this “program for excellence” the development from a simple processor of procurement orders to a sought-after business partner with clear responsibility for costs and results succeeded. This systematic program was set up in 2007 and its major parts were completed in spring 2012. As part of the “Excellence Program”, it was necessary to develop essential instruments and methods in corporate purchasing and to link them with innovative approaches. This includes consistent supplier management and a reduction in the number of creditors while increasing the quality of the master data. The program also includes regular analyses of benchmarks for costs and the preparation of price forecasts for the group. Group-wide rules were also introduced to map savings with IT support in procurement. The application of auctions and game theories in specific awards is
also part of the package of measures, as is the introduction of formalized quality milestones in all relevant product groups. Career paths and a qualification program have been set up for around 900 employees. The overall concept has improved the quality and reliability of the rail system. For example, the significantly increased material availability significantly shortens the times for maintenance visits. The result effect of the program is more than 100 million EURO. Corporate Purchasing has formulated further development steps for the periods up to 2016 and 2020 (BME, 2013) (Fig. 17.5).

Fig. 17.5 General managers Mr. Lin and Dr. Marc Helmold

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