Inzinerine Ekonomika-Engineering Economics, **2023, 34(2), 230–239**

The Quest for Regionalization of Global Value Chains in a Pandemic Global Business Environment

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https://doi.org/10.5755/j01.ee.34.2.31640

Covid - 19 has affected global value chains (GVCs) and firms' behaviours within GVCs to a large extent. Firms need to find flexible solutions to stabilize production and rethink value chain governance and supplier relationships. Thus, GVCs recover from the initial shock, and the GVCs reconfiguration becomes essential for managers. We reviewed recent literature focusing on the GVCs, the role of governance and Covid – 19 effects on it as well as the regionalization trend. Thus, this study aims to give empirical evidence on the reconfiguration of GVCs, particularly the changes in the structure of suppliers in the global apparel industry, by using the Bloomberg Supply Chain Analysis tool in the period of 2017–2021. We analysed the structural changes in selected leading apparel multinational companies' GVCs - Industria de Diseno Textil, S.A. (Inditex), Hennes & Mauritz AB (H & M) and adidas AG. The findings provide insights on the current state of the theoretically discussed and widely expected regionalization trend in GVCs. The study concludes that two out of three cases provide evidence indicating an ongoing trend toward GVCs regionalization. The contribution of this study consists of empirical evidence of the changes in GVCs supplier structure in the apparel industry in response to pandemic global business environment. Practical implications and recommendations for businesses and policy makers are related to the revealed theories and testable models by using Bloomberg's Supply Chain Analysis data and linking causes and effects of the GVCs regionalization processes.

Keywords: *Global Value Chain; Governance; Regionalization; Apparel Industry.*

Introduction

Many firms around the globe have reported different disruptions in their global value chains (GVCs) during the Covid – 19 pandemic. Due to lockdowns implemented by governments, both domestic and international supply chains have been affected (OECD, 2020). Covid-19 pandemic has reinforced the trend toward reconfiguration of the GVCs. According to Gandoy and Diaz-Mora (2020), reconfigured GVCs are organized for cooperation among geographically close economies and businesses. McKinsey Global Institute (McKinsey, 2020) emphasized that the lead companies in their GVCs and relations chains will foster long-term collaborative relationships with suppliers and other actors in their network on a regional level. According to Pla - Barber *et al*. (2021), regionalization of the GVCs would impacts the governance systems in the GVCs as well as the types of upgrading trajectories.

There are already many studies on GVCs and their governance types (Gereffi *et al.,* 2005; Buckley & Strange, 2015; Kano, 2018; Kano *et al.,* 2020); geographic scope of GVCs (Rugman & Verbeke, 2004; Rugman *et al*., 2009; Mudambi & Puck, 2016); changes of the relations between countries in GVCs by using trade data (Nacewska – Twardowska, 2020) and upgrading trajectories of the firms involved (De Marchi *et al*., 2013; Lema *et al*., 2015). However, the Covid 19 pandemic raised new challenges and opened a new window for scientific discussion on responses to Covid 19 pandemic and GVCs reconfiguration and resilience. Other perspectives and empirical research are needed, as in recent works governance of GVCs after the Covid-19 pandemic is analysed from theoretical/conceptual perspectives (Pla – Barber *et al.,* 2021; Elia *et al.,* 2021), the literature does not offer clear and comprehensive empirical evidence.

In this research we will focus on the apparel industry. There are few recent studies based on case analysis; rather the available studies have a specific focus on one particular country. Mostafiz *et al*., (2022) analysed Covid-19 and the GVCs with a spotlight on immediate dynamics and long – term restructuring in seven cases of Bangladeshi garment manufacturers. Based on four cases (two from the USA, and two from China) Zhao and Kim (2021) developed a framework explaining the connections among diverse value chain segments that have been affected due to Covid – 19 crisis. However, these studies have not focused on the effects of GVCs reconfiguration after Covid-19 pandemic, thus we will enrich the recent empirical studies on the topic of GVCs by analysing the selected European-originated global leaders in the apparel industry, the changes in their GVCs and in their collaborative supply chains, which are defined by close interactions among the lead firm an its key suppliers.

Thus, we formulate the following research question: Did the global business environment during pandemic encourage GVCs to regionalize by increasing numbers of local or home macro-region suppliers?

This study aims to give empirical evidence on the changes in suppliers' structure in the global apparel industry GVCs by using the Bloomberg Supply Chain

Analysis function data between 2017 and 2021. We analysed the structural changes in the selected leading apparel multinational companies GVCs – Inditex, H&M and adidas.

The study contributes to GVCs literature, particularly by the attempt to provide empirical evidence of the changes in GVCs supplier structure in the apparel industry. In this sense, it reflects Hernández's and Pedersen's (2017) future research call. According to the authors, apparel's firm has to reconfigure the way it operates in the global value chain, taking into account the location decision and the geographical scope of the value chain. Governance, coordination and location decisions are closely related to the dynamics that may emerge over time. Thus, more theoretical and empirical research needed that "scrutinizes how the firms change their GVCs configurations including the aspects determining these changes" (Hernandez & Pedersen, 2017, p. 147). Moreover, our research is in line with Pla – Barber *et al.* (2021) research, in which the authors emphasized the question, how Covid-19 pandemic affects GVC's reconfiguration by driving a trend toward more regional footprint in sectors, in which resilience and reliability are critical aspects.

This paper is organized as follows. The first part of the paper aims to define GVCs, their governance and the need for GVCs reconfiguration seeking to answer to Covid-19 challenges. The second part is dedicated to the methodology by using Bloomberg Supply Chain Analysis (SPLC <GO>) tool. The third part of the paper provides the findings by analysing the geographical structure of selected leading companies GVCs. The extent of regionalization in global value chains is measured by comparing pre-pandemic years –2017 and 2019 with a -pandemic year – 2021. Finally, a discussion and conclusions are provided covering outcomes of empirical research as well as the relevance of the Bloomberg's Supply Chain analysis data in the international business research.

Literature Review

Global Value Chains and their Governance in Response to External "Shocks"

GVCs are defined as full range of the activities that firms perform to bring the product from it conception to end – use in a global scale (Gerreffi & Fernandez – Stark, 2011). GVCs also are called as globally dispersed networks that are formed by various firms with distinct objectives (Buckley & Ghauri, 2004), and orchestrated by multinational companies (MNCs). These networks have no legal identity and are led and orchestrated by a firm, that controls critical assets, intermediate products and knowledge (Pla – Barber *et al.,* 2021) and are related to costs, capability creation and economizing features (Kano, 2018).

In the global economy, GVCs are of great need, leading to increased international trade, a growing global GDP and employment (Gereffi & Fernandez - Stark, 2011). The evolution of GVCs in different industries, such as trade, textile and clothing, tourism, electronics, business outsourcing, has implications in terms of the growth of global trade, production, employment and integration of firms and workers into the global economy. For lower income economies the ability of their firms effectively integrate into GVCs is crucial condition for development of such economies. On the other hand, it is important not only to successfully integrate companies into GVCs, but also to take as many benefits as possible from it.

According to Kano *et al*. (2020), the arrangements and relationships between actors in GVCs change over time and are not static because of macro – environmental changes and changes in particular industries. Thus, governance of the value chains became very important during last years. Governance of the GVC refers to the "power relationships and authority that determine how the material, financial and human resources are allocated and frow within value chain" (Gereffi & Korzeniewicz, 1994, p. 97). The governance of the GVC's is defined as the process by which particular actors in the value chain exert control over other participants. At the same time how these actors – lead firms distribute the value that is created along the chain (Bair, 2009).

Seeking to theorize the inter-firms' relations and explain governance of the GVC, Gereffi *et al.,* (2005) used three supply chain variables that are important for GVC restructuring: complexity of the transactions, codifiability of the transactions and capabilities within the supply base. The lead company (MNC) often has the power of force and decisions (namely, because of having contractual agreements), which allows the value chain to be reconstructed. The companies managing the GVCs are the main decision - makers on value chain management (Locanto, 2010), and this enables them to lead and orchestrate GVCs to constantly upgrade their global competitiveness (Enderwick, 2018). Thus, governance models in the same industry may vary depending on individual value chain lead companies, their adopted strategies in reconfiguring their partners' network. The form of governance may change not only because of the nature and capacity of the transactions in the supply chain and lead company's network's reconfiguration decisions, but also because the industry might evolve and mature (Dolan & Humphrey, 2004), as the result the trajectories of the value capture and development's outcomes in a various industries, regions and countries might change, or due to economic crises, external shocks or other disruptions.

It should be stated that the role of disruptions in GVC governance and GVC restructuring is underexplored (Mostafiz *et al*., 2022). As well as the role of global "shocks". Disruptions in GVCs might be defined as natural disasters, delays in transportation, factory strikes, terrorism, and other strategic and operational issues (Chapman *et al.,* 2002). Global "shocks" without comparable prior since World War II have been defined as a "black swans", and such an example is Covid-19 pandemic. Global shocks affected GVCs and disrupted them differently. From the companies' viewpoint, in the face of crisis and other disruption, most firms have put their efforts on internal processes and their revision to cope with the unprecedented situation (McKinsey, 2020). According to Mostafiz *et al*. (2022) the scholars, analysing GVCs disruptions focused on GVC resilience to global shocks and other disruptions.

There are already some recent studies on GVCs resilience, with emphasis on the necessity to flexible use

suppliers from the domestic market and develop national and regional value chains, and integrate GVCs activities seeking to achieve the goals (Tang, 2006; Song *et al*., 2021), sustain the current network of the external relationships in the supply chain, create relational continuity (Colm & Ordanini, 2021), have a stock buffer and back – up sources (Vanpoucke & Ellis, 2019), to share the risk with external partners within the supply chain and its influences on resilient capabilities to cope with disruptions outbreak (Manuj & Mentzer, 2008; El Baz & Ruel, 2020). Maintenance of vertical relationships, which influences company's decisions and scope of actions, becomes challenging not only during disruption but also during the recovery phase (Colm & Ordanini, 2021). Thus, the question of how the disruption impacts long-term evolution and governance of GVCs remains scarcely analysed yet and needs more empirical contextual analysis.

Covid-19 Pandemic and Effects on GVCs Governance

Covid-19 pandemic has been considered as a "global shock" and caused major GVCs disruptions. The pandemic affected the global economy, especially the largest economies of the world. According to Gereffi (2020), national governments have struggled to respond to the global pandemic by adopting measures that have limited the growth of global trade, as well as productions. This has led to an increase in unemployment and to the increase in the debts as a result of the implementation of stimulus packages to support economies.

Companies tried to adopt strategies seeking to recover GVCs and achieve resilience, flexibility, responsiveness and sustainable operations. Especially suffered firms that global supply chains from manufacturing industries were dependent on China as a partner on global business operations (Belhadi *et al.,* 2020). However, it can be stated that due to Covid - 19 pandemic many supply chains around the globe have faced significant disruptions in vertical upstream and downstream activities, affecting both supply and demand, and making it imperative to study managing strategies in supply chain operations and policy making decisions (Nikolopoulos *et al.,* 2020). Thus, designing strategies and tactics for resilient GVCs to the global Covid 19 pandemic has become an actual topic for scholars to study.

According to Elia *et al.* (2021), Covid-19 pandemic is expected to cause the changes in GVCs governance, the need to rethink GVC paradigm and reconfiguration of GVCs based on four alternative trajectories: reshoring, regionalization, replication and diversification. These trajectories are described in the latest World Investment Report (UNCTAD, 2020), with more emphasison two of them, as most expected: regionalization and reshoring, which indicate the shortening GVCs and relocation of manufacturing activities. It is in line with Barbieri *et al.* (2019) study in which authors discuss: a) relocation of the international firms into their home country by describing a back – shoring scenario, which corresponds to the reshoring; and b) relocation into the home macro – region, by describing a near – shoring scenario, which corresponds to the regionalization. The idea of regionalization is supported by Pla-Barber *et al.* (2021) in their latest conceptual research. The authors discussed how a pandemic might affect GVCs configuration by turning toward more regional footprint, specifically in industries in which reliability and resilience are vital factors for the recovery after Covid-19 crisis. From the perspective of scholars, Covid-19 crisis has reinforced the trajectory toward GVCs reconfiguration seeking to reduce financial and economic risks by making GVCs more local or regional. Accordingly, by reducing the number of linkages with other firms and by trading off productive efficiency by enhancing supply chain security (Shih, 2020). Pla-Barber *et al.* (2021) emphasized the need for all actors within GVCs to endorse the costs, related to the creation of new infrastructure and technologies, and to find the new reliable suppliers.

The shift to regionalization is unlikely to occur immediately. According to UNCTAD (2020) stronger tendency toward regionalization and reconfiguration of GVCs will appear in some industries, and value chains will regionalize with different intensities and different extent. Economic factors leading to the development of specific industries' supply chains may still affect the geography of production. Such competitive factors as cost and scale economies will influence the need for a more global reconfiguration of GVCs and the need for efficient way of governance (Pla-Barber *et al.,* 2021).

Geographic Location in the GVCs Reconfiguration

GVCs might operate at different – local, national regional and global – geographic scales. Thus supply chain's activities are globally dispersed in terms of geographic scope and proximity. Countries are involved in different industries by leveraging their assets of competitive advantage in a global economy (Gereffi & Fernandez – Stark, 2011). The geographical analysis of the value chain is based on the identification of the lead firm and distribution of its activities globally or regionally. In most cases, emerging or developing countries can offer lower labour costs and raw materials, while developed countries can offer R&D activities, product design, knowledge, highly educated talents, institutional quality and developed infrastructure. For instance, Almeida and Kogut (1999) emphasized that the localization of a particular knowledge (in their research – engineering) is specific to certain regions (particularly Silicon Valley, USA). The degree of density – the use of knowledge created by others in the same region – varies across regions. According to Buckley and Tian (2017) if the GVC is technology-based, then control of the GVC is most likely to be in the hands of the lead company (MNC) which is a technology and/or market leader, which is usually located in the developed countries and globally orchestrate GVCs activities.

Geographical location and GVCs scope analysis is one of the most common research topics under consideration, which aims to assess the geographical dispersion of investigated GVCs, also to assess the scope of these value chains, their level of globality or regionality and the distribution of activities across regions (Rugman & Verbeke, 2004). Location decisions address the geographic configuration of the GVCs, where and how activities within the value chain should be located and distributed to maximize the value captured through the GVC.

It should be noted that most of the studies analysing location and GVCs emphasized GVCs effects on specific location and regional development. A study conducted by Kano *et al.* (2020) emphasizes that the following topics of GVC mapping predominate in the studies: localization of business activities, regional versus global governance, emerging versus developed markets and clusters and local linkages within GVC.

Summarizing, there is a need to estimate systematically the geographic localization of GVCs activities, as well as the geographic scope of economic activity as global versus regional. Firm-level GVC mapping by linking locations with "detailed data on inputs, outputs, flows of services and skills, employment, revenue, and value creation and capture" is an appropriate way to accomplish such goals (Kano *et al.,* 2020, p. 611). It might help managers to evaluate the effectiveness of local, regional and global governance.

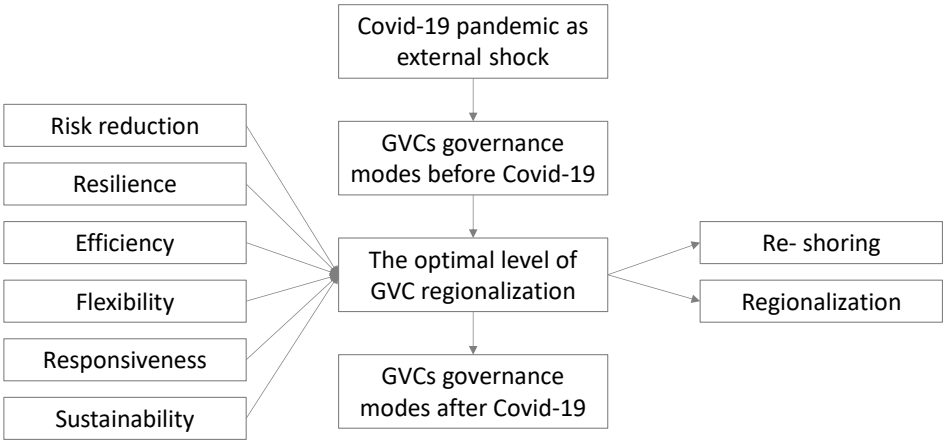

Figure 1. The Conceptually Defined Context behind the Expected Regionalization of GVCs

Source: made by the authors based on the literature review

The review of previous research suggests that a range of business performance-related motivations should call for attempts to optimize the value chain structure dealing between global and regional supplies, which then should result in noticeable regionalization in a pandemic global business environment. Further, this proposition is explored empirically, considering supply chain data of selected apparel sector companies.

Methodology

The research aims to provide empirical evidence on the back shoring, re-shoring, regionalization and other trends that are expected to be observed due to the Covid-19 pandemic effects on GVCs. The research does not consider differences among different forms and types of the process. The only indicator of increased regionalization here is the increased number of suppliers from the lead company's home country or home region.

This research also extends business research methodological perspectives and discusses the availability of empirical data in international business and GVCs research and studies. Bloomberg Profesional Services Supply Chain Analysis (SPLC <GO> function)[1] data is used. Various data sources, including companies' reports, media news, and others are used by Bloomberg to estimate the buyer-supplier relationships among companies. These relationships represent GVCs governed by selected focal companies.

This research responds to the calls to utilize Bloomberg's data not only in financial markets research but also in management, strategy, competitiveness, and international business studies (Beorchia, Crook, 2020). Supply chain analysis data is one of the areas with the potential to extend Bloomberg Professional Services for the research.

Supply chain data provided by the Bloomberg Profesional Services links companies by specifying the kind of relationship. Lists of suppliers and customers are provided for the selected focal company. All identified relationships are assigned to a particular time. Each listed relationship is linked to the data source, where data on this relationship was obtained.

The identification of the companies is based on their equities listed on the particular stock exchange. The availability of the public data determines that only the small part of relationships is quantified, providing actual yearly relationship values, per cent of revenues and costs exposed to the focal and partner companies. The type of quantified relationships also is specified by the COGS (Cost of Goods Sold), SG&A (Selling, General and Administrative expenses), CAPEX (Capital Expenditures) cost categories.

The analysis of the geographical spread and scope of the GVCs is based on the domicile country of the company. To some extent, the domicile country of supplying or buying company is indicated by Bloomberg's SPLC <GO> function, but there are many suppliers whose domicile country is not identified. However, for most (but not all) companies this information is available in the detailed description of the company (through Bloomberg's DES <GO> function).

[1] https://www.bloomberg.com/professional/dataset/global-supply-chain-data/

To track the geographical structure changes of GVCs and explore widely theorised Covid-19 effects, lists of selected focal company suppliers were analysed. Lists of supplying and buying companies were obtained by Bloomberg's SPLC <GO> function. Then grouping by country was applied. Count of companies by their domicile country was done. Companies whose domicile country was not identified were checked one by one through detailed security descriptions (by DES <GO>). Total count numbers of focal companies' home country and the home region, as well as global suppliers, were analysed. The workflow of the data collection and research process is represented in Figure 2. The data were collected in January of 2022.

2017, 2019 and 2021 year data counting supply chain relationships for the respective year 31 of December were taken to illustrate a pre-pandemic trend in the development and possible pandemic effect on the certain company – GVC leader – value chain.

The proposition of the empirical research is based on the outcomes of theoretical analysis which state that the expected effect on GVCs of the Covid-19 pandemic is the tendency to re-shore GVCs, regionalize suppliers base, to reshape the geographical scope of GVCs.

The above-defined research design has some limitations worth considering. Although data collection and overall research is based on the simple counting of companies according to their domicile country, it would be difficult to replicate the research to obtain the same results and thus prove them. The reason that the data is not stable, it is dynamic and constantly updated by counting and adding any new suppliers if and when any new unstructured evidence on the relationship is observed. It could be expected that the recent data are affected more significantly. However, actual data fluctuation, though might be observed, is not critical; the number of suppliers could change in several units over a year. Another related issue is that there is no verification that all actual relationships are disclosed and counted. Nevertheless, it is one of the data sources that could be employed to provide empirical evidence on the discussed research question.

Figure 2. Outline of Steps made in Bloomberg Terminal to Obtain Count Numbers of Suppliers According to their Geographical Representativeness

Source: made by the authors'

Findings

To explore empirically the above-discussed theoretical propositions, three companies were selected. Industria de Diseno Textil, S.A. (Inditex in further text) is the fashion retailer, based in Spain. In Spain and Europe, its stores are almost all owned stores, while in the Americas and the Rest of the World it has a larger concentration of franchises. Europe (excluding Spain) is host to over 45 % of Inditex's total store count, while Spain accounts for around 20 %. Asia and other also has about 20 %, and the Americas hosts the remainder[2].

Hennes & Mauritz AB (further abbreviated as H&M), based in Sweden, designs and retails fashions for women, men, teens, and children. The Company provides modern and classic garments in addition to jewellery, bags, scarves, cosmetics and other accessories. H&M owns and operates stores in European countries and the United States[3].

The adidas AG production covers sports shoes and sports equipment categories. The Company produces footwear, sports apparel, and balls. adidas sells its products worldwide. Based in Bavaria, Germany, it sells adidas and Reebok-branded clothing through 2,500 stores worldwide. Its e-commerce operation reaches customers in over 50 countries worldwide. adidas outsources nearly all its manufacturing. Over 130 independent manufacturing partners are producing in 277 manufacturing facilities. The majority (roughly 70 %) of its independent manufacturing partners are located in Asia[4].

These companies represent the European apparel industry, where GVCs in business operations are widely spread.

The total count number of Inditex suppliers identified by Bloomberg changed from 223 as of the end of the year 2017 to 410 and 421 as of the end of the year 2019 and 2021 respectively. The domicile country was not detected for 4, 33 and 35 companies in 2017, 2019 and 2021 year data. The numbers of identified customers did not exceed 10. The further analysis of the Inditex and other case value chains will focus only on the upstream part, i.e. the number and geographical structure of suppliers.

The percentage shares of count numbers of the home country (Spain), Home region (Europe) and global Inditex suppliers did not change noticeably in the pre-pandemic year 2017 to 2019 and pandemic 2021 year (Table 1). The total number and respective share of home country and home region suppliers slightly increased in 2021, but this change could not be considered as convincing evidence of the ongoing restructuring of the GVC governed by Inditex.

[2]Bloomberg Profesional Services terminal. 'DES INDITEX Equity' function data.

[3]Bloomberg Profesional Services terminal. 'DES HENNES & MAURITZ AB-B SHS Equity' function data.

[4]Bloomberg Profesional Services terminal. 'DES ADIDAS AG Equity' function data.

The count number of global suppliers did not decrease and the share of suppliers representing countries outside the home region remained almost the same (Table 1).

It could be that expected post-pandemic effects will be observed later. On the other hand, theoretical research-based hypotheses about coming restructuring and turning to home country and home region suppliers in global value chains could require rethinking and wider empirical testing.

The total count number of H&M suppliers identified by Bloomberg changed from 377 as of the end of the year 2017 to 409 and 155 as of the end of the year 2019 and 2021 respectively (Table 2).

Even this limited data still indicates that the group of global suppliers (compared to home country and home region) dominated in 2021. Though data on major Asian supplying countries (China, Hong Kong, India, Turkey) is missing, global suppliers still count for more than 60 % of the total number of H&M suppliers as of the year 2021. It is seen, that the count number of global suppliers has dropped significantly; the count number of global suppliers decreased three times. Assuming, that Bloomberg-provided data is reliable and represents an actual (or at least near to actual) number of H&M suppliers, it may be concluded that the case of H&M supports the theoretical proposition, anticipating the coming regionalization of current GVCs. Such a conclusion still is preliminary and should be confirmed on the bases of the data from other sources, or proved by the company's representatives.

H&M itself provides a wider list of suppliers on its website (https://hmgroup.com/sustainability/leading-the-change/transparency/supply-chain/#supplierListContainer), but there is no indication of the dates of collaboration with listed suppliers. This makes this data not appropriate for consideration and respective comparison with the above-cited Bloomberg terminal data.

The total count number of adidas suppliers identified by Bloomberg changed from 478 as of the end of the year 2017 to 458 and 347 as of the end of the year 2019 and 2021 respectively. The domicile country was not detected for 43, 49 and 32 companies in 2017, 2019 and 2021 year data. The numbers of identified customers are not considered to maintain the comparability with previously analysed cases and the overall integrity of the analysis. The further analysis of the adidas value chain also will focus only on the upstream part.

The shares of count numbers of the home country (Germany), Home region (Europe) and global adidas suppliers did not change noticeably in the pre-pandemic year 2017 to 2019, but slight restructuring is observed in pandemic 2021 year (Table 3).

Table 1

Count Number of Inditex Suppliers (data source: Bloomberg's SPLC <GO> function)

	Count number			**Per cent in the region and overall totals**		
	2017	**2019**	**2021**	**2017**	**2019**	**2021**
Spain (home country)	15	18	19	6.85	4.77	4.92
Europe (home region)	42	82	87	19.18	21.75	22.54
France	3	5	10	7.14	6.10	11.49
Germany	5	8	7	11.90	9.76	8.05
Italy	9	29	30	21.43	35.37	34.48
Portugal	19	28	21	45.24	34.15	24.14
Global	162	277	280	73.97	73.47	72.54
Bangladesh	10	14	12	6.17	5.05	4.29
China	27	76	70	16.67	27.44	25.00
India	30	37	38	18.52	13.36	13.57
Turkey	64	105	93	39.51	37.91	33.21
United States	10	10	12	6.17	3.61	4.29
Total	**219**	**377**	**386**			

Source: authors' calculations based on the methodology

Table 2

Count number of H&M suppliers (data source: Bloomberg's SPLC <GO> function)

	Count number			**Per cent in the region and overall totals**		
	2017	**2019**	**2021**	**2017**	**2019**	**2021**
Sweden (home country)	8	8	7	2.12	1.96	4.52
Europe (home region)	74	87	52	19.63	21.27	33.55
France	5	9	12	6.76	10.34	23.08
Italy	25	30	1	33.78	34.48	1.92
Portugal	12	12	1	16.22	13.79	1.92
United Kingdom	13	15	8	17.57	17.24	15.38
Global	295	314	96	78.25	76.77	61.94
China	68	50	8	23.05	15.92	8.33
Hong Kong	38	44	1	12.88	14.01	1.04
India	39	45	12	13.22	14.33	12.50
Turkey	57	66	0	19.32	21.02	0.00
Total	**377**	**409**	**155**			

Source: authors' calculations based on the methodology

Table 3

Count number of Adidas suppliers (*data source: Bloomberg's SPLC <GO> function*)

	Count number			Per cent in the region and overall totals		
	2017	**2019**	**2021**	**2017**	**2019**	**2021**
Germany (home country)	25	22	14	5.23	4.80	4.03
Europe (home region)	67	58	57	14.02	12.66	16.43
France	8	10	10	11.94	17.24	17.54
Italy	15	12	13	22.39	20.69	22.81
Portugal	5	5	5	7.46	8.62	8.77
United Kingdom	22	18	12	32.84	31.03	21.05
Global	386	378	276	80.75	82.53	79.54
China	59	56	37	15.28	14.81	13.41
Japan	34	33	19	8.81	8.73	6.88
South Korea	33	37	24	8.55	9.79	8.70
Taiwan	27	39	36	6.99	10.32	13.04
United States	111	96	47	28.76	25.40	17.03
Total	**478**	**458**	**347**			

Source: authors' calculations based on the methodology

The shares of the home country and global suppliers slightly decreased in 2021. Respectively, the share of the home region (i.e., Europe) countries-based suppliers increased (Table 3). Attention here also should be paid to the fact that the total number of suppliers decreased in 2021. This could be caused by data incompleteness. However, the most noticeably decreased the number of global suppliers. As in the case of the above-considered H&M, here we also may say that this decrease is caused by ongoing GVC regionalization. The case of adidas also provides empirical evidence on the possible GVCs regionalization and back shoring to the home region.

In summary, two out of three cases provide evidence indicating an early trend toward GVCs regionalization.

Conclusions and Discussion

The review of data on the count numbers of suppliers of three selected European manufacturers and distributors of apparel serves as a background for several conclusions:

1. The changes in the suppliers' structure by their domicile country in 2021 compared to 2017–2019 year period are noticed. The most significant change is in the number of global suppliers. H&M and adidas cases indicate a drop in the count number of global suppliers by one-third of the pre-pandemic number.

2. The 1.5 years of pandemic global environment impacted GVCs in the apparel industry. The regionalization of GVCs has already started; its intensity in the apparel industry varies company by company.

3. The analysis of count numbers of selected apparel industry companies' suppliers provides empirical evidence and proves the theoretically proposed regionalization of GVCs in a pandemic global business environment.

Looking back to the conceptually defined context behind the expected regionalization of GVCs, it is proved that companies try to optimize their GVCs. As it was also confirmed in Pla-Barber *et al.* (2021) study. The motivation for this optimization may vary covering theoretically defined factors, such as risk reduction, resilience, efficiency, flexibility, responsiveness and sustainability. This was also confirmed in our literature review, with reference to empirical studies of El Baz & Ruel (2020), Belhadi *et al.* (2020) and Song *et al.* (2021). The expected results which are defined as GVCs regionalization as a result of apparel industry's GVCs restructurization were also observed empirically in Mostafiz *et al.* (2022) work. Moreover, Nacewska-Twardowska (2020) emphasized that despite the trade and production interdependencies between different countries, most trade connections exist in regional supply hubs. These conclusions should be considered and generalized taking into account the background of empirical data. Data limitations and shortages which occurred due to the very short time between the observed events and accessibility of structured data which provide evidence of these events might cause biases in the above-stated conclusions.

It is expected that the increased availability of additional data should improve the empirical background for conclusions. However, even this early attempt to provide empirical evidence on theoretically widely discussed trends is significant and relevant to enrich the scientific discussion by adding the empirically reasoned point of view.

The results of the study also confirm that trends in GVCs reshoring and regionalization are not sudden and absolute. A longer time, possibly, is needed to restructure established relationships, to reconfigure the GVCs. The turn to the GVC regionalization also is subject to any certain company's own strategic decisions. Inditex, for example, remains in a pre-pandemic state of its GVC, while H&M and adidas already moved back to a shorter and regional instead of the global value chains.

This research serves as a background for future research directions. To provide reliable and generalizable empirical evidence-based conclusions, it would be relevant to expand the research to other industries, including but not limited to automotive, high-tech, and electronics. The comparison of the intensity and shape of regionalization processes in different industries would provide new ideas about factors that accelerate and slow down the ongoing GVCs reconfiguration.

It is already proved that the level of innovation intensity, product differentiation or customization (UNCTAD,

2020) are among the factors that will shape future trends of GVCs development and regionalization-globalization balance. Revealed theories and testable models linking causes and effects of the GVCs regionalization processes would be useful for businesses, governments and other stakeholders supporting the process of insightful strategic planning.

The opportunities to apply Bloomberg Professional Services Supply Chain Analysis data provided by SPLC <GO> function for GVCs geographical configuration research are attractive though with some considerations. The most important limitation is that not all companies are identified by the domicile country and require manual checking and data entering. Such work is a time-consuming and inefficient way of data collection. The support for researchers in terms of data collection and download is only basic: most of the supply chain-related data should be screenshotted and manually entered into Excel or other applications of data analysis for further processing.

The experience gained during this study revealed that Bloomberg's Supply Chain Analysis data so far may be not full, reliable and complete. The nature of this data source means that it does not provide any confirmation or evidence of the data's fullness and completeness. On the other hand, the data itself is unique and valuable for research and international business studies. The authors of this study agree with earlier calls (e.g. Boerchia and Crook, 2020) to expand the application of Bloomberg's Supply Chain Analysis data in management, business and related subject research.

The opportunities to apply Bloomberg's Professional Services Supply Chain Analysis data for other GVCs-related topics also could be considered. Data on quantified supply chain links, when relationship values, as well as cost and revenue exposures, are reported are relevant for in-depth analysis of international production networks, applying social network theory and respective analytical methodology. So far, such kind of research would be limited by data availability. So, the increase in the number of quantified supply chain relationships would be welcome by researchers and very useful for advances in international business research and studies.

Further advancements in the research on this topic could be made by processing qualitative data from media and companies' news. This approach to the research also would face challenges. It would be difficult to collect all relevant data from a wide range of globally dispersed data sources. But only a view from different perspectives and based on different data sources would provide a full and reliable understanding of the current and future global business trends.

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The article has been reviewed.
Received in June 2022; accepted in January 2023.