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IDE DISCUSSION PAPER No. 820

**MNEs and Exogenous Pandemic Shocks through COVID-19: From Context to GVC Agility**

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June 2021

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**JEL classification:** F2, F6, H12

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# MNES AND EXOGENOUS PANDEMIC SHOCKS THROUGH COVID-19: FROM CONTEXT TO GVC AGILITY

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## Abstract

In International Business (IB), the discussion of COVID-19 related GVC models driving resilience has taken momentum since May 2020. This study opts for an integrative review to help create new knowledge through the conceptualisation of exogenous shock context with its succession to disruptive responses, leading to GVC impacts through country- and MNE- dependencies, with the residual impact determining the balance between Just-in-Time and Just-in-case that, if agile, allows alignment with context. To this effect, we examine the extant body of IB literature as current stock of collective IB knowledge, highlighting research avenues supporting further conceptualizing and theorizing of GVCs.

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## Introduction

The COVID-19 pandemic has been identified as an exogenous shock in that it is now categorized less a “Black Swan” than a “foreseeable unexpected event” (Walls 2020; Becker et al. 2020). This moves its discussion, including those about Global Value Chain (GVC) vulnerability and resilience to exogenous shock research as a significant emerging field in the international business literature. The World Health Organization (WHO) declared the outbreak a Public Health Emergency of International Concern on 30 January 2020, and a pandemic on 11 March 2020. COVID-19 today is an enduring health crisis with a total of 220.7 million more confirmed cases, nearly 4.6 million deaths in more than 190 countries/territories (JHU 2021) as of September 6, 2021 and 26 cruise/naval ships (Mallapaty 2020) as of June 6, 2021, and rising due to variants such as the so-called Delta-strain. Not counting that testing did not start in the initial stages of the outbreak, many people may not have been tested and some passed without counting especially in less developed countries. The global outbreak of the COVID-19 pandemic triggered sudden yet repetitive lockdowns, varying degrees and timing of national border closure, social distancing, and other restrictive measures to curb the spread, whether for elimination or management of the virus. Those measures, impacting both domestic and international movements of people, have been reported to cause significant alterations in business operations and especially, adaptations of supply chain management. The pandemic has thus caused a severe blow to the conventional approach to GVCs.

The rise of GVC research in the International Business (IB) literature, noted especially over the past ten years, has been considered an important illustration of the rapid evolution and fragmented nature of MNEs’ (multinational enterprises) cross-border investment in recent decades, evidencing resulting interdependencies and vulnerabilities. The ‘GVC’ terminology is originally used in the economics (Krugman 1995) and in general business literature (see Gereffi et al. 2005; for the most comprehensive information about GVC-related analytical frameworks cf. Inomata (2018)). Despite the use of different terms of GVCs (international production fragmentation, offshore sourcing, global production sharing, trade in tasks etc.)<sup>1</sup>, they all focus on the similar feature of GVCs: Value chains mainly managed by MNEs are sliced up into tasks and functions across borders. This cross-border and inter- or intra-firm moving of goods, services, people, money, and information supporting global production systems is revealed to have become

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<sup>1</sup> This GVC-related literature has explored phenomena relating to GVCs from different complementary perspectives, such as originally viewed as international production fragmentation (Jones & Kierzkowski, 1990), offshore sourcing (Arndt, 1997), external orientation (Campa & Goldberg, 1997), production disintegration (Feenstra, 1998), global production sharing (Yeats, 2001), then coming to vertical specialization (Hummels et al., 2001; Yi, 2003), outsourcing (Grossman & Helpman, 2002, 2005), vertical production networks (Hanson, et al. 2005), trade in tasks (Grossman & Rossi-Hansberg, 2008), the second great unbundling (Baldwin, 2011) and global factories (Kano, et al. 2020).

more cost efficient, easier to manage, and timelier in delivery, driven mainly by both technological innovations (e.g., the great decline in transportation and communication costs and their optimization effects) and institutional factors (e.g., the reduction of tariff and non-tariff barriers under various free trade agreements and investment treaties).

Two critical ‘traditional’ (or: pre-COVID) sources of GVC efficiency are recognized by the extant body of literature as functioning together, combined:

- (1) *Global fragmentation production from the view of resource allocation geographically and***
- (2) *“Just in Time” production system from the view of resource allocation temporally.***

Yet within months of the COVID-19 outbreak, more than two-thirds of multinational investors in developing countries reported disruptions in supply chains, declines in revenues, and falls in production (Saurav et al. 2020). Real-world examples and anecdotal evidence of GVC challenges across the world are numerous as data was gathered: One amongst many, Fiat’s plant in Serbia stopped producing specific models owing to disruptions in the supply of audio system components from China. This has led a number of IB researchers of GVCs to bring forward some timely research into a global shock of unprecedented nature and hence, a possibly unique learning opportunity from this research to test and reframe the traditional efficiency discourse shedding light on resilience issues.

Kano & Oh (2020) noted “a GVC as a governance arrangement that utilizes, within a single structure, multiple governance modes for distinct, geographically dispersed and finely sliced parts of the value chain.” (p. 579), whilst Srinidh & Tayi (2004) were precursors when questioning the valence of *Just in Time* vs *Just in Case*. This brings to light key dependencies of GVCs regarding time and space, or simply put: when what is produced where in the chain. These sources exhibit the risks to GVCs during exogenous shock, due to unprecedented uncertainty and disruption to the conventional GVCs commonly sees as dominated by the ‘efficiency mindset’ (i.e., an attempt to eliminate resource misallocation geographically and temporally) and optimization at the detriment of exogenous shock resilience planning (i.e., risk-mitigation factors to counter shocks).

In other words, in a conventional model of GVC governance, the dynamics of MNEs utilizing value chains to aim to increase efficiency and productivity and reduce production costs is well documented. However, whether and how this model exposes GVCs to high levels of vulnerability, is increasingly questioned.

This paper hence examines the extant international business literature through a review that focuses on the current state of knowledge about GVCs under COVID-19, to document the current state of investigation and understanding of the COVID-19 pandemic's impact on GVCs and their conceptualisation in IB. We use this approach to set a basis for future GVC research informed by exogenous shock, by revealing key dependencies found as key themes in this literature that expose MNEs to vulnerability, their impact on GVC governance and configuration, and we highlight further research avenues that are called for to strengthen that understanding. We also build a framework supporting this early conceptualizing and ongoing theorizing efforts on GVCs under exogenous shock. We follow Snyder (2019) who argues that “the literature review as a research method is more relevant than ever” when “knowledge production within the field of business research is accelerating at a tremendous speed while at the same time remaining fragmented and interdisciplinary” (p. 333) and when it becomes timely to assess the collective evidence. This follows Webster & Watson (2002) as an instrumental path to building a solid foundation for progressing knowledge and accelerating theory development, opting here for an integrative review to help create new knowledge paths for future research.

## **Method & Sample**

We look at the current stock of pandemic risks investigations about GVCs in IB at the inception of the new decade. While COVID-19 gained global attention mainly from February 2020 onwards, IB literature on GVC started to pick up the theme at around May 2020 with its first publications. We aim to offer as comprehensive an overview as possible of the sources, mechanisms, and impacts of the shock as reflected in IB literature on GVCs. We are thereby able to extract the key dependencies that may mitigate GVC challenges and disruptions during exogenous shock, as *context*, both on country (macro) and MNE level. Also, we provide insights into the key GVC vulnerabilities and impacts seen through the lens of IB literature to date, from the explorations on GVCs potentially becoming more nationalized, localized, or regionalized to GVC models shifting production arrangement for MNEs to manage exogenous shock better. We examine the key themes for future research as suggested by the informed IB researchers who published on GVCs and COVID during that period.

Integrative literature reviews include a problem formulation (i.e., that is limited to published topics around an emerging theme) as above, here hence focused on What is the current contribution of IB research into COVID-19 as an example of exogenous shock and what future research is needed to allow for a refined conceptualisation and theory building. A literature search upon a target sample, here international business

literature is part of an integrative literature review method; followed by the evaluation of data, i.e., individual studies are examined for the strength and then contribution of relationship to the theme, though a data analysis in this method is not typically using statistical methods - in contrast to meta-analyses. Finally, the interpretation and discussion enhancing the understanding of results, i.e., dissemination including delimitation based on the ongoing expansion of the body of literature and hence, evolution which may lead to meta-analyses as a future framing tool through a synthesis of the emerging field (Cooper 1998; Russell 2005; Elsbach & van Knippenberg 2020; applied for example in: Debellis et al. 2021 and Eduardsen & Marinova 2020).

**Table 1: Journals: Article distribution, number and references**

Journal title	No of papers in sample	Reference
Journal of World Business	5	Soundararajan, et al. (2021)/Delios, et al. (2021)/ Hitt, et al. (2021)/ McWilliam, et al. (2020)/ Ambos, et al. (2021)
Journal of International Business Policy	4	Buckley (2021)/ Gereffi (2020)/ Miroudot (2020)/ Zhan (2021)
Transnational Corporations	4	Voss (2020)/ Fu (2020)/ Golgeci, et al. (2020)/ Enderwick & Buckley (2020)
International Business Review	3	De Marchi, et al. (2020)/ Ghauri, et al. (2021)/ Oliveira, et al. (2021)
Journal of International Business Studies	2	Kano, et al. (2020)
Global Strategy Journal	2	Autio, et al. (2021)/ Dindial & Voss (2020)
Journal of Management Studies	2	Kano & Oh (2020)
Critical Perspectives on International Business	1	Curran, et al. (2021)
British Journal of Management	1	Verbeke, A. (2020)
International Journal of Emerging Markets	1	Arora & Hartley (2020)
European Management Review	1	Magableh (2021)
Problems and Perspectives in Management	1	Veselovská (2020)
Management and Organization Review	1	Williamson (2021)
East Asian Economic Review	1	Miroudot (2020)
Asian Economic Journal	1	Kimura, et al. (2020)
Journal of International Logistics and Trade	1	Kwon (2020)
The World Economy	1	Espitia, et al. (2021)
Regional Science Policy & Practice	1	Ferreira, et al. (2021)

Given this COVID-19 literature has emerged since early 2020, this paper reviews a total number of 33 recent publications. The selection of the sample (Table 1) followed a simple protocol established to focus exclusively on articles published in IB journals: They exclusively focus on “COVID-19” and “GVC”s and are published in IB journals from April 2020 to May 2021. The articles were sourced through a manual search and scrutiny of publications of journals that focus on IB, via Scopus and Web of Science in this

period of time, and that include the keywords “COVID-19” and “GVC” and, as checked through reading, focus on their relationship. In our introduction and discussion, additional relevant literature is brought in from other contextual sources (such as health, transport, economic policy) that adequately illustrate additional context and may indicate potential cross-disciplinary contribution.

### **Views on the sources of pandemic risks & their importance for GVCs**

A pandemic is an epidemic occurring on a scale that crosses international boundaries, usually affecting people on a worldwide scale (Porta 2008). Pandemics have occurred throughout human history (e.g., smallpox, tuberculosis, and the Black Death), although the term “pandemic” was not always used. Pandemics appear to be increasing in frequency (e.g., 1918 influenza, HIV/AIDS, the 2009 swine flu, and the current COVID-19 pandemic). Although “a worldwide scale” is a condition defining pandemic, the term “pandemic” is also broadly used for regional and seasonal epidemics in many cases, such as the Asian Flu (1957–1958), Influenza A (H3N2, 1968), SARS (2002–2004), and MERS (since 2012).

The source of pandemic risks is the “virus” itself. In most cases, the threat of cross-species transmission events leads to outbreaks in humans (Menachery et al. 2020). For example, the 1918 influenza pandemic was caused by an H1N1 virus with genes of avian origin, which “was special—a uniquely deadly product of nature, evolution, and the intermingling of people and animals” (Tumpey et al. 2005). Scientists generally accepted that HIV in humans arose by cross-species transmission from chimpanzees in the African region (e.g., Takehisa et al. 2009; Sharp & Hahn 2010). Moreover, species of bats are considered a natural host of coronaviruses closely related to those responsible for the SARS outbreak in 2002 to 2003 in southern China (Li et al., 2005). Concerning the origin of the COVID-19 virus, we might not determine precisely how humans were initially infected with SARS-CoV-2, but we do believe scientists need to be given sufficient time to reach an answer.

Whether, to whom, and to what extent a virus, such as the SARS-CoV-2, could cause pandemic risks mainly depend on its epidemiological features and on its early detection, which can minimize the risk of a full-fledged pandemic. Epidemiologically, the SARS-CoV-2 virus spreads more easily, causes more severe illnesses in some people, and can take longer before people show symptoms; moreover, people infected with SARS-CoV-2 virus can be contagious for a longer period than those infected with influenza viruses (USCDC 2021). Recently, scientists have found that the variants of COVID-19 tend to spread faster and are more transmissible or more infectious (WHO 2021a, 2021b). More recent insights from Lund et al. (2020) at the McKinsey Global Institute further highlighted that ending the pandemic could require



COVID-19 vaccination uptake ranging between 58% and 94%, which is higher than most adult-vaccine benchmarks. Recent studies have shown clear evidence that countries with higher levels of socioeconomic globalization are exposed to higher levels of case fatality ratio (e.g., Farzanegan et al. 2020). This is mainly because the COVID-19 virus is unprecedented in its capacity to take advantage of modern globalization allowing for massive trans-border spread at a surprising speed (Mas-Coma, et al. 2020).

The epidemiological factors of the SARS-CoV-2 virus may be combined with many other factors (e.g., social, economic, political, cultural, and public health-related factors) to drive pandemic risks to impact various aspects of GVCs – and to prepare for further pandemics into the mid- and long-term future. Learning from exogenous shocks – and especially, this pandemic- provides the society (and business therein) with a unique opportunity for better resilience into the future. Investigating GVC-related risks and solutions are inherent part of this opportunity, and instrumental to better understanding the nature of future MNE operations across borders.

### **Key insights on mechanisms of GVC contagion & measures through COVID-19 impacts**

Literature since early 2020 provides insights into the exogenous shock resulting from COVID-19, affecting GVCs firstly through market mechanism that led to GVC risk contagion: The adjustment of demand and supply enforces “stress response” (e.g., risk avoidance behaviors, activities, and actions) by individuals, firms, investors, governments, and other market agents via multiple channels. Note that all stress responses may cause or transfer the pandemic impacts on or to both supply and demand upstream and downstream along GVCs (Gereffi 2020; Guan et al. 2020; Pisch 2020; Ferreira, et al. 2021).

During the pandemic, people tend to be more self-restrained in their working and consumption activities in the so-called “3Cs” environment (i.e., closed spaces with poor ventilation, crowded places with many people nearby, and close-contact settings such as closer-range conversations). Consequently, the supply of labor forces into GVCs, alters through a decline in labor force participation, an increase in work absenteeism, and a decrease in working hours (Cowan 2020; ILO 2021). Simultaneously, the COVID-19 outbreak also altered work modes, and accelerated remote working (teleworking or work from home), as quarantine and lockdown made millions of people unable to commute and work in their offices. For example, in 2020, about 75 million US employees worked from home at least part time (56% of the workforce) (GWA 2020), whereas in 2019, only 7% of civilian workers in the United States had access to a “flexible workplace” or telework, according to the 2019 National Compensation Survey (NCS 2019). Accordingly, an enormous surge in demand for some goods and services (e.g., medicines, ICT goods, and

online services), due to changes in consumer behaviors and working styles, has been placed under severe strain. However, the demand for many manufactured goods and services, including airlines, tourism, accommodation, restaurants, and sports, which are normally provided in the “3Cs” environment, and other business-supporting sectors, which highly depend on face-to-face communication, were hit seriously (OECD 2020). In particular, transferring to a new digitally enhanced business model through the adoption of new or more online technologies, such as e-commerce, e-entertainment, live-stream conferencing, and remote working, has proven difficult.

During the pandemic, companies have been challenged to achieve full-state operations in a short time, though pressured by clients for immediacy, thus leading to a drop in production. However, business disruptions due to the pandemic are not specific to GVCs per se, but to locations where the virus has spread and hence unevenly distributed in space and time. Both supply- and demand-side changes are highly correlated and have synergy effects on the real economy. For example, the drop or stop in production typically further causes cuts and layoffs, which means that income during the pandemic can no longer sustain the same consumption in the past. Moreover, as total consumption will drop, the structure of personal consumption shifts because of public health concerns, thus leading to demand-side shock (Sahoo and Ashwani 2020; Kwon 2020; Baqaee and Farhi 2020; Maliszewska, et al. 2020). A recent economic model analysis (Baqaee & Farhi, 2020) shows that “supply and demand shocks each explain about half the reduction in real GDP of the US from February to May 2020.” Furthermore, the supply–demand synergy effects dynamically impact investment markets, affecting investor information and changing their short-term decisions, thereby increasing market and location uncertainty (Van Bavel, et al. 2020; Hitt, et al. 2021; Soundararajan, et al. 2021).

The highly complex and integrated nature of existing GVCs amplifies risks regarding the logic of value-adding at each production stage, i.e., one of the most important sources of GVC efficiency. According to Strange (2020), “the corollary is that no country is immune to the health and economic impacts of the virus unless it is totally isolated from the rest of the world.” For example, for the purpose of herd immunity, Sweden conducted an unorthodox, open-air experiment without lockdown measures at the start of the COVID-19 pandemic in Europe: it still suffered a large economic loss, compared with locked-down neighboring countries (Goodman 2020). This has allowed the world to examine the significance of supply chain propagation in transferring pandemic risks upstream and downstream across countries and firms along GVCs. Baldwin and Freedman (2020) argue that trade disruptions in global supply chains due to COVID-19 economic shocks could lead to a high contraction in demand. As manufacturers worldwide rely on Chinese inputs, it was reported that the closure of factories in China impacted other countries through

“supply-chain contagion” waves at the start of the pandemic. As China resumed production and the economy recovers, the rapid spread of the pandemic in the other two supply chain centers, Germany and the United States, has caused “reverse supply-chain contagion,” which is the industrial equivalent of re-contagion.

Mandatory and non-mandatory measures and governmental policy actions, such as city or state lockdown, school closures, social distancing and national border closure, pose risks to GVCs. Those measures reduce human mobility (Grossman et al. 2020; Yabe et al. 2020), thus contributing to mitigate the spreading of coronavirus (Yabe, et al. 2020). At the same time, those measures may hit the real economy directly and indirectly because of the sudden decline of willingness to move around and conduct activities. For example, a model-based analysis of Inoue & Todo (2020) shows that if Tokyo were locked down for a month, the indirect economic effect via supply chain propagation on other regions of the country would be twice as large as the direct effect on Tokyo; Guan et al. (2020)’ study confirms propagation effects through GVC via forward and backward linkages even to countries not directly affected by COVID-19. In a scenario where COVID-19 is strictly contained within China, GDP losses for China are substantial (16.7% of China’s annual GDP) but propagation via GVCs--within and beyond China--raise losses to 21.5%; impacts on migration and the ability for business to move their talents around or individuals to expatriate or repatriate (Delios, et al. 2021). This is also reported to reduce working efficiency (Wren-Lewis 2010), production productivity (Dieppe, 2020), and interconnectedness, which are factors that firms rely on in conducting global business (Vidya & Prabheesh 2020).

Additionally, the policy coordination among countries and nationalistic vs collaborative behaviours also affects the impact of the pandemic on GVCs: Whilst coordinated arrangements can dynamically share infection and economic risks and solutions internationally, in the Nash equilibrium, “uncoordinated trade policies robustly feature inefficiently high tariffs ... This distorts terms of trade dynamics and magnifies the welfare costs of tariff wars during a pandemic due to lower levels of consumption and production and smaller gains via diversification of infection curves across economies” (Acharya, et al. 2020). Table 2 below summarises specifically the IB – focused key insights found in literature. They are found to center on impacts of the pandemic characterized by ripple effects, i.e., multiplier effects across GVCs, that includes: Stress response of stakeholders, remote or “3Cs” impact, changes to new digitally enhanced business models, production/operations acceleration issues, governmental policy, International Relations and Value-add locations disruptions.

**Table 2: Summary of Key insights into COVID-19 challenges to GVCs and resulting impacts**

<b>COVID-impacts for GVCs/ Ripple effects</b>	<b>Modifications/Adaptations</b>	<b>Key literature</b>
Stress response of stakeholders	Adjustment of demand and supply	Bonadio, et al. 2020/ Sahoo, et al. 2020/ Gereffi 2020/ Magableh 2021/ Williamson 2021/ Kwon et al. 2020
“3Cs” environment	Altered supply of labour forces & Ways of Working	Voss 2020/ De Marchi, et al. 2020
Change to new digitally enhanced business model	Surge & drop in demand	Agrawal, et al., 2021/ Autio, et al. 2021/ Miroudot 2020a/ Oliveira, et al. 2021/ Fu 2020/ Kwon, et al. 2020/ Ghauri, et al. 2021/ Kano, et al. 2020
Governmental policy	Reduced human mobility (talent, efficiency, productivity, interconnectedness for global operations)	Delios, et al. 2021/ Kano & Oh 2020/ Kimura, et al. 2020/ Miroudot 2020b
International Relations impact	Distorted trade dynamics and associated gain patterns	Buckley 2021/ Curran, et al., 2021/ Dindial & Voss 2020/ Espitia, et al. 2021/ Ferreira, et al. 2021 Miroudot 2020a/ Enderwick & Buckley 2020.
Value-add locations disruptions	GVC upstream and downstream issues	Kumagai, et al. 2020/ Maliszewska, et al. 2020/ Sforza & Steininger 2020/ Guan, et al. 2020/ Pla-Barber, et al. 2021
Production/Operations acceleration issue	Cuts and layoffs, demand-shock	Maliszewska, et al. 2020

### **Pandemic Impact dependencies for GVCs: The Foundation of a Resilience wall**

COVID-19 hit the value-added centers of GVCs (China, USA, Germany) (Suder, et al. 2015, 2017; Xiao et al. 2020) causing highly impactful disruptions that determined ripple impacts throughout all phases of the production networks, from material supplies, production, processing to distribution (Kumagai, et al. 2020; Gereffi 2020). This is mainly because both countries and firms are deeply involved in GVCs via complex linkages of trade and investment (e.g., 80% of trade occurs in value chains linked to transnational corporations) (UNCTAD 2013). As a result, the impacts of COVID-19 for a given country or region not only depend on its economic size and ability to cope but also on the degree of openness, participation, and position of the country or region in GVCs (Maliszewska, et al. 2020; Sforza & Steininger 2020) that can provide resilience through agility, balancing Just in Time and Just in Case as needed. Developed countries with a strong comparative advantage in knowledge-intensive industries (e.g., services sectors) appear in the high end of GVCs. Meanwhile, developing countries with a strong comparative advantage in labor-intensive industries (e.g., manufacturing or assembling sectors) occur in the low end of GVCs (Meng et al. 2020; Meng & Ye 2020), with less agility to adapt to shock (intuitively linked to lack of control). This

could partly explain why developed countries' services exports, developing countries' goods exports, and developing countries' jobs in small firms (vs. large firms) are likely hit harder by COVID-19 in the short run (Maliszewska, et al. 2020; UNCTAD 2020; Arora & Hartley 2020)

Moreover, the COVID-19 pandemic has introduced an unexpected new level of uncertainty into GVCs that creates a residual degree of risk, we find, that is described as difficult to manage even if agile and/or at the high end. Take the United States as an example. Indicators of economic uncertainty (e.g., stock market volatility, newspaper-based measures, and business expectation surveys) are at historical highs. In addition, the negative impacts of COVID-19-induced economic uncertainty explain about 60% of the output contraction for the United States (Baker McKenzie 2020). Furthermore, according to recent reports, global FDI (Foreign Direct Investment) flows decreased by 49% in the first half of 2020 compared with 2019, as foreign affiliates experienced difficult operational, market-related, and financial conditions, with profits plummeting (UNCTAD 2020). Given the fact that FDI is one of the most salient forms and key drivers of GVCs, the extreme uncertainty about the path, duration, magnitude, and impact of the pandemic could pose a vicious cycle. In turn, this alters investment confidence, changes short-term decisions, and creates spillovers to the whole GVC activities (Hitt, et al. 2021), thus potentially leading to job loss and investment in some locations and sectors and gains in others. This includes the important discussion of future GVC-bound focus on human rights and sustainability (Voss 2020). Also, governments are facing great challenges in designing and conducting a well-balanced policy package with impact on effectively mitigation for MNEs of the impact of COVID-19 on GVCs (Buckley 2021) and support, attract or maintain industry for resilience and recovery planning (Miroudot 2020a; Fu 2020) as well as appropriate trade relations and measures (Curran, et al. 2021; Ferreira et al. 2021) and regional cooperation (Kimura, et al. 2020; Enderwick & Buckley 2020).

Additionally, GVCs are mainly organized and dominated by MNEs, which “account for roughly one-half of international trade, one-third of output and GDP, and one-fourth of employment in the global economy” (Cadestin 2019). Therefore, for a given industry or firm, the impacts of COVID-19 are reported as highly depend on the intra or inter-firm relationship between MNCs and domestic firms or between large firms and SMEs (Oliveira, et al. 2021). The impacts also depend on what type or model of GVC governance has been implemented (Pla-Barber, et al. 2021; Soundararajan, et al. 2021; De Marchi, et al. 2020; McWilliam, et al. 2020; Verbeke 2020), and oftentimes, a discussion of the traditional focus on efficiencies (Golgeci, et al., 2020; Kwon 2020). For example, the “factory-less” goods phenomenon is still seen as a critical feature of the current GVC arrangement (Bayard, et al. 2015; Xing 2021). Namely, an increasing number of MNEs, especially those from developed countries (e.g., Apple, the world's largest consumer

electronics maker; Nike, the world's no. 1 athletic shoemaker; Advanced Micro Device, fabless semiconductor manufacturer; Fast Retailing Co., Japan's largest fashion producer; and Hennes & Maurita AB, a Swedish clothing-retail) have no production facilities, but they own the rights to the intellectual property or design of the products manufactured or assembled by "factory-less goods producers" typically located in developing countries (Dindial & Voss 2020). This phenomenon could also be confirmed by the fact that an estimated 90% of the market value of the S&P 500—the 500 largest firms on the US stock market, most of which are involved in international trade—came from intangible assets in 2020 (Ocean Tomo 2020). A recent research from IMF (Georgieva, et al. 2021) highlighted that "the COVID-19 crisis has hit SMEs especially hard, causing massive job losses and other economic scars. Among these, although less noticeable but serious, is the rising market power among dominant firms as they emerge even stronger, whereas smaller rivals fall away", reflected also in IB literature including in the exploration of power relationships (Oliveira, et al. 2021).

Further, according to a new business survey report by McKinsey & Company (2020), "COVID-19 has speeded the adoption of digital technologies by several years—and that many of these changes could be here for the long haul." The notion of a tipping point for technology adoption or digital disruption is not new, but this survey suggests that "the COVID-19 crisis is a tipping point of historic proportions—and that more changes will be required as the economic and human situation evolves." This is reflected in new 'realities' of GVCs under this exogenous shock (Ghauri 2021; Autio et al. 2021). However, not every country or firm is ready to embrace a more digitized existence, innovation (Ambos, et al. 2021) or remote work resulting in disadvantages for example in contracts and hence less GVC participation (Espitia, et al. 2021): One concern is that countries (e.g., digital-technology-forward vs. digital-technology-backward countries) and firms (e.g., large MNCs vs. domestic SMEs) located in different positions (low-end vs. high-end) in GVCs, that is, a kind of country or firm level digital divide, vary significantly in the capacity of digital technologies, the ability of the application of those technologies, and the ability of R&D on those technologies. This may pose great challenges to countries and firms with less digital technologies or less bargaining power in contract negotiation, thus hampering the ability of large parts of the world to take advantage of technologies that help GVCs cope with the pandemic. For example, Agrawal, et al. (2021) showed that "companies whose industry 4.0 implementation is more mature report stronger ability to repose to crisis."<sup>2</sup>

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<sup>2</sup> Note that not all damages by COVID-19 could be mitigated by introducing new technologies (e.g., digitalization, remote working, and online conference) in the short run. COVID-19 may eventually become as common as the flu (a kind of new normal) and the development of vaccine could not always win the race with virus variants. Given these

**Table 3: Impact Dependencies: Foundations to a resilience wall of mitigation**

<b>Country = level dependencies</b>	<b>Key Sources/Literature</b>
Participation, and position of the country or region in GVCs	Maliszewska, et al. 2020/ Sforza & Steininger 2020/ Dindial & Voss 2020/ Ambos, et al. 2021
Degree of openness	Maliszewska, et al., 2020/ Sforza & Steininger 2020/ Curran, et al. 2021
Relative changes in the exporting countries' competitiveness and their trading partners	Espitia, et al. 2021/ Miroudot 2020a/ Enderwick & Buckley 2020
Other: Locus of comparative advantage: knowledge or labor-intensive industries, initial output and export by industry and destination composition, mitigation policy choices.	Kano,et al. (2020)/ Williamson (2021)/ Sahoo & Ashwani (2020) / Buckley (2021)/ Curran, et al. (2021)/ Ferreira, et al. (2021)/ Gereffi (2020)/ Kimura, et al. (2020)/ Miroudot (2020)/ Zhan (2021)/ Pla-Barber, et al. (2021)/ Enderwick & Buckley (2020)
<b>MNE – level dependencies</b>	<b>Key Sources/Literature</b>
Intra or inter-firm relationship between MNCs and domestic firms, or large firms and SMEs	Espitia, et al. (2021)/ Hitt, et al. (2021)/ McWilliam, et al. (2020)
Model of GVC governance - “factory-less” goods phenomenon - High or low end of value-added contribution	Pla-Barber, et al. (2021)/ Veselovská (2020)/ Soundararajan, et al. (2021)/ De Marchi, et al. (2020)/ McWilliam (2020)/ Verbeke (2020)
Supply chain efficiency vs preparedness	Buckley (2021)/ Veselovská (2020)/ Zhan (2021)/ Pla-Barber, et al. (2021)/Golgeci, et al. (2020)
Investment confidence: changes in short-term decisions	Miroudot (2020a)/ Pla-Barber, et al. (2021)
Locus of competitive advantage: digitalization & innovation	Autio, et al. (2021)/ Oliveira, et al. (2021)/ Fu (2020)/ Kwon (2020)/ Ambos, et al. (2021)

### **Where to from here for exogenous shock research on GVCs? A suggested IB research framework based on the COVID-19 pandemic**

The purpose of this integrative literature review was to combine perspectives explored in International Business literature since the outbreak of COVID-19, underpinned by GVC sources seen as contextually relevant in that literature, to help form a framework for future IB research on exogenous shock (rather than to cover all articles published on the topic research (Snyder 2019; Palmatier et al. 2018) and to set a basis for the future in what served as initial and maturing observations in the emergence and through the rolling

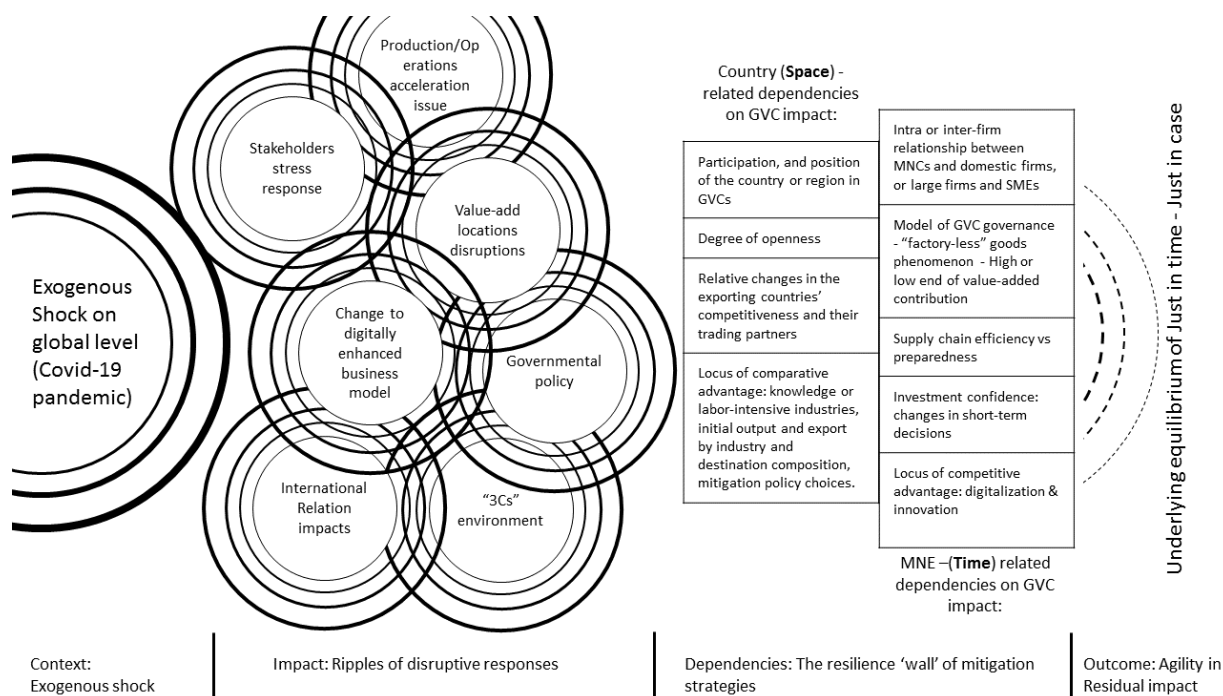
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worst-case scenarios, businesses in GVCs will need to start considering what warrants face-to-face interaction and how to make the most of those precious opportunities, taking a good balance for resource allocation between virtual and face-to-face activities.

nature of the COVID-19 pandemic and its impact on GVCs. We hence focused on a sample of 33 key IB published from April 2020 to May 2021.

We found that the *Journal of World Business*, followed by the *Journal of International Business Policy* and *Transnational Corporations*, as well as the *International Business Review* paid most attention to the analysis of COVID-19 and GVC impacts in IB within the period assessed, hence crucially paving the way for this emerging research adaption to *context*. Examining views on the sources of pandemic risks and their importance for GVCs allowed us to reveal key dependencies between the exogenous shock, i.e., context, and the impacts investigated by this literature on GVC. We were able to categorize those as macro and MNE dependencies, with an additional overarching assessment of key vulnerabilities and impacts emphasised in this literature. This was anchored into a basis of insights on mechanisms of GVC contagion through COVID-19 impacts, using as basic assumption - as shared across this literature - that the traditional GVC governance model (designed for efficiency, cost, and proximity to markets with pre-dominance for just in time) has shifted to accommodate adaptation and adjustment to resilience and just in case considerations.

**Figure 1:** GVC resilience conceptualisation – Exogenous shock scenario: COVID-19





The fragmentation and sophistication of GVCs is viewed in this literature as having evolved dramatically over the past twenty years, with warnings expressed during the shock of 09/11 appearing to have had little relation with the need of preparing for a truly globalised pandemic or the recognition of potential lessons learnt as such. Our review rather revealed that whilst the exogenous shock caused by COVID-19 has been shown to impact GVCs through dependencies on country- and MNE- level combined, the key challenges in their ‘rolling’ globally phased, concurrent and recurrent nature and/or scale truly are seen as unprecedented. Figure 1 hence illustrates a framework that we can construct from our findings into the essential dependencies that come to light through this comprehensive analysis of insights provided by IB literature, brought together to develop this conceptual framework.

This conceptual framework visualises the succession from exogenous shock as context to what we call ‘ripples’ of disruptive responses, leading to GVCs being impacted by both country – and MNE - dependencies, with the residual impact determining the (uncertain) balance or quest for equilibrium between Just in time and Just in case - that, if agile, is expected to allow for alignment with context.

We base this on the commonly shared assumption in IB literature that GVC efficiency was viewed as having at least two sources:

- (1) “Just in Time” production systems, from the view of time-related resource allocation by MNEs (across: ‘time’), and***
- (2) Global production fragmentation, from the view of space-related resource allocation in particular locations (here: across ‘countries’).***

These two forces were conceptualised as functioning together. However, as the literature unanimously reports, context in the shape of COVID-19 has impacted both dimensions, i.e., both space and time, and within this ‘folded’ context alteration, these GVC governance models have shown to not being sufficiently mitigated (or: calibrated) to provide adequate solutions during exposure of exogenous shock characterised by cross-border reach, concurrent and recurring impact. This understanding, triggered through exogenous shock on global scale through COVID-19, has moved IB research into GVCs from a view of predominant efficiency and optimisation to assessing what went wrong, how and why, what went well and how to mitigate dependencies and hence, context, for greater GVC stability. As Brakman et al. (2020) argues, COVID-19 transforms modern “just in time” management into a “just in case” counterbalance because resilience will be priced and discounted for by enterprises and governments alike, leading to an increase in inventory holdings to cushion negative shocks in the future. This bring a range of reconfiguration

dependencies into play, recognised as key avenues to be investigated, conceptualised and theory-built through future research. Table 4 below summarises these themes by number of mentions in the IB literature reviewed for this article.

**Table 4: Key themes for future GVC- exogenous shock (pandemic) research**

<b>Key theme recommended</b>	<b>Papers making that recommendation</b>
Different geographic contexts - operating in different emerging market – global & regional orchestration - networks	De Marchi, et al. (2020)/ Buckley (2021)/ Espitia, et al. (2021)/ Kano & Oh (2020)/ Arora & Hartley (2020) / Kano, et al. (2020)/ Kimura, et al. (2020)/ McWilliam, et al. (2020)/ Miroudot (2020a)/ Verbeke (2020)/ Williamson (2021)/ Enderwick & Buckley (2020)/ Pla-Barber, et al. (2021)
How institutional adaptation occurs in complex global organization - multiple, potentially competing institutional forces – non-market strategy- intl. trade & investment policy	De Marchi, et al. (2020)/Arora & Hartley (2020)/ Buckley (2021)/ Curran, et al. (2021)/ Ferreira, et al. / (2021)/ Kano & Oh (2020)/ Kano, et al. (2020)/ Kimura, et al. (2020)/ McWilliam, et al. (2020)/ Miroudot (2020a)/ Miroudot (2020b)/ Zhan (2021)
Knowledge, innovation & digitalisation impacts	Autio, et al. (2021)/ Kano, et al. (2020)/ Magableh (2021)/ Miroudot (2020a)/ Williamson (2021)/ Ambos, et al. (2021)/ Oliveira, et al. (2021)/ Fu (2020)/ Kwon (2020)
Mixing methodologies – Input-Output techniques - Efficiency, Performance, Resources – Sectors – Customer focus	Ferreira, et al. (2021)/ Kano & Oh (2020)/ McWilliam, et al. (2020)/ Miroudot (2020a)/ Veselovská, L. (2020)/ Zhan (2021)/ Ambos, et al. (2021)/ Pla-Barber, et al. (2021)/ Kwon (2020)
Just-in-time vs just-in-case; Agile vs top-down Governance – Value-added mechanisms	Miroudot (2020b)/ Soundararajan, et al. (2021)/ Dindial & Voss (2020)/ Kano & Oh (2020)/ McWilliam, et al. (2020)/ Verbeke (2020)/ Oliveira, et al. (2021)
Sustainability post-crisis – future resilience options– future benefits - inclusiveness	De Marchi, et al. (2020)/Gereffi (2020)/ Magableh (2021)/ Veselovská (2020)/ Enderwick & Buckley (2020)/ Voss (2020)/ Golgeci, et al.(2020)/ Kwon (2020)
Supplier managerial decision logic – Lead-supplier management – contracts management	Soundararajan, et al. (2021)/ Buckley (2021)/ Kano, et al. (2020)/ Verbeke (2020)
Protectionism - techno-nationalism - localisation	Delios, et al. (2021)/ Kano, et al. (2020)/ Golgeci, et al.(2020)

Future research is mainly invited to look into the themes emerging from different geographic contexts, and variables and dependencies not yet fully investigated. Amongst them, IB researchers call to reinforce that IB researchers recognise a long-term importance of GVCs operating indifferent emerging market, across networks and in need for appropriate global & regional orchestration. Also, by logic, additional key questions focus on, how institutional adaptation occurs in complex global organization, within contexts of multiple, potentially competing institutional forces, influenced by the interplay of non-market strategy, international trade and investment policy that require further investigation of this (and potentially other) exogenous shock into the future. A key theme here is also the research required into knowledge, innovation & digitalisation and their impact on GVCs and their governance, especially through a view invited by an important number of IB research to develop through mixed methodologies, including Input-Output

techniques, foci on Efficiency, Performance, and Resources, across sectors and adding a customer focus to that of the lead and the supplier network. This call for a blend of methodologies to better understand and advance GVC-focused literature in future IB is interesting as it reflects a quasi-balance of methodology in the sample's papers, see Table 5 below.

**Table 5: Methodologies used in key IB papers sample**

<b>Methodology</b>	<b>Papers</b>
Qualitative	Soundararajan, et al., (2021), Delios, et al., (2021), Buckley (2021), Curran, et al. (2021), Gereffi (2020), Ghauri, et al. (2021), Hitt, et al. (2021), Kano, et al. (2020), Kimura, et al. (2020), Magableh (2021), McWilliam, et al. (2020), Williamson (2021), Zhan (2021), Ambos, et al. (2021), Enderwick & Buckley (2020), Pla-Barber, et al. (2021), Voss (2020), Fu (2020), Golgeci, et al.(2020), Kwon (2020).
Quantitative or mixed	De Marchi, et al. (2020), Sahoo, et al., (2020), Autio, et al. (2021), Dindial & Voss (2020), Espitia, et al. (2021), Ferreira, et al. (2021), Miroudot (2020a), Miroudot (2020b), Veselovská (2020), Oliveira, et al. (2021)

This confirms the contemporary evolution of IB in terms of an increasing openness to methodologies that link and leverage contributions made to IB, for example the important role of input-output analysis (Ferreira et al. 2021; Miroudot 2020a; Meng 2020; Inomata 2018; Suder, et al 2015, et al.). Further future avenues of research are seen in the better understanding of an optimal 'Just-in-time vs just-in-case' equilibrium with calls for further work on the tension between agile vs top-down governance and the adaptation of value-added mechanisms. The question of future sustainability post-crisis, future resilience options, future benefits and inclusiveness is similarly important. What can we take from this exogenous shock conceptualisation into future theory – building? Finally, researchers also call for further research into the supplier managerial decision logic in this context, as well as lead- supplier management and contracts management: will the pandemic have shaped those relations into the future, with benefits to GVCs and lessons learnt for contextual changes including future pandemics or other exogenous shocks across borders? Will protectionism, techno-nationalism, GVC repatriation and localisation play an important and ongoing role for IB to dive deeper into, to make our contributions more rigorous and relevant when it comes to context?

As COVID-19 mutates and continues to roll across borders recurrently and concurrently, it has highlighted pre-existing contextual vulnerabilities in GVCs, prompting participants to realign their strategies (Silverthorne 2020). GVCs may undergo certain reconfigurations in the post-pandemic world, including strategic supply chain diversification (Gereffi 2020), greater localization of production of

essential supplies, and a reduction in ‘irreversible’ investments abroad (Verbeke 2020). Policymakers from various countries have suggested turning inward to make essential goods, for value chains to assure “sovereign” and “independent” supplies.

Is it true that “Managing GVCs, where resilience begins to battle for efficiency and effectiveness as the dominant objective, will become a more complex task” (Delios, et al. 2021) ?

We would like to borrow the words of mathematician John Allen Paulos to conclude this paper: “Uncertainty is the only certainty there is, and knowing how to live with insecurity is the only security.” We opted to document the current state of investigation and understanding of the COVID-19 pandemic’s impact on GVCs, using this approach to set a solid basis for future GVC research informed by exogenous shock. As in our outset, assessing the collective evidence for knowledge production within this field of IB research served us to frame the future: accelerating of research in a field that is core to the IB discipline.

**Acknowledgments:** This paper was partly supported by Japanese KAKENHI (#20KK0033# “Global Value Chain Reconstruction in the Post COVID-19 Pandemic Era: Interdisciplinary Research Based on Big Data” and the IDE-JETRO research project “Global Value Chain in Transition” (2020-2022) (used as a background paper for the “Global Value Chain Development Report 2021: Beyond Production”).

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